

PDP-11 CIS INST EXERCISER
CZKEEC.P11

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IDENTIFICATION

PRODUCT CODE: AC-F226C-MC
PRODUCT NAME: CZKEECO PDP-11 CIS INST EXERCISER
DATE: APRIL, 1981
MAINTAINER: BASE SYSTEMS DIAGNOSTIC ENGINEERING

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THE CIS INSTRUCTION EXERCISER TESTS ALL CIS INSTRUCTIONS IN BOTH REGISTER AND IN-LINE MODES. EACH INSTRUCTION IS TESTED USING ALL COMBINATIONS OF OPERAND DATA TYPES, IN EACH OF THE THREE POSSIBLE PROCESSOR MODES (USER, SUPERVISOR, KERNEL), WITH MEMORY MANAGEMENT ENABLED/DISABLED, WITH D-SPACE ENABLED/DISABLED, IN AN INTERRUPT ENVIRONMENT, FOR MANY CASES OF STRING LENGTH, STRING ADDRESS AND STRING DATA.

THIS PROGRAM IS NOT DIRECTED AT ANY ONE CIS HARDWARE IMPLEMENTATION BUT RATHER IS INTENDED TO PROVIDE THOROUGH INSTRUCTION EXERCISING FOR ALL PDP-11 CIS PROCESSORS.

1.1.1 STRUCTURE OF PROGRAM

THIS DIAGNOSTIC OCCUPIES 28K WORDS OF MEMORY AND IS COMPATIBLE WITH XXDP, ACT AND APT. IT CAN BE RUN STANDALONE UNDER XXDP, AND CAN BE CHAINED UNDER XXDP, ACT AND APT (REFERENCE XXDP USERS MANUAL FOR DETAILS OF CHAINING PROCEDURE).

THIS PROGRAM SETS UP FOR AND EXECUTES ONE CIS INSTRUCTION AT A TIME AND THEN COMPARES RESULTS WITH EXPECTED RESULTS. ERROR MESSAGES IDENTIFY ALL OPERANDS AND STRING DATA ASSOCIATED WITH THE FAILING INSTRUCTION TEST CASE. THE PROGRAM IS STRUCTURED AS A SINGLE COMPLEX LOOP WHICH GETS REEXECUTED ONCE FOR EACH INSTRUCTION TEST CASE. INSTRUCTION OPERANDS FOR EACH TEST CASE ARE EITHER EXTRACTED FROM INPUT TABLES OR GENERATED USING A RANDOM NUMBER GENERATOR. EXPECTED RESULTS ARE COMPUTED IN THE LOOP BY EMULATING CIS INSTRUCTIONS USING THE BASIC PDP-11 INSTRUCTIONS.

1.1.2 DIAGNOSTIC INFORMATION

1.2 SYSTEM REQUIREMENTS

1.2.1 HARDWARE REQUIREMENTS

PDP-11 PROCESSOR (WITH CIS CAPABILITY) WITH 28K OR MORE OF MEMORY
CONSOLE DEVICE (LA30, LA36, VT50, ETC.)
PROGRAM LOAD DEVICE (PAPER TAPE, APT, ACT, DISK, MAGTAPE, ETC)
OPTIONAL HARDWARE:
1 OR 2 KW11-P PROGRAMMABLE REAL TIME CLOCKS
1 MHZ OSCILLATOR

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1.2.2 SOFTWARE REQUIREMENTS

1.3 RELATED DOCUMENTS AND STANDARDS

XXDP USERS MANUAL
DEC STANDARD 168 (PDP11 EXTENDED INSTRUCTIONS)

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

ALL BASE PROCESSOR DIAGNOSTICS AND THE CIS DIAGNOSTIC
SHOULD BE RUN ERROR FREE BEFORE ATTEMPTING TO EXECUTE THIS
CIS INSTRUCTION EXERCISER.

1.5 ASSUMPTIONS

THE HARDWARE OTHER THAN THE SUBSYSTEM BEING TESTED IS ASSUMED TO WORK
PROPERLY. FALSE ERRORS MAY BE REPORTED IF THE PROCESSOR, MEMORY, ETC.,
DO NOT FUNCTION PROPERLY.

2.0 OPERATING INSTRUCTIONS

2.1 LOADING AND STARTING PROCEDURES

2.1.1 LOADING PROCEDURES

THIS PROGRAM MAY BE LOADED FROM PAPER TAPE USING THE ABSOLUTE LOADER.
IT MAY ALSO BE LOADED FROM ANY XXDP LOAD MEDIA. THE PROGRAM IS
BOTH APT AND ACT COMPATIBLE AND CAN BE DOWN LINE LOADED
INTO THE SYSTEM UNDER TEST FROM THE APT OR ACT HOST PROCESSOR.

2.1.2 STEPS FOR QUICK AND SIMPLE EXECUTION

THE DIAGNOSTIC CAN BE EXECUTED STANDALONE WITHOUT READING THE REMAINDER OF THIS
DOCUMENT, AS FOLLOWS:

- A) LOAD THE DIAGNOSTIC
- B) START AT ADDRESS 200
- G) GET END OF PASS MESSAGES OR ERROR MESSAGES

2.1.3 STARTING PROCEDURE

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THE NORMAL PROGRAM STARTING ADDRESS IS 200. AN OPTIONAL STARTING ADDRESS (204) PROVIDES FOR USER SELECTION OF INSTRUCTION(S) TO TEST AND USER CONTROL OVER TEST ENVIRONMENT. AN OPTIONAL STARTING ADDRESS (210) PROVIDES A QUICK VERIFY (ONLY) MODE TAILORED TO THE PROCESSOR TYPE UNDER TEST TO RUN IN LESS THAN 5 MINUTES PER PASS AND PROVIDE A FAIR LEVEL OF MICROCODE COVERAGE (>80%).

STARTING ADDRESS = 200

STARTING AT ADDRESS 200 RESULTS IN EXECUTION OF THE STANDARD TEST SEQUENCE. A QV PASS IS RUN FIRST (SUBSET OF ALL TABLED TEST CASES). THIS QV PASS IS FOLLOWED BY A END OF QV PASS INDICATION. THEN ALL TABLED TEST CASES FOR ALL INSTRUCTIONS ARE EXECUTED (APPROX 30 MINUTES) FOLLOWED BY AN END OF PASS INDICATION. TESTING THEN PROCEEDS IN A RANDOM MODE UNTIL THE OPERATOR TERMINATES EXECUTION.

CIS INSTRUCTION INTERRUPTABILITY IS EXERCISED PROVIDED THE SYSTEM UNDER TEST HAS A LINE TIME CLOCK (KW11-L TYPE).

PROCESSOR MODE (KERNEL, SUPERVISOR, USER) IS SELECTED RANDOMLY PRIOR TO EXECUTION OF EACH CIS INSTRUCTION TEST CASE. MEMORY MANAGEMENT IS ENABLED WITH THE D-SPACE ENABLE/DISABLE STATE SELECTED RANDOMLY PRIOR TO EACH TEST CASE. MODE IS SWITCHED TO THE TEST MODE AND MEMORY MANAGEMENT IS TURNED ON JUST PRIOR TO EXECUTION OF THE CIS INSTRUCTION UNDER TEST. DURING INTERRUPT SERVICE AND IMMEDIATELY FOLLOWING THE COMPLETION OF THE CIS INSTRUCTION EXECUTION THE MODE IS SWITCHED BACK TO KERNEL AND MEMORY MANAGEMENT IS SHUT OFF.

TABLED TEST CASES ARE EXHAUSTED FOR A GIVEN INSTRUCTION BEFORE PROCEEDING TO TEST THE NEXT CIS INSTRUCTION. AT THE START OF EACH NEW INSTRUCTION (NON-RANDOM MODE) A MESSAGE IS DISPLAYED AS A PROGRESS INDICATOR IDENTIFYING THE CIS INSTRUCTION UNDER TEST. A 'CONTROL T' ENTERED AT ANY TIME WILL CAUSE THE PROGRAM TO DISPLAY THE INSTRUCTION UNDER TEST AND THE CURRENT INSTRUCTION COUNT. THE FOLLOWING LIST IDENTIFIES THE ORDER IN WHICH INSTRUCTIONS ARE TESTED (NON-RANDOM MODE) AND THE APPROXIMATE NUMBER OF TESTS EXECUTED FOR EACH INSTRUCTION (AFTER THE QV PASS).

INSTRUCTION	# OF TESTS
-----	-----
L2D	8
L3D	8
MOVC	354
LOCC	36
CMPC	362
MOVRC	354
MOVTC	354
SKPC	30

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MATC	904
SCANC	126
SPANC	126
CVTPN	226
CVTNP	568
CVTLP	170
CVTLN	323
CVTPL	53
CVTNL	99
ADDP	1970
ADDN	3872
SUBP	1970
SUBN	3746
CMPP	502
CMPN	1089
ASHP	1972
ASHN	3872
MULP	1993
DIVP	1973

AFTER BEING STARTED AT LOCATION 200 THE PROGRAM SHOULD RESPOND AS FOLLOWS:

CZKEECO PDP-11 CIS INSTRUCTION EXERCISER
QUICK VERIFY PASS TIME: LESS THAN 5 MINUTES
L2D0 INST CT: XX XXXXX

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DIVP INST CT: XX XXXXX
END OF QUICK VERIFY PASS
INST UNDER TEST WILL BE DISPLAYED
PASS TIME: APPROX. 30 MIN
L2D0 INST CT: XX XXXXX

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DIVP INST CT: XX XXXXX
END OF PASS (EXECUTION OF TABLED TEST CASES COMPLETE)
ENTERING RANDOM TEST MODE
NO FURTHER END OF PASS MESSAGES WILL BE ISSUED
RANDOM # GENERATOR SEED CONSTANTS WILL BE PRINTED
EVERY 1024 CIS INSTRUCTION TESTS
RANDOM # GENERATOR SEED XXXXXX XXXXXX XXXXXX

(UNTIL PROGRAM EXECUTION IS TERMINATED BY USER)

THE INSTRUCTION COUNT DISPLAYED AT THE START OF TESTING FOR EACH INSTRUCTION IS CUMULATIVE FROM THE FIRST L2D0 CIS INSTRUCTION

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TESTED. THE LOWER 5 DIGIT COUNT GETS INCREMENTED ONCE PER CIS INSTRUCTION TEST (I.E. ONCE PER CIS INSTRUCTION EXECUTED) AND COUNTS FROM 0 TO 65,535 (DECIMAL). THE UPPER 2 DIGIT COUNT GETS INCREMENTED ONCE PER 65,535 TESTS. THE INSTRUCTION COUNT IS ZEROED AT THE START OF RANDOM MODE TESTING. CONTROL T MUST BE USED TO DISPLAY THE INSTRUCTION COUNT IN RANDOM MODE.

IN XXDP CHAIN AND ACT CHAIN MODE TESTING TERMINATES AFTER THE END OF PASS INDICATION AND CONTROL IS RETURNED TO THE RESPECTIVE MONITOR. RANDOM MODE IS NOT ENTERED IN THESE CHAIN MODES. RANDOM TEST MODE IS ENTERED AUTOMATICALLY IN ALL OTHER ENVIRONMENTS (STANDALONE,XXDP MANUAL,ACT DUMP,APT).

THE RANDOM # GENERATOR SEED CONSTANTS ARE DISPLAYED TO PERMIT THE USER TO STOP AND LATER RESUME RANDOM TESTING FROM THE TERMINATION POINT. THIS IS EXPLAINED BELOW UNDER THE HEADING "STARTING ADDRESS = 214".

STARTING ADDRESS = 204

STARTING AT ADDRESS 204 REQUIRES THE OPERATOR TO RESPOND TO QUESTIONS TO SELECT INSTRUCTION(S) FOR TEST, TEST MODE, AND TEST ENVIRONMENT.

AFTER BEING STARTED AT LOCATION 204 THE PROGRAM SHOULD RESPOND AS FOLLOWS:

CZKEECO PDP-11 CIS INSTRUCTION EXERCISER
TEST INTERRUPTABILITY OF CIS INSTRUCTIONS (Y OR N)?
RANDOM EXERCISE MODE (Y OR N)?
ENTER INSTRUCTION TO TEST <ALL>

IF THE USER ANSWERS YES (Y) TO THE INTERRUPTABILITY QUESTION THE PROGRAM WILL PROMPT FOR WHAT INTERRUPT SOURCE TO USE (LTC- LINE TIME CLOCK, KW11-P @ 100KHZ, KW11-P @ 10KHZ, KW11-P WITH EXTERNAL 1 MHZ OSCILLATOR). IF THE LTC IS SELECTED, THE PROGRAM CONTROLS INTERRUPT TIMING TO ASSURE THAT MOST CIS INSTRUCTIONS ARE INTERRUPTED ONCE. IF THE KW11-P WITH A 1 MHZ EXTERNAL OSCILLATOR IS SELECTED, EACH CIS INSTRUCTION WILL BE INTERRUPTED AND FORCED TO SUSPEND EXECUTION AT ALL POSSIBLE SERVICE EXIT POINTS. USE OF THE P-CLK WILL GREATLY INCREASE RUN TIME.

IF EITHER THE KW11-P @100KHZ OR THE KW11-P WITH EXTERNAL OSCILLATOR IS SELECTED, THE PROGRAM WILL ASK WHETHER OR NOT TO ALLOW AN INTERRUPT DURING THE CIS INST (DIVP - STATE DISTURBING INSTRUCTION) NORMALLY EXECUTED WITHIN THE KW11-P INTERRUPT SERVICE ROUTINE.

IF THE USER ANSWERS YES (Y) TO THE RANDOM EXERCISE MODE QUESTION, MEMORY MANAGEMENT TEST STATE, PROCESSOR TEST MODE, TEST OPERANDS AND STRING DATA FOR EACH CIS INSTRUCTION TEST WILL BE DERIVED USING A RANDOM NUMBER GENERATOR. A

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NO (N) ANSWER WILL CAUSE EXECUTION OF CIS INSTRUCTION TESTS WITH ALL TEST OPERANDS AND STRING DATA PROVIDED FROM PROGRAM INPUT AND PARAMETER TABLES. FOLLOWING A (N) RESPONSE, THE PROGRAM WILL PROMPT FOR PROCESSOR TEST MODE (KERNEL,SUPERVISOR,USER) AND MEMORY MANAGEMENT TEST STATE (OFF,ON WITH D SPACE ENABLED, ON WITH D SPACE DISABLED).

THE LAST QUESTION ENABLES THE USER TO SELECT ONE OR ALL CIS INSTRUCTIONS FOR TEST. TO SELECT A SINGLE INSTRUCTION FOR TEST ENTER THE NMEUMONIC FOR THE DESIRED INSTRUCTION FROM THE INSTRUCTION LIST ABOVE. THE SAME QUESTION WILL BE REASKED IF THE INSTRUCTION IS INCORRECTLY ENTERED. TO SELECT ALL CIS INSTRUCTIONS FOR TEST (THE DEFAULT CASE) SIMPLY RESPOND WITH A CARRIAGE RETURN.

IF THE RANDOM MODE QUESTION IS ANSWERED YES (Y) AND THE INSTRUCTION(S) FOR TEST IS ANSWERED 'ALL', THE ACTUAL INSTRUCTION UNDER TEST ON ANY GIVEN TEST WILL BE SELECTED AT RANDOM.

STARTING ADDRESS = 210

STARTING AT ADDRESS 210 PROVIDES REPETITIVE QUICK VERIFY PASSES. NOTE THAT THE QV PASS IS DESIGNED TO GIVE A FAIR LEVEL OF MICROCODE COVERAGE (>80%) IN LESS THAN 5 MINUTES PER PASS.

THIS QV MODE RESULTS IN EXECUTION OF A SUBSET OF THE TABLED TEST CASES. THE SUBSET HAS BEEN VERIFIED TO PROVIDE AT LEAST THE DESIRED 80% LEVEL OF COVERAGE. NOTE, THE SUBSET OF TABLED TEST CASES THAT GETS RUN IN QV MODE VARIES WITH PROCESSOR TYPE. ALSO NOTE THAT SOME CIS INSTRUCTIONS MAY NOT BE EXECUTED AT ALL IN QV MODE BECAUSE IT HAS BEEN DETERMINED THAT DUE TO COMMON ROUTINES WITHIN THE MICROCODE IMPLEMENTATION IT IS POSSIBLE TO GET THE 80% COVERAGE WITHOUT EXERCISING ALL INSTRUCTIONS.

THE INSTRUCTION COUNTS LISTED UNDER THE NORMAL RUN MODE (STARTING ADDRESS 200) ABOVE DO NOT APPLY IN QV MODE.

CIS INSTRUCTION INTERRUPTABILITY IS EXERCISED PROVIDED THAT THE SYSTEM UNDER TEST HAS EITHER A LINE TIME CLOCK OR A PROGRAMMABLE REAL TIME CLOCK (KW11-P).

PROCESSOR TEST MODE(KERNEL,SUPERVISOR, USER) AND MEMORY MANAGEMENT TEST STATE ARE SELECTED RANDOMLY AS IN THE 'STARTING ADDRESS - 200' SECTION ABOVE.

AFTER BEING STARTED AT LOCATION 210, THE PROGRAM SHOULD RESPOND AS FOLLOWS:

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QUICK VERIFY PASS TIME: LESS THAN 5 MINUTES
L2D0 INST CT: XX XXXXX

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DIVP INST CT: XX XXXXX
END OF QUICK VERIFY PASS

RANDOM MODE EXERCISING IS NOT INVOKED DURING A QUICK VERIFY PASS.

STARTING ADDRESS = 214

STARTING AT ADDRESS 214 ALLOWS THE USER TO MODIFY RANDOM NUMBER GENERATOR SEED CONSTANTS. THIS IS DESIRABLE IN 2 SITUATIONS.

IF THE USER DESIRES TO RUN IN RANDOM TEST MODE FOR VERY LONG PERIODS OF TIME (DAYS, WEEKS, ETC), THE RANDOM NUMBER GEN. SEED CONSTANTS PRINTED EVERY 1024 TESTS PROVIDE FOR STOPPING AND LATER CONTINUING WITHOUT REPEATING PRIOR TESTS RUN. (REMEMBER THAT THE RANDOM # GENERATOR USED IS PSEUDO RANDOM - I.E. THE SAME SEQUENCE OF RANDOM TESTS IS EXECUTED EVERY TIME THE PROGRAM IS RESTARTED FROM THE BEGINNING).

THE SEED CONSTANTS ARE ALSO DISPLAYED WITH THE STANDARD ERROR REPORT. THIS PERMITS THE USER TO START WITH THE FAILING TEST AT SOME FUTURE TIME.

AFTER STARTING AT 214 THE PROGRAM QUERIES FOR RANDOM NUMBER SEED CONSTANTS:

ENTER THE 3 RANDOM NUMBER GEN. SEED CONSTANTS:

AFTER THE THIRD SEED IS ENTERED THE PROGRAM WILL CONTINUE AS IF STARTED AT 204. ANSWER YES TO THE RANDOM EXERCISE MODE QUESTION AND <CR> TO THE ENTER INST TO TEST QUESTION. THE FIRST TEST EXECUTED WILL BE GENERATED USING THE NEW SEEDS.

2.2 SPECIAL ENVIRONMENTS

APT - THE CIS INSTRUCTION EXERCISER IS FULLY APT COMPATIBLE, HOWEVER ITS OPERATION UNDER APT IS SOMEWHAT DIFFERENT THAN THAT OF OTHER DIAGNOSTICS. THE FIRST 2 PASSES UNDER APT ARE IDENTICAL TO THE TESTS RUN IN STANDALONE - 1 QV PASS AND 1 FULL TABLED TEST CASE PASS. SUBSEQUENT PASSES ARE NOT IDENTICAL TO THE 2ND PASS BUT RATHER BLOCKS OF 20,000 (OCTAL) RANDOM MODE TEST CASES. THAT IS, EACH PASS (BEYOND THE FIRST) IS A UNIQUE SET OF RANDOM CIS INSTRUCTION TEST CASES.

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THE INFORMATION RECORDED (AND SUBSEQUENTLY DISPLAYED) BY APT ON ERROR INCLUDES TEST NUMBER AND FATAL ERROR NUMBER. THE FATAL ERROR NUMBER SHOULD BE INTERPRETED AS FOLLOWS:

- BITS 5-0 FAILING CIS INST (RFF COMMENT SECTION OF OCTAL CODING TABLE - PAGE 66-1)
- BIT 6 INST TYPE (0=REG; 1=IN LINE)
- BIT 9 ACTIVE REGISTER SET
- BITS 13-12 PROCESSOR MODE (11=USER,01=SUP,00=KERNEL)
- BIT 14 INTERRUPT (1=INST WAS INTERRUPTED)

NOTE: A FATAL ERROR # = 177 INDICATES THAT THE POWER MONITOR BIT (BIT 0 IN THE CPU ERROR REG) SET DURING EXECUTION OF THE DIAGNOSTIC.

2.3 PROGRAM OPTIONS

THE FOLLOWING CONTROL CHARACTERS ARE RECOGNIZED BY THE EXERCISER DURING TEST EXECUTION:

- CNTL T - DISPLAY INST UNDER TEST AND TEST #
- CNTL C - (RECOGNIZED ONLY IF PROGRAM WAS STARTED AT 204). RESTART EXERCISER.
- CNTL D - DISPLAY ALL TEST CASE OPERANDS AND RESULTS SUBSEQUENT TO EACH CIS INST TEST. CONTINUE (WITHOUT QUERY) TO NEXT TEST.
- CNTL E - DISPLAY ALL TEST CASE OPERANDS AND RESULTS SUBSEQUENT TO EACH CIS INST TEST. QUERY FOR CONTINUE.
- CNTL N - CANCEL PRIOR CNTL D OR CNTL E REQUEST
- CNTL O - CONTROL OVER PROGRESS INDICATION PRINTOUT (I.E. INST AND INST CNT; RANDOM NUMBER GENERATOR SEED). ON - OFF TOGGLE.

SWITCH REGISTER OPTIONS:

NOTE: ON MACHINES WITH NO HARDWARE SWITCH REGISTER (11/24) LOCATION 176 IS THE SOFTWARE SWITCH REGISTER.

- BIT 0 - STOP ON TEST; PROGRAM WILL QUERY USER FOR TEST (DECIMAL) TO STOP ON AND DISPLAY.

2.4 EXECUTION TIMES

THE FIRST PASS RUN TIME (TABLED TEST CASES ONLY) IS APPROXIMATELY: 30 MINUTES ON AN 11/44; 90 MIN ON AN 11/24

AFTER THE FIRST PASS THE PROGRAM ENTERS RANDOM TEST MODE AND EXECUTES RANDOMLY GENERATED TEST CASES INDEFINITELY.

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IN QV MODE THE PASS TIME IS LESS THAN 5 MINUTES.
REFER TO DOCUMENTATION ABOVE FOR DEFINITION OF QV MODE.

3.0 ERROR INFORMATION

IF THE COMPUTER HALTS WITHOUT ERROR DISPLAY THE FOLLOWING
LOCATIONS SHOULD BE EXAMINED TO DETERMINE INFORMATION
ABOUT THE FAILING TEST.

TINST --- CIS INSTRUCTION UNDER TEST

TR0 - TR6 --- CIS INSTRUCTION OPERANDS (LENGTHS,ADDRESSES,ETC)

INFORMATION DISPLAYED UPON DETECTION OF AN ERROR DESCRIBES
THE COMPLETE ENVIRONMENT OF THE FAILURE. ALL INSTRUCTION ERRORS
ARE DISPLAYED WITH ONE FORMAT. THE FORMAT CONTAINS SLIGHT
VARIATIONS TO ACCOUNT FOR DIFFERENCES BETWEEN CHARACTER
AND DECIMAL STRING INSTRUCTIONS.

CHARACTER STRING INSTRUCTION ERROR DISPLAY

ERROR #000001

MOV C INST CNT: 00 0004 INTR CNT:0010 REG SET:0 MODE:K D EN:N

	SL	SA	DL	DA	F				NZVC
INPUT	R0-R6,CC/	003760	111241	000054	111046	000344	155555	053444	1111
EXP OUT	R0-R6,CC/	003704	000000	000000	000000	000344	155555	053444	0000
ACT OUT	R0-R6,CC/		000001						1000
EXP BUFFER		111246/	057						
ACT BUFFER		100246/	344						

C=CONT.;R=REPEAT TEST;S=RESTART;D=DISPLAY MEMORY;H=REPEAT AND HALT AT CIS?

DECIMAL STRING INSTRUCTION ERROR DISPLAY

ERROR #000002

ASHP INST CNT: 00 00250' INTR CNT: 0000 REG SET:1 MODE:S D EN:Y

	SL	SA	DL	DA	R,S				NZVC
INPUT	R0-R6,CC/	070000	110200	070000	110206	000005	155555	053444	0100
EXP OUT	R0-R6,CC/	000000	000000	070000	000206	000000	155555	053444	1011
ACT OUT	R0-R6,CC/								1000

SRC 0+ SIGN BYTE=0F

EXP RESULT 0+ SIGN BYTE=0F

ACT RESULT 0+ SIGN BYTE=0F

C=CONT.;R=REPEAT TEST;S=RESTART;D=DISPLAY MEMORY;H=REPEAT AND HALT AT CIS?

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THE WORD 'ERROR' FOLLOWED BY A COUNT OF THE NUMBER OF ERRORS WHICH HAVE OCCURRED UP TO AND INCLUDING THIS TEST FAILURE AND A LONG STRING OF DASHES IS USED TO SEPARATE ONE TEST FAILURE DISPLAY FROM THE NEXT.

THE SECOND LINE OF THE ERROR REPORT IDENTIFIES THE CIS INSTRUCTION THAT FAILED, A COUNT OF THE NUMBER OF CIS INSTRUCTIONS WHICH HAVE EXECUTED, A COUNT OF THE NUMBER OF TIMES THE FAILING INSTRUCTION TEST CASE WAS SUSPENDED DUE TO INTERRUPT, THE ACTIVE REGISTER SET (0 OR 1), THE TEST MODE (KERNEL, SUPERVISOR, USER), AND WHETHER D SPACE (MEMORY MGMT) WAS ENABLED DURING CIS INSTRUCTION EXECUTION.

THE THIRD LINE GIVES HEADER LABELS TO IDENTIFY REGISTER OR IN-LINE OPERANDS FOR THE PARTICULAR CIS INSTRUCTION UNDER TEST. 'SL' IDENTIFIES THE SOURCE LENGTH OPERAND; 'DA' IDENTIFIES THE DESTINATION ADDRESS, ETC. CONDITION CODE LABELS ARE INCLUDED AT THE END OF THIS LINE.

THE FOURTH LINE DISPLAYS ACTUAL OPERAND VALUES AND CONDITION CODES USED AS CIS INSTRUCTION INPUTS.

THE FIFTH LINE DISPLAYS EXPECTED REGISTER AND CONDITION CODE CONTENTS AT THE COMPLETION OF CIS INSTRUCTION EXECUTION. THESE EXPECTED VALUES ARE DERIVED BY EMULATION AS NOTED ABOVE.

THE SIXTH LINE, ACTUAL CIS INSTRUCTION OUTPUT, IS DISPLAYED ONLY IF ANY OF THE ACTUAL REGISTER OR CONDITION CODE OUTPUTS DO NOT AGREE WITH THE EXPECTED VALUES. ONLY THOSE SPECIFIC RESULTS WHICH ARE NOT IN AGREEMENT ARE DISPLAYED.

THE REMAINING PORTION OF THE ERROR PRINTOUT VARIES WITH THE CIS INSTRUCTION UNDER TEST. SOURCE OPERANDS, EXPECTED AND ACTUAL OPERATION RESULTS ARE DISPLAYED WITH EACH NIBBLE REPRESENTED BY A HEXADECIMAL DIGIT. SIGNS ARE DISPLAYED IN SYMBOLIC FORMAT (+, -) AND THE SIGN BYTE IS GIVEN AS TWO HEXADECIMAL NIBBLES.

'BUFFER XXXXXX' IS DISPLAYED ONLY WHEN THE BUFFER ASSOCIATED WITH ACTUAL CIS INSTRUCTION EXECUTION DIFFERS FROM THAT ASSOCIATED WITH EMULATION. ONLY THE FIRST BYTE (STARTING FROM THE LOW ADDRESS END OF THE BUFFERS UNDER CONSIDERATION) IN DISAGREEMENT IS PRINTED.

THE LAST LINE DISPLAYED AS PART OF EACH ERROR REPORT PERMITS THE USER SEVERAL OPTIONS RELATING TO HOW TO PROCEED FOLLOWING AN ERROR. CONTINUE (C) PROCEEDS TO THE NEXT INSTRUCTION TEST CASE AS IF THE ERROR HAD NEVER OCCURRED. DISPLAY MEMORY (D) ALLOWS THE USER TO DISPLAY ANY BYTES(S) IN MEMORY. RESTART (S) RETURNS CONTROL TO THE BEGINNING OF THE PROGRAM. REPEAT TEST (R) REPEATS THE FAILING TEST CASE. THE SAME ERROR MESSAGE WILL BE DISPLAYED AGAIN PROVIDED THE TEST FAILS DURING THE REPEAT TEST. THE REPEAT AND HALT OPTION REPEATS THE FAILING TEST BUT HALTS JUST PRIOR TO EXECUTING THE CIS

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INSTRUCTION UNDER TEST. THIS MODE ALLOWS THE USER TO SINGLE
STEP THROUGH THE FAILING CIS MICROCODE USING CONSOLE COMMANDS.

4.0 PERFORMANCE AND PROGRESS REPORTS

4.1 PERFORMANCE REPORTS

NONE

4.2 PROGRESS REPORTS

THE CIS INSTRUCTION AND THE TEST COUNT IS DISPLAYED AT THE
START OF TESTING FOR EACH CIS INSTRUCTION TYPE (EXCEPT IN
RANDOM TEST MODE). NOTE, AS STATED IN SECTION 2.1.3 ABOVE THAT
MANY TEST CASES ARE EXECUTED FOR EACH CIS INSTRUCTION.

IN RANDOM TEST MODE THE RANDOM NUMBER GENERATOR SEED
CONSTANTS ARE DISPLAYED EVERY 1024 TESTS. IF THE
DIAGNOSTIC IS TO BE RUN FOR A PROLONGED PERIOD IN THIS
MODE, THESE CONSTANTS PROVIDE A MECHANISM FOR STOPPING AND
LATER CONTINUING THE DIAG AT ANY FUTURE TIME.
REFER TO SECTION 2.1.3 UNDER THE HEADING 'STARTING ADDRESS
FOR INSTRUCTIONS ON HOW TO USE THE RANDOM # GENERATOR SEED
CONSTANTS.

214''

5.0 REVISION HISTORY

REVISION B - MADE COMPATIBLE WITH 11/23 AND 11/24 CIS
- ADDED STOP ON TEST FEATURE; SEE SECTION 2.3
REVISION C - FIXED CMPP EMULATOR PROBLEM
- USED NEW SYSMAC.C5 TO FIX XON-XOFF PROBLEM
- ADDED POWER MONITOR CHECK

6.0 PROGRAM TABLE OF CONTENTS

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6748      .ENABL ABS,AMA
6864      .TITLE PDP-11 CIS INST EXERCISER
(1)      :*COPYRIGHT (C) 1979
(1)      :*DIGITAL EQUIPMENT CORP.
(1)      :*MAYNARD, MASS. 01754
(1)      :*
(1)      :*PROGRAM BY BARRY POLAND
(1)      :*
(1)      :*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
(1)      :*PACKAGE (MAINDEC-11-DZQAC-C5), JAN, 1981.
(1)      :*
(1)      000001 $TN=1
(1)      160000 $SWR=160000      ;;HALT ON ERROR, LOOP ON TEST, INHIBIT ERROR TYP0UT
6669      .SBTTL BASIC DEFINITIONS
(1)
(1)      ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
(1)      001100 STACK= 1100      ;;FIRST ADDRESS OF THE STACK
(1)      001100 KERSTK= STACK      ;;KERNEL STACK
(1)      000700 SUPSTK= STACK-200      ;;SUPERVISOR STACK
(1)      000600 USESTK= STACK-300      ;;USER STACK
(1)      .EQUIV EMT,ERROR      ;;BASIC DEFINITION OF ERROR CALL
(1)      .EQUIV ICT,SCOPE      ;;BASIC DEFINITION OF SCOPE CALL
(1)      177776 PS= 177776      ;;PROCESSOR STATUS WORD
(1)      .EQUIV PS,PSW
(1)      177774 STKLMT= 177774      ;;STACK LIMIT REGISTER
(1)      177772 PIRQ= 177772      ;;PROGRAM INTERRUPT REQUEST REGISTER
(1)      177570 DSWR= 177570      ;;HARDWARE SWITCH REGISTER
(1)      177570 DDISP= 177570      ;;HARDWARE DISPLAY REGISTER
(1)      177546 LKS= 177546      ;;LINE CLOCK (KW11-L) STATUS REGISTER
(1)
(1)      ;*MISCELLANEOUS DEFINITIONS
(1)      000011 HT= 11      ;;CODE FOR HORIZONTAL TAB
(1)      000012 LF= 12      ;;CODE LINE FEED
(1)      000015 CR= 15      ;;CODE CARRIAGE RETURN
(1)      000200 CRLF= 200      ;;CODE FOR CARRIAGE RETURN-LINE FEED
(1)
(1)      ;*GENERAL PURPOSE REGISTER DEFINITIONS
(1)      000000 R0= %0      ;;GENERAL REGISTER
(1)      000001 R1= %1      ;;GENERAL REGISTER
(1)      000002 R2= %2      ;;GENERAL REGISTER
(1)      000003 R3= %3      ;;GENERAL REGISTER
(1)      000004 R4= %4      ;;GENERAL REGISTER
(1)      000005 R5= %5      ;;GENERAL REGISTER
(1)      000006 R6= %6      ;;GENERAL REGISTER
(1)      000007 R7= %7      ;;GENERAL REGISTER
(1)      .EQUIV R0,R10      ;;GENERAL REGISTER
(1)      .EQUIV R1,R11      ;;GENERAL REGISTER
(1)      .EQUIV R2,R12      ;;GENERAL REGISTER
(1)      .EQUIV R3,R13      ;;GENERAL REGISTER
(1)      .EQUIV R4,R14      ;;GENERAL REGISTER
(1)      .EQUIV R5,R15      ;;GENERAL REGISTER
(1)      000006 SP= %6      ;;STACK POINTER
(1)      .EQUIV SP,KSP      ;;KERNEL STACK POINTER
(1)      .EQUIV SP,SSP      ;;SUPERVISOR STACK POINTER

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 CZKFEC.P11 BASIC DEFINITIONS

```

(1)          .EQUIV SP,USP          ;;USER STACK POINTER
(1)          PC= %7                ;;PROGRAM COUNTER
(1)
(1)          ;*PRIORITY LEVEL DEFINITIONS
(1)          000000                PRO= 0          ;;PRIORITY LEVEL 0
(1)          000040                PR1= 40         ;;PRIORITY LEVEL 1
(1)          000100                PR2= 100        ;;PRIORITY LEVEL 2
(1)          000140                PR3= 140        ;;PRIORITY LEVEL 3
(1)          000200                PR4= 200        ;;PRIORITY LEVEL 4
(1)          000240                PR5= 240        ;;PRIORITY LEVEL 5
(1)          000300                PR6= 300        ;;PRIORITY LEVEL 6
(1)          000340                PR7= 340        ;;PRIORITY LEVEL 7
(1)
(1)          ;*'SWITCH REGISTER' SWITCH DEFINITIONS
(1)          100000                SW15= 100000
(1)          040000                SW14= 40000
(1)          020000                SW13= 20000
(1)          010000                SW12= 10000
(1)          004000                SW11= 4000
(1)          002000                SW10= 2000
(1)          001000                SW09= 1000
(1)          000400                SW08= 400
(1)          000200                SW07= 200
(1)          000100                SW06= 100
(1)          000040                SW05= 40
(1)          000020                SW04= 20
(1)          000010                SW03= 10
(1)          000004                SW02= 4
(1)          000002                SW01= 2
(1)          000001                SW00= 1
(1)          .EQUIV SW09,SW9
(1)          .EQUIV SW08,SW8
(1)          .EQUIV SW07,SW7
(1)          .EQUIV SW06,SW6
(1)          .EQUIV SW05,SW5
(1)          .EQUIV SW04,SW4
(1)          .EQUIV SW03,SW3
(1)          .EQUIV SW02,SW2
(1)          .EQUIV SW01,SW1
(1)          .EQUIV SW00,SW0
(1)
(1)          ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
(1)          100000                BIT15= 100000
(1)          040000                BIT14= 40000
(1)          020000                BIT13= 20000
(1)          010000                BIT12= 10000
(1)          004000                BIT11= 4000
(1)          002000                BIT10= 2000
(1)          001000                BIT09= 1000
(1)          000400                BIT08= 400
(1)          000200                BIT07= 200
(1)          000100                BIT06= 100
(1)          000040                BIT05= 40
(1)          000020                BIT04= 20

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 CZKEEC.P11 MEMORY MANAGEMENT DEFINITIONS

```

(1)          .SBTTL MEMORY MANAGEMENT DEFINITIONS
(1)
(1)
(1)          ;*MEMORY MANAGEMENT STATUS REGISTER ADDRESSES
(1)
(1)          MMR0= 177572
(1)          MMR1= 177574
(1)          MMR2= 177576
(1)          MMR3= 172516
(1)          .EQUIV MMR0,SRO
(1)          .EQUIV MMR1,SR1
(1)          .EQUIV MMR2,SR2
(1)          .EQUIV MMR3,SR3
(1)
(1)          ;*USER 'I' PAGE DESCRIPTOR REGISTERS
(1)
(1)          UIPDR0= 177600
(1)          UIPDR1= 177602
(1)          UIPDR2= 177604
(1)          UIPDR3= 177606
(1)          UIPDR4= 177610
(1)          UIPDR5= 177612
(1)          UIPDR6= 177614
(1)          UIPDR7= 177616
(1)
(1)          ;*USER 'D' PAGE DESCRIPTOR REGISTERS
(1)
(1)          UDPDR0= 177620
(1)          UDPDR1= 177622
(1)          UDPDR2= 177624
(1)          UDPDR3= 177626
(1)          UDPDR4= 177630
(1)          UDPDR5= 177632
(1)          UDPDR6= 177634
(1)          UDPDR7= 177636
(1)
(1)          ;*USER 'I' PAGE ADDRESS REGISTERS
(1)
(1)          UIPAR0= 177640
(1)          UIPAR1= 177642
(1)          UIPAR2= 177644
(1)          UIPAR3= 177646
(1)          UIPAR4= 177650
(1)          UIPAR5= 177652
(1)          UIPAR6= 177654
(1)          UIPAR7= 177656
(1)
(1)          ;*USER 'D' PAGE ADDRESS REGISTERS
(1)
(1)          UDPAR0= 177660
(1)          UDPAR1= 177662
(1)          UDPAR2= 177664
(1)          UDPAR3= 177666
(1)          UDPAR4= 177670

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 (ZKEEC.P11 MEMORY MANAGEMENT DEFINITIONS

(1)	177672	UDPAR5= 177672
(1)	177674	UDPAR6= 177674
(1)	177676	UDPAR7= 177676
(1)		
(1)		;*SUPERVISOR 'I' PAGE DESCRIPTOR REGISTERS
(1)		
(1)	172200	SIPDR0= 172200
(1)	172202	SIPDR1= 172202
(1)	172204	SIPDR2= 172204
(1)	172206	SIPDR3= 172206
(1)	172210	SIPDR4= 172210
(1)	172212	SIPDR5= 172212
(1)	172214	SIPDR6= 172214
(1)	172216	SIPDR7= 172216
(1)		
(1)		;*SUPERVISOR 'D' PAGE DESCRIPTOR REGISTERS
(1)		
(1)	172220	SDPDR0= 172220
(1)	172222	SDPDR1= 172222
(1)	172224	SDPDR2= 172224
(1)	172226	SDPDR3= 172226
(1)	172230	SDPDR4= 172230
(1)	172232	SDPDR5= 172232
(1)	172234	SDPDR6= 172234
(1)	172236	SDPDR7= 172236
(1)		
(1)		;*SUPERVISOR 'I' PAGE ADDRESS REGISTERS
(1)		
(1)	172240	SIPAR0= 172240
(1)	172242	SIPAR1= 172242
(1)	172244	SIPAR2= 172244
(1)	172246	SIPAR3= 172246
(1)	172250	SIPAR4= 172250
(1)	172252	SIPAR5= 172252
(1)	172254	SIPAR6= 172254
(1)	172256	SIPAR7= 172256
(1)		
(1)		;*SUPERVISOR 'D' PAGE ADDRESS REGISTERS
(1)		
(1)	172260	SDPAR0= 172260
(1)	172262	SDPAR1= 172262
(1)	172264	SDPAR2= 172264
(1)	172266	SDPAR3= 172266
(1)	172270	SDPAR4= 172270
(1)	172272	SDPAR5= 172272
(1)	172274	SDPAR6= 172274
(1)	172276	SDPAR7= 172276
(1)		
(1)		;*KERNEL 'I' PAGE DESCRIPTOR REGISTERS
(1)		
(1)	172300	KIPDR0= 172300
(1)	172302	KIPDR1= 172302
(1)	172304	KIPDR2= 172304
(1)	172306	KIPDR3= 172306

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 C7KFECC.P11 MEMORY MANAGEMENT DEFINITIONS

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(1)      172310      KIPDR4= 172310
(1)      172312      KIPDR5= 172312
(1)      172314      KIPDR6= 172314
(1)      172316      KIPDR7= 172316
(1)
(1)
(1)      :*KERNEL 'D' PAGE DESCRIPTOR REGISTERS
(1)
(1)      172320      KDPDR0= 172320
(1)      172322      KDPDR1= 172322
(1)      172324      KDPDR2= 172324
(1)      172326      KDPDR3= 172326
(1)      172330      KDPDR4= 172330
(1)      172332      KDPDR5= 172332
(1)      172334      KDPDR6= 172334
(1)      172336      KDPDR7= 172336
(1)
(1)      :*KERNEL 'I' PAGE ADDRESS REGISTERS
(1)
(1)      172340      KIPAR0= 172340
(1)      172342      KIPAR1= 172342
(1)      172344      KIPAR2= 172344
(1)      172346      KIPAR3= 172346
(1)      172350      KIPAR4= 172350
(1)      172352      KIPAR5= 172352
(1)      172354      KIPAR6= 172354
(1)      172356      KIPAR7= 172356
(1)
(1)      :*KERNEL 'D' PAGE ADDRESS REGISTERS
(1)
(1)      172360      KDPAR0= 172360
(1)      172362      KDPAR1= 172362
(1)      172364      KDPAR2= 172364
(1)      172366      KDPAR3= 172366
(1)      172370      KDPAR4= 172370
(1)      172372      KDPAR5= 172372
(1)      172374      KDPAR6= 172374
(1)      172376      KDPAR7= 172376
(1)
(1)
(1)      :SBTTL UNIBUS MAP REGISTER DEFINITIONS
(1)
(1)      :*THE LOWER 16 BITS OF THE MAP REGISTERS ARE LABELED 'MAPLXX'
(1)      :*THE UPPER 6 BITS OF THE MAP REGISTERS ARE LABELED 'MAPHXX'
(1)
(1)      170200      MAPL00 - 170200
(1)      170202      MAPH00 = 170202
(1)      170204      MAPL01 = 170204
(1)      170206      MAPH01 = 170206
(1)      170210      MAPL02 - 170210
(1)      170212      MAPH02 - 170212
(1)      170214      MAPL03 170214

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PDP-11 CIS INST EXERCISER MACY1' 27(655) 25-MAR-81 12:25 PAGE 61-6
 CZKEEC.P1' UNIBUS MAP REGISTER DEFINITIONS

(1)	170216	MAPH03 = 170216
(1)	170220	MAPL04 = 170220
(1)	170222	MAPH04 = 170222
(1)	170224	MAPL05 = 170224
(1)	170226	MAPH05 = 170226
(1)	170230	MAPL06 = 170230
(1)	170232	MAPH06 = 170232
(1)	170234	MAPL07 = 170234
(1)	170236	MAPH07 = 170236
(1)	170240	MAPL10 = 170240
(1)	170242	MAPH10 = 170242
(1)	170244	MAPL11 = 170244
(1)	170246	MAPH11 = 170246
(1)	170250	MAPL12 = 170250
(1)	170252	MAPH12 = 170252
(1)	170254	MAPL13 = 170254
(1)	170256	MAPH13 = 170256
(1)	170260	MAPL14 = 170260
(1)	170262	MAPH14 = 170262
(1)	170264	MAPL15 = 170264
(1)	170266	MAPH15 = 170266
(1)	170270	MAPL16 = 170270
(1)	170272	MAPH16 = 170272
(1)	170274	MAPL17 = 170274
(1)	170276	MAPH17 = 170276
(1)	170300	MAPL20 = 170300
(1)	170302	MAPH20 = 170302
(1)	170304	MAPL21 = 170304
(1)	170306	MAPH21 = 170306
(1)	170310	MAPL22 = 170310
(1)	170312	MAPH22 = 170312
(1)	170314	MAPL23 = 170314
(1)	170316	MAPH23 = 170316
(1)	170320	MAPL24 = 170320
(1)	170320	MAPH24 = 170320
(1)	170324	MAPL25 = 170324
(1)	170326	MAPH25 = 170326
(1)	170330	MAPL26 = 170330
(1)	170332	MAPH26 = 170332
(1)	170334	MAPL27 = 170334
(1)	170336	MAPH27 = 170336
(1)	170340	MAPL30 = 170340
(1)	170342	MAPH30 = 170342
(1)	170344	MAPL31 = 170344
(1)	170346	MAPH31 = 170346
(1)	170350	MAPL32 = 170350
(1)	170352	MAPH32 = 170352
(1)	170354	MAPL33 = 170354
(1)	170356	MAPH33 = 170356
(1)	170360	MAPL34 = 170360
(1)	170362	MAPH34 = 170362
(1)	170364	MAPL35 = 170364
(1)	170366	MAPH35 = 170366
(1)	170370	MAPL36 = 170370

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 6'-7
 CZKFECL.P11 UNIBUS MAP REGISTER DEFINITIONS

```

(1) 170372 MAPH36 = 170372
(1) 170374 MAPL37 = 170374
(1) 170376 MAPH37 = 170376
(1) .EQUIV MAPL00,MAPL0
(1) .EQUIV MAPH00,MAPH0
(1) .EQUIV MAPL01,MAPL1
(1) .EQUIV MAPH01,MAPH1
(1) .EQUIV MAPL02,MAPL2
(1) .EQUIV MAPH02,MAPH2
(1) .EQUIV MAPL03,MAPL3
(1) .EQUIV MAPH03,MAPH3
(1) .EQUIV MAPL04,MAPL4
(1) .EQUIV MAPH04,MAPH4
(1) .EQUIV MAPL05,MAPL5
(1) .EQUIV MAPH05,MAPH5
(1) .EQUIV MAPL06,MAPL6
(1) .EQUIV MAPH06,MAPH6
(1) .EQUIV MAPL07,MAPL7
(1) .EQUIV MAPH07,MAPH7
6870 .
6871 076175 DIVPI==076175
6872 170000 BS0==170000
6873 100000 BS00==100000
6874 174000 BS2==174000
6875 176000 BS4==176000
6876 177000 BS8==177000
6877 177400 BS16==177400
6878 177600 BS32==177600
6879 177700 BS64==177700
6880 177740 BS128==177740
6881 177760 BS256==177760
6882 177770 BS512==177770
6883 177777 BSNULL==177777
6884 177400 BY==177400
6885 006000 MPO6000==006000 ;MASK (176000) THEN OFFSET (6000)
6886 004000 MPO4000==004000
6887 000000 WD==0
6888 125252 EOT==125252
6889 000020 MPO20==000020
6890 000070 MPO70==000070
6891 000100 MPO100==000100
6892 000140 MPO140==000140
6893 002000 MPO2000==002000
6894 004040 MPO4040==004040
6895 152525 DSCPTR==152525
6896 022000 MPO2200==22000
6897 .SBTTL TRAP CATCHER
(1) . =0
(1) 000000
(1) ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ''.+2,HALT''
(1) ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
(1) ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
(1) . 174
(1) 000174 000000 DISPREG: .WORD 0 ;:SOFTWARE DISPLAY REGISTER
    
```

PDP-11 CIS INST EXERCISER
CZKEEC.P11 TRAP CATCHER

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(1) 000176 000000
(1)
(1) 000200 000137 037066
6899 000204 000137 037276
6900 000210 000137 037074
6901 000214 000137 037056
6908
6910

SWREG: .WORD 0 ;:SOFTWARE SWITCH REGISTER
.SBTTL STARTING ADDRESS(ES)
JMP @#START ;:JUMP TO STARTING ADDRESS OF PROGRAM
JMP DVTST
JMP QVST
JMP SEEDST

(1)
(2)
(1)
(1) 000220
(1) 000046 053672
(1) 000052 000052
(1) 000052 000000
(1) 000220
6911 001100
6913

.SBTTL ACT11 HOOKS
:*****
:HOOKS REQUIRED BY ACT11
\$SVPC=. ;SAVE PC
.=46
ENDAD ;:1)SET LOC.46 TO ADDRESS OF ENDAD
.=52
.WORD 0 ;:2)SET LOC.52 TO ZERO
.= \$SVPC ;: RESTORE PC
.-1100

(1)
(2)
(1)
(2)
(1) 000024 000200
(1) 000044 001100
(1) 001100
(1) 001100 000000
(1) 001102 001114
(1) 001104 000170
(1) 001106 000454
(1) 001110 000000
(1) 001112 000016
6918

.SBTTL APT PARAMETER BLOCK
:*****
:SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
:*****
.\$X=. ;:SAVE CURRENT LOCATION
.=24 ;:SET POWER FAIL TO POINT TO START OF PROGRAM
200 ;:FOR APT START UP
.=44 ;:POINT TO APT INDIRECT ADDRESS PNTR.
\$APTHDR ;:POINT TO APT HEADER BLOCK
.=.\$X ;:RESET LOCATION COUNTER
:*****
:SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
:INTERFACE SPEC.
\$APTHD:
\$HIBTS: .WORD 0 ;:TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
\$MBADR: .WORD \$MAIL ;:ADDRESS OF APT MAILBOX (BITS 0-15)
\$TSTM: .WORD 120. ;:RUN TIM OF LONGEST TEST
\$PASTM: .WORD 300. ;:RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
\$UNITM: .WORD 0 ;:ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
.WORD \$ETEND-\$MAIL/2 ;:LENGTH MAILBOX-ETABLE(WORDS)

(1)
(2)
(1)
(1) 001114 000000
(1) 001114 000000
(1) 001116 000000
(1) 001120 000000
(1) 001122 000000
(1) 001124 000000
(1) 001126 000000
(1) 001130 000000
(1) 001132 000000
(1) 001134

.SBTTL APT MAILBOX-ETABLE
:*****
:EVEN
\$MAIL: ;:APT MAILBOX
\$MSGTY: .WORD AMSGTY ;:MESSAGE TYPE CODE
\$FATAL: .WORD AFATAL ;:FATAL ERROR NUMBER
\$TESTN: .WORD ATESTN ;:TEST NUMBER
\$PASS: .WORD APASS ;:PASS COUNT
\$DEVCT: .WORD ADEVCT ;:DEVICE COUNT
\$UNIT: .WORD AUNIT ;:I/O UNIT NUMBER
\$MSGAD: .WORD AMSGAD ;:MESSAGE ADDRESS
\$MSGLG: .WORD AMSGLG ;:MESSAGE LENGTH
\$ETABLE: ;:APT ENVIRONMENT TABLE

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 61-9
CZKEEC.P11 APT MAILBOX-ETABLE

```

(1) 001134 000 $ENV: .BYTE AENV ;; ENVIRONMENT BYTE
(1) 001135 000 $ENVM: .BYTE AENVM ;; ENVIRONMENT MODE BITS
(1) 001136 000000 $SWREG: .WORD ASWREG ;; APT SWITCH REGISTER
(1) 001140 000000 $USWR: .WORD AUSWR ;; USER SWITCHES
(1) 001142 000000 $CPUOP: .WORD ACPUOP ;; CPU TYPE, OPTIONS
(1) ;* BITS 15-11=CPU TYPE
(1) ;* 11/04=01,11/05=02,11/20=03,11/40=04,11/45 05
(1) ;* 11/70-06,PDQ=07,Q=10
(1) ;* BIT 10=REAL TIME CLOCK
(1) ;* BIT 9=FLOATING POINT PROCESSOR
(1) ;* BIT 8=MEMORY MANAGEMENT
(1) 001144 000 $MAMS1: .BYTE AMAMS1 ;; HIGH ADDRESS, M.S. BYTE
(1) 001145 000 $MTYP1: .BYTE AMTYP1 ;; MEM. TYPE, BLK#1
(1) ;* MEM. TYPE BYTE -- (HIGH BYTE)
(1) ;* 900 NSEC CORE=001
(1) ;* 300 NSEC BIPOLAR=002
(1) ;* 500 NSEC MOS=003
(1) 001146 000000 $MADR1: .WORD AMADR1 ;; HIGH ADDRESS, BLK#1
(1) ;* MEM. LAST ADDR.=3 BYTES, THIS WORD AND LOW OF "TYPE" ABOVE
(1) 001150 $ETEND:
(1) .MEXIT
6919 .SBTTL APT COMMUNICATIONS ROUTINE
(1) ;:*****
(1) 001150 112737 000001 001414 $SATY1: MOV #1,$FFLG ;; TO REPORT FATAL ERROR
(1) 001156 112737 000001 001412 $SATY3: MOV #1,$MFLG ;; TO TYPE A MESSAGE
(1) 001164 000403 BR $ATYC
(1) 001166 112737 000001 001414 $SATY4: MOV #1,$FFLG ;; TO ONLY REPORT FATAL ERROR
(2) 001174 $ATYC:
(3) 001174 010046 MOV R0,-(SP) ;; PUSH R0 ON STACK
(3) 001176 010146 MOV R1,-(SP) ;; PUSH R1 ON STACK
(1) 001200 105737 001412 TSTB $MFLG ;; SHOULD TYPE A MESSAGE?
(1) 001204 001450 BEQ 5$ ;; IF NOT: BR
(1) 001206 122737 000001 001134 CMPB #APTENV,$ENV ;; OPERATING UNDER .PT?
(1) 001214 001031 BNE 3$ ;; IF NOT: BR
(1) 001216 132737 000100 001135 BITB #APTSPOOL,$ENVM ;; SHOULD SPOOL MESSAGES?
(1) 001224 001425 BEQ 3$ ;; IF NOT: BR
(1) 001226 017600 MOV @4(SP),R0 ;; GET MESSAGE ADDR.
(1) 001232 062766 000002 000004 ADD #2,4(SP) ;; BUMP RETURN ADDR.
(1) 001240 005737 001114 1$: TST $MSGTYPE ;; SEE IF DONE W/ LAST XMISSION?
(1) 001244 001375 BNE 1$ ;; IF NOT: WAIT
(1) 001246 010037 001130 MOV R0,$MSGAD ;; PUT ADDR IN MAILBOX
(1) 001252 105720 2$: TSTB (R0)+ ;; FIND END OF MESSAGE
(1) 001254 001376 BNE 2$
(1) 001256 163700 001130 SUB $MSGAD,R0 ;; SUB START OF MESSAGE
(1) 001262 006200 ASR R0 ;; GET MESSAGE LNTH IN WORDS
(1) 001264 010037 001132 MOV R0,$MSGLGT ;; PUT LENGTH IN MAILBOX
(1) 001270 012737 000004 001114 MOV #4,$MSGTYPE ;; TELL APT TO TAKE MSG.
(1) 001276 000413 BR 5$
(1) 001300 017637 000004 001324 3$: MOV @4(SP),4$ ;; PUT MSG ADDR IN JSR LINKAGE
(1) 001306 062766 000002 000004 ADD #2,4(SP) ;; BUMP RETURN ADDRESS
(3) 001314 013746 177776 MOV 177776,-(SP) ;; PUSH 177776 ON STACK
(1) 001320 004737 111622 JSR PC,$TYPE ;; CALL TYPE MACRO
(1) 001324 000000 4$: .WORD 0

```

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CZKEEC.P11 APT COMMUNICATIONS ROUTINE

```

(1) 001326
(1) 001326 105737 001414
(1) 001332 001416
(1) 001334 005737 001134
(1) 001340 001413
(1) 001342 005737 001114
(1) 001346 001375
(1) 001350 017637 000004 001116
(1) 001356 062766 000002 000004
(1) 001364 005237 001114
(1) 001370 105037 001414
(1) 001374 105037 001413
(1) 001400 105037 001412
(3) 001404 012601
(3) 001406 012600
(1) 001410 000207
(1) 001412 000
(1) 001413 000
(1) 001414 000
(1) 001416
(1) 000200
(1) 000001
(1) 000100
(1) 000040
6920

```

```

5$:
10$: TSTB $FFLG ;; SHOULD REPORT FATAL ERROR?
      BEQ 12$ ;; IF NOT: BR
      TST $ENV ;; RUNNING UNDER APT?
      BEQ 12$ ;; IF NOT: BR
11$: TST $MSGTYPE ;; FINISHED LAST MESSAGE?
      BNE 11$ ;; IF NOT: WAIT
      MOV @4(SP), $FATAL ;; GET ERROR #
      ADD #2, 4(SP) ;; BUMP RETURN ADDR.
      INC $MSGTYPE ;; TELL APT TO TAKE ERROR
12$: CLRB $FFLG ;; CLEAR FATAL FLAG
      CLRB $LFLG ;; CLEAR LOG FLAG
      CLRB $MFLG ;; CLEAR MESSAGE FLAG
      MOV (SP)+, R1 ;; POP STACK INTO R1
      MOV (SP)+, R0 ;; POP STACK INTO R0
      RTS PC ;; RETURN
$MFLG: .BYTE 0 ;; MESSG. FLAG
$LFLG: .BYTE 0 ;; LOG FLAG
$FFLG: .BYTE 0 ;; FATAL FLAG
      .EVEN
APTSIZE=200
APTENV=001
APTSPOOL=100
APTCSUP=040
;:*****

```


6922
6923
6924
6925
6926 001416 000000
6927 001420 000000
6928 001422 000000
6929 001424 000000
6930
6931
6932

.SBTTL GLOBAL DATA SECTION

.SBTTL TEST COUNTS
TOTTC: .WORD 0 ;TEST COUNT MULTIPLIER
TOTTC: .WORD 0 ;TOTAL TEST COUNT
INVTTC: .WORD 0 ;INVALID TEST COUNT
REDTTC: .WORD 0 ;REDUNDANT TEST COUNT

PDP-11 CIS INST EXERCISER
CZKEEC.P11

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INPUT TABLE ENTRY TYPE DISPATCH TABLE

6934		
6935		
6936		
6937	001426	
6938	001426	041226
6939	001430	041376
6940	001432	000000
6941	001434	000000
6942		

```

:SBTTL      INPUT TABLE ENTRY TYPE DISPATCH TABLE
:INPUT TABLE ENTRY TYPE DISPATCH TABLE.
:
:TYPE:
.WORD TYPE0
.WORD TYPE1
.WORD 0
.WORD 0

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 61-13
 CZKEEC.P11 : POINTERS TO CIS INST FLOW TABLES

6944			.SBTTL	POINTERS TO CIS INST FLOW TABLES
6945			.POINTERS TO CIS INSTRUCTION FLOW TABLES.	
6946			:	
6947	001436		INO:	
6948	001436	000000	.WORD	0
6949	001440	006340	.WORD	XMOV C
6950	001442	006340	.WORD	XMOV RC
6951	001444	006420	.WORD	XMOV TC
6952	001446	007002	.WORD	XLOC C
6953	001450	007002	.WORD	XSKPC
6954	001452	007140	.WORD	XSCANC
6955	001454	007140	.WORD	XSPANC
6956	001456	006502	.WORD	XCMP C
6957	001460	006564	.WORD	XMATCHC
6958	001462	007050	.WORD	XADDN
6959	001464	007050	.WORD	XSUBN
6960	001466	006646	.WORD	XCMPN
6961	001470	007350	.WORD	XCVTNL
6962	001472	007222	.WORD	XCVT PN
6963	001474	007222	.WORD	XCVT NP
6964	001476	006722	.WORD	XASHN
6965	001500	007300	.WORD	XCVT LN
6966	001502	007050	.WORD	XADDP
6967	001504	007050	.WORD	XSUBP
6968	001506	006646	.WORD	XCMP P
6969	001510	007350	.WORD	XCVT PL
6970	001512	007050	.WORD	XMUL P
6971	001514	007050	.WORD	XDIV P
6972	001516	006722	.WORD	XASHP
6973	001520	007300	.WORD	XCVT LP
6974	001522	007412	.WORD	XL2D
6975	001524	007412	.WORD	XL3D
6976				

PDP-11 CIS INST EXERCISER
CZKEEC.P11

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FLOW COMMAND DISPATCH TABLE

6978		
6979		
6980		
6981	001526	
6982	001526	054032
6983	001530	042216
6984	001532	042426
6985	001534	042526
6986	001536	042576
6987	001540	042704
6988	001542	043012
6989	001544	043122
6990	001546	046114
6991	001550	046150
6992	001552	046346
6993	001554	050400
6994	001556	051560
6995	001560	054502
6996	001562	054032
6997	001564	054032
6998		
6999		

.SBTTL FLOW COMMAND DISPATCH TABLE
:FLOW COMMAND DISPATCH TABLE

FLODIS:

.WORD	FC00
.WORD	FC01
.WORD	FC02
.WORD	FC03
.WORD	FC04
.WORD	FC05
.WORD	FC06
.WORD	FC07
.WORD	FC10
.WORD	FC11
.WORD	FC12
.WORD	FC13
.WORD	FC14
.WORD	FC15
.WORD	FC00
.WORD	FC00

;FLOW COMMANDS 16,8 17 ARE UNUSED.

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 62-1
 CZKEEC.P11 PARAMETER TABLE POINTERS

			.SBTTL	PARAMETER TABLE POINTERS
7001			.PARAMETER TABLE POINTERS	
7002			.	
7003			.	
7004	001566		PTP:	
7005	001566	000000		.WORD 0
7006	001570	000000	PTP01:	.WORD 0
7007	001572	000000	PTP02:	.WORD 0
7008	001574	000000	PTP03:	.WORD 0
7009	001576	000000	PTP04:	.WORD 0
7010	001600	000000	PTP05:	.WORD 0
7011	001602	000000	PTP06:	.WORD 0
7012	001604	000000	PTP07:	.WORD 0
7013	001606	000000	PTP10:	.WORD 0
7014	001610	000000	PTP11:	.WORD 0
7015	001612	000000	PTP12:	.WORD 0
7016	001614	000000	PTP13:	.WORD 0
7017	001616	000000	PTP14:	.WORD 0
7018	001620	000000	PTP15:	.WORD 0
7019	001622	000000	PTP16:	.WORD 0
7020	001624	000000	PTP17:	.WORD 0
7021	001626	000000	PTP20:	.WORD 0
7022	001630	000000	PTP21:	.WORD 0
7023	001632	000000	PTP22:	.WORD 0
7024	001634	000000	PTP23:	.WORD 0
7025	001636	000000	PTP24:	.WORD 0
7026				

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 63
MISCELLANEOUS CONSTANTS

```

7028          .SBTTL          MISCELLANEOUS CONSTANTS
7029          :MISCELLANEOUS CONSTAN'S
7030          :
7032 001640 130000          TBADR:  .WORD 130000          ;TEST BUFFER STARTING ADDRESS
7033 001642 002000          TBLN:  .WORD 2000          ;TEST BUFFER LENGTH
7034 001644 010000          RTBLN: .WORD 10000         ;RANDOM MODE TEST BUFFER LENGTH
7035 001646 140000          EBADR: .WORD 140000         ;EMULATION BUFFER STARTING ADDRESS
7036 001650 002000          EBLN:  .WORD 2000          ;EMULATION BUFFER LENGTH
7037 001652 020000          TPERP: .WORD 20000        ;# OF TESTS PER APT PASS IN RANDOM MODE
7038 001654 002000          PSEED: .WORD 2000          ;# OF TESTS TO EXECUTE IN RANDOM MODE
7039
7040
7041
7055 001656 000024          IPNU:  .WORD 24          ;# OF INPUT PARAMETERS PER INPUT
7056                                     ; TABLE ENTRY.
7057 001660 000001          INCSQ1: .WORD 1          ;INCREMENT SEQUENCE WORD 1
7058 001662 000002          INCSQ2: .WORD 2          ;INCREMENT SEQUENCE WORD 2
7059 001664 177776          TPSW:  .WORD 177776        ;PSW
7060 001666 177560          TKS:   177560
7061 001670 000240          KNOP:  NOP
7062 001672 000000          KHALT: HALT
7063 001674 000405          KBR5:  .WORD 405
7064 001676 000403          KBR3:  .WORD 403
7065 001700 000402          KBR2:  .WORD 402
7066 001702 123321          NOTREG: .WORD 123321      ;PATTERN LOADED INTO REG SET NO SELECTED FOR TEST
7067 001704 000002          EL74:  .WORD 2          ;11/74 PROCESSOR TYPE
7068 001706 000001          EL44:  .WORD 1          ;11/44 PROCESSOR TYPE
7069 001710 000003          EL2324: .WORD 3          ;11/23/24 PROCESSOR TYPE
7070                                     ; BETWEEN PRINTING OF RNG SEED.
7071                                     ;NOTE: ONLY 1 BIT IS ALLOWED TO BE SET IN PSEED.
7072 001712 177562          TKB:   177562
7073 001714 177564          TPS:   177564
7074 001716 177566          TPB:   177566
7075                                     CR=    15
7076                                     LF=    12
7077                                     SL=    57
7078                                     BS=    10
7079                                     MFPT=   7
7080 001720 177777          PAT0:  .WORD 177777
7081 001722 111111          PAT1:  .WORD 111111
7082 001724 122222          PAT2:  .WORD 122222
7083 001726 133333          PAT3:  .WORD 133333
7084 001730 144444          PAT4:  .WORD 144444
7085 001732 155555          PAT5:  .WORD 155555
7086 001734 120606          IXLTB1: .WORD XLTL1
7087 001736 177570          SWR:   .WORD DSWR          ;ADDRESS OF SWITCH REGISTER
7088 001740 177570          DISPLAY: .WORD DDISP      ;ADDRESS OF DISPLAY REGISTER

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

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MISCELLANEOUS CONSTANTS

7090				
7091			.SBTTL	MISCELLANEOUS VARIABLES
7092			:MISCELLANEOUS VARIABLES	
7093			:	
7094	001742	000000	CERFLG:	.WORD 0
7095	001744	000000	CERSAV:	.WORD 0
7096	001746	000000	FLOPTR:	.WORD 0
7097	001750	000000	ESEED:	.WORD 0
7098	001752	000000	DENS:	.WORD 0
7099	001754	000000	NZOOM:	.WORD 0
7100	001756	000000	TSTPSW:	.WORD 0
7101	001760	000000	TBEND:	.WORD 0
7102	001762	000000	SBR:	.WORD 0
7103	001764	000000	RANDOM:	.WORD 0
7104	001766	000000	CTACT:	.WORD 0
7105	001770	000000	PMASK:	.WORD 0
7106	001772	177417	ZMSK:	.WORD 177417
7107	001774	000000	RANDTA:	.WORD 0
7108	001776	000000	LIMSTG:	.WORD 0
7109	002000	000000	RNIB:	.WORD 0
7110	002002	000000	STRNC:	.WORD 0
7111	002004	000000	STRP1:	.WORD 0
7112	002006	000000	STRP2:	.WORD 0
7113	002010	000000	SXRNC:	.WORD 0
7114	002012	000000	SXRP1:	.WORD 0
7115	002014	000000	SXRP2:	.WORD 0
7116	002016	000000	SYRNC:	.WORD 0
7117	002020	000000	SYRP1:	.WORD 0
7118	002022	000000	SYRP2:	.WORD 0
7119	002024	000000	SWRNC:	.WORD 0
7120	002026	000000	SWRP1:	.WORD 0
7121	002030	000000	SWRP2:	.WORD 0
7122	002032	000000	SVRNC:	.WORD 0
7123	002034	000000	SVRP1:	.WORD 0
7124	002036	000000	SVRP2:	.WORD 0
7125	002040	000000	ZCCR:	.WORD 0
7126	002042	000000	SPCV:	.WORD 0
7127	002044	000000	TPRECS:	.WORD 0
7128	002046	000000	NOERDS:	.WORD 0
7129	002050	000000	PROGD:	.WORD 0
7130	002052	000000	SURLEN:	.WORD 0
7131	002054	000000	SURADR:	.WORD 0
7132	002056	000000	REGSET:	.WORD 0
7133	002060	000000	ERRCT:	.WORD 0
7134	002062	000000	ERRS:	.WORD 0
7135	002064	000000	TWOSETS:	.WORD 0
7136	002066	000000	FAVR5:	.WORD 0
7137	002070	000000	FAVR4:	.WORD 0
7138	002072	000000	FAVR3:	.WORD 0
7139	002074	000000	FAVR2:	.WORD 0
7140	002076	000000	FAVR1:	.WORD 0
7141	002100	000000	FSRUN:	.WORD 0
7142	002102	000000	MSEED:	.WORD 0
7143	002104	000000	NBLKS:	.WORD 0

::REV-C

::REV-C

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 64-1
 CZKEEC.P11 MISCELLANEOUS VARIABLES

```

7144 002106 000000 TRA: .WORD 0
7145 002110 000000 TRL: .WORD 0
7146 002112 000000 STGDS1: .WORD 0
7147 002114 000000 STGDS2: .WORD 0
7148 002116 000000 STGLN: .WORD 0
7149 002120 000000 STGAD: .WORD 0
7150 002122 000000 SAVSL: .WORD 0
7151 002124 000000 SAVSA: .WORD 0
7152 002126 000000 SAVSGL: .WORD 0
7153 002130 000000 SIGN: .WORD 0
7154 002132 000000 VIP: .WORD 0
7155 002134 000000 PTW1: .WORD 0
7156 002136 000000 FATAL: .WORD 0
7157 002140 000000 INPTP: .WORD 0
7158 002142 000000 PTPTR: .WORD 0
7159 002144 000000 SPHAND: .WORD 0
7160 002146 000000 EMPTR: .WORD 0
7161 002150 000000 ERRCC: .WORD 0
7162 002152 000000 ERRREG: .WORD 0
7163 002154 000000 ERRBUF: .WORD 0
7164 002156 000000 ERRSTK: .WORD 0
7165 002160 000000 PT34: .WORD 0
7166 002162 000000 MMFLG: .WORD 0
7167 002164 000000 MODE: .WORD 0
7168
7169 002166 000000 DEN: .WORD 0
7170 002170 000000 NMODES: .WORD 0
7171
7172 002172 000000 TRPLOC: .WORD 0
7173 002174 000000 HLTLOC: .WORD 0
7174 002176 000000 IRXLT: .WORD 0
7175 002200 000000 AEADR: .WORD 0
7176 002202 000000 AEDTA: .WORD 0
7177 002204 000000 EMADR: .WORD 0
7178 002206 000000 EMDTA: .WORD 0
7179 002210 000000 QRYFLG: .WORD 0
7180 002212 000000 QVMODE: .WORD 0
7181 002214 000000 MMSTAT: .WORD 0
7182 002216 000000 PTQV: .WORD 0
7183 002220 000000 ICOMP: .WORD 0
7184 002222 000000 STOPTH: .WORD 0
7185 002224 000000 STOPTH: .WORD 0
7186 002226 000000 RLL: .WORD 0
7187 002230 000000 RUL: .WORD 0
7188 002232 000000 BAD: .WORD 0
7189 002234 000000 TSP: .WORD 0
7190 002236 000000 NXFLD: .WORD 0
7191 002240 000000 TTR0: .WORD 0
7192 002242 000000 TTR1: .WORD 0
7193 002244 000000 TTR2: .WORD 0
7194 002246 000000 TTR3: .WORD 0
7195 002250 000000 TTR4: .WORD 0
7196 002252 000000 TTR5: .WORD 0
7197 002254 000000 TTR6: .WORD 0

```

```

;11/34 TYPE PROCESSOR FLAG
;WHEN NON ZERO, TESTING WITH MEMORY MGMT ON
;PROCESSOR MODE USED FOR CIS INST TEST
; (0=KERNEL,1=SUPERVISOR,3=USER)
;D-SPACE ENABLED(1)/DISABLED(0)
;# OF PROCESSOR MODES ON MACHINE UNDER TEST
; (I.E. KERNEL,SUP,USER)

```


PDP-11 (IS INST EXERCISER MACY1 27(655) 25-MAR-81 12:25 PAGE 64-2
 CZKEEC.P11 MISCELLANEOUS VARIABLES

7198	002256	000000	TER0R:	.WORD	0	
7199	002260	000000	TER1R:	.WORD	0	
7200	002262	000000	TER2R:	.WORD	0	
7201	002264	000000	TER3R:	.WORD	0	
7202	002266	000000	TER4R:	.WORD	0	
7203	002270	000000	TER5R:	.WORD	0	
7204	002272	000000	TER6R:	.WORD	0	
7205	002274	000000	TERR:	.WORD	0	
7206	002276	000000	RPTFLG:	.WORD	0	
7207	002300	000000	FILLS2:	.WORD	0	
7208	002302	000000	OCTIC:	.WORD	0	
7209	002304	000000	TW1:	.WORD	0	
7210	002306	000000	TW2:	.WORD	0	
7211	002310	000000	PRTSGN:	.WORD	0	
7212	002312	000000	STGDIG:	.WORD	0	
7213	002314	000000	STGTYP:	.WORD	0	
7214	002316	044244	TYPTAB:	.WORD	TYPSZ	:SIGNED ZONED
7215	002320	044276		.WORD	TYPUZ	:UNSIGNED ZONED
7216	002322	044300		.WORD	TYPTO	:TRAILING OVERPUNCH
7217	002324	044406		.WORD	TYPLO	:LEADING OVERPUNCH
7218	002326	044416		.WORD	TYPTS	:TRAILING SEPARATE
7219	002330	044462		.WORD	TYPLS	:LEADING SEPARATE
7220	002332	002336		.WORD	TYPSP	:RESERVED
7221	002334	002336		.WORD	TYPSP	:RESERVED
7222	002336	000000	TYPSP:	HALT		
7223	002340	175	NEGTAB:	.BYTE	175	:-0
7224	002341	112		.BYTE	112	:-1
7225	002342	113		.BYTE	113	:-2
7226	002343	114		.BYTE	114	:-3
7227	002344	115		.BYTE	115	:-4
7228	002345	116		.BYTE	116	:-5
7229	002346	117		.BYTE	117	:-6
7230	002347	120		.BYTE	120	:-7
7231	002350	121		.BYTE	121	:-8
7232	002351	122		.BYTE	122	:-9
7233	002352	135	NEGTB1:	.BYTE	135	:-0
7234	002353	112		.BYTE	112	:-1
7235	002354	113		.BYTE	113	:-2
7236	002355	114		.BYTE	114	:-3
7237	002356	115		.BYTE	115	:-4
7238	002357	116		.BYTE	116	:-5
7239	002360	117		.BYTE	117	:-6
7240	002361	120		.BYTE	120	:-7
7241	002362	121		.BYTE	121	:-8
7242	002363	122		.BYTE	122	:-9
7243	002364	173	POSTAB:	.BYTE	173	:+0
7244	002365	101		.BYTE	101	:+1
7245	002366	102		.BYTE	102	:+2
7246	002367	103		.BYTE	103	:+3
7247	002370	104		.BYTE	104	:+4
7248	002371	105		.BYTE	105	:+5
7249	002372	106		.BYTE	106	:+6
7250	002373	107		.BYTE	107	:+7
7251	002374	110		.BYTE	110	:+8

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 64-3
 CZKEEC.P11 MISCELLANEOUS VARIABLES

7252	002375	111		.BYTE 111	:+9
7253	002376	060	POSTB1:	.BYTE 060	:+0
7254	002377	061		.BYTE 061	:+1
7255	002400	062		.BYTE 062	:+2
7256	002401	063		.BYTE 063	:+3
7257	002402	064		.BYTE 064	:+4
7258	002403	065		.BYTE 065	:+5
7259	002404	066		.BYTE 066	:+6
7260	002405	067		.BYTE 067	:+7
7261	002406	070		.BYTE 070	:+8
7262	002407	071		.BYTE 071	:+9
7263	002410	133	POSTB2:	.BYTE 133	:+0
7264	002411	061		.BYTE 061	:+1
7265	002412	062		.BYTE 062	:+2
7266	002413	063		.BYTE 063	:+3
7267	002414	064		.BYTE 064	:+4
7268	002415	065		.BYTE 065	:+5
7269	002416	066		.BYTE 066	:+6
7270	002417	067		.BYTE 067	:+7
7271	002420	070		.BYTE 070	:+8
7272	002421	071		.BYTE 071	:+9
7273	002422	045416	PTYPTA:	.WORD PTYPSZ	:SIGNED ZONED
7274	002424	046112		.WORD E1STG	:UNSIGNED ZONED
7275	002426	045260		.WORD PTYPTO	:TRAILING OVERPUNCH
7276	002430	045426		.WORD PTYPLO	:LEADING OVERPUNCH
7277	002432	045436		.WORD PTYPTS	:TRAILING SEPARATE
7278	002434	045452		.WORD PTYPLS	:LEADING SEPARATE
7279	002436	002336		.WORD TYPSP	:RESERVED
7280	002440	002336		.WORD TYPSP	:RESERVED
7281	002442	000000	ONEBEY:	.WORD 0	
7282	002444	000000	DECINS:	.WORD 0	
7283	002446	000006	S1TYPE:	.WORD 6	
7284	002450	000006	S2TYPE:	.WORD 6	
7285	002452	000006	S3TYPE:	.WORD 6	
7286	002454	070000	TYPFLD:	.WORD 070000	
7287	002456	000000	MIXTYP:	.WORD 0	: MANUALLY SET TO ANY NONZERO VALUE
7288					: TO CAUSE TESTING OF MIXED DATA TYPES
7289					: WITHIN INST. NOTE: THIS WILL
7290					: GREATLY INCREASE RUN TIME!!!
7291	002460	000006	PKPTW:	.WORD 0	
7292	002462	000000	NDESC:	.WORD 0	
7293	002464	000000	ZPM:	.WORD 0	
7294	002466	000000	ACINST:	.WORD 0	
7295	002470	000000		.WORD 0	
7296	002472	000000		.WORD 0	
7297	002474	000000	ONEINS:	.WORD 0	
7298	002476	000000	PZCODE:	.WORD 0	
7299	002500	000000	SAVPT:	.WORD 0	
7300	002502	000000	SAVSR:	.WORD 0	
7301	002504	000000	INSRC1:	.WORD 0	:SRC1 STRING SAVE BUFFER DESCRIPTOR
7302	002506	003045		.WORD BUFSR1	
7303	002510	000000	INSRC2:	.WORD 0	:SRC2 STRING SAVE BUFFER DESCRIPTOR
7304	002512	003106		.WORD BUFSR2	
7305					

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655)
MISCELLANEOUS VARIABLES

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7306 002514 120000
7307 002516 000000

RANDSC: .WORD 120000
.WORD 0

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 64-
 CZKEEC.P11 PROGRAMMABLE CLOCK CONSTANTS

```

7309          .SBTTL          PROGRAMMABLE CLOCK CONSTANTS
7310          ;PROGRAMMABLE CLOCK CONSTANTS
7311 002520 000104          PCLK1V: .WORD 104          ;P-CLK 1
7312 002522 000106          PCLK1P: .WORD 106
7313 002524 172540          PC1CSR: .WORD 172540
7314 002526 172542          PC1CSB: .WORD 172542
7315 002530 172544          PC1CTR: .WORD 172544
7316 002532 000000          PCLK2V: .WORD 000          ;P-CLK 2
7317 002534 172550          PC2CSR: .WORD 172550
7318 002536 172552          PC2CSB: .WORD 172552
7319 002540 172554          PC2CTR: .WORD 172554
7320 002542 000004          TIMOUT: .WORD 4
7321
7322 002544 000000          PROGCT: .WORD 0
7323 002546 000000          LATCT: .WORD 0
7324 002550 000000          LATEN: .WORD 0
7325 002552 000000          INTCT: .WORD 0
7326 002554 000240          KNOP1: .WORD NOP
7327 002556 000240          KNOP2: .WORD NOP
7328 002560 000240          KNOP3: .WORD NOP
7329 002562 000000          INTRVL: .WORD 0
7330 002564 000000          STOPLA: .WORD 0          ;IF NONZERO & LATENCY EXCEEDS THIS VALUE PROGRAM HALTS
7331 002566 001000          MAXIVL: .WORD 1000          ;USER DEFINED MAXIMUM INTERVAL ALLOWED
7332
7333 002570 000000          STATPS: .WORD 0
7334 002572 000000          STATR0: .WORD 0
7335 002574 000000          STATR1: .WORD 0
7336 002576 000000          STATR2: .WORD 0
7337 002600 000000          STATR3: .WORD 0
7338 002602 000000          STATR4: .WORD 0
7339 002604 000000          STATR5: .WORD 0
7340 002606 000000          STATR6: .WORD 0
7341 002610 000100          .BLKW ^D64
7342 003010          SCSTK:
7343
7344 003010 000000          SGPR0: .WORD 0
7345 003012 000000          SGPR1: .WORD 0
7346 003014 000000          SGPR2: .WORD 0
7347 003016 000000          SGPR3: .WORD 0
7348 003020 000000          SGPR4: .WORD 0
7349 003022 000000          SGPR5: .WORD 0
7350 003024 000000          SGPR6: .WORD 0
7351
7352

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 64-6
LINE TIME CLOCK CONSTANTS

7354			.SBTTL	LINE TIME CLOCK CONSTANTS
7355			;LINE TIME CLOCK CONSTANTS	
7356	003026	000100	LTCIV: .WORD	100
7357	003030	000102	LTCIP: .WORD	102
7358	003032	177546	CLKS: .WORD	177546
7359	003034	000000	LCNT: .WORD	0
7360	003036	000000	VLCNT: .WORD	0
7361	003040	000240	KNOP4: .WORD	240
7362	003042	000000	LTCPLY: .WORD	0
7363				
7364				

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 65
LINE TIME CLOCK CONSTANTS

7366			.SBTTL	SOURCE STRING STORAGE BUFFER	
7367			:SOURCE	STRING STORAGE BUFFER - USED BY ERROR PRINTOUT ROUTINES	
7368			:		
7369			:		
7370	003044	000	BUF SR1:	.BYTE 0	
7371	003045	000040		.BLKB ^D32	;S1 BUFFER
7372	003105	000		.BYTE 0	
7373	003106	000040	BUF SR2:	.BLKB ^D32	;S2 BUFFER
7374					
7375					
7376					
7377	003146	000	PB0:	.BYTE 0	;DISPLAY BUFFER
7378	003147	000	PB1:	.BYTE 0	
7379	003150	000	PB2:	.BYTE 0	
7380	003151	000	PB3:	.BYTE 0	
7381	003152	000	PB4:	.BYTE 0	
7382	003153	000	PB5:	.BYTE 0	
7383	003154	000	PB6:	.BYTE 0	
7384	003155	000	PB7:	.BYTE 0	
7385					

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 65-1
SOURCE STRING STORAGE BUFFER

7387
7388
7389
7390 003156 000012
7391 003160 003254
7392 003162 000020
7393 003164 003166
7394 003166 000031
7395
7396

; DESCRIPTORS AND DESTINATION BUFFER FOR INTERRUPTABILITY SERVICE
; ROUTINE DIVPI INST.
;
DIVDS: .WORD 12 ; SOURCE 1 & 2 DESC
; .WORD SSTG2
DIVDD: .WORD 20 ; DESTINATION DESC
; .WORD DESTBUF
DESTBUF: .BLKW 31

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 65-2
 CZKEEC.P11 PRE-SPECIFIED STRINGS

```

7398 .SBTTL PRE-SPECIFIED STRINGS
7399 ;PRE-SPECIFIED STRINGS
7400
7401 003250 001 SSTG1: .BYTE 001
7402 003251 001 .BYTE 001
7403 003252 007 .BYTE 007
7404 003253 000 .BYTE 000
7405
7406 003254 012002 SSTG2: .WORD 012002 ;PACKED 2,147,483,648 +MAX+1
7407 003256 101564 .WORD 101564
7408 003260 106144 .WORD 106144
7409
7410 003262 024404 SSTG2A: .WORD 024404 ;PACKED 4,294,967,294 +MAX * 2
7411 003264 063511 .WORD 063511
7412 003266 046051 .WORD 046051
7413
7414 003270 112102 SSTG2B: .WORD 112102 ;PACKED 42,949,677,940 +MAX * 20
7415 003272 071226 .WORD 071226
7416 003274 006224 .WORD 006224
7417
7418 003276 000402 SSTG3: .WORD 000402 ;ZONED 2,147,483,648 +MAX+1
7419 003300 003404 .WORD 003404
7420 003302 034064 .WORD 034064
7421 003304 003003 .WORD 003003
7422 003306 034164 .WORD 034164
7423
7424 003310 012002 SSTG4: .WORD 012002 ;PACKED 2,147,483,647 +MAX
7425 003312 101564 .WORD 101564
7426 003314 076144 .WORD 076144
7427
7428 003316 000402 SSTG5: .WORD 000402 ;ZONED 2,147,483,647 +MAX
7429 003320 003404 .WORD 003404
7430 003322 034064 .WORD 034064
7431 003324 003003 .WORD 003003
7432 003326 033564 .WORD 033564
7433
7434 003330 012002 SSTG6: .WORD 012002 ;PACKED -2,147,483,648 -MAX
7435 003332 101564 .WORD 101564
7436 003334 106544 .WORD 106544
7437
7438 003336 000402 SSTG7: .WORD 000402 ;ZONED -2,147,483,648 -MAX
7439 003340 003404 .WORD 003404
7440 003342 034064 .WORD 034064
7441 003344 003003 .WORD 003003
7442 003346 074164 .WORD 074164
7443
7444 003350 012002 SSTG10: .WORD 012002 ;PACKED -2,147,483,649 -MAX-1
7445 003352 101564 .WORD 101564
7446 003354 116544 .WORD 116544
7447
7448 003356 000402 SSTG11: .WORD 000402 ;ZONED -2,147,483,649 -MAX-1
7449 003360 003404 .WORD 003404
7450 003362 034064 .WORD 034064
7451 003364 003003 .WORD 003003

```


PDP-11 CIS INST EXERCISFR MACY11 27(655) 25-MAR-81 12:25 PAGE 65-3
CZKEEC.P11 PRE-SPECIFIED STRINGS

7452	003366	074564	.WORD	074564	
7453					
7454	003370	032022	SSTG12: .WORD	032022	:PACKED STRING
7455	003372	074126	.WORD	074126	: 1234567891234567891234000891233
7456	003374	021621	.WORD	021621	
7457	003376	063505	.WORD	063505	
7458	003400	011211	.WORD	011211	
7459	003402	000064	.WORD	000064	
7460	003404	110410	.WORD	110410	
7461	003406	036043	.WORD	036043	
7462					
7463	003410	000000	STG12B: .WORD	000000	:PACKED STRING
7464	003412	000000	.WORD	000000	
7465	003414	000000	.WORD	000000	
7466	003416	000000	.WORD	000000	
7467	003420	000000	.WORD	000000	
7468	003422	000000	.WORD	000000	
7469	003424	000000	.WORD	000000	
7470	003426	106610	.WORD	106610	: 000888-
7471					
7472	003430	000100	STG12C: .WORD	000100	:PACKED STRING
7473	003432	000000	.WORD	000000	: 40000000000000000000000000000000-
7474	003434	000000	.WORD	000000	
7475	003436	000000	.WORD	000000	
7476	003440	000000	.WORD	000000	
7477	003442	000000	.WORD	000000	
7478	003444	000000	.WORD	000000	
7479	003446	006400	.WORD	006400	
7480					
7481	003450	001001	SSTG13: .WORD	001001	:ZONED STRING
7482	003452	002003	.WORD	002003	: 1234567891234567891234000891233
7483	003454	003005	.WORD	003005	
7484	003456	004007	.WORD	004007	
7485	003460	000411	.WORD	000411	
7486	003462	101602	.WORD	101602	
7487	003464	072564	.WORD	072564	
7488	003466	073566	.WORD	073566	
7489	003470	034470	.WORD	034470	
7490	003472	031061	.WORD	031061	
7491	003474	002003	.WORD	002003	
7492	003476	000000	.WORD	000000	
7493	003500	004000	.WORD	004000	
7494	003502	000411	.WORD	000411	
7495	003504	001402	.WORD	001402	
7496	003506	000063	.WORD	000063	
7497					
7498	003510	000000	STG13B: .WORD	000000	:ZONED STRING
7499	003512	000000	.WORD	000000	
7500	003514	000000	.WORD	000000	
7501	003516	000000	.WORD	000000	
7502	003520	000000	.WORD	000000	
7503	003522	000000	.WORD	000000	
7504	003524	000000	.WORD	000000	
7505	003526	000000	.WORD	000000	

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 65-4
CZKEEC.P11 PRE-SPECIFIED STRINGS

7506	003530	000000	.WORD	000000	
7507	003532	000000	.WORD	000000	
7508	003534	000000	.WORD	000000	
7509	003536	000000	.WORD	000000	
7510	003540	000000	.WORD	000000	
7511	003542	000000	.WORD	000000	
7512	003544	004000	.WORD	004000	; 000888-
7513	003546	074010	.WORD	074010	
7514					
7515	003550	000004	STG13C: .WORD	000004	:ZONED STRING
7516	003552	000000	.WORD	000000	: 40000000000000000000000000000000-
7517	003554	000000	.WORD	000000	
7518	003556	000000	.WORD	000000	
7519	003560	000000	.WORD	000000	
7520	003562	000000	.WORD	000000	
7521	003564	000000	.WORD	000000	
7522	003566	000000	.WORD	000000	
7523	003570	000000	.WORD	000000	
7524	003572	000000	.WORD	000000	
7525	003574	000000	.WORD	000000	
7526	003576	000000	.WORD	000000	
7527	003600	000000	.WORD	000000	
7528	003602	000000	.WORD	000000	
7529	003604	000000	.WORD	000000	
7530	003606	000160	.WORD	000160	
7531					
7532	003610	042006	SSTG14: .WORD	042006	:PACKED STRING 3X2**31
7533	003612	050044	.WORD	050044	: 6442450944 +
7534	003614	046224	.WORD	046224	
7535					
7536	003616	042006	SSTG15: .WORD	42006	:PACKED STRING 3X2**31 -
7537	003620	050044	.WORD	50044	:6442450944 -
7538	003622	046624	.WORD	46624	
7539					
7540	003624	000000	SSTG16: .WORD	000000	:PACKED STRING
7541	003626	000000	.WORD	000000	: 000000000000333+
7542	003630	000000	.WORD	000000	
7543	003632	036063	.WORD	036063	
7544					

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 66
 CZKEEC.P11 TEST AND EMULATION OPERANDS

```

7546 .SBTTL TEST AND EMULATION OPERANDS
7547 ;TEST OPERANDS
7548 ;
7549 003634 TRN:
7550 003634 000000 TR0: .WORD 0
7551 003636 000000 TR1: .WORD 0
7552 003640 000000 TR2: .WORD 0
7553 003642 000000 TR3: .WORD 0
7554 003644 000000 TR4: .WORD 0
7555 003646 000000 TR5: .WORD 0
7556 003650 000000 TR6: .WORD 0
7557 003652 000000 TCC: .WORD 0
7558
7559 ;TEST RESULTS - REGISTERS
7560 ;
7561 003654 TRNR:
7562 003654 000000 TR0R: .WORD 0
7563 003656 000000 TR1R: .WORD 0
7564 003660 000000 TR2R: .WORD 0
7565 003662 000000 TR3R: .WORD 0
7566 003664 000000 TR4R: .WORD 0
7567 003666 000000 TR5R: .WORD 0
7568 003670 000000 TR6R: .WORD 0
7569
7570 ;TEST RESULTS - CONDITION CODES
7571 ;
7572 003672 000000 TCCR: .WORD 0
7573
7574 ;EMULATION OPERANDS
7575 ;
7576 003674 ERN:
7577 003674 000000 ER0: .WORD 0
7578 003676 000000 ER1: .WORD 0
7579 003700 000000 ER2: .WORD 0
7580 003702 000000 ER3: .WORD 0
7581 003704 000000 ER4: .WORD 0
7582 003706 000000 ER5: .WORD 0
7583 003710 000000 ER6: .WORD 0
7584
7585 ;EMULATION RESULTS - REGISTERS
7586 ;
7587 003712 ERNR:
7588 003712 000000 ER0R: .WORD 0
7589 003714 000000 ER1R: .WORD 0
7590 003716 000000 ER2R: .WORD 0
7591 003720 000000 ER3R: .WORD 0
7592 003722 000000 ER4R: .WORD 0
7593 003724 000000 ER5R: .WORD 0
7594 003726 000000 ER6R: .WORD 0
7595
7596 ;EMULATION RESULTS - CONDITION CODES
7597 ;
7598 003730 000000 ECCR: .WORD 0

```

PDP-11 CIS INST EXERCISE
CZKFECC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 66-1
OCTAL CODING FOR EACH CIS INSTRUCTION

			.SBTTL		OCTAL CODING FOR EACH CIS INSTRUCTION	
			:OCTAL		CODING FOR EACH CIS INSTRUCTION	
			:		:	
			OINST:		:	
7600			.WORD	0	:	0 - UNASSIGNED
7601			.WORD	76030	:	1 - MOVC
7602			.WORD	76031	:	2 - MOVRC
7603	003732	000000	.WORD	76032	:	3 - MOVTC
7604	003734	076030	.WORD	76040	:	4 - LOCC
7605	003736	076031	.WORD	76041	:	5 - SKPC
7606	003740	076032	.WORD	76042	:	6 - SCANC
7607	003742	076040	.WORD	76043	:	7 - SPANC
7608	003744	076041	.WORD	76044	:	10 - CMPC
7609	003746	076042	.WORD	76045	:	11 - MATCHC
7610	003750	076043	.WORD	76050	:	12 - ADDN
7611	003752	076044	.WORD	76051	:	13 - SUBN
7612	003754	076045	.WORD	76052	:	14 - CMPN
7613	003756	076050	.WORD	76053	:	15 - CVTNL
7614	003760	076051	.WORD	76054	:	16 - CVTPN
7615	003762	076052	.WORD	76055	:	17 - CVTNP
7616	003764	076053	.WORD	76056	:	20 - ASHN
7617	003766	076054	.WORD	76057	:	21 - CVTLN
7618	003770	076055	.WORD	76070	:	22 - ADDP
7619	003772	076056	.WORD	76071	:	23 - SUBP
7620	003774	076057	.WORD	76072	:	24 - CMPP
7621	003776	076070	.WORD	76073	:	25 - CVTPL
7622	004000	076071	.WORD	76074	:	26 - MULP
7623	004002	076072	.WORD	76075	:	27 - DIVP
7624	004004	076073	.WORD	76076	:	30 - ASHP
7625	004006	076074	.WORD	76077	:	31 - CVTLP
7626	004010	076075	.WORD	76020	:	32 - L2DR
7627	004012	076076	.WORD	76060	:	33 - L3DR
7628	004014	076077				
7629	004016	076020				
7630	004020	076060				

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 66-2
 CZKFECP11 CONDITION CODE USAGE RECORD

.SBTTL			CONDITION CODE USAGE RECORD	
:CONDITION CODE USAGE RECORD				
:LOW 4 BITS OF LOW BYTE = '1' STATE EXERCISED;			LOW 4 BITS OF HIGH BYTE '0' STATE EXERCISED	
CCREC:	WORD	STATE	EXERCISED	LOW 4 BITS OF HIGH BYTE
7632				
7633				
7634				
7635	004022	000000	: 0	- UNASSIGNED
7636	004024	000000	: 1	- MOVC
7637	004026	000000	: 2	- MOVRC
7638	004030	000000	: 3	- MOVTC
7639	004032	000003	: 4	- LOCC
7640	004034	000003	: 5	- SKPC
7641	004036	000003	: 6	- SCANC
7642	004040	000003	: 7	- SPANC
7643	004042	000000	:10	- CMPC
7644	004044	000003	:11	- MATCHC
7645	004046	000001	:12	- ADDN
7646	004050	000001	:13	- SUBN
7647	004052	000003	:14	- CMPN
7648	004054	000000	:15	- CVTNL
7649	004056	000001	:16	- CVTPN
7650	004060	000001	:17	- CVTNP
7651	004062	000001	:20	- ASHN
7652	004064	000001	:21	- CVTLN
7653	004066	000001	:22	- ADDP
7654	004070	000001	:23	- SUBP
7655	004072	000003	:24	- CMPP
7656	004074	000000	:25	- CVTPL
7657	004076	000001	:26	- MULP
7658	004100	000000	:27	- DIVP
7659	004102	000001	:30	- ASHP
7660	004104	000001	:31	- CVTLP
7661	004106	000000	:32	- L2DR
7662	004110	000000	:33	- L3DR
7663				

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 ZKREC.P11 INTERRUPT LATENCY TABLE

```

7665          .SBTTL          INTERRUPT LATENCY TABLE
7666          ;INTERRUPT LATENCY TABLE (WORST CASE VALUE FOR GIVEN INST)
7667          ;
7668 004112 000000          ILATEN: .WORD 0          ; 0 - UNASSIGNED
7669 004114 000000          .WORD 0          ; 1 - MOVC
7670 004116 000000          .WORD 0          ; 2 - MOVRC
7671 004120 000000          .WORD 0          ; 3 - MOVTC
7672 004122 000000          .WORD 0          ; 4 - LOCC
7673 004124 000000          .WORD 0          ; 5 - SKPC
7674 004126 000000          .WORD 0          ; 6 - SCANC
7675 004130 000000          .WORD 0          ; 7 - SPANC
7676 004132 000000          .WORD 0          ;10 - CMPC
7677 004134 000000          .WORD 0          ;11 - MATCHC
7678 004136 000000          .WORD 0          ;12 - ADDN
7679 004140 000000          .WORD 0          ;13 - SUBN
7680 004142 000000          .WORD 0          ;14 - CMPL
7681 004144 000000          .WORD 0          ;15 - CVTNL
7682 004146 000000          .WORD 0          ;16 - CVTPN
7683 004150 000000          .WORD 0          ;17 - CVTNP
7684 004152 000000          .WORD 0          ;20 - ASHN
7685 004154 000000          .WORD 0          ;21 - CVTLN
7686 004156 000000          .WORD 0          ;22 - ADPP
7687 004160 000000          .WORD 0          ;23 - SUBP
7688 004162 000000          .WORD 0          ;24 - CMPP
7689 004164 000000          .WORD 0          ;25 - CVTPL
7690 004166 000000          .WORD 0          ;26 - MULP
7691 004170 000000          .WORD 0          ;27 - DIVP
7692 004172 000000          .WORD 0          ;30 - ASHP
7693 004174 000000          .WORD 0          ;31 - CVTLP
7694 004176 000000          .WORD 0          ;32 - L2DR
7695 004200 000000          LATEND: .WORD 0          ;33 - L3DR

```

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 CZKEEC.P11 RANDOM EXERCISE MODE MASK TABLE POINTERS

```

7697
7698
7699
7700 004202 000000
7701 004204 006074
7702 004206 006074
7703 004210 006110
7704 004212 006144
7705 004214 006144
7706 004216 006154
7707 004220 006154
7708 004222 006074
7709 004224 006170
7710 004226 006250
7711 004230 006250
7712 004232 006276
7713 004234 006232
7714 004236 006204
7715 004240 006204
7716 004242 006322
7717 004244 006220
7718 004246 006250
7719 004250 006250
7720 004252 006276
7721 004254 006232
7722 004256 006250
7723 004260 006250
7724 004262 006322
7725 004264 006220

.SBTTL          RANDOM EXERCISE MODE MASK TABLE POINTERS
RANDOM EXERCISE MODE MASK TABLE POINTERS
MINST:
.WORD 0          ; 0 - UNASSIGNED
.WORD MMOVCC    ; 1 - MOVCC
.WORD MMOVRC    ; 2 - MOVRC
.WORD MMOVTC    ; 3 - MOVTC
.WORD MLOCC     ; 4 - LOCC
.WORD MSKPC     ; 5 - SKPC
.WORD MSCANC    ; 6 - SCANC
.WORD MSPANC    ; 7 - SPANC
.WORD MCMPCC    ;10 - CMPCC
.WORD MMTCHC    ;11 - MATCHC
.WORD MADDN     ;12 - ADDN
.WORD MSUBN     ;13 - SUBN
.WORD MCMPN     ;14 - CMPN
.WORD MCVTNL    ;15 - CVTNL
.WORD MCVTPN    ;16 - CVTPN
.WORD MCVTNP    ;17 - CVTNP
.WORD MASHN     ;20 - ASHN
.WORD MCVTLN    ;21 - CVTLN
.WORD MADDP     ;22 - ADDP
.WORD MSUBP     ;23 - SUBP
.WORD MCMPPP    ;24 - CMPPP
.WORD MCVTPL    ;25 - CVTPL
.WORD MMULP     ;26 - MULP
.WORD MDIVP     ;27 - DIVP
.WORD MASHP     ;30 - SHP
.WORD MCVTLP    ;31 - CVTLP

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 66-5
 C7REEC.P11 .DECIMAL INST DATA TYPE CONTROL WORDS

			.SBTTL DECIMAL INST DATA TYPE CONTROL WORDS		
			:DECIMAL INSTRUCTION DATA TYPE CONTROL WORDS		
			:		
7727			.DECIMAL INSTRUCTION DATA TYPE CONTROL WORDS		
7728			:		
7729			:		
7730	004266	004220	DECTYP: .WORD DECTTB-50		
7731			:		
7732	004270	001400	DECTTB: .WORD 1400	:	ADDN NDESC,PKPTW
7733	004272	002000	.WORD 2000	:	ZPM,SXTYPE
7734	004274	001400	.WORD 1400	:	SUBN
7735	004276	002000	.WORD 2000	:	
7736	004300	001000	.WORD 1000	:	CMPN
7737	004302	002000	.WORD 2000	:	
7738	004304	000400	.WORD 0400	:	CVTNL
7739	004306	002000	.WORD 2000	:	
7740	004310	001006	.WORD 1006	:	CVTPN
7741	004312	004006	.WORD 4006	:	
7742	004314	001060	.WORD 1060	:	CVTNP
7743	004316	003060	.WORD 3060	:	
7744	004320	001000	.WORD 1000	:	ASHN
7745	004322	002000	.WORD 2000	:	
7746	004324	000400	.WORD 0400	:	CVTLN
7747	004326	002000	.WORD 2000	:	
7748	004330	001400	.WORD 1400	:	ADDP
7749	004332	001777	.WORD 1777	:	
7750	004334	001400	.WORD 1400	:	SUBP
7751	004336	001777	.WORD 1777	:	
7752	004340	001000	.WORD 1000	:	CMPP
7753	004342	001777	.WORD 1777	:	
7754	004344	000400	.WORD 0400	:	CVTPI
7755	004346	001777	.WORD 1777	:	
7756	004350	001400	.WORD 1400	:	MULP
7757	004352	001777	.WORD 1777	:	
7758	004354	001400	.WORD 1400	:	DIVP
7759	004356	001777	.WORD 1777	:	
7760	004360	001000	.WORD 1000	:	ASHP
7761	004362	001777	.WORD 1777	:	
7762	004364	000400	.WORD 0400	:	CVTLP
7763	004366	001777	.WORD 1777	:	

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CZKEEC.P11

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TYPE 0 INDIRECTLY SPECIFIED PARAMETERS

```

7765          .SBTTL          TYPE 0 INDIRECTLY SPECIFIED PARAMETERS
7766          ;TYPE 0 ENTRY - INDIRECTLY SPECIFIED PARAMETERS
7767
7768 004370 000000 INSTID: .WORD 0          ;UNASSIGNED
7769 004372 006     .BYTE 6          ;MOVC
7770 004373 000     .BYTE 0
7771 004374 006     .BYTE 6          ;MOVRC
7772 004375 000     .BYTE 0
7773 004376 006     .BYTE 6          ;MOVTC
7774 004377 015     .BYTE 15
7775 004400 004     .BYTE 4          ;LOCC
7776 004401 000     .BYTE 0
7777 004402 004     .BYTE 4          ;SKPC
7778 004403 000     .BYTE 0
7779 004404 006     .BYTE 6          ;SCANC
7780 004405 011     .BYTE 11
7781 004406 006     .BYTE 6          ;SPANC
7782 004407 011     .BYTE 11
7783 004410 006     .BYTE 6          ;CMPC
7784 004411 011     .BYTE 11
7785 004412 006     .BYTE 6          ;MATCHC
7786 004413 011     .BYTE 11
7787 004414 007     .BYTE 7          ;ADDN
7788 004415 012     .BYTE 12
7789 004416 007     .BYTE 7          ;SUBN
7790 004417 012     .BYTE 12
7791 004420 006     .BYTE 6          ;CMPN
7792 004421 011     .BYTE 11
7793 004422 003     .BYTE 3          ;CVTNL
7794 004423 000     .BYTE 0
7795 004424 005     .BYTE 5          ;CVTPN
7796 004425 000     .BYTE 0
7797 004426 005     .BYTE 5          ;CVTNP
7798 004427 000     .BYTE 0
7799 004430 006     .BYTE 6          ;ASHN
7800 004431 000     .BYTE 0
7801 004432 000     .BYTE 0          ;CVTLN
7802 004433 000     .BYTE 0
7803 004434 007     .BYTE 7          ;ADDP
7804 004435 012     .BYTE 12
7805 004436 007     .BYTE 7          ;SUBP
7806 004437 012     .BYTE 12
7807 004440 006     .BYTE 6          ;CMPP
7808 004441 011     .BYTE 11
7809 004442 003     .BYTE 3          ;CVTPL
7810 004443 000     .BYTE 0
7811 004444 007     .BYTE 7          ;MULP
7812 004445 012     .BYTE 12
7813 004446 007     .BYTE 7          ;DIVP
7814 004447 012     .BYTE 12
7815 004450 006     .BYTE 6          ;ASHP
7816 004451 000     .BYTE 0
7817 004452 000     .BYTE 0          ;CVTLP
7818 004453 000     .BYTE 0

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 CZKEEC.P11 ASCII TABLE FOR CIS INST NMEUMONICS

Address	Op Code	Op Code	Op Code	Op Code	Op Code	Instruction
7820						.SBTTL ASCII TABLE FOR CIS INST NMEUMONICS
7821						..
7822						..ASCII TABLE FOR CIS INSTRUCTION NMEUMONICS
7823						..
7824	004454					..ASZINS:
7826	004454	047515	041526	000000		.ASCII /MOVC/<0><0>
7827	004462	073204				.WORD IMOVC
7828	004464	047515	041526	000061		.ASCII /MOVC1/<0>
7829	004472	073260				.WORD IMOVC1
7830	004474	047515	041526	000062		.ASCII /MOVC2/<0>
7831	004502	073334				.WORD IMOVC2
7832	004504	047514	041503	000000		.ASCII /LOCC/<0><0>
7833	004512	073410				.WORD ILOCC
7834	004514	047514	041503	000061		.ASCII /LOCC1/<0>
7835	004522	073464				.WORD ILOCC1
7836	004524	047514	041503	000062		.ASCII /LOCC2/<0>
7837	004532	073540				.WORD ILOCC2
7838	004534	046503	041520	000000		.ASCII /CMPC/<0><0>
7839	004542	073614				.WORD ICMPC
7840	004544	046503	041520	000061		.ASCII /CMPC1/<0>
7841	004552	073670				.WORD ICMPC1
7842	004554	046503	041520	000062		.ASCII /CMPC2/<0>
7843	004562	073744				.WORD ICMPC2
7844	004564	047515	051126	000103		.ASCII /MOVRC/<0>
7845	004572	074020				.WORD IMOVR
7846	004574	047515	051126	030503		.ASCII /MOVRC1/
7847	004602	074074				.WORD IMOVR1
7848	004604	047515	051126	031103		.ASCII /MOVRC2/
7849	004612	074150				.WORD IMOVR2
7850	004614	047515	052126	000103		.ASCII /MOVTC/<0>
7851	004622	074224				.WORD IMOVT
7852	004624	047515	052126	030503		.ASCII /MOVTC1/
7853	004632	074300				.WORD IMOVT1
7854	004634	047515	052126	031103		.ASCII /MOVTC2/
7855	004642	074354				.WORD IMOVT2
7856	004644	045523	041520	000000		.ASCII /SKPC/<0><0>
7857	004652	074430				.WORD ISKPC
7858	004654	045523	041520	000061		.ASCII /SKPC1/<0>
7859	004662	074504				.WORD ISKPC1
7860	004664	045523	041520	000062		.ASCII /SKPC2/<0>
7861	004672	074560				.WORD ISKPC2
7862	004674	040515	041524	000000		.ASCII /MATC/<0><0>
7863	004702	074634				.WORD IMATC
7864	004704	040515	041524	000061		.ASCII /MATC1/<0>
7865	004712	074710				.WORD IMATC1
7866	004714	040515	041524	000062		.ASCII /MATC2/<0>
7867	004722	074764				.WORD IMATC2
7868	004724	041523	047101	000103		.ASCII /SCANC/<0>
7869	004732	075040				.WORD ISCAN
7870	004734	041523	047101	030503		.ASCII /SCANC1/
7871	004742	075114				.WORD ISCAN1
7872	004744	041523	047101	031103		.ASCII /SCANC2/
7873	004752	075170				.WORD ISCAN2
7874	004754	050123	047101	000103		.ASCII /SPANC/<0>

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 CZKEEC.P11 ASCII TABLE FOR CIS INST NMEUMONICS

7875	004762	075244				.WORD ISPAN
7876	004764	050123	047101	030503		.ASCII /SPANC1/
7877	004772	075320				.WORD ISPAN1
7878	004774	050123	047101	031103		.ASCII /SPANC2/
7879	005002	075374				.WORD ISPAN2
7880	005004	053103	050124	000116		.ASCII /CVTPN/<0>
7881	005012	075450				.WORD ICPZ
7882	005014	053103	050124	030516		.ASCII /CVTPN1/
7883	005022	075524				.WORD ICPZ1
7884	005024	053103	047124	000120		.ASCII /CVTNP/<0>
7885	005032	075600				.WORD ICZP
7886	005034	053103	047124	030520		.ASCII /CVTNP1/
7887	005042	075654				.WORD ICZP1
7888	005044	053103	047124	031120		.ASCII /CVTNP2/
7889	005052	075730				.WORD ICZP2
7890	005054	053103	046124	000120		.ASCII /CVTLP/<0>
7891	005062	076004				.WORD ICLP
7892	005064	053103	046124	030520		.ASCII /CVTLP1/
7893	005072	076060				.WORD ICLP1
7894	005074	053103	046124	031120		.ASCII /CVTLP2/
7895	005102	076134				.WORD ICLP2
7896	005104	053103	046124	000116		.ASCII /CVTLN/<0>
7897	005112	076210				.WORD ICLZ
7898	005114	053103	046124	030516		.ASCII /CVTLN1/
7899	005122	076264				.WORD ICLZ1
7900	005124	053103	050124	000114		.ASCII /CVTPL/<0>
7901	005132	076340				.WORD ICPL
7902	005134	053103	050124	030514		.ASCII /CVTPL1/
7903	005142	076414				.WORD ICPL1
7904	005144	053103	050124	031114		.ASCII /CVTPL2/
7905	005152	076470				.WORD ICPL2
7906	005154	053103	050124	031514		.ASCII /CVTPL3/
7907	005162	076544				.WORD ICPL3
7908	005164	053103	047124	000114		.ASCII /CVTNL/<0>
7909	005172	076620				.WORD ICZL
7910	005174	053103	047124	030514		.ASCII /CVTNL1/
7911	005202	076674				.WORD ICZL1
7912	005204	053103	047124	031114		.ASCII /CVTNL2/
7913	005212	076750				.WORD ICZL2
7914	005214	042101	050104	000000		.ASCII /ADDP/<0><0>
7915	005222	077024				.WORD IADDP
7916	005224	042101	050104	000061		.ASCII /ADDP1/<0>
7917	005232	077100				.WORD IADDP1
7918	005234	042101	050104	000062		.ASCII /ADDP2/<0>
7919	005242	077154				.WORD IADDP2
7920	005244	042101	050104	000063		.ASCII /ADDP3/<0>
7921	005252	077230				.WORD IADDP3
7922	005254	042101	050104	000064		.ASCII /ADDP4/<0>
7923	005262	077304				.WORD IADDP4
7924	005264	042101	047104	000000		.ASCII /ADDN/<0><0>
7925	005272	077360				.WORD IADDN
7926	005274	042101	047104	000061		.ASCII /ADDN1/<0>
7927	005302	077434				.WORD IADDN1
7928	005304	042101	047104	000062		.ASCII /ADDN2/<0>

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 CZKCEC.P11 ASCII TABLE FOR CIS INST NMEUMONICS

7929	005312	077510			.WORD IADDN2
7930	005314	042101	047104	000063	.ASCII /ADDN3/<0>
7931	005322	077564			.WORD IADDN3
7932	005324	042101	047104	000064	.ASCII /ADDN4/<0>
7933	005332	077640			.WORD IADDN4
7934	005334	052523	050102	000000	.ASCII /SUBP/<0><0>
7935	005342	077770			.WORD ISUBP
7936	005344	052523	050102	000061	.ASCII /SUBP1/<0>
7937	005352	100044			.WORD ISUBP1
7938	005354	052523	050102	000062	.ASCII /SUBP2/<0>
7939	005362	100120			.WORD ISUBP2
7940	005364	052523	050102	000063	.ASCII /SUBP3/<0>
7941	005372	100174			.WORD ISUBP3
7942	005374	052523	050102	000064	.ASCII /SUBP4/<0>
7943	005402	100250			.WORD ISUBP4
7944	005404	052523	047102	000000	.ASCII /SUBN/<0><0>
7945	005412	100324			.WORD ISUBN
7946	005414	052523	047102	000061	.ASCII /SUBN1/<0>
7947	005422	100400			.WORD ISUBN1
7948	005424	052523	047102	000062	.ASCII /SUBN2/<0>
7949	005432	100454			.WORD ISUBN2
7950	005434	052523	047102	000063	.ASCII /SUBN3/<0>
7951	005442	100530			.WORD ISUBN3
7952	005444	052523	047102	000064	.ASCII /SUBN4/<0>
7953	005452	100604			.WORD ISUBN4
7954	005454	046503	050120	000000	.ASCII /CMPN/<0><0>
7955	005462	100660			.WORD ICMPN
7956	005464	046503	050120	000061	.ASCII /CMPN1/<0>
7957	005472	100734			.WORD ICMPN1
7958	005474	046503	050120	000062	.ASCII /CMPN2/<0>
7959	005502	101010			.WORD ICMPN2
7960	005504	046503	050120	000063	.ASCII /CMPN3/<0>
7961	005512	101064			.WORD ICMPN3
7962	005514	046503	050120	000064	.ASCII /CMPN4/<0>
7963	005522	101140			.WORD ICMPN4
7964	005524	046503	047120	000000	.ASCII /CMPN/<0><0>
7965	005532	101214			.WORD ICMPN
7966	005534	046503	047120	000061	.ASCII /CMPN1/<0>
7967	005542	101270			.WORD ICMPN1
7968	005544	046503	047120	000062	.ASCII /CMPN2/<0>
7969	005552	101344			.WORD ICMPN2
7970	005554	046503	047120	000063	.ASCII /CMPN3/<0>
7971	005562	101420			.WORD ICMPN3
7972	005564	046503	047120	000064	.ASCII /CMPN4/<0>
7973	005572	101474			.WORD ICMPN4
7974	005574	051501	050110	000000	.ASCII /ASHP/<0><0>
7975	005602	101550			.WORD IASHP
7976	005604	051501	050110	000061	.ASCII /ASHP1/<0>
7977	005612	101624			.WORD IASHP1
7978	005614	051501	050110	000062	.ASCII /ASHP2/<0>
7979	005622	101700			.WORD IASHP2
7980	005624	051501	047110	000000	.ASCII /ASHN/<0><0>
7981	005632	101754			.WORD IASHN
7982	005634	051501	047110	000061	.ASCII /ASHN1/<0>

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 CZKEEC.P11 ASCII TABLE FOR CIS INST NMEUMONICS

7983	005642	102030			.WORD IASHN1
7984	005644	051501	047110	000062	.ASCII /ASHN2/<0>
7985	005652	102104			.WORD IASHN2
7986	005654	052515	050114	000000	.ASCII /MULP/<0><0>
7987	005662	102160			.WORD IMULP
7988	005664	052515	050114	000061	.ASCII /MULP1/<0>
7989	005672	102234			.WORD IMULP1
7990	005674	052515	050114	000062	.ASCII /MULP2/<0>
7991	005702	102310			.WORD IMULP2
7992	005704	052515	050114	000063	.ASCII /MULP3/<0>
7993	005712	102364			.WORD IMULP3
7994	005714	052515	050114	000064	.ASCII /MULP4/<0>
7995	005722	102440			.WORD IMULP4
7996	005724	052515	050114	000065	.ASCII /MULP5/<0>
7997	005732	102514			.WORD IMULP5
7998	005734	052515	050114	000066	.ASCII /MULP6/<0>
7999	005742	102570			.WORD IMULP6
8000	005744	052515	050114	000067	.ASCII /MULP7/<0>
8001	005752	102644			.WORD IMULP7
8002	005754	044504	050126	000000	.ASCII /DIVP/<0><0>
8003	005762	102720			.WORD IDIVP
8004	005764	044504	050126	000061	.ASCII /DIVP1/<0>
8005	005772	102774			.WORD IDIVP1
8006	005774	044504	050126	000062	.ASCII /DIVP2/<0>
8007	006002	103050			.WORD IDIVP2
8008	006004	044504	050126	000063	.ASCII /DIVP3/<0>
8009	006012	103124			.WORD IDIVP3
8010	006014	044504	050126	000064	.ASCII /DIVP4/<0>
8011	006022	103200			.WORD IDIVP4
8012	006024	044504	050126	000065	.ASCII /DIVP5/<0>
8013	006032	103254			.WORD IDIVP5
8014	006034	044504	050126	000066	.ASCII /DIVP6/<0>
8015	006042	103330			.WORD IDIVP6
8017	006044	031114	000104	000000	.ASCII /L2D/<0><0><0>
8018	006052	073054			.WORD IL2D
8019	006054	031514	000104	000000	.ASCII /L3D/<0><0><0>
8020	006062	073130			.WORD IL3D
8021	006064	000000			.WORD 0
8022	006066	000000			.WORD 0
8023	006070	000000			.WORD 0
8024	006072	000000			.WORD 0

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 CZKEEC.P11 RANDOM EXERCISE MASK TABLES

```

8026          .SBTTL          RANDOM EXERCISE MASK TABLES
8027          :
8028          :RANDOM EXERCISING MASK TABLES
8029          :
8030          :
8031 006074    MMOVC:
8032 006074    MCMPC:
8033 006074    MMOVRC.
8035 006074 174000      .WORD BS2          :IP1 MASK      (LEN)
8036 006076 176000      .WORD BS4          :IP2          (ADR)
8037 006100 174000      .WORD BS2          :IP3          (LEN)
8038 006102 174000      .WORD BS2          :IP4          (ADR)
8046 006104 177400      .WORD BY          :IP5          (FILL)
8047 006106 125252      .WORD EOT
8048
8049
8050
8051
8052 006110    MMOVTC:
8054 006110 174000      .WORD BS2          :IP1 MASK      (LEN)
8055 006112 176000      .WORD BS4          :IP2          (ADR)
8056 006114 174000      .WORD BS2          :IP3          (LEN)
8057 006116 002000      .WORD MPO2000     :IP4          (ADR)
8065 006120 177400      .WORD BY          :IP5          (FILL)
8066 006122 177777      .WORD BSNULL      :IP6
8067 006124 177777      .WORD BSNULL      :IP7
8068 006126 177777      .WORD BSNULL      :IP10
8069 006130 177777      .WORD BSNULL      :IP11
8070 006132 177777      .WORD BSNULL      :IP12
8071 006134 177777      .WORD BSNULL      :IP13
8072 006136 177777      .WORD BSNULL      :IP14
8073 006140 022000      .WORD MPO2200     :IP15          (TAB_E ADR)
8074 006142 125252      .WORD EOT
8075

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CZKEEC.P11MACY11 27(655) 25-MAR-81 12:25 PAGE 68
RANDOM EXERCISE MASK TABLES

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8077
8078      ;RANDOM EXERCISE MASK TABLES (CONTINUED)
8079      ;
8080
8081      006144      MLOCC:
8082      006144      MSKPC:
8084      006144      174000      .WORD BS2      ;IP1 MASK      (LEN)
8085      006146      174000      .WORD BS2      ;IP2      (ADR)
8091      006150      177400      .WORD BY      ;IP3      (CHAR)
8092      006152      125252      .WORD EOT
8093
8094
8095
8096      006154      MSCANC:
8097      006154      MSPANC:
8099      006154      174000      .WORD BS2      ;IP1 MASK      (LEN)
8100      006156      174000      .WORD BS2      ;IP2      (ADR)
8106      006160      177400      .WORD BY      ;IP3      (TABLE LEN)
8107      006162      177400      .WORD BY      ;IP4      (TABLE MASK)
8109      006164      174000      .WORD BS2      ;IP5      (TABLE ADR)
8114      006166      125252      .WORD EOT
8115
8116
8117      006170      MMTCHC:
8119      006170      177000      .WORD BS8      ;IP1 MASK      (LEN)
8120      006172      176000      .WORD BS4      ;IP2      (ADR)
8121      006174      174000      .WORD BS2      ;IP3      (LEN)
8122      006176      174000      .WORD BS2      ;IP4      (ADR)
8130      006200      177400      .WORD BY      ;IP5      (DATA)
8131      006202      125252      .WORD EOT

```

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CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 69
RANDOM EXERCISE MASK TABLES

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8133
8134
8135      ;
8136      ;RANDOM EXERCISE MODE MASK TABLES (CONTINUED)
8137      ;
8138      MCVTNP:
8139      006204 177740      MCVTPN: .WORD BS128      ;IP1 MASK      (LEN)
8141      006206 176000      .WORD BS4      ;IP2      (ADR)
8146      006210 177740      .WORD BS128      ;IP3      (LEN)
8148      006212 004000      .WORD MPO4000      ;IP4      (ADR)
8153      006214 152525      .WORD DSCPTR      ;IP5      (DESC POINTER)
8154      006216 125252      .WORD EOT
8155
8156
8157      MCVTLP:
8158      006220 000000      MCVTLN: .WORD WD      ;IP1 MASK      (LONG-HIGH)
8159      006222 000000      .WORD WD      ;IP2      (LONG-LOW)
8160      006224 177740      .WORD BS128      ;IP3      (LEN)
8162      006226 174000      .WORD BS2      ;IP4      (ADR)
8167      006230 125252      .WORD EOT
8168
8169
8170      MCVTPL:
8171      006232 177740      MCVTNL: .WORD BS128      ;IP1 MASK      (LEN)
8173      006234 174000      .WORD BS2      ;IP2      (ADR)
8178      006236 152525      .WORD DSCPTR      ;IP3      (DESC POINTER)
8179      006240 177777      .WORD BSNULL      ;IP4
8180      006242 177777      .WORD BSNULL      ;IP5
8181      006244 177400      .WORD BY      ;IP6      (DATA)
8182      006246 125252      .WORD EOT

```


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 7KFECC.P11 RANDOM EXERCISE MASK TABLES

```

8184
8185
8186
8187
8188
8189 006250
8190 006250
8191 006250
8192 006250
8193 006250
8194 006250
8195 006250 177740
8197 006252 177000
8198 006254 177740
8199 006256 002000
8200 006260 177740
8201 006262 004040
8210 006264 152525
8211 006266 177777
8212 006270 177777
8213 006272 152525
8214 006274 125252
8215
8216
8217 006276
8218 006276
8219 006276 177740
8221 006300 176000
8222 006302 177740
8223 006304 004000
8230 006306 177400
8231 006310 152525
8232 006312 177777
8233 006314 177777
8234 006316 152525
8235 006320 125252
    
```

:RANDOM EXERCISE MODE MASK TABLES (CONTINUED)

```

MADDP:
MADDN:
MSUBP:
MSUBN:
MMULP:
MDIVP:
    .WORD BS128      :IP1 MASK      (LEN)
    .WORD BS8        :IP2           (ADR)
    .WORD BS128      :IP3           (LEN)
    .WORD MPO2000    :IP4           (ADR)
    .WORD BS128      :IP5           (LEN)
    .WORD MPO4040    :IP6           (ADR)
    .WORD DSCPTR     :IP7           (DESC POINTER)
    .WORD BSNNULL    :IP10          (LEN)
    .WORD BSNNULL    :IP11          (ADR)
    .WORD DSCPTR     :IP12          (DESC POINTER)
    .WORD EOT
MCOMP:
MCMPP:
    .WORD BS128      :IP1 MASK      (LEN)
    .WORD BS4        :IP2           (ADR)
    .WORD BS128      :IP3           (LEN)
    .WORD MPO4000    :IP4           (ADR)
    .WORD BY         :IP5           (DATA)
    .WORD DSCPTR     :IP6           (DESC POINTER)
    .WORD BSNNULL    :IP7           (LEN)
    .WORD BSNNULL    :IP10          (ADR)
    .WORD DSCPTR     :IP11          (DESC POINTER)
    .WORD EOT
    
```

POP-11 .IS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 71
.Z*FEEL.P11 RANDOM EXERCISE MASK TABLES

8237
8238
8239
8240
8241
8242
8243
8244
8246
8247
8248
8249
8257
8258

006322
006322
006322 177740
006324 176000
006326 170000
006330 177740
006332 004000
006334 152525
006336 125252

:
:RANDOM EXERCISE MODE MASK TABLES (CONTINUED)
:

MASHP:
MASHN:

.WORD BS128 :IP1 MASK (LEN)
.WORD BS4 :IP2 (ADR)
.WORD BS0 :IP3 (RD, SC)
.WORD BS128 :IP4 (LEN)
.WORD MPO4000 :IP5 (ADR)
.WORD DSCPTR :IP6 (DESC POINTER)
.WORD EOT

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CZKEEC.P11

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RANDOM EXERCISE MASK TABLES

```

8288
8289
8290
8291
8292 006340
8293 006340
8294 006340 151600
8295 006342 010100
8296 006344 010201
8297 006346 010302
8298 006350 010504
8299 006352 020403
8300 006354 031001
8301 006356 031303
8302 006360 041001
8303 006362 041323
8304 006364 051300
8305 006366 060000
8306 006370 071123
8307 006372 001312
8308 006374 070601
8309 006376 001007
8310 006400 100000
8311 006402 111300
8312 006404 122400
8313 006406 001300
8314 006410 000000
8315 006412 007000
8316 006414 137000
8317 006416 140000
8318
8319

```

```

.SBTTL          CIS INST FLOW TABLES
:CIS INSTRUCTION FLOW TABLES
:
XMOVRC:
XMOVRC:
.WORD 151600
.WORD 010100
.WORD 010201
.WORD 010302
.WORD 010504
.WORD 020403
.WORD 031001
.WORD 031303
.WORD 041001
.WORD 041323
.WORD 051300
.WORD 060000
.WORD 071123
.WORD 001312
.WORD 070601
.WORD 001007
.WORD 100000
.WORD 111300
.WORD 122400
.WORD 001300
.WORD 000000
.WORD 007000
.WORD 137000
.WORD 140000

```

```

:MOVRC FLOW TABLE S1=SRC, S2=DST
:MOVRC FLOW TABLE S1=SRC, S2=DST
:LOAD SPECIAL HANDLING WORD FROM PTP16
:LOAD TR0 FROM PTP01
:LOAD TR1 FROM PTP02
:LOAD TR2 FROM PTP03
:LOAD TR4 FROM PTP05
:GENERATE TR3 FROM PTP04
:VERIFY THAT S1.ADR-S1.SURR.LEN >=20
:VERIFY THAT S2.ADR-S2.SURR.LEN >= 20
:VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLEN
:VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLEN
:ADD TEST BUFFER ADDRESS TO TR1 AND TR3
:INITIALIZE TEST BUFFER
:INSERT S2 & S2.SURR STRINGS IN TEST BUFFER
:INSERT S1 & S1.SURR STRINGS IN TEST BUFFER
:
:COPY TEST BUFFER INTO EMULATION BUFFER
:SETUP EMULATION OPERANDS & EMULATE INST
:SETUP CC & REGS AND EXECUTE CIS INST.
:
:COMPARE RESULTS
:UPDATE PTRS FOR NEXT TEST CONDITION.
: RETURN TO START EXECUTING NEXT TEST CONDITION.

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

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CIS INST FLOW TABLES

8321				
8322	006420		XMOVTC:	:MOVRC FLOW TABLE S1-SRC, S2=DST
8323	006420	151600	.WORD 151600	:LOAD SPECIAL HANDLING WORD FROM PTP16
8324	006422	010100	.WORD 010100	:LOAD TR0 FROM PTP01
8325	006424	010201	.WORD 010201	:LOAD TR1 FROM PTP02
8326	006426	010302	.WORD 010302	:LOAD TR2 FROM PTP03
8327	006430	010504	.WORD 010504	:LOAD TR4 FROM PTP05
8328	006432	011505	.WORD 011505	:LOAD TR5 FROM PTP15 (TRANSLATION TABLE)
8329	006434	020403	.WORD 020403	:GENERATE TR3 FROM PTP04
8330	006436	031001	.WORD 031001	:VERIFY THAT S1.ADR-S1.SURR.LEN >=20
8331	006440	031303	.WORD 031303	:VERIFY THAT S2.ADR-S2.SURR.LEN >= 20
8332	006442	041001	.WORD 041001	:VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLN
8333	006444	041323	.WORD 041323	:VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLN
8334	006446	051300	.WORD 051300	:ADD TEST BUFFER ADDRESS TO TR1 AND TR3
8335	006450	060000	.WORD 060000	:INITIALIZE TEST BUFFER
8336	006452	071123	.WORD 071123	:INSERT S2 & S2.SURR STRINGS IN TEST BUFFER
8337	006454	001312	.WORD 001312	
8338	006456	070601	.WORD 070601	:INSERT S1 & S1.SURR STRINGS IN TEST BUFFER
8339	006460	001007	.WORD 001007	
8340	006462	100000	.WORD 100000	:COPY TEST BUFFER INTO EMULATION BUFFER
8341	006464	111300	.WORD 111300	:SETUP EMULATION OPERANDS & EMULATE INST
8342	006466	122450	.WORD 122450	:SETUP CC & REGS AND EXECUTE CIS INST.
8343	006470	001300	.WORD 001300	
8344	006472	000000	.WORD 000000	
8345	006474	007000	.WORD 007000	
8346	006476	137000	.WORD 137000	:COMPARE RESULTS
8347	006500	140000	.WORD 140000	:UPDATE PTRS FOR NEXT TEST CONDITION.
8348				: RETURN TO START EXECUTING NEXT TEST CONDITION.
8349				

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE /4
CIS INST FLOW TABLES

8351
8352
8353 006502
8354 006502 151500
8355 006504 010100
8356 006506 010201
8357 006510 010302
8358 006512 010504
8359 006514 020403
8360 006516 031001
8361 006520 031303
8362 006522 041001
8363 006524 041323
8364 006526 051300
8365 006530 060000
8366 006532 071123
8367 006534 001312
8368 006536 070601
8369 006540 001007
8370 006542 100000
8371 006544 111300
8372 006546 122400
8373 006550 001300
8374 006552 000000
8375 006554 007000
8376 006556 131370
8377 006560 007000
8378 006562 140000
8379

XCMPC:

.WORD 151500
.WORD 010100
.WORD 010201
.WORD 010302
.WORD 010504
.WORD 020403
.WORD 031001
.WORD 031303
.WORD 041001
.WORD 041323
.WORD 051300
.WORD 060000
.WORD 071123
.WORD 001312
.WORD 070601
.WORD 001007
.WORD 100000
.WORD 111300
.WORD 122400
.WORD 001300
.WORD 000000
.WORD 007000
.WORD 131370
.WORD 007000
.WORD 140000

;CMPC FLOW TABLE S1=SRC1, S2=SRC2
;LOAD SPECIAL HANDLING WORD FROM PTP15
;LOAD TR0 FROM PTP01
;LOAD TR1 FROM PTP02
;LOAD TR2 FROM PTP03
;LOAD TR4 FROM PTP05
;GENERATE TR3 FROM PTP04
;VERIFY THAT S1.ADR-S1.SURR.LEN >-20
;VERIFY THAT S2.ADR-S2.SURR.LEN >- 20
;VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLEN
;VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLEN
;ADD TEST BUFFER ADDRESS TO TR1 AND TR3
;INITIALIZE TEST BUFFER
;INSERT S2 & S2.SURR STRINGS IN TEST BUFFER

;INSERT S1 & S1.SURR STRINGS IN TEST BUFFER

;COPY TEST BUFFER INTO EMULATION BUFFER
;SETUP EMULATION OPERANDS & EMULATE INST
;SETUP CC & REGS AND EXECUTE CIS INST.

;COMPARE RESULTS

;UPDATE PTRS FOR NEXT TEST CONDITION.
; RETURN TO START EXECUTING NEXT TEST CONDITION.

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 75
CIS INST FLOW TABLES

8381
8382 006564
8383 006564 151500
8384 006566 010300
8385 006570 010102
8386 006572 010203
8387 006574 010504
8388 006576 020401
8389 006600 031301
8390 006602 031003
8391 006604 041301
8392 006606 041023
8393 006610 051300
8394 006612 060000
8395 006614 070623
8396 006616 001007
8397 006620 071101
8398 006622 001312
8399 006624 100000
8400 006626 111300
8401 006630 122000
8402 006632 001300
8403 006634 000000
8404 006636 000170
8405 006640 131370
8406 006642 001700
8407 006644 140000
8408

XMATCHC:
.WORD 151500
.WORD 010300
.WORD 010102
.WORD 010203
.WORD 010504
.WORD 020401
.WORD 031301
.WORD 031003
.WORD 041301
.WORD 041023
.WORD 051300
.WORD 060000
.WORD 070623
.WORD 001007
.WORD 071101
.WORD 001312
.WORD 100000
.WORD 111300
.WORD 122000
.WORD 001300
.WORD 000000
.WORD 000170
.WORD 131370
.WORD 001700
.WORD 140000

```
;MATCHC FLOW TABLE S1=SRC, S2=OBJ
;LOAD SPECIAL HANDLING WORD FROM P1P15
;LOAD TR0 FROM PTP03
;LOAD TR2 FROM PTP01
;LOAD TR3 FROM PTP02
;LOAD TR4 FROM PTP05
;GENERATE TR1 FROM PTP04
;VERIFY THAT S1.ADR-S1.SURR.LEN >=20
;VERIFY THAT S2.ADR-S2.SURR.LEN >= 20
;VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLN
;VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLN
;ADD TEST BUFFER ADDRESS TO TR1 AND TR3
;INITIALIZE TEST BUFFER
;INSERT S2 & S2.SURR STRINGS IN TEST BUFFER

;INSERT S1 & S1.SURR STRINGS IN TEST BUFFER

;COPY TEST BUFFER INTO EMULATION BUFFER
;SETUP EMULATION OPERANDS & EMULATE INST
;SETUP CC & REGS AND EXECUTE CIS INST.

;COMPARE RESULTS

;UPDATE PTRS FOR NEXT TEST CONDITION.
; RETURN TO START EXECUTING NEXT TEST CONDITION.
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CZKEEC.P11

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CIS INST FLOW TABLES

8410				
8411				
8412	006646		XCMPP:	:CMPP FLOW TABLE S1=SRC1, S2=SRC2
8413	006646		XCMPN:	:CMPN FLOW TABLE S1=SRC1, S2=SRC2
8414	006646	151500		:LOAD SPECIAL HANDLING FROM PTP15
8415	006650	010110	.WORD 151500	:LOAD TR0 FROM PTP01
8416	006652	010201	.WORD 010110	:LOAD TR1 FROM PTP02
8417	006654	010312	.WORD 010201	:LOAD TR2 FROM PTP03
8418	006656	010504	.WORD 010312	:LOAD TR4 FROM PTP05
8419	006660	020403	.WORD 010504	:GENERATE TR3 FROM PTP04
8420	006662	031001	.WORD 020403	:VERIFY THAT S1.ADR-S1.SURR.LEN >= 20
8421	006664	031303	.WORD 031001	:VERIFY THAT S2.ADR-S2.SURR.LEN >= 20
8422	006666	041001	.WORD 031303	:VERIFY THAT S1.ADR+S1.LEN+S1.SURR.LEN < TBLN
8423	006670	041323	.WORD 041001	:VERIFY THAT S2.ADR+S2.LEN+S2.SURR.LEN < TBLN
8424	006672	051300	.WORD 041323	:ADD TEST BUFFER ADDRESS TO TR1 AND TR3
8425	006674	060000	.WORD 051300	:INITIALIZE TEST BUFFER
8426	006676	075123	.WORD 060000	:INSERT S2 & S2.SURR STRINGS IN TEST BUFFER
8427	006700	074601	.WORD 075123	:INSERT S1 & S1.SURR STRINGS IN TEST BUFFER
8428	006702	100000	.WORD 074601	:COPY TEST BUFFER INTO EMULATION BUFFER
8429	006704	111300	.WORD 100000	:SETUP EMULATION OPERANDS & EMULATE INST
8430	006706	122000	.WORD 111300	:SETUP CC & REGS AND EXECUTE CIS INST.
8431	006710	001300	.WORD 122000	
8432	006712	000000	.WORD 001300	
8433	006714	007000	.WORD 000000	:COMPARE RESULTS
8434	006716	137000	.WORD 007000	:UPDATE PTRS FOR NEXT TEST CONDITION.
8435	006720	140000	.WORD 137000	: RETURN TO START EXECUTING NEXT TEST CONDITION.
8436			.WORD 140000	

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CZKEEC.P11

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CIS INST FLOW TABLES

8438					
8439	006722		XASHP:		:ASHP FLOW TABLE
8440	006722		XASHN:		:ASHN FLOW TABLE
8441	006722	151500		.WORD 151500	:LOAD SPECIAL HANDLING FROM PTP15
8442	006724	010110		.WORD 010110	:LOAD TR0 FROM PTP01
8443	006726	010201		.WORD 010201	:LOAD TR1 FROM PTP02
8444	006730	010422		.WORD 010422	:LOAD TR2 FROM PTP04
8445	006732	010304		.WORD 010304	:LOAD TR4 FROM PTP03
8446	006734	020503		.WORD 020503	:GENERATE TR3 FROM PTP05
8447	006736	031001		.WORD 031001	:VERIFY THAT SRC.ADR-SRC.SURR.LEN >= 20
8448	006740	031303		.WORD 031303	:VERIFY THAT DST.ADR-DST.SURR.LEN >= 20
8449	006742	041001		.WORD 041001	:VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN < TBLEN
8450	006744	041323		.WORD 041323	:VERIFY THAT DST.ADR+DST.LEN+DST.SURR.LEN < TBLEN
8451	006746	051300		.WORD 051300	:ADD TEST BUFFER ADDRESS TO TR1 & TR5
8452	006750	060000		.WORD 060000	:INITIALIZE TEST BUFFER
8453	006752	071123		.WORD 071123	:INSERT DST & DST.SURR STRINGS IN TEST BUFFER
8454	006754	001312		.WORD 001312	
8455	006756	074601		.WORD 074601	:INSERT SRC IN TST BUFFER
8456	006760	100000		.WORD 100000	:COPY TEST BUFFER INTO EMULATION BUFFER
8457	006762	111300		.WORD 111300	:SETUP EMULATION OPERANDS & EXECUTE INST
8458	006764	122400		.WORD 122400	:SETUP CC & REGS AND EXECUTE CIS INST
8459	006766	001300		.WORD 001300	
8460	006770	000000		.WORD 000000	
8461	006772	007000		.WORD 007000	
8462	006774	133700		.WORD 133700	:COMPARE RESULTS
8463	006776	007000		.WORD 007000	
8464	007000	140000		.WORD 140000	:UPDATE PTRS FOR NEXT TEST CONDITION
8465					: AND RETURN TO START EXECUTING NEXT
8466					: TEST CONDITION

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CIS INST FLOW TABLES

8468				
8469				
8470				
8471	007002	XLOCC:		:LOCC FLOW TABLE
8472	007002	XSKPC:		:SKPC FLOW TABLE
8473	007002		.WORD 150700	:LOAD SPECIAL HANDLING WORD FROM PTP07
8474	007004		.WORD 010100	:LOAD TR0 FROM PTP01
8475	007006		.WORD 010201	:LOAD TR1 FROM PTP02
8476	007010		.WORD 010304	:LOAD TR4 FROM PTP03
8477	007012		.WORD 030601	:VERIFY THAT SRC.ADR-SRC.SURR.LEN >=20
8478	007014		.WORD 040601	:VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN < TBLEN
8479	007016		.WORD 051000	:ADD TEST BUFFER ADDRESS TO TR1
8480	007020		.WORD 060000	:INITIALIZE TEST BUFFER
8481	007022		.WORD 070401	:INSERT SRC & SRC SURR STRINGS IN BUFFER
8482	007024		.WORD 000605	
8483	007026		.WORD 100000	:COPY TEST BUFFER INTO EMULATION BUFFER
8484	007030		.WORD 111000	:SETUP EMULATION OPERANDS & EMULATE INST.
8485	007032		.WORD 121400	:SETUP CC & REGS AND EXECUTE CIS INST
8486	007034		.WORD 001000	
8487	007036		.WORD 000000	
8488	007040		.WORD 000170	
8489	007042		.WORD 131700	:COMPARE RESULTS
8490	007044		.WORD 001700	:UPDATE POINTERS AND RETURN FOR NEXT
8491	007046		.WORD 140000	: TEST CONDITION.
8492				
8493				

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CIS INST FLOW TABLES

8495			
8496	007050	XADDP:	:ADDP FLOW TABLE
8497	007050	XADDN:	:ADDN FLOW TABLE
8498	007050	XSUBP:	:SUBP FLOW TABLE
8499	007050	XSLBN:	:SUBN FLOW TABLE
8500	007050	XMULP:	:MULP FLOW TABLE
8501	007050	XDIVP:	:DIVP FLOW TABLE
8502	007050	152100	:LOAD SPECIAL HANDLING FROM PTP21
8503	007052	010110	:LOAD TR0 FROM PTP01
8504	007054	010201	:LOAD TR1 FROM PTP02
8505	007056	010322	:LOAD TR2 FROM PTP03
8506	007060	010534	:LOAD TR4 FROM PTP05
8507	007062	010605	:TYPE 0 USE ONLY - LOAD TR5 FROM PTP06
8508	007064	020403	:GENERATE TR3 & TR5 FROM PTP04
8509	007066	031101	:VERIFY THAT SRC1.ADR-SRC1.SURR.LEN > 20
8510	007070	031403	:VERIFY THAT SRC2.ADR-SRC2.SURR.LEN >= 20
8511	007072	031705	:VERIFY THAT DST.ADR-DST.SURR.LEN >=20
8512	007074	041101	:VERIFY THAT SRC1.ADR+SRC1.LEN+SRC1.SURR.LEN < TBLLEN
8513	007076	041423	:VERIFY THAT SRC2.ADR+SRC2.LEN+SRC2.SURR.LEN < TBLLEN
8514	007100	041745	:VERIFY THAT DST.ADR+DST.LEN+DST.SURR.LEN < TBLLEN
8515	007102	051350	:ADD TEST BUFFER ADDRESS TO TR1, TR3, & TR5
8516	007104	060000	:INITIALIZE TEST BUFFER
8517	007106	071545	:INSERT DST & DST.SURR STRINGS IN TEST BUFFER
8518	007110	001716	
8519	007112	074701	:INSERT SRC1 IN TEST BUFFER
8520	007114	075223	:INSERT SRC2 IN TEST BUFFER
8521	007116	100000	:COPY TEST BUFFER INTO EMULATION BUFFER
8522	007120	111350	:SETUP EMULATION OPERANDS & EMULATE INST
8523	007122	123000	:SETUP CC & REGS AND EXECUTE CIS INST.
8524	007124	001350	
8525	007126	000000	
8526	007130	007000	
8527	007132	135700	:COMPARE RESULTS
8528	007134	007000	
8529	007136	140000	:UPDATE POINTERS FOR NEXT TEST CONDITION
8530			: AND RETURN TO START EXECUTING NEXT
8531			: TEST CONDITION

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CIS INST FLOW TABLES

8533				
8534	007140		>SCANC:	:SCANC FLOW TABLE
8535	007140		XSPANC:	:SPANC FLOW TABLE
8536	007140	151500		:LOAD SPECIAL HANDLING WORD FROM PTP15
8537	007142	010100	.WORD 151500	:LOAD TR0 FROM PTP01
8538	007144	010201	.WORD 010100	:LOAD TR1 FROM PTP02
8539	007146	010302	.WORD 010201	:LOAD TR2 FROM PTP03
8540	007150	010303	.WORD 010302	:LOAD TR3 FROM PTP03 (TR2 & TR3 CONTAIN TABLE LEN)
8541	007152	010404	.WORD 010303	:LOAD TR4 FROM PTP04
8542	007154	020505	.WORD 010404	:GENERATE TR5 FROM PTP05
8543	007156	031001	.WORD 020505	:VERIFY THAT SRC.ADR - SRC.SURR.LEN > - 20.
8544	007160	031305	.WORD 031001	:VERIFY THAT TABLE.ADR - TABLE.SURR.LEN > 20
8545	007162	041001	.WORD 031305	:VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN<TBLEN
8546	007164	041325	.WORD 041001	:VERIFY THAT TABLE.ADR+256+TABLE.SURR.LEN<TBLEN
8547	007166	051500	.WORD 041325	:ADD TEST BUFFER ADDRESS TO TR1 AND TR5
8548	007170	060000	.WORD 051500	:INITIALIZE TEST BUFFER
8549	007172	071125	.WORD 060000	:INSERT TABLE & TABLE SURR IN BUFFER
8550	007174	070601	.WORD 071125	:INSERT SRC & SRC SURR STRINGS IN BUFFER
8551	007176	007007	.WORD 070601	
8552	007200	100000	.WORD 007007	:COPY TEST BUFFER INTO EMULATION BUFFER
8553	007202	111500	.WORD 100000	:SETUP EMULATION OPERANDS & EMULATE INST
8554	007204	122000	.WORD 111500	:SETUP CC REGS & EXECUTE CIS INST
8555	007206	001500	.WORD 122000	
8556	007210	000000	.WORD 001500	
8557	007212	000170	.WORD 000000	
8558	007214	131570	.WORD 000170	:COMPARE RESULTS
8559	007216	001700	.WORD 131570	
8560	007220	140000	.WORD 001700	:UPDATE PTRS FROM NEXT TEST CONDITION
8561			.WORD 140000	

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CIS INST FLOW TABLES

8563
8564
8565 007222
8566 007222
8567 007222 151400
8568 007224 010110
8569 007226 010201
8570 007230 010322
8571 007232 020403
8572 007234 030701
8573 007236 031203
8574 007240 040701
8575 007242 041223
8576 007244 051300
8577 007246 060000
8578 007250 071023
8579 007252 001211
8580 007254 074501
8581 007256 100000
8582 007260 111300
8583 007262 122000
8584 007264 001300
8585 007266 000000
8586 007270 007000
8587 007272 133700
8588 007274 007000
8589 007276 140000
8590

XCVTPN:
XCVTNP:
.WORD 151400
.WORD 010110
.WORD 010201
.WORD 010322
.WORD 020403
.WORD 030701
.WORD 031203
.WORD 040701
.WORD 041223
.WORD 051300
.WORD 060000
.WORD 071023
.WORD 001211
.WORD 074501
.WORD 100000
.WORD 111300
.WORD 122000
.WORD 001300
.WORD 000000
.WORD 007000
.WORD 133700
.WORD 007000
.WORD 140000

:CVTPN FLOW TABLE
:CVTNP FLOW TABLE
:LOAD SPECIAL HANDLING FROM PTP14
:LOAD TR0 FROM PTP01
:LOAD TR1 FROM PTP02
:LOAD TR2 FROM PTP03
:GENERATE TR3 FROM PTP04
:VERIFY THAT SRC.ADR-SRC.SURR.LEN>=20
:VERIFY THAT DST.ADR-DST.SURR.LEN>=20
:VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN<TBLEN
:VERIFY THAT DST.ADR+DST.LEN+DST.SURR.LEN<TBLEN
:ADD TEST BUFFER ADDRESS TO TR1 & TR3
:INITIALIZE TEST BUFFER
:INSERT DST & DST SURR STRINGS IN BUFFER

:INSERT SRC STRING IN BUFFER
:COPY TEST BUFFER INTO EMULATION BUFFER
:SETUP EMULATION OPERANDS & EMULAT INST.
:SETUP CC REGS & EXECUTE CIS INST.

:COMPARE RESULTS

:UPDATE PTRS FROM NEXT TEST CONDITION

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CIS INST FLOW TABLES

8592				
8593				
8594	007300		XCVTLP:	:CVTLP FLOW TABLE
8595	007300		XCVTLN:	:CVTLN FLOW TABLE
8596	007300	151000	.WORD 151000	:LOAD SPECIAL HANDLING FROM PTP10
8597	007302	010102	.WORD 010102	:LOAD TR2 FROM PTP01
8598	007304	010203	.WORD 010203	:LOAD TR3 FROM PTP02
8599	007306	010310	.WORD 010310	:LOAD TR0 FROM PTP03
8600	007310	010401	.WORD 010401	:LOAD TR1 FROM PTP04
8601	007312	030701	.WORD 030701	:VERIFY THAT DST.ADR-DST.SURR.LEN>=20
8602	007314	040701	.WORD 040701	:VERIFY THAT DST.ADR+DST.LEN+DST.SURR.LEN<TBLEN
8603	007316	051000	.WORD 051000	:ADD TEST BUFFER ADDRESS TO TR1
8604	007320	060000	.WORD 060000	:INITIALIZE TEST BUFFER
8605	007322	070501	.WORD 070501	:INSERT DST & DST SURR STRINGS IN BUFFER
8606	007324	000706	.WORD 000706	
8607	007326	100000	.WORD 100000	:COPY TEST BUFFER INTO EMULATION BUFFER
8608	007330	111000	.WORD 111000	:SETUP EMULATION OPERANDS & EMULATE INST
8609	007332	122000	.WORD 122000	:SETUP CC REGS & EXECUTE CIS INST
8610	007334	001300	.WORD 001300	
8611	007336	000000	.WORD 000000	
8612	007340	007000	.WORD 007000	
8613	007342	131700	.WORD 131700	:COMPARE RESULTS
8614	007344	007000	.WORD 007000	
8615	007346	140000	.WORD 140000	:UPDATE PTRS FOR NEXT TEST CONDITION
8616				
8617				
8618				

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ZKEEL.P11

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CIS INST FLOW TABLES

8620				
8621				
8622	007350		XCVTPL:	:CVTPL FLOW TABLE
8623	007350		XCVTNL:	:CVTNL FLOW TABLE
8624	007350	150700	.WORD 150700	:LOAD SPECIAL HANDLING FROM PTP07
8625	007352	010110	.WORD 010110	:LOAD TR0 FROM PTP01
8626	007354	010201	.WORD 010201	:LOAD TR1 FROM PTP02
8627	007356	010604	.WORD 010604	:LOAD TR4 FROM PTP06
8628	007360	030501	.WORD 030501	:VERIFY THAT SRC.ADR-SRC.SURR.LEN.+20
8629	007362	040501	.WORD 040501	:VERIFY THAT SRC.ADR+SRC.LEN+SRC.SURR.LEN<TBLEN
8630	007364	051000	.WORD 051000	:ADD TEST BUFFER ADDRESS TO TR1
8631	007366	060000	.WORD 060000	:INITIALIZE TEST BUFFER
8632	007370	074301	.WORD 074301	:INSERT SRC STRING IN TEST BUFFER
8633	007372	100000	.WORD 100000	:COPY TEST BUFFER INTO EMULATION BUFFER
8634	007374	111000	.WORD 111000	:SETUP EMULATION OPERANDS & EMULATE INST.
8635	007376	122000	.WORD 122000	:SETUP CC REGS & EXECUTE CIS INST
8636	007400	001000	.WORD 001000	
8637	007402	007300	.WORD 007300	
8638	007404	007000	.WORD 007000	
8639	007406	137000	.WORD 137000	:COMPARE RESULTS
8640	007410	140000	.WORD 140000	:UPDATE PTRS FOR NEXT TEST CONDITION
8641				
8642				

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CIS INST FLOW TABLES

8644 007412
8645 007412
8646 007412 010100
8647 007414 010201
8648 007416 010302
8649 007420 010403
8650 007422 010504
8651 007424 010605
8652 007426 060000
8653 007430 020700
8654 007432 100000
8655 007434 110000
8656 007436 120000
8657 007440 137000
8658 007442 140000

XL2D:
XL3D:

.WORD 010100
.WORD 010201
.WORD 010302
.WORD 010403
.WORD 010504
.WORD 010605
.WORD 060000
.WORD 020700
.WORD 100000
.WORD 110000
.WORD 120000
.WORD 137000
.WORD 140000

:L2DR FLOW TABLE
:L3DR FLOW TABLE
:LOAD TR0 FROM PTP01
:LOAD TR1 FROM PTP02
:LOAD TR2 FROM PTP03
:LOAD TR3 FROM PTP04
:LOAD TR4 FROM PTP05
:LOAD TR5 FROM PTP06
:INITIALIZE TEST BUFFER
:GENERATE TRN FROM PTP07
:COPY TEST BUFFER INTO EMUL. BUFFER
:SETUP EMUL. OPERANDS & EMUL INST.
:SETUP CC & REGS & EXECUTE CIS INST.
:COMPARE RESULTS
:UPDATE PTRS FOR NEXT TEST CONDITION.

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 ZKFECC.P11 GLOBAL TEXT SECTION

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8660 .SBTTL GLOBAL TEXT SECTION
8661
8662 : FORMAT STATEMENTS USED IN PRINT CALLS
8663 :
8664 :
8665 :MESSAGES
8666 007444 040445 046440 053117 AMOVC: .ASCIZ /%A MOVC/
      007452 000103
8667 007454 040445 046440 053117 AMOVRC: .ASCIZ /%A MOVRC/
      007462 041522 000
8668 007465 045 020101 047515 AMOVTC: .ASCIZ /%A MOVTC/
      007472 052126 000103
8669 007476 040445 046040 041517 ALOCC: .ASCIZ /%A LOCC/
      007504 000103
8670 007506 040445 051440 050113 ASKPC: .ASCIZ /%A SKPC/
      007514 000103
8671 007516 040445 051440 040503 ASCANC: .ASCIZ /%A SCANC/
      007524 041516 000
8672 007527 045 020101 050123 ASPANC: .ASCIZ /%A SPANC/
      007534 047101 000103
8673 007540 040445 041440 050115 ACMPC: .ASCIZ /%A CMPC/
      007546 000103
8674 007550 040445 046440 052101 AMATCHC: .ASCIZ /%A MATC/
      007556 000103
8675 007560 040445 040440 042104 AADDN: .ASCIZ /%A ADDN/
      007566 000116
8676 007570 040445 051440 041125 ASUBN: .ASCIZ /%A SUBN/
      007576 000116
8677 007600 040445 041440 050115 ACPN: .ASCIZ /%A CPN/
      007606 000116
8678 007610 040445 041440 052126 ACVTNL: .ASCIZ /%A CVTNL/
      007616 046116 000
8679 007621 045 020101 053103 ACVTPN: .ASCIZ /%A CVTPN/
      007626 050124 000116
8680 007632 040445 041440 052126 ACVTNP: .ASCIZ /%A CVTNP/
      007640 050116 000
8681 007643 045 020101 051501 AASHN: .ASCIZ /%A ASHN/
      007650 047110 000
8682 007653 045 020101 053103 ACVTLN: .ASCIZ /%A CVTLN/
      007660 046124 000116
8683 007664 040445 040440 042104 AADDP: .ASCIZ /%A ADDP/
      007672 000120
8684 007674 040445 051440 041125 ASUBP: .ASCIZ /%A SUBP/
      007702 000120
8685 007704 040445 041440 050115 ACMPP: .ASCIZ /%A Cmpp/
      007712 000120
8686 007714 040445 041440 052126 ACVTPL: .ASCIZ /%A CVTPL/
      007722 046120 000
8687 007725 045 020101 052515 AMULP: .ASCIZ /%A MULP/
      007732 050114 000
8688 007735 045 020101 044504 ADIVP: .ASCIZ /%A DIVP/
      007742 050126 000
8689 007745 045 020101 051501 AASHP: .ASCIZ /%A ASHP/
      007752 050110 000

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 ZKFEC.P11 GLOBAL TEXT SECTION

8690	007755	045	020101	053103	ACVTLP:	.ASCIZ	/%A CVTLP/
	007762	046124	000120				
8691	007766	040445	046040	042062	AL2D:	.ASCIZ	/%A L2D%01/
	007774	047445	000061				
8692	010000	040445	046040	042063	AL3D:	.ASCIZ	/%A L3D%01/
	010006	047445	000061				
8693	010012	051445	031462	040445	FORM1:	.ASCIZ	/%S23%ASL%S5%ASA%S5%ADL%S5%ADA%S5%AF%S?4%ANZVC%N/
8694	010020	046123	051445	022465			
	010026	051501	022501	032523			
	010034	040445	046104	051445			
	010042	022465	042101	022501			
	010050	032523	040445	022506			
	010056	031123	022464	047101			
	010064	053132	022503	000116			
8695	010072	051445	031462	040445	FORM2:	.ASCIZ	/%S23%ASL%S5%ASA%S5%ADL%S5%ADA%S5%AF%S6%AT%S15%ANZVC%N/
	010100	046123	051445	022465			
	010106	051501	022501	032523			
	010114	040445	046104	051445			
	010122	022465	042101	022501			
	010130	032523	040445	022506			
	010136	033123	040445	022524			
	010144	030523	022465	047101			
	010152	053132	022503	000116			
8696	010160	051445	031462	040445	FORM3:	.ASCIZ	/%S23%ASL%S5%ASA%S23%ACHAR%S21%ANZVC%N/
	010166	046123	051445	022465			
	010174	051501	022501	031123			
	010202	022463	041501	040510			
	010210	022522	031123	022461			
	010216	047101	053132	022503			
	010224	000116					
8697	010226	051445	031462	040445	FORM4:	.ASCIZ	/%S23%ASL%S5%ASA%S23%AMASK%S3%AT%S15%ANZVC%N/
	010234	046123	051445	022465			
	010242	051501	022501	031123			
	010250	022463	046501	051501			
	010256	022513	031523	040445			
	010264	022524	030523	022465			
	010272	047101	053132	022503			
	010300	000116					
8698	010302	051445	031462	040445	FORM5:	.ASCIZ	/%S23%AS1L%S4%AS1A%S4%AS2L%S4%AS2A%S4%AF%S24%ANZVC%N/
	010310	030523	022514	032123			
	010316	040445	030523	022501			
	010324	032123	040445	031123			
	010332	022514	032123	040445			
	010340	031123	022501	032123			
	010346	040445	022506	031123			
	010354	022464	047101	053132			
	010362	022503	000116				
8699	010366	051445	031462	040445	FORM6:	.ASCIZ	/%S23%ASL%S5%ASA%S5%AOL%S5%A0A%S32%ANZVC%N/
	010374	046123	051445	022465			
	010402	051501	022501	032523			
	010410	040445	046117	051445			
	010416	022465	047501	022501			
	010424	031523	022462	047101			

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CZKEEC.P11 GLOBAL TEXT SECTION

8700	010432	053132	022503	000116		
	010440	051445	031462	040445	FORM7:	.ASCIZ /%S23%AS1L%S4%AS1A%S4%AS2L%S4%AS2A%S4%ADL%SS%ADA%S14%ANZVC%N/
	010446	030523	022514	032123		
	010454	040445	030523	022501		
	010462	032123	040445	031123		
	010470	022514	032123	040445		
	010476	031123	022501	032123		
	010504	040445	046104	051445		
	010512	022465	042101	022501		
	010520	030523	022464	047101		
	010526	053132	022503	000116		
8701	010534	051445	031462	040445	FORM8:	.ASCIZ /%S23%AS1L%S4%AS1A%S4%AS2L%S4%AS2A%S32%ANZVC%N/
	010542	030523	022514	032123		
	010550	040445	030523	022501		
	010556	032123	040445	031123		
	010564	022514	032123	040445		
	010572	031123	022501	031523		
	010600	022462	047101	053132		
	010606	022503	000116			
8702	010612	051445	031462	040445	FORM9:	.ASCIZ /%S23%ASL%S5%ASA%S5%AD.H%S4%AD.L%S32%ANZVC%N/
	010620	046123	051445	022465		
	010626	051501	022501	032523		
	010634	040445	027104	022510		
	010642	032123	040445	027104		
	010650	022514	031523	022462		
	010656	047101	053132	022503		
	010664	000116				
8703	010666	051445	031462	040445	FORM10:	.ASCIZ /%S23%ASL%S5%ASA%S5%ADL%SS%ADA%S32%ANZVC%N/
	010674	046123	051445	022465		
	010702	051501	022501	032523		
	010710	040445	046104	051445		
	010716	022465	042101	022501		
	010724	031523	022462	047101		
	010732	053132	022503	000116		
8704	010740	051445	031462	040445	FORM11:	.ASCIZ /%S23%ASL%S5%ASA%S5%ADL%SS%ADA%S5%AR.S%S22%ANZVC%N/
	010746	046123	051445	022465		
	010754	051501	022501	032523		
	010762	040445	046104	051445		
	010770	022465	042101	022501		
	010776	032523	040445	026122		
	011004	022523	031123	022462		
	011012	047101	053132	022503		
	011020	000116				
8705	011022	051445	031462	040445	FORM12:	.ASCIZ /%S23%ADL%SS%ADA%S5%AS.H%S4%AS.L%S32%ANZVC%N/
	011030	046104	051445	022465		
	011036	042101	022501	032523		
	011044	040445	027123	022510		
	011052	032123	040445	027123		
	011060	022514	031523	022462		
	011066	047101	053132	022503		
	011074	000116				
8706	011076	040445	044440	050116	INREG:	.ASCIZ +%A INPUT R0-R6,CC/ +
	011104	052125	020040	051040		
	011112	026460	033122	041454		

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8707 011120 027503 000040
      011124 040445 044440 050116 INMEM: .ASCIZ +%A INPUTS IN MEMORY/ +
      011132 052125 020123 047111
      011140 046440 046505 051117
      011146 027531 000040
8708 011152 040445 042440 050130 EMOUT: .ASCIZ +%A EXP OUT R0-R6,CC/ +
      011160 047440 052125 051040
      011166 026460 033122 041454
      011174 027503 000040
8709 011200 047445 022466 030523 FORM13: .ASCIZ /%06XS1%06XS1%06XS1%06XS1%06XS1%06XS1%06XS1%06XS1%Y4ZN/
      011206 047445 022466 030523
      011214 047445 022466 030523
      011222 047445 022466 030523
      011230 047445 022466 030523
      011236 047445 022466 030523
      011244 047445 022466 030523
      011252 054445 022464 000116
8710 011260 047445 022466 030523 FORM14: .ASCIZ /%06XS1%06XS1%06XS1%06XS1%06XS1%06XS1%06XS1%Y4ZN/
      011266 047445 022466 030523
      011274 047445 022466 030523
      011302 047445 022466 030523
      011310 047445 022466 030523
      011316 047445 022466 030523
      011324 047445 022466 030523
      011332 054445 022464 000116
8711 011340 040445 040440 052103 ACOUT: .ASCIZ +%A ACT OUT R0-R6,CC/ +
      011346 047440 052125 051040
      011354 026460 033122 041454
      011362 027503 000040
8712 011366 047445 022466 030523 FORM15: .ASCIZ /%06XS1/
      011374 000
8713 011375 045 033523 000 FORM16: .ASCIZ /XS7/
8714 011401 045 033123 022461 FORM17: .ASCIZ /XS61ZY4/
      011406 032131 000
8715 011411 045 032131 000 FORM18: .ASCIZ /ZY4/
8716 011415 045 022516 020101 EBUFO: .ASCIZ +%NZA EXP BUFFER %06XA/ %03ZN+
      011422 054105 020120 052502
      011430 043106 051105 022440
      011436 033117 040445 020057
      011444 047445 022463 000116
8717 011452 040445 040440 052103 ABUFO: .ASCIZ +%A ACT BUFFER %06XA/ %03+
      011460 043040 043125 042506
      011466 020122 047445 022466
      011474 027501 022440 031517
      011502 000
8718 011503 015 041412 041475 QDISP: .ASCIZ <CR><LF>/C=CONT.;R=REPEAT TEST;S=RESTART;D=DISPLAY MEMORY;H=REPEAT & HAL
      011510 047117 027124 051073
      011516 051075 050105 040505
      011524 020124 042524 052123
      011532 051473 051075 051505
      011540 040524 052122 042073
      011546 042075 051511 046120
      011554 054501 046440 046505
      011562 051117 035531 036510

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	011570	042522	042520	052101	
	011576	023040	044040	046101	
	011604	020124	052101	041440	
	011612	051511	044440	051516	
	011620	037524	000		
8719	011623	045	022516	041501	STKM1: .ASCIZ /%N%ACIS INST EXECUTION USED MORE THAN 64 LOCS ON STACK%N/
	011630	051511	044440	051516	
	011636	020124	054105	041505	
	011644	052125	047511	020116	
	011652	051525	042105	046440	
	011660	051117	020105	044124	
	011666	047101	033040	020064	
	011674	047514	051503	047440	
	011702	020116	052123	041501	
	011710	022513	000116		
8720	011714	047045	040445	044503	STKM2: .ASCIZ /%N%ACIS INST EXECUTION DESTROYED CONTENTS OF WORD AT STACK+2%N/
	011722	020123	047111	052123	
	011730	042440	042530	052503	
	C11736	044524	047117	042040	
	011744	051505	051124	054517	
	011752	042105	041440	047117	
	011760	042524	052116	020123	
	011766	043117	053440	051117	
	011774	020104	052101	051440	
	012002	040524	045503	031053	
	012010	047045	000		
8721	012013	045	022516	052101	CISQ: .ASCIZ /%N%ATRAP TO 10 OCCURRED ON CIS INST IN TEST #1. IS CISP PRESENT?%N/
	012020	040522	020120	047524	
	012026	030440	020060	041517	
	012034	052503	051122	042105	
	012042	047440	020116	044503	
	012050	020123	047111	052123	
	012056	044440	020116	042524	
	012064	052123	021440	027061	
	012072	044440	020123	044503	
	012100	050123	050040	042522	
	012106	042523	052116	022477	
	012114	000116			
8722	012116	047045	040445	051124	MMVMSG: .ASCIZ /%N%ATRAP TO 250/
	012124	050101	052040	020117	
	012132	032462	000060		
8723	012136	047045	040445	051124	TRAP4: .ASCIZ /%N%ATRAP TO 4/
	012144	050101	052040	020117	
	012152	000064			
8724	012154	047045	040445	051124	TRAP10: .ASCIZ /%N%ATRAP TO 10/
	012162	050101	052040	020117	
	012170	030061	000		
8725	012173	045	022516	042501	HLTMSG: .ASCIZ /%N%AERROR HALT/
	012200	051122	051117	044040	
	012206	046101	000124		
8726	012212	047045	040445	044503	NOUPROG: .ASCIZ /%N%ACIS INST IS NOT MAKING PROGRESS%N/
	012220	020123	047111	052123	
	012226	044440	020123	047516	
	012234	020124	040515	044513	

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	012242	043516	050040	047522	
	012250	051107	051505	022523	
	012256	000116			
8727	012260	047045	040445	040514	LATEXC: .ASCIZ /%N%ALATENCY EXCESSIVE%N/
	012266	042524	041516	020131	
	012274	054105	042503	051523	
	012302	053111	022505	000116	
8728	012310	040445	020040	052101	TRPINF: .ASCIZ /%A AT:%06%A MODE:%01%A D-EN:%B1%A INST:%06%A INST CT:%D2%S1%D5%N/
	012316	022472	033117	040445	
	012324	020040	047515	042504	
	012332	022472	030517	040445	
	012340	020040	026504	047105	
	012346	022472	030502	040445	
	012354	020040	047111	052123	
	012362	022472	033117	040445	
	012370	020040	047111	052123	
	012376	041440	035124	042045	
	012404	022462	030523	042045	
	012412	022465	000116		
8729	012416	047045	040445	047105	ASK: .ASCIZ /%N%ENTER INSTRUCTION TO TEST <ALL> /
	012424	042524	020122	047111	
	012432	052123	052522	052103	
	012440	047511	020116	047524	
	012446	052040	051505	020124	
	012454	040474	046114	020076	
	012462	020040	000		
8730	012465	045	022516	051101	ASKRM: .ASCIZ /%N%RANDOM EXERCISE MODE (Y OR N) ? /
	012472	047101	047504	020115	
	012500	054105	051105	044503	
	012506	042523	046440	042117	
	012514	020105	054450	047440	
	012522	020122	024516	037440	
	012530	020040	000		
8731	012533	045	022516	050101	ASKMOD: .ASCIZ /%N%PROCESSOR TEST MODE (K=KERNEL,S=SUPV,U=USER)? /
	012540	047522	042503	051523	
	012546	051117	052040	051505	
	012554	020124	047515	042504	
	012562	024040	036513	042513	
	012570	047122	046105	051454	
	012576	051475	050125	026126	
	012604	036525	051525	051105	
	012612	037451	020040	000	
8732	012617	045	022516	046501	ASKMM: .ASCIZ /%N%MEMORY MANAGEMENT (N=OFF,D=D-SPACE ENABLED,H-D-SPACE DISABLED)? /
	012624	046505	051117	020131	
	012632	040515	040516	042507	
	012640	042515	052116	024040	
	012646	036516	043117	026106	
	012654	036504	026504	050123	
	012662	041501	020105	047105	
	012670	041101	042514	026104	
	012676	036510	026504	050123	
	012704	041501	020105	044504	
	012712	040523	046102	042105	
	012720	037451	020040	000	

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8733 012725 045 022516 052101 ASKINT: .ASCIZ /%N%ATEST INTERRUPTABILITY OF CIS INSTRUCTIONS (KW11-P REQUIRED) (Y OR N
      012732 051505 020124 047111
      012740 042524 051122 050125
      012746 040524 044502 044514
      012754 054524 047440 020106
      012762 044503 020123 047111
      012770 052123 052522 052103
      012776 047511 051516 024040
      013004 053513 030461 050055
      013012 051040 050505 044525
      013020 042522 024504 024040
      013026 020131 051117 047040
      013034 020051 000077
8734 013040 047045 040445 047105 ASKST: .ASCIZ /%N%AENTER STOP TEST NUMBER (DECIMAL):%N/
      013046 042524 020122 052123
      013054 050117 052040 051505
      013062 020124 052516 041115
      013070 051105 024040 042504
      013076 044503 040515 024514
      013104 022472 000116
8735 013110 047045 040445 047111 ASKSRG: .ASCIZ /%N%AINTR SOURCE (R=LTC,N=KW11-P @100KHZ,C=KW11-P @10KHZ,Y=KW11-P EXT OS
      013116 051124 051440 052517
      013124 041522 020105 051050
      013132 046075 041524 047054
      013140 045475 030527 026461
      013146 020120 030500 030060
      013154 044113 026132 036503
      013162 053513 030461 050055
      013170 040040 030061 044113
      013176 026132 036531 053513
      013204 030461 050055 042440
      013212 052130 047440 041523
      013220 037451 000
8736 013223 045 022516 040501 ASKDI: .ASCIZ /%N%AALLOW INTERRUPTING THE CIS INST EXECUTED DURING NORMAL INTR SERVICE
      013230 046114 053517 044440
      013236 052116 051105 052522
      013244 052120 047111 020107
      013252 044124 020105 044503
      013260 020123 047111 052123
      013266 042440 042530 052503
      013274 042524 020104 052504
      013302 044522 043516 047040
      013310 051117 040515 020114
      013316 047111 051124 051440
      013324 051105 044526 042503
      013332 000077
8737 013334 047045 040445 040503 NOLAT: .ASCIZ /%N%ACAN'T TEST LATENCY - NEED 2ND KW11-P/
      013342 023516 020124 042524
      013350 052123 046040 052101
      013356 047105 054503 026440
      013364 047040 042505 020104
      013372 047062 020104 053513
      013400 030461 050055 000
8738 013405 045 022516 041501 NOINT: .ASCIZ /%N%ACAN'T TEST INTERRUPTABILITY - NO CLOCK/
  
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	013412	047101	052047	052040		
	013420	051505	020124	047111		
	013426	042524	051122	050125		
	013434	040524	044502	044514		
	013442	054524	026440	047040		
	013450	020117	046103	041517		
	013456	000113				
8739	013460	047045	040445	053523	SWNG:	.ASCIZ /%N%ASWITCH ON CIS MODULE ACTS LIKE IT IS IN THE INCORRECT POSITION%N/
	013466	052111	044103	047440		
	013474	020116	044503	020123		
	013502	047515	052504	042514		
	013510	040440	052103	020123		
	013516	044514	042513	044440		
	013524	020124	051511	044440		
	013532	020116	044124	020105		
	013540	047111	047503	051122		
	013546	041505	020124	047520		
	013554	044523	044524	047117		
	013562	047045	000			
8740	013565	045	022516	041501	NOABO:	.ASCIZ /%N%ACIS INST FAILED TO ABORT%N/
	013572	051511	044440	051516		
	013600	020124	040506	046111		
	013606	042105	052040	020117		
	013614	041101	051117	022524		
	013622	000116				
8741	013624	047045	040445	047520	POWMON:	.ASCIZ /%N%APOWER MONITOR BIT<0> SET IN CPU ERROR REG%N/ ;:REV-C
	013632	042527	020122	047515		
	013640	044516	047524	020122		
	013646	044502	036124	037060		
	013654	051440	052105	044440		
	013662	020116	050103	020125		
	013670	051105	047522	020122		
	013676	042522	022507	000116		
8742	013704	047045	040445	044514	KW11L:	.ASCIZ /%N%ALINE CLOCK WILL BE USED FOR INTERRUPT SOURCE%N/
	013712	042516	041440	047514		
	013720	045503	053440	046111		
	013726	020114	042502	052440		
	013734	042523	020104	047506		
	013742	020122	047111	042524		
	013750	051122	050125	020124		
	013756	047523	051125	042503		
	013764	047045	000			
8743	013767	015	040412	042104	AST:	.ASCIZ <CR><LF>/ADDR(S)?/
	013774	024122	024523	000077		
8744	014002	047445	022466	027501	FORM19:	.ASCIZ +%06%A/%S3%03%S2%03%S2%03%S2%03+
	014010	051445	022463	031517		
	014016	051445	022462	031517		
	014024	051445	022462	031517		
	014032	051445	022462	031517		
	014040	000				
8745	014041	045	020101	020040	ADDHDR:	.ASCIZ /%A 0 2 3 4 5 6 7%N'
	014046	020040	020040	020040		
	014054	020040	020060	020040		
	014062	030440	020040	020040		

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	014070	020062	020040	031440	
	014076	020040	020040	020064	
	014104	020040	032440	020040	
	014112	020040	020066	020040	
	014120	033440	047045	000	
8746	014125	045	031123	047445	FORM20: .ASCIZ /%S2%03%S2%03%S2%03%S2%03%N/
	014132	022463	031123	047445	
	014140	022463	031123	047445	
	014146	022463	031123	047445	
	014154	022463	000116		
8747	014160	047045	000		FORM21: .ASCIZ /%N/
8748	014163	045	022516	020101	FORM22: .ASCIZ /%N%A SRC%S13/
	014170	051123	022503	030523	
	014176	000063			
8749	014200	047045	040445	051440	FORM23: .ASCIZ /%N%A SRC1%S12/
	014206	041522	022461	030523	
	014214	000062			
8750	014216	047045	040445	051440	FORM24: .ASCIZ /%N%A SRC2%S12/
	014224	041522	022462	030523	
	014232	000062			
8751	014234	047045	040445	042440	FORM25: .ASCIZ /%N%A EXP RESULT%S4/
	014242	050130	051040	051505	
	014250	046125	022524	032123	
	014256	000			
8752	014257	045	022516	020101	FORM26: .ASCIZ /%N%A ACT RESULT%S4/
	014264	041501	020124	042522	
	014272	052523	052114	051445	
	014300	000064			
8753	014302	040445	000040		FORM27: .ASCIZ /%A /
8754	014306	051445	022462	044501	FORM30: .ASCIZ /%S2%A INST CNT:%D2%S1%D5/
	014314	051516	020124	047103	
	014322	035124	042045	022462	
	014330	030523	042045	000065	
8755	014336	040445	000111		FORM31: .ASCIZ /%A I/
8756	014342	040445	020040	044523	FORM32: .ASCIZ /%A SIGN BYTE=(/
	014350	047107	041040	052131	
	014356	036505	000050		
8757	014362	040445	000051		FORM33: .ASCIZ /%A)/
8758	014366	040445	025440	000	FORM34: .ASCIZ /%A +/
8759	014373	045	020101	000055	FORM35: .ASCIZ /%A -/
8760	014400	047045	047045	040445	FORM36: .ASCIZ /%N%N%ARANDOM # GENERATOR SEED%S5%06%S2%06%S2%06%N/
	014406	040522	042116	046517	
	014414	021440	043440	047105	
	014422	051105	052101	051117	
	014430	051440	042505	022504	
	014436	032523	047445	022466	
	014444	031123	047445	022466	
	014452	031123	047445	022466	
	014460	000116			
8761	014462	047045	040445	051105	FORM37: .ASCIZ /%N%A ERROR #%D6/
	014470	047522	020122	022443	
	014476	033104	000		
8762	014501	045	022516	042501	FORM38: .ASCIZ /%N%A ERROR IN UNUSED REGISTER SET: USED SET:%01/
	014506	051122	051117	044440	

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	014514	020116	047125	051525	
	014522	042105	051040	043505	
	014530	051511	042524	020122	
	014536	042523	035124	052440	
	014544	042523	020104	042523	
	014552	035124	047445	000061	
8763	014560	047045	040445	054105	FORM39: .ASCIZ /%N%EXP:%06% ACT R0-R5 %06%S1%06%S1%06%S1%06%S1%06%
	014566	035120	047445	022466	
	014574	020101	040440	052103	
	014602	051040	026460	032522	
	014610	022440	033117	051445	
	014616	022461	033117	051445	
	014624	022461	033117	051445	
	014632	022461	033117	051445	
	014640	022461	033117	051445	
	014646	022461	033117	000	
8764	014653	045	020101	047111	FORM40: .ASCIZ /%A INTR CNT:%D4% REG SET:%01% MODE: /
	014660	051124	041440	052116	
	014666	022472	032104	040445	
	014674	051040	043505	051440	
	014702	052105	022472	030517	
	014710	040445	046440	042117	
	014716	035105	000		
8765	014721	045	020101	042040	FRM40A: .ASCIZ /%A D-EN: /
	014726	042455	035116	000	
8766	014733	045	031123	022463	FORM41: .ASCIZ /%S23%AR0%S5%AR1%S5%AR2%S5%AR3%S5%AR4%S5%AR5%S5%AR6%S5%ANZVC%N/
	014740	051101	022460	032523	
	014746	040445	030522	051445	
	014754	022465	051101	022462	
	014762	032523	040445	031522	
	014770	051445	022465	051101	
	014776	022464	032523	040445	
	015004	032522	051445	022465	
	015012	051101	022466	032523	
	015020	040445	055116	041526	
	015026	047045	000		
8767	015031	045	022516	041501	FORM42: .ASCIZ /%N%ACIS INSTRUCTION WAS SUSPENDED TO SERVICE INTERRUPT/
	015036	051511	044440	051516	
	015044	051124	041525	044524	
	015052	047117	053440	051501	
	015060	051440	051525	042520	
	015066	042116	042105	052040	
	015074	020117	042523	053122	
	015102	041511	020105	047111	
	015110	042524	051122	050125	
	015116	000124			
8768	015120	047045	040445	051520	FORM43: .ASCIZ /%N%APSW BI' 8 SHOULD HAVE BEEN SET BUT WAS NOT%N/
	015126	020127	044502	020124	
	015134	020070	044123	052517	
	015142	042114	044040	053101	
	015150	020105	042502	047105	
	015156	051440	052105	041040	
	015164	052125	053440	051501	
	015172	047040	052117	047045	

PCP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 84-11
 (ZKEEC.P11 GLOBAL TEXT SECTION

	015200	000			
8769	015201	045	022516	041101	FORM44: .ASCIZ /%N%ABIT 8 OF PSW SET WITH PC < CIS INST PC/
	015206	052111	034040	047440	
	015214	020106	051520	020127	
	015222	042523	020124	044527	
	015230	044124	050040	020103	
	015236	020074	044503	020123	
	015244	047111	052123	050040	
	015252	000103			
8770	015254	047045	040445	052523	FORM45: .ASCIZ /%N%ASUSPECT THAT CIS INST BACKED UP PC TOO FAR/
	015262	050123	041505	020124	
	015270	044124	052101	041440	
	015276	051511	044440	051516	
	015304	020124	040502	045503	
	015312	042105	052440	020120	
	015320	041520	052040	047517	
	015326	043040	051101	000	
8771	015333	045	022516	004501	FORM46: .ASCIZ /%N%A WHEN EXITING TO SERVICE INTERRUPT%/
	015340	044127	047105	042440	
	015346	044530	044524	043516	
	015354	052040	020117	042523	
	015362	053122	041511	020105	
	015370	047111	042524	051122	
	015376	050125	022524	000116	
8772	015404	047045	040445	044503	FORM47: .ASCIZ /%N%ACIS INST COMPLETED BUT PSW BIT 8 STILL SET%/
	015412	020123	047111	052123	
	015420	041440	046517	046120	
	015426	052105	042105	041040	
	015434	052125	050040	053523	
	015442	041040	052111	034040	
	015450	051440	044524	046114	
	015456	051440	052105	047045	
	015464	000			
8773	015465	045	022516	044501	FORM48: .ASCIZ /%N%AIN-LINE CIS INSTRUCTION COMPLETED WITH PC/
	015472	026516	044514	042516	
	015500	041440	051511	044440	
	015506	051516	051124	041525	
	015514	044524	047117	041440	
	015522	046517	046120	052105	
	015530	042105	053440	052111	
	015536	020110	041520	000	
8774	015543	045	022516	020101	FORM49: .ASCIZ /%N%A POINTING AT IN-LINE OPERANDS RATHER THAN NEXT INST%/
	015550	050011	044517	052116	
	015556	047111	020107	052101	
	015564	044440	026516	044514	
	015572	042516	047440	042520	
	015600	040522	042116	020123	
	015606	040522	044124	051105	
	015614	052040	040510	020116	
	015622	042516	052130	044440	
	015630	051516	022524	000116	
8775	015636	006477	051012	042505	QUES: .ASCIZ /?/<CR><LF>/REENTER: /
	015644	052116	051105	000072	
8776	015652	005015	000		XCR LF: .ASCIZ <CR><LF>

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 CZKEEC.P11 GLOBAL TEXT SECTION

```

8777 015655 057 C05015 000 SLCRLF: .ASCIZ <SL><CR><LF>
8779 015661 015 042412 042116 ENDP: .ASCIZ <CR><LF>/END OF PASS (EXECUTION OF TABLED TEST CASES COMPLETE)/
      015666 047440 020106 040520
      015674 051523 024040 054105
      015702 041505 052125 047511
      015710 020116 043117 052040
      015716 041101 042514 020104
      015724 042524 052123 041440
      015732 051501 051505 041440
      015740 046517 046120 052105
      015746 024505 000
2784 015751 015 042412 042116 ENDQP: .ASCIZ <CR><LF>/END OF QUICK VERIFY PASS/
      015756 047440 020106 052521
      015764 041511 020113 042526
      015772 044522 054506 050040
      016000 051501 000123
8785 016004 005015 047111 052123 FSHDR: .ASCIZ <CR><LF>/INST UNDER TEST WILL BE DISPLAYED AT THE START OF TESTING FOR E
      016012 052440 042116 051105
      C16020 052040 051505 020124
      016026 044527 046114 041040
      016034 020105 044504 050123
      016042 040514 042531 020104
      016050 052101 052040 042510
      016056 051440 040524 052122
      016064 047440 020106 042524
      016072 052123 047111 020107
      016100 047506 020122 040505
      016106 044103 044440 051516
      C16114 000124
8786 016116 005015 052521 041511 QVHDR: .ASCIZ <CR><LF>/QUICK VERIFY PASS TIME: LESS THAN 5 MINUTES/
      016124 020113 042526 044522
      016132 054506 050040 051501
      016140 020123 044524 042515
      016146 020072 046040 051505
      016154 020123 044124 047101
      016162 032440 046440 047111
      016170 052125 051505 000
8787 016175 045 022516 042501 ACCSEED: .ASCIZ /%N%ENTER 3 RANDOM NUMBER GEN. SEED CONSTANTS: %N/
      016202 052116 051105 031440
      016210 051040 047101 047504
      C16216 020115 052516 041115
      016224 051105 043440 047105
      016232 020056 042523 042105
      016240 041440 047117 052123
      016246 047101 051524 020072
      C16254 022440 000116
8789 016260 005015 040520 051523 FSHDR1: .ASCIZ <CR><LF>+PASS TIME: APPROX 30 MIN+
      016266 052040 046511 035105
      016274 040440 050120 047522
      016302 020130 030063 046440
      016310 047111 000
2794 016313 015 042412 052116 FSHDR2: .ASCIZ <CR><LF>/ENTERING RANDOM TEST MODE/
      016320 051105 047111 020107
      016326 040522 042116 046517

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GLOBAL TEXT SECTION

	016334	052040	051505	020124	
	016342	047515	042504	000	
8795	016347	015	047012	020117	FSHDR3: .ASCIZ <CR><LF>/NO FURTHER END OF PASS MESSAGES WILL BE ISSUED/
	016354	052506	052122	042510	
	016362	020122	047105	020104	
	016370	043117	050040	051501	
	016376	020123	042515	051523	
	016404	043501	051505	053440	
	016412	046111	020114	042502	
	016420	044440	051523	042525	
	016426	000104			
8796	016430	005015	040522	042116	FSHDR4: .ASCIZ <CR><LF>/RANDOM # GENERATOR SEED CONSTANTS WILL BE PRINTED/
	016436	046517	021440	043440	
	016444	047105	051105	052101	
	016452	051117	051440	042505	
	016460	020104	047503	051516	
	016466	040524	052116	020123	
	016474	044527	046114	041040	
	016502	020105	051120	047111	
	016510	042524	000104		
8797	016514	005015	020040	020040	FSHDR5: .ASCIZ <CR><LF>/ EVERY 1024 CIS INSTRUCTION TESTS/
	016522	053105	051105	020131	
	016530	030061	032062	041440	
	016536	051511	044440	051516	
	016544	051124	041525	044524	
	016552	047117	052040	051505	
	016560	051524	000		
8801	016563	045	026501	026455	DASH: .ASCIZ /%A-----ZN/
	016570	026455	026455	026455	
	016576	026455	026455	026455	
	016604	026455	026455	026455	
	016612	026455	026455	026455	
	016620	026455	026455	026455	
	016626	026455	026455	026455	
	016634	026455	026455	026455	
	016642	026455	026455	026455	
	016650	026455	026455	026455	
	016656	026455	047045	000	
8802	016663	045	022516	026501	SDASH: .ASCIZ /ZN%A-----/
	016670	026455	026455	026455	
	016676	026455	026455	026455	
	016704	000			
8804	016705	015	041412	045532	PNAME: .ASCIZ <CR><LF>/CZKEECO PDP-11 CIS INSTRUCTION EXERCISER /
	016712	042505	030103	050040	
	016720	050104	030455	020061	
	016726	044503	020123	047111	
	016734	052123	052522	052103	
	016742	047511	020116	054105	
	016750	051105	044503	042523	
	016756	020122	000		
8809	016761	015	046412	046505	MPT34: .ASCIZ <CR><LF>+MEM MGMT HARDWARE AVAILABLE ON SYSTEM UNDER TEST+
	016766	046440	046507	020124	
	016774	040510	042122	040527	
	017002	042522	040440	040526	

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 ZKFECP:1 GLOBAL TEXT SECTION

	017010	046111	041101	042514	
	017016	047440	020116	054523	
	017024	052123	046505	052440	
	017032	042116	051105	052040	
	017040	051505	000124		
8810	017044	005015	030461	032057	MPT44: .ASCIZ <CR><LF>+11/44 PROCESSOR+
	017052	020064	051120	041517	
	017060	051505	047523	000122	
8811	017066	005015	030461	033457	MPT74: .ASCIZ <CR><LF>+11/74 TYPE PROCESSOR+
	017074	020064	054524	042520	
	017102	050040	047522	042503	
	017110	051523	051117	000	
8812	017115	015	030412	027461	MPT2324: .ASCIZ <CR><LF>+11/23 OR 11/24 PROCESSOR+
	017122	031462	047440	020122	
	017130	030461	031057	020064	
	017136	051120	041517	051505	
	017144	047523	000122		
8813	017150	005015	047516	046440	MMM: .ASCIZ <CR><LF>+NO MEMORY MGMT HARDWARE ON SYSTEM UNDER TEST+
	017156	046505	051117	020131	
	017164	043515	052115	044040	
	017172	051101	053504	051101	
	017200	020105	047117	051440	
	017206	051531	042524	020115	
	017214	047125	042504	020122	
	017222	042524	052123	000	

8814

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ZREF.P11 GLOBAL SUBROUTINES SECTION

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.SBTTL GLOBAL SUBROUTINES SECTION

.SBTTL CIS EMULATOR

: FUNCTIONAL DESCRIPTION:

: CIS EMULATOR CONTAINS ROUTINES TO EMULATE EACH OF THE
: CIS INSTRUCTIONS USING STANDARD PDP-11 INSTRUCTIONS

: INPUTS: CIS INSTRUCTION TO EMULATE
: CIS INSTRUCTION OPERANDS (LENGTHS,ADDRESSES,ETC)
: STARTING ADDRESS FOR REGISTER RESULTS
: ADDRESS FOR CONDITION CODE RESULTS

: IMPLICIT INPUTS: CHARACTER OR DECIMAL STRINGS SETUP IN EMULATION BUFFER

: OUTPUTS: CONDITION CODES
: GENERAL PURPOSE REGISTERS
: STRINGS IN EMULATION BUFFER

: IMPLICIT OUTPUTS:

: SUBORDINATE ROUTINES USED:

: FUNCTIONAL SIDE EFFECTS:

: CALLING SEQUENCE: JSR PC,EMULATE
: XXXXXX
: YYYYYY
: ZZZZZZ
: WWWWWW

:OCTAL ENCODING OF CIS INST
:POINTER TO REGISTER OPERANDS
:POINTER TO REGISTER RESULTS
:POINTER TO CONDITION CODE RESULTS

177776
017230

EPSW = 177776

.EVEN

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INSTRUCTION DECODER

```

8850
8851 017230 010037 017422
8852 017234 010137 017424
8853 017240 010237 017426
8854 017244 010337 017430
8855 017250 010437 017432
8856 017254 010537 017434
8857 017260 005037 036316
8858 017264 011600
8859 017266 012037 017440
8860 017272 012037 017442
8861 017276 012037 017444
8862 017302 012037 017446
8863 017306 010016
8864 017310 012700 017470
8865 017314 005710
8866 017316 001001
8867 017320 000207
8868 017322 023720 017440
8869 017326 001372
8870 017330 162700 017472
8871 017334 062700 017614
8872 017340 011037 017436
8873 017344 012700 017450
8874 017350 013701 017442
8875 017354 012120
8876 017356 022700 017466
8877 017362 001374
8878 017364 004777 000046
8879 017370 013700 017422
8880 017374 013701 017424
8881 017400 013702 017426
8882 017404 013703 017430
8883 017410 013704 017432
8884 017414 013705 017434
8885 017420 000207
    
```

EMULAT:

```

.SBTTL
MOV R0,ESTORE
MOV R1,ESTORE+2
MOV R2,ESTORE+4
MOV R3,ESTORE+6
MOV R4,ESTORE+10
MOV R5,ESTORE+12
CLR EZDF
MOV (SP),RO
MOV (RO)+,EINST
MOV (RO)+,EIRSTK
MOV (RO)+,EORSTK
MOV (RO)+,EOPSW
MOV RO,(SP)
MOV #ELISTA,RO
1$: TST (RO)
   BNE 2$
   RTS PC
2$: CMP EINST,(RO)+
   BNE 1$
   SUB #ELISTA+2,RO
   ADD #ELISTB,RO
   MOV (RO),EROUT
   MOV #EO,RO
3$: MOV EIRSTK,R1
   MOV (R1)+,(RO)+
   CMP #E6+2,RO
   BNE 3$
   JSR PC,@EROUT
   MOV ESTORE,RO
   MOV ESTORE+2,R1
   MOV ESTORE+4,R2
   MOV ESTORE+6,R3
   MOV ESTORE+10,R4
   MOV ESTORE+12,R5
   RTS PC
    
```

INSTRUCTION DECODER
;SAVE OLD REGISTER VALUES

```

;CLEAR ZERO DIVIDE FLAG
;GRAB DATA POINTERS
;CIS INSTRUCTION BEING CALLED
;FAKE INPUT GPRS
;FAKE OUTPUT GPRS
;FAKE PSW
;SUB RETURN ADDRESS
;CIS COMMAND LIST POINTER
;EXIT IF INSTRUCTION CANT DECODE
;ELSE CONTINUE SEARCH

;LOOK AT TABLE FOR MATCH
;KEEP TRYING
;AT LAST, SO FIND HANDLER FOR IT
;HANDLER ADDRESS IN TABLE B
;HOLD ADDRESS WHILE I FIND THE DATA
;POINTER TO EMULATE GPRS
;POINTER TO REGISTER DATA
;BEAM OVER THE DATA
;EXIT LOOP AFTER R6 LOADED
;ELSE LOAD NEXT
;EXECUTE EMULATED CIS INSTRUCTION
;ON RETURN RESTORE REGISTERS
    
```

;RETURN TO MAIN PROGRAM

PDP-11 CIS INST EXERCISER
 (ZKEEC.P11)

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 DATA STORAGE

8887			.SBTTL	DATA STORAGE
8888	017422	000006	.BLKW 6	
8889	017436	000000	.WORD 0	
8890	017440	000000	.WORD 0	
8891	017442	000000	.WORD 0	
8892	017444	000000	.WORD 0	
8893	017446	000000	.WORD 0	
8894	017450	000000	.WORD 0	
8895	017452	000000	.WORD 0	
8896	017454	000000	.WORD 0	
8897	017456	000000	.WORD 0	
8898	017460	000000	.WORD 0	
8899	017462	000000	.WORD 0	
8900	017464	000000	.WORD 0	
8901	017466	000000	.WORD 0	
8902	017470	076020	.WORD 076020	
8903	017472	076021	.WORD 076021	
8904	017474	076022	.WORD 076022	
8905	017476	076023	.WORD 076023	
8906	017500	076024	.WORD 076024	
8907	017502	076025	.WORD 076025	
8908	017504	076026	.WORD 076026	
8909	017506	076027	.WORD 076027	
8910	017510	076030	.WORD 76030	
8911	017512	076031	.WORD 76031	
8912	017514	076032	.WORD 76032	
8913	017516	076040	.WORD 76040	
8914	017520	076041	.WORD 76041	
8915	017522	076042	.WORD 76042	
8916	017524	076043	.WORD 76043	
8917	017526	076044	.WORD 76044	
8918	017530	076045	.WORD 76045	
8919	017532	076050	.WORD 76050	
8920	017534	076051	.WORD 76051	
8921	017536	076052	.WORD 76052	
8922	017540	076053	.WORD 76053	
8923	017542	076054	.WORD 76054	
8924	017544	076055	.WORD 76055	
8925	017546	076056	.WORD 76056	
8926	017550	076057	.WORD 76057	
8927	017552	076060	.WORD 076060	
8928	017554	076061	.WORD 076061	
8929	017556	076062	.WORD 076062	
8930	017560	076063	.WORD 076063	
8931	017562	076064	.WORD 076064	
8932	017564	076065	.WORD 076065	
8933	017566	076066	.WORD 076066	
8934	017570	076067	.WORD 076067	
8935	017572	076070	.WORD 76070	
8936	017574	076071	.WORD 76071	
8937	017576	076072	.WORD 76072	
8938	017600	076073	.WORD 76073	
8939	017602	076074	.WORD 76074	
8940	017604	076075	.WORD 76075	

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CZKEEC.P11

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DATA STORAGE

8941	017606	076076	.WORD	76076
8942	017610	076077	.WORD	76077
8943	017612	000000	.WORD	0
8944	017614	036324	.WORD	EL2D0
8945	017616	036430	.WORD	EL2D1
8946	017620	036436	.WORD	EL2D2
8947	017622	036444	.WORD	EL2D3
8948	017624	036452	.WORD	EL2D4
8949	017626	036466	.WORD	EL2D5
8950	017630	036502	.WORD	EL2D6
8951	017632	036546	.WORD	EL2D7
8952	017634	017736	.WORD	EMOVC
8953	017636	020442	.WORD	EMOVRC
8954	017640	020160	.WORD	EMOVTC
8955	017642	021332	.WORD	ELOCC
8956	017644	021364	.WORD	ESKPC
8957	017646	021254	.WORD	ESCNC
8958	017650	021176	.WORD	ESPNC
8959	017652	020664	.WORD	ECMPC
8960	017654	021066	.WORD	EMTCHC
8961	017656	023520	.WORD	EADDN
8962	017660	023566	.WORD	ESUBN
8963	017662	032422	.WORD	ECMPN
8964	017664	027074	.WORD	ECVTNL
8965	017666	027640	.WORD	ECVTPN
8966	017670	030252	.WORD	ECVTNP
8967	017672	031024	.WORD	EASHN
8968	017674	025276	.WORD	ECVTLN
8969	017676	036606	.WORD	EL3D0
8970	017700	036662	.WORD	EL3D1
8971	017702	036670	.WORD	EL3D2
8972	017704	036676	.WORD	EL3D3
8973	017706	036704	.WORD	EL3D4
8974	017710	036712	.WORD	EL3D5
8975	017712	036720	.WORD	EL3D6
8976	017714	037000	.WORD	EL3D7
8977	017716	023510	.WORD	EADDP
8978	017720	023526	.WORD	ESUBP
8979	017722	032346	.WORD	ECMPP
8980	017724	027102	.WORD	ECVTPL
8981	017726	033206	.WORD	EMULP
8982	017730	035250	.WORD	EDIVP
8983	017732	030750	.WORD	EASHP
8984	017734	025304	.WORD	ECVTLP

ELISTB:

PDP-11 CIS INST EXERCISER
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MOVE STRING

8986						.SBTTL		MOVE STRING
8987	017736	013700	017452		EMOVC:	MOV E1,R0		;FIND END OF SOURCE STRING
8988	017742	063700	017450			ADD E0,R0		
8989	017746	013701	017456			MOV E3,R1		;FIND END OF DEST. STRING
8990	017752	063701	017454			ADD E2,R1		
8991	017756	023737	017450	017454		CMP E0,E2		;WICH STRING IS LONGER
8992	017764	101003				BHI 1\$;SOURCE
8993	017766	103416				BLO 2\$;DEST.
8994	017770	010102				MOV R1,R2		;THEIR THE SAME
8995	017772	000420				BR 3\$		
8996	017774	013700	017452		1\$:	MOV E1,R0		;SHORTEN SOURCE STRING
8997	020000	063700	017454			ADD E2,R0		
8998	020004	010102				MOV R1,R2		;DEST USED END = REAL END
8999	020006	013703	017450			MOV E0,R3		;CALCULATE # OF CHARS
9000	020012	163703	017454			SUB E2,R3		; NOT TRANSFERRED.
9001	020016	010377	177422			MOV R3,@EORSTK		;SAVE RESULT
9002	020022	000406				BR 4\$		
9003	020024	013702	017456		2\$:	MOV E3,R2		;USED END < REAL END
9004	020030	063702	017450			ADD E0,R2		
9005	020034	005077	177404		3\$:	CLR @EORSTK		;ALL CHAR. TRANSFERED TO DEST.
9006	020040	023737	017452	017456	4\$:	CMP E1,E3		;WICH STRING IS IN HIGH CORE
9007	020046	103410				BLO EFORWD		;DEST STRING IS
9008	020050	013703	017452		EBACK:	MOV E1,R3		;START ADDRESS OF SOURCE
9009	020054	013704	017456			MOV E3,R4		;START ADDRESS OF DEST.
9010	020060	020402			1\$:	CMP R4,R2		;IS TRANSFER COMPLETE ?
9011	020062	001410				REQ EFILL		;YES
9012	020064	112324				MOVB (R3)+,(R4)+		;XFER CHAR.
9013	020066	000774				BR 1\$		
9014	020070	010203			EFORWD:	MOV R2,R3		;DEST STRING POINTER
9015	020072	023700	017452		1\$:	CMP E1,R0		;IS XFER COMPLETE ?
9016	020076	001402				BEQ EFILL		;YES
9017	020100	114043				MOVB -(R0),-(R3)		;XFER CHAR.
9018	020102	000773				BR 1\$		
9019	020104	020102			EFILL:	CMP R1,R2		;ADD FILL CHARS. TO COMPLETE STRING
9020	020106	001403				BEQ 2\$		
9021	020110	113722	017460			MOVB E4,(R2)+		;XFER FILL
9022	020114	000773				BR EFILL		
9023	020116	013700	017444		2\$:	MOV EORSTK,R0		;RETURN CLEAN UP
9024	020122	005720				TST (R0)+		;R0 = R0
9025	020124	005020				CLR (R0)+		;R1 = 0
9026	020126	005020				CLR (R0)+		;R2 = 0
9027	020130	005020				CLR (R0)+		;R3 = 0
9028	020132	013720	017460			MOV E4,(R0)+		;R4 = R4
9029	020136	013710	017462			MOV E5,(R0)		;R5 = R5
9030	020142	023737	017450	017454		CMP E0,E2		;SET PSW CC BITS
9031	020150	013777	177776	177270		MOV EPSW,@EOPSW		;STORE RESULT
9032	020156	000207				RTS PC		

PDP-11 CIS INST EXERCISER
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MACY11 27(655) 25-MAR-81 12:25 PAGE 86
MOVE STRING TRANSLATE

9034					.SBTTL		MOVE STRING TRANSLATE
9035	020160	013700	017452		MOV E1,R0		;FIND END OF SOURCE
9036	020164	063700	017450		ADD E0,R0		
9037	020170	013701	017456		MOV E3,R1		;FIND END OF DEST.
9038	020174	063701	017454		ADD E2,R1		
9039	020200	023737	017450	017454	CMP E0,E2		;WHICH STRING IS LONGER
9040	020206	101003			BHI 1\$;SOURCE
9041	020210	103416			BLO 2\$;DEST.
9042	020212	010102			MOV R1,R2		;SAME
9043	020214	000420			BR 3\$		
9044	020216	013700	017452		1\$: MOV E1,R0		;SHORTEN SOURCE STRING
9045	020222	063700	017454		ADD E2,R0		
9046	020226	010102			MOV R1,R2		
9047	020230	013703	017450		MOV E0,R3		;CALCULATE NO. OF CHARS.
9048	020234	163703	017454		SUB E2,R3		; NOT TRANSFERRED
9049	020240	010377	177200		MOV R3,@EORSTK		;STORE RESULT
9050	020244	000406			BR 4\$		
9051	020246	013702	017456		2\$: MOV E3,R2		;MARK REAL END OF DEST
9052	020252	063702	017450		ADD E0,R2		
9053	020256	005077	177162		3\$: CLR @EORSTK		
9054	020262	023737	017452	017456	4\$: CMP E1,E3		;WHO'S HIGHER IN MEMORY
9055	020270	103420			BLO EMTFRD		;MOVE FORWARD
9056	020272	013703	017452		EMTFRD: MOV E1,R3		;START OF SOURCE
9057	020276	013704	017456		MOV E3,R4		;START OF DEST.
9058	020302	020402			1\$: CMP R4,R2		;XFER COMPLETE YET
9059	020304	001430			BEQ EMTFIL		;YES
9060	020306	112337	017466		MOV B (R3)+,TEMP		;CAL. INDEX INTO TABLE
9061	020312	105037	017467		CLRB TEMP+1		
9062	020316	063737	017462	017466	ADD E5,TEMP		
9063	020324	117724	177136		MOV B @TEMP,(R4)+		;MOVE TABLE VALUE TO DEST.
9064	020330	000764			BR 1\$		
9065	020332	010203			EMTFRD: MOV R2,R3		;DEST MOVE POINTER
9066	020334	023700	017452		1\$: CMP E1,R0		;XFER COMPLETE ?
9067	020340	001412			BEQ EMTFIL		
9068	020342	114037	017466		MOV B -(R0),TEMP		;CAL INDEX INTO TABLE
9069	020346	105037	017467		CLRB TEMP+1		
9070	020352	063737	017462	017466	ADD E5,TEMP		
9071	020360	117743	177102		MOV B @TEMP,-(R3)		;MOVE TABLE VALUE INTO DEST.
9072	020364	000763			BR 1\$		
9073	020366	020102			EMTFIL: CMP R1,R2		;COMPLETE
9074	020370	001403			BEQ 2\$;YES
9075	020372	113722	017460		MOV B E4,(R2)+		;XFER FILL
9076	020376	000773			BR EMTFIL		
9077	020400	013700	017444		2\$: MOV EORSTK,R0		;RETURN CLEAN UP
9078	020404	005720			TST (R0)+		;R0 = R0
9079	020406	005020			CLR (R0)+		;R1 = 0
9080	020410	005020			CLR (R0)+		;R2 = 0
9081	020412	005020			CLR (R0)+		;R3 = 0
9082	020414	013720	017460		MOV E4,(R0)+		;R4 = R4
9083	020420	013710	017462		MOV E5,(R0)		;R5 = R5
9084	020424	023737	017450	017454	CMP E0,E2		;SET CC BITS
9085	020432	013777	177776	177006	MOV EPSW,@EOPSW		;RETURN STATUS
9086	020440	000207			RTS PC		

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MOVE REVERSE STRING

9089					.SBTTL	MOVE REVERSE STRING
9090	020442	013700	017452		EMOVRC: MOV E1,R0	:FIND END OF SOURCE
9091	020446	063700	017450		ADD E0,R0	
9092	020452	013701	017456		MOV E3,R1	:FIND END OF DEST.
9093	020456	063701	017454		ADD E2,R1	
9094	020462	023737	017450	017454	CMP E0,E2	:WHICH STRING IS LARGER
9095	020470	101004			BHI 1\$:SOURCE
9096	020472	103421			BLO 2\$:DEST.
9097	020474	013702	017456		MOV E3,R2	:SAME
9098	020500	000421			BR 3\$	
9099	020502	010037	017452		1\$: MOV R0,E1	:SHORTEN SOURCE
9100	020506	163737	017454	017452	SUB E2,E1	
9101	020514	013702	017456		MOV E3,R2	:DEST. REAL START
9102	020520	013703	017450		MOV E0,R3	:CALCULATE NO OF CHARS
9103	020524	163703	017454		SUB E2,R3	: NOT TRANSFERRED
9104	020530	010377	176710		MOV R3,@EORSTK	:STORE RESULT
9105	020534	000405			BR 4\$	
9106	020536	010102			2\$: MOV R1,R2	:MARK REAL START OF DEST.
9107	020540	163702	017450		SUB E0,R2	
9108	020544	005077	176674		3\$: CLR @EORSTK	:ALL CHARS. TRANSFERED
9109	020550	023702	017452		4\$: CMP E1,R2	:WHO'S IN HIGH MEMORY
9110	020554	103407			BLO EMRFRWD	:MOVE FORWARD
9111	020556	013703	017452		EMRBKD: MOV E1,R3	:SOURCE START POINTER
9112	020562	010204			MOV R2,R4	:DEST. START POINTER
9113	020564	020401			1\$: CMP R4,R1	:XFER COMPLETE
9114	020566	001406			BEQ EMRFIL	:YES
9115	020570	112324			MOVB (R3)+,(R4)+	:XFER CHAR.
9116	020572	000774			BR 1\$	
9117	020574	020102			EMRFRWD: CMP R1,R2	:XFER COMPLETE
9118	020576	001402			BEQ EMRFIL	:YES
9119	020600	114041			MOVB -(R0),--(R1)	:XFER CHAR.
9120	020602	000774			BR EMRFRWD	
9121	020604	013703	017456		EMRFIL: MOV E3,R3	:ADD FILLER
9122	020610	020302			2\$: CMP R3,R2	:FILL COMPLETE
9123	020612	001403			BEQ 1\$:YES
9124	020614	113723	017460		MOVB E4,(R3)+	:XFER FILL
9125	020620	000773			BR 2\$	
9126	020622	013700	017444		1\$: MOV EORSTK,R0	:RETURN CLEAN UP
9127	020626	005720			TST (R0)+	:R0 = R0
9128	020630	005020			CLR (R0)+	:R1 = 0
9129	020632	005020			CLR (R0)+	:R2 = 0
9130	020634	005020			CLR (R0)+	:R3 = 0
9131	020636	013720	017460		MOV E4,(R0)+	:R4 = R4
9132	020642	013710	017462		MOV E5,(R0)	:R5 = R5
9133	020646	023737	017450	017454	CMP E0,E2	:SET CC BITS
9134	020654	013777	177776	176564	MOV EPSW,@EOPSW	:RETURN TO USER
9135	020662	000207			RTS PC	

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COMPARE STRING

9137					.SBTTL	COMPARE STRING
9138	020664	013700	017450	ECMPC:	MOV E0,R0	;CAL. END OF SCR1
9139	020670	063700	017452		ADD E1,R0	
9140	020674	013701	017454		MOV E2,R1	;CAL. END OF SCR2
9141	020700	063701	017456		ADD E3,R1	
9142	020704	013702	017452		MOV E1,R2	;START OF SCR1
9143	020710	013703	017456		MOV E3,R3	;START OF SCR2
9144	020714	020002		1\$:	CMP R0,R2	;END OF SCR1
9145	020716	001427			BEQ ENDA	;YES
9146	020720	020103			CMP R1,R3	;END OF CR2
9147	020722	001445			BEQ ENDB	;YES
9148	020724	121213			CMPB (R2),(R3)	;SET CC BITS
9149	020726	013777	177776 176512		MOV EPSW,@EOPSW	;STORE STATUS
9150	020734	122322			CMPB (R3)+,(R2)+	;FIND NON MATCHING CHARS.
9151	020736	001766			BEQ 1\$;KEEP TRYING
9152	020740	005303			DEC R3	;ADJ SCR1 POINTER
9153	020742	005302			DEC R2	;ADJ SCR2 POINTER
9154	020744	160301		ECMOUT:	SUB R3,R1	;NO. OF CHARS. LEFT IN SCR2
9155	020746	160200			SUB R2,R0	;NO. OF CHARS. LEFT IN SCR1
9156	020750	013704	017444	EMATOT:	MOV EORSTK,R4	;REGISTER DUMP POINTER
9157	020754	010024			MOV R0,(R4)+	;R0 = SCR1 LEN
9158	020756	010224			MOV R2,(R4)+	;R1 = SCR1 START
9159	020760	010124			MOV R1,(R4)+	;R2 = SCR2 LEN
9160	020762	010324			MOV R3,(R4)+	;R3 = SCR2 START
9161	020764	013724	017460		MOV E4,(R4)+	;R4 = R4
9162	020770	013724	017462		MOV E5,(R4)+	;R5 = R5
9163	020774	000207			RTS PC	
9164	020776	020103		ENDA:	CMP R1,R3	;END SCR2 ?
9165	021000	001004			BNE 1\$	
9166	021002	013777	177776 176436		MOV EPSW,@EOPSW	;YES - STORE STATUS
9167	021010	000755			BR ECMOUT	
9168	021012	123713	017460	1\$:	CMPB E4,(R3)	;SET CC BITS
9169	021016	013777	177776 176422		MOV EPSW,@EOPSW	;STORE RESULT
9170	021024	123723	017460		CMPB E4,(R3)+	;FIND NON MATCHING CHARS.
9171	021030	001762			BEQ ENDA	;KEEP TRYING
9172	021032	005303			DEC R3	;ADJ SCR2 POINTER
9173	021034	000743			BR ECMOUT	
9174	021036	020002		ENDB:	CMP R0,R2	;END SCR1
9175	021040	001741			BEQ ECMOUT	;YES
9176	021042	121237	017460		CMPB (R2),E4	;SET CC BITS
9177	021046	013777	177776 176372		MOV EPSW,@EOPSW	;SAVE RESULT
9178	021054	123722	017460		CMPB E4,(R2)+	;FIND NON MATCHING CHARS.
9179	021060	001766			BEQ ENDB	;KEEP TRYING
9180	021062	005302			DEC R2	;ADJ POINTER
9181	021064	000727			BR ECMOUT	

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MACY11 27(655) 25-MAR-81 12:25 PAGE 87-2
MATCH STRING

9183					.SBTTL	MATCH STRING
9184	021066	013700	017450	EMTCHC:	MOV E0,R0	;CALCULATE END OF SRC
9185	021072	063700	017452		ADD E1,R0	
9186	021076	013701	017454		MOV E2,R1	;CALCULATE END OF OBJ
9187	021102	063701	017456		ADD E3,R1	
9188	021106	013702	017452		MOV E1,R2	;START OF SRC
9189	021112	013703	017456		MOV E3,R3	;START OF OBJ
9190	021116	010204		4\$:	MOV R2,R4	;SAVE START OF SRC
9191	021120	020103		1\$:	CMP R1,R3	;OBJ FOUND IN STRING?
9192	021122	001411			BEQ 3\$;YES
9193	021124	020200			CMP R2,R0	;END OF STRING AND NO MATCH
9194	021126	001410			BEQ 2\$;YES
9195	021130	122322			CMPB (R3)+,(R2)+	;DO CHARS. MATCH
9196	021132	001772			BEQ 1\$;YES
9197	021134	013703	017456		MOV E3,R3	;NO , SO RESET OBJ POINTER
9198	021140	005204			INC R4	;ADVANCE SRC POINTER TO ONE CHAR
9199						; POSITION BEYOND WHERE IT WAS
9200	021142	010402			MOV R4,R2	
9201	021144	000764			BR 4\$	
9202	021146	010402		3\$:	MOV R4,R2	
9203	021150	013703	017456	2\$:	MOV E3,R3	;RESTORE OBJ.LEN AND OBJ.ADR
9204	021154	013701	017454		MOV E2,R1	
9205	021160	160200			SUB R2,R0	;SET CC BITS
9206	021162	005700			TST R0	
9207	021164	013777	177776 176254		MOV EPSW,@EPSW	;SAVE RESULT
9208	021172	000137	020750		JMP EMATOT	

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 87-3
SEARCH FOR NON GROUP CHARS.

9210				
9211	021176	013700	017452	
9212	021202	063700	017450	
9213	021206	013701	017452	
9214	021212	020100		
9215	021214	001476		
9216	021213	112137	017466	
9217	021222	105037	017467	
9218	021226	063737	017462	017466
9219	021234	117702	176226	
9220	021240	133702	017460	
9221	021244	001362		
9222	021246	005301		
9223	021250	000137	021412	

```

ESPNC:      .SBTTL          SEARCH FOR NON GROUP CHARS.
             MOV E1,R0      ;CALCULATE END OF SOURCE
             ADD E0,R0      ;
             MOV E1,R1      ; START OF SOURCE
1$:          CMP R1,R0      ; COMPLETE
             BEQ ESPND      ; YES
             MOVB (R1)+,TEMP ; TABLE OFFSET
             CLRB TEMP+1    ; LOWER BYTE ONLY
             ADJ E5,TEMP     ; TABLE DATA
             MOVB @TEMP,R2
             BITB E4,R2     ; AND MASK
             BNE 1$         ; IF = 0 END SEARCH
             DEC R1         ; ADJ POINTER
             JMP ESPND

```

PDP-11 CIS INST EXERCISER
 IZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 87-4
 SEARCH FOR GROUP CHARS.

9225			
9226	021254	013700	017452
9227	021260	063700	017450
9228	021264	013701	017452
9229	021270	020100	
9230	021272	001447	
9231	021274	112137	017466
9232	021300	105037	017467
9233	021304	063737	017462
9234	021312	117702	176150
9235	021316	133702	017460
9236	021322	001762	
9237	021324	005301	
9238	021326	000137	021412

ESCNC:

1\$:

017466

```

.SBTTL
MOV E1,R0
ADD E0,R0
MOV E1,R1
CMP R1,R0
BEQ ESPND
MOVB (R1)+,TEMP
CLRB TEMP+1
ADD E5,TEMP
MOVB @TEMP,R2
BITB E4,R2
BEQ 1$
DEC R1
JMP ESPND
    
```

```

SEARCH FOR GROUP CHARS.
;CALCULATE END OF SOURCE

;START OF SOURCE
;COMPLETE ?
;YES
;TABLE OFFSET
;LOWER BYTE ONLY
;TABLE DATA

;AND MASK
;IF <>0 END SEARCH
;ADJ POINTER
    
```


REP-11 IS INST EXERCISER
ZKFEQ.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 87-5
LOCC INSTRUCTION

9240			
9241	021332	013700	017452
9242	021336	010001	
9243	021340	063700	017450
9244	021344	020001	
9245	021346	001421	
9246	021350	122137	017460
9247	021354	001373	
9248	021356	005301	
9249	021360	000137	021412

ELOCC:

1\$:

```

.SBTTL
MOV E1,R0
MOV R0,R1
ADD E0,R0
CMP R0,R1
BEQ ESPND
(MPB (R1)+,E4
BNE 1$
DEC R1
JMP ESPND

```

```

LOCC INSTRUCTION
;CALCULATE END ADDRESS
;SEARCH POINTER
;HAS SEARCH FAILED
;YES
;LOOK FOR CHAR.
;NOT FOUND YET
;ADJUST POINTER
;RETURN

```

POP-11 CIS INST EXERCISER
ZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 87-6
SKPC INSTRUCTION

9251					
9252	021364	013700	017452		
9253	021370	010001			
9254	021372	063700	017450		
9255	021376	020001			
9256	021400	001404			
9257	021402	122137	017460		
9258	021406	001773			
9259	021410	005301			
9260	021412	160100			
9261	021414	013702	017444		
9262	021420	010022			
9263	021422	010122			
9264	021424	013722	017454		
9265	021430	013722	017456		
9266	021434	013722	017460		
9267	021440	013722	017462		
9268	021444	005700			
9269	021446	013777	177776	175772	
9270	021454	000207			

ESKPC:	.SBTTL	SKPC INSTRUCTION
	MOV E1,R0	;CALCULATE END ADDRESS
	MOV R0,R1	;START ADDRESS
	ADD E0,R0	
1\$:	CMP R0,R1	;SEARCH FOR PASS
	BEQ ESPND	;FOUND IT
	(MPB (R1)+,E4	;LOOK FOR NOT CHAR.
	BEQ 1\$	
	DEC R1	
ESPND:	SUB R1,R0	;NO. OF CHARS.
	MOV EORSTK,R2	;REGISTER DUMP POINTER
	MOV R0,(R2)+	;R0 = LEN
	MOV R1,(R2)+	;R1 = POS.
	MOV E2,(R2)+	;R2 = R2
	MOV E3,(R2)+	;R3 = R3
	MOV E4,(R2)+	;R4 = R4
	MOV E5,(R2)+	;R5 = R5
	TST R0	;SET CC BITS
	MOV EPSW,@EOPSW	;STORE RESULTS
	RTS PC	

PCP-11 (1) INST EXERCISER
CZREEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 88-1
DIGIT (SIGN) RETRIEVER

9326	021622	020227	C00013			CMP R2,#13	; IS RETRIEVED SIGN NEG (1011)?
9327	021626	001403				BEQ 7\$; BRANCH IF YES
9328	021630	020227	000015			CMP R2,#15	; IS RETRIEVED SIGN NEG (1101)?
9329	021634	001007				BNE 6\$; BRANCH IF NO
9330	021636	122737	000160	032241	7\$:	CMPB #160,ETMPR1+1	; IS INST UNSIGNED PACKED?
9331	021644	001403				BEQ 6\$; BRANCH IF YES
9332	021646	012737	177777	025170		MOV #177777,ERSNEG	; SET NEG FLAG
9333	021654	005002			6\$:	CLR R2	
9334	021656	013700	032236		5\$:	MOV ETMPRO,R0	; RESTORE REGISTERS
9335	021662	013701	032240			MOV ETMPR1,R1	
9336	021666	000207				RTS PC	; RETURN
9337	021670	006202			3\$:	ASR R2	; SELECT UPPER NIBBLE
9338	021672	006202				ASR R2	
9339	021674	006202				ASR R2	
9340	021676	006202				ASR R2	
9341	021700	000740				BR 4\$	
9342							
9343							
9344	021702	010037	032236			: ZONED STRING DIGIT RETRIEVER	
9345	021706	010137	032240			EFNDTZ: MOV R0,ETMPRO	; SAVE REGISTER
9346	021712	013737	025236	025230		MOV R1,ETMPR1	
9347	021720	042701	070000			MOV ELSD,ESLSD	
9348	021724	123737	025236	032240		BIC #070000,R1	
9349	021732	001442				CMPB ELSD,ETMPR1	; REQUEST FOR SIGN?
9350	021734	122737	000040	032241	6\$:	BEQ 1\$; BRANCH IF YES
9351	021742	001405				CMPB #040,ETMPR1+1	; IS DESC TYPE TRAILING OVERPUNCH?
9352	021744	122737	000060	032241		BEQ 4\$; BRANCH IF YES
9353	021752	001411				CMPB #060,ETMPR1+1	; IS DESC TYPE LEADING OVERPUNCH?
9354	021754	000415				BEQ 5\$; BRANCH IF YES
9355						BR 3\$	
9356	021756	005337	025236		4\$:	DEC ELSD	; TYPE = TRAILING OVERPUNCH
9357	021762	123701	025236			CMPB ELSD,R1	; IS DIGIT REQUESTED PART OF THE
9358							; ENCODED SIGN DIGIT?
9359	021766	001010				BNE 3\$; BRANCH IF NO
9360	021770	004737	022322			JSR PC,DECZO	; DECODE OVERPUNCH BYTE FOR DIGIT
9361	021774	000407				BR 2\$	
9362							
9363	021776				5\$:		; TYPE = LEADING OVERPUNCH
9364	021776	005701				TST R1	; IS DIGIT REQUESTED PART OF ENCODED
9365							; SIGN DIGIT?
9366	022000	001003				BNE 3\$; BRANCH IF NO
9367	022002	004737	022322			JSR PC,DECZO	; DECODE OVERPUNCH BYTE
9368	022006	000402				BR 2\$	
9369							
9370	022010	060100			3\$:	ADD R1,R0	; BYTE ADDRESS
9371	022012	111002				MOVB (R0),R2	; DATA
9372	022014	042702	177760		2\$:	BIC #177760,R2	; MASK OFF JUNK
9373	022020	013700	032236			MOV ETMPRO,R0	; RESTORE REGISTER
9374	022024	013701	032240			MOV ETMPR1,R1	
9375	022030	013737	025230	025236		MOV ELSD,ESLSD	
9376	022036	000207				RTS PC	
9377	022040				1\$:		; SIGN REQUESTED
9378	022040	105737	025236			TSTB ELSD	; IS STRING LEN = 0?
9379	022044	001020				BNE 10\$; BRANCH IF NO

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DIGIT (SIGN) RETRIEVER

9380	022046	122737	000100	032241		CMPB #100,ETMPR1+1	:TYPE = TRAILING SEPARATE?
9381	022054	001002				BNE 103\$:BRANCH IF NO
9382	022056	000137	022240			JMP 14\$:RETURN SIGN AT 'A'
9383	022062	122737	000120	032241	103\$:	CMPB #120,ETMPR1+1	:IS STRING TYPE LEADING SEPARATE?
9384							:NOTE: SEPARATE TYPE ARE THE ONLY
9385							: 0 LEN ZONED STRING THAT
9386							: THAT OCCUPIES MEMORY.
9387	022070	001002				BNE 102\$:BRANCH IF NO
9388	022072	000137	022266			JMP 15\$:RETURN SIGN AT 'A-1'
9389	022076	005037	025274		102\$:	CLR SGNBYT	:CLEAR SIGN BYTE FOR POSSIBLE EKROR PRINT
9390	022102	000137	022140			JMP 100\$:RETURN + SIGN
9391							
9392	022106	122737	000000	032241	10\$:	CMPB #000,ETMPR1+1	:IS TYPE = SIGNED ZONED?
9393	022114	001022				BNE 11\$:BRANCH IF NO
9394	022116	060100				ADD R1,R0	:FORM SIGN ADDRESS
9395	022120	114002				MOVB -(R0),R2	
9396	022122	010237	025274			MOV R2,SGNBYT	:SAVE SIGN BYTE
9397	022126	042702	177417			BIC #177417,R2	:LOOK ONLY AT SIGN
9398	022132	020227	000160			CMP R2,#160	:IS IT (0111) NEGATIVE
9399	022136	001404				BEQ 101\$:BRANCH IF YES
9400	022140	005037	025170		100\$:	CLR ERSNEG	:SET SIGN FLAG TO +
9401	022144	005002				CLR R2	
9402	022146	000722				BR 2\$	
9403							
9404	022150	012737	177777	025170	101\$:	MOV #177777,ERSNEG	:SET SIGN FLAG TO '-'
9405	022156	005002				CLR R2	
9406	022160	000715				BR 2\$	
9407	022162	122737	000020	032241	11\$:	CMPB #020,ETMPR1+1	:IS TYPE - UNSIGNED ZONED?
9408	022170	001004				BNE 12\$:BRANCH IF NO
9409	022172	060100				ADD R1,R0	
9410	022174	114037	025274			MOVB -(R0),SGNBYT	:SAVE SIGN BYTE
9411	022200	000757				BR 100\$	
9412	022202	122737	000040	032241	12\$:	CMPB #040,ETMPR1+1	:IS TYPE = TRAILING OVERPUNCH?
9413	022210	001005				BNE 13\$:BRANCH IF NO
9414	022212	005301				DEC R1	
9415	022214	004737	022322		120\$:	JSR PC,DECZO	
9416	022220	005002				CLR R2	
9417	022222	000674				BR 2\$	
9418							
9419	022224	122737	000060	032241	13\$:	CMPB #060,ETMPR1+1	:IS TYPE = LEADING OVERPUNCH?
9420	022232	001002				BNE 14\$:BRANCH IF NO
9421	022234	005001				CLR R1	
9422	022236	000766				BR 120\$	
9423	022240	122737	000100	032241	14\$:	CMPB #100,ETMPR1+1	:IS TYPE = TRAILING SEPARATE
9424	022246	001007				BNE 15\$:BRANCH IF NO
9425	022250	060100				ADD R1,R0	:FORM ADDRESS OF SIGN
9426	022252	111037	025274			MOVB (R0),SGNBYT	:SAVE SIGN BYTE
9427	022256	121027	000055			CMPB (R0),#55	:IS SIGN = '-'
9428	022262	001326				BNE 100\$:BRANCH IF NO
9429	022264	000731				BR 101\$	
9430	022266	122737	000120	032241	15\$:	CMPB #120,ETMPR1+1	:IS TYPE=LEADING SEPARATE
9431	022274	001404				BEQ 115\$	
9432	022276	012737	000001	001114		MOV #1,\$MSGTY	:TELL APT THERE IS A FATAL ERROR::REV-C
9433	022304	000000				HALT	:ILLEGAL ZONED DATA TYPE

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DIGIT (SIGN) RETRIEVER

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9434 022306 114037 025274          115$:  MOVB -(R0),SGNBYT
9435 022312 121027 000055          CMPB (R0),#55          ;IS SIGN = '-' ?
9436 022316 001310          BNE 100$              ;BRANCH IF NO
9437 022320 000713          BR 101$
9438
9439
9440
9441
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9443 022322 060100          ;SUBROUTINE TO DECODE ZONED OVERPUNCH SIGN DIGIT BYTE
9444          DECZO:          ADD R1,R0          ;FIND DIGIT BY DECODING
9445 022324 111002          MOVB (R0),R2          ;DIGIT RETURNED IN R2; SIGN IN ERSNEG
9446 022326 010237 025274          MOV R2,SGNBYT        ;GET ENCODED BYTE
9447 022332 042702 177417          BIC #177417,R2       ;SAVE SIGN BYTE FOR POSSIBLE ERROR PRINTOUT
9448 022336 020227 000160          CMP R2,#160          ;LOOK AT HIGH NIBBLE
9449 022342 001014          BNE 1$               ;IS HIGH NIBBLE A 7
9450 022344 111002          MOVB (R0),R2          ;BRANCH IF NO
9451 022346 032702 000002          5$:  BIT #2,R2           ;DIGIT = 0
9452 022352 001403          BEQ 2$               ;IS SIGN + OR -
9453 022354 005037 025170          CLR ERSNEG           ;BRANCH IF -
9454 022360 000403          BR 3$
9455 022362 012737 177777 025170          2$:  MOV #177777,ERSNEG
9456 022370 005002          3$:  CLR R2
9457 022372 000207          RTS PC
9458 022374 020227 000120          1$:  CMP R2,#120          ;IS HIGH NIBBLE A 5?
9459 022400 001014          BNE 4$               ;BRANCH IF NO
9460 022402 111002          MOVB (R0),R2
9461 022404 032702 000010          BIT #10,R2           ;IS DIGIT = 0?
9462 022410 001356          BNE 5$               ;BRANCH IF YES
9463 022412 012737 177777 025170          MOV #177777,ERSNEG  ;DIGIT IS NEG
9464 022420 042702 177760          BIC #177760,R2
9465 022424 062702 000007          ADD #7,R2
9466 022430 000207          RTS PC
9467 022432 020227 000060          4$:  CMP R2,#060          ;IS HIGH NIBBLE A 3?
9468 022436 001006          BNE 6$               ;BRANCH IF NO
9469 022440 005037 025170          CLR ERSNEG           ;SIGN IS POSITIVE
9470 022444 111002          MOVB (R0),R2
9471 022446 042702 177760          BIC #177760,R2       ;DIGIT = LOW NIBBLE OF BYTE
9472 022452 000207          RTS PC
9473 022454 020227 000100          6$:  CMP R2,#100          ;IS HIGH NIBBLE A 4?
9474 022460 001407          BEQ 61$
9475 022462 005737 002310          TST PRMSGN           ;DECIMAL PRINTING IN PROGRESS?
9476 022466 001021          BNE 62$              ;BRANCH IF YES (DONT WANT TO HALT IN
9477          ; MIDDLE OF ERROR PRINTOUT)
9478 022470 012737 000001 001114          MOV #1,$MSGTY        ;TELL APT THERE IS A FATAL ERROR;:REV-C
9479 022476 000000          HALT                 ;ILLEGAL ENCODING OF OVERPUNCH DIGIT
9480 022500 111002          61$: MOVB (R0),R2
9481 022502 042702 177760          BIC #177760,R2
9482 022506 020227 000012          CMP R2,#12           ;IS DIGIT POSITIVE?
9483 022512 103407          BLO 62$              ;BRANCH IF YES
9484 022514 012737 177777 025170          MOV #177777,ERSNEG
9485 022522 042702 000010          BIC #10,R2
9486 022526 005302          DEC R2
9487 022530 000207          RTS PC

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DIGIT (SIGN) RETRIEVER

SEQUENCE 103

9488 022532 005037 025170
9489 022536 000207

62\$: CLR ERSNEG
RTS PC

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DIGIT (SIGN) PUSHER

.SBTTL DIGIT (SIGN) PUSHER

ROUTINE TO PUSH A PACKED OR ZONED DIGIT (OR SIGN) ONTO A DECIMAL STRING

INPUTS: R0 = STRING ADDRESS
R1 = TYPE & POSITION OF WHERE TO STORE DIGIT IN STRING
ELSD = TYPE & STRING LEN
EODD = ODD SIZE INDICATOR
ERSNEG = SIGN IF SIGN IS TO BE STORED
(EXCEPT 1111 IS ALWAYS STORED FOR UNSIGNED PACKED STRINGS)
R2 = DIGIT TO PUSH INTO STRING

OUTPUT: ERSNEG = 0 FOR UNSIGNED STRINGS SIGN
R0,R1,ELSD,EODD,R2 RETURNED UNDISTURBED

USAGE: TO PUSH MSD SET R1 = 0
" " LSD SET R1 = STRING LEN - 1
" " SIGN SET R1 = STRING LEN
IF STRING LEN = 0 THEN STORED BYTE - 0,SIGN

EPUSH: TST EPAK ;ZONED OR PACKED STRING?
BMI 1\$
JSR PC,EPUDTZ ;ZONED
BR 2\$
1\$: JSR PC,EPUTDT ;PACKED
2\$: RTS PC

:PACKED STRING NIBBLE PUSHER
EPUTDT: MOV R0,ETMPRO ;SAVE REGISTERS
MOV R1,ETMPR1
BIC #070000,R1 ;CLEAR TYPE FIELD
MOV R2,ETMPR2
TST EODD ;POSITION CORRECT FOR ODD SIZE NUMBERS
BMI 10\$
INC R1
10\$: MOV R1,EFINDA ;FIND WORD TO NIBBLE
ASR EFINDA
ADD EFINDA,R0
BIC #177760,R2 ;MASK JUNK FROM DATA
CMPB ELSD,ETMPR1 ;REQUEST TO INSERT SIGN?
BNE 5\$;BRANCH IF NO
CMPB #160,ETMPR1+1 ;UNSIGNED INST?
BNE 7\$;BRANCH IF NO
MOVB #17,R2 ;YES - STORE (1111)
CLR ERSNEG ;SET SIGN FLAG TO POSITIVE
BR 5\$
7\$: TST ERSNEG ;STORE + SIGN?
BEQ 6\$;BRANCH IF YES
MOVB #15,R2 ;STORE MINUS SIGN
BR 5\$
6\$: MOVB #14,R2 ;STORE POSITIVE SIGN

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9514 022540 005737 026430
9515 022544 100403
9516 022546 004737 023016
9517 022552 000402
9518 022554 004737 022562
9519 022560 000207
9520
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9522 022562 010037 032236
9523 022566 010137 032240
9524 022572 042701 070000
9525 022576 010237 032242
9526 022602 005737 025220
9527 022606 100401
9528 022610 005201
9529 022612 010137 025202
9530 022616 006237 025202
9531 022622 063700 025202
9532 022626 042702 177760
9533 022632 123737 025236 032240
9534 022640 001021
9535 022642 122737 000160 032241
9536 022650 001005
9537 022652 112702 000017
9538 022656 005037 025170
9539 022662 000410
9540 022664 005737 025170
9541 022670 001403
9542 022672 112702 000015
9543 022676 000402
9544 022700 112702 000014

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DIGIT (SIGN) PUSHER

9545	022704	010237	017466		5\$:	MOV R2,TEMP	:HOLD DATA
9546	022710	012737	000017	025214	4\$:	MOV #17,EMASK	:LOW NIBBLE MASK
9547	022716	032701	000001			BIT #1,R1	:WHICH NIBBLE
9548	022722	001013				BNE 2\$:LOW
9549	022724	006337	017466			ASL TEMP	:POSITION FOR HIGH NIBBLE
9550	022730	006337	017466			ASL TEMP	
9551	022734	006337	017466			ASL TEMP	
9552	022740	006337	017466			ASL TEMP	
9553	022744	012737	000360	025214		MOV #360,EMASK	:NIBBLE MASK
9554	022752	143710	025714		2\$:	BICB EMASK,(R0)	:CLEAR NIBBLE BEFORE LOAD
9555	022756	153710	017466			BISB TEMP,(R0)	:LOAD NIBBLE
9556	022762	005737	025220			TST EODD	:IF NUMBER IS EVEN LENGTH
9557	022766	100404				BMI 3\$	
9558	022770	005037	017466			CLR TEMP	:AND THIS IS LAST DIGIT
9559	022774	005301				DEC R1	
9560	022776	001744				BEQ 4\$:THEN CLEAR UNUSED NIBBLE
9561	023000	013700	032236		3\$:	MOV ETMPRO,R0	:RESTORE REGISTERS
9562	023004	013701	032240			MOV ETMPR1,R1	
9563	023010	013702	032242			MOV ETMPR2,R2	
9564	023014	000207				RTS PC	
9565							
9566						:ZONED STRING DIGIT PUSHER	
9567	023016	010037	032236			MOV R0,ETMPRO	:SAVE REGISTER
9568	023022	010137	032240			MOV R1,ETMPR1	
9569	023026	042701	070000			BIC #070000,R1	
9570	023032	010237	032242			MOV R2,ETMPR2	
9571	023036	042702	177760			BIC #177760,R2	:MASK OFF JUNK
9572	023042	052702	000060			BIS #60,R2	:ADD JUNK
9573	023046	123737	025236	032240		CMPB ELSD,ETMPR1	:REQUEST TO PUSH SIGN?
9574	023054	001411				BEQ 1\$:BRANCH IF YES
9575	023056	060100				ADD R1,R0	:WORD ADDRESS
9576	023060	110210				MOVB R2,(R0)	:DEPOSIT DATA
9577	023062	013700	032236		2\$:	MOV ETMPRO,R0	:RESTORE REGISTER
9578	023066	013701	032240			MOV ETMPR1,R1	
9579	023072	013702	032242			MOV ETMPR2,R2	
9580	023076	000207				RTS PC	
9581	023100	105737	025236		1\$:	TSTB ELSD	:IS STRING 0 IN LEN
9582	023104	001015				BNE 3\$:BRANCH IF NO
9583	023106	122737	000100	032241		CMPB #100,ETMPR1+1	:IS SIGN = TRAILING SEPARATE
9584	023114	001001				BNE 100\$	
9585	023116	000472				BR 14\$:PUSH TRAILING SEP SIGN INTO 'A'
9586	023120	122737	000120	032241	100\$:	CMPB #120,ETMPR1+1	:IS STRING TYPE = LEADING SEPARATE
9587	023126	001001				BNE 4\$:BRANCH IF NO
9588	023130	000503				BR 16\$:PUSH LEADING SEPARATE SIGN INTO 'A-1'
9589	023132	005037	025170		4\$:	CLR ERSNEG	
9590	023136	000751				BR 2\$	
9591	023140	122737	000000	032241	3\$:	CMPB #000,ETMPR1+1	:IS TYPE=SIGNED ZONED
9592	023146	001021				BNE 5\$:BRANCH IF NO
9593	023150	005737	025170			TST ERSNEG	:WHAT SIGN IS TO BE STORED
9594	023154	001003				BNE 6\$	
9595	023156	112702	000003			MOVB #3,R2	:STORE + SIGN
9596	023162	000402				BR 7\$	
9597	023164	112702	000007		6\$:	MOVB #7,R2	:STORE - SIGN
9598	023170	060100			7\$:	ADD R1,R0	:FORM SIGN BYTE ADDRESS

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DECIMAL ADDER

9646						.SBTTL	DECIMAL ADDER
9647	023364	063737	025176	025200	EDCAD:	ADD EDCOPA,EDCOPB	;ADD TWO SOURCE DIGITS
9648	023372	005737	025174			TST ECARRY	;ANY CARRY OR BORROW
9649	023376	001410				BEQ 1\$;NO
9650	023400	105737	025175			TSTB ECARRY+1	;WHICH ONE
9651	023404	001403				BEQ 2\$	
9652	023406	005337	025200			DEC EDCOPB	;BORROW
9653	023412	000402				BR 1\$	
9654	023414	005237	025200		2\$:	INC EDCOPB	;CARRY
9655	023420	005037	025174		1\$:	CLR ECARRY	;RESET CARRY/BORROW FLAG
9656	023424	005737	025200			TST EDCOPB	;IS RESULT NEGATIVE
9657	023430	100006				BPL 3\$;NO
9658	023432	062737	000012	025200		ADD #12,EDCOPB	;MAKE VALUE POSITIVE
9659	023440	112737	000377	025175		MOV# #377,ECARRY+1	;SET BORROW FLAG
9660	023446	023727	025200	000011	3\$:	CMP EDCOPB,#11	;IS RESULT > 9
9661	023454	101411				BLOS 4\$;NO
9662	023456	062737	000006	025200		ADD #6,EDCOPB	;CONVERT TO DECIMAL
9663	023464	042737	177760	025200		BIC #177760,EDCOPB	
9664	023472	112737	000377	025174		MOV# #377,ECARRY	
9665	023500	053737	025200	025212	4\$:	BIS EDCOPB,EADSUM	;RESULT = 0 INDICATOR
9666	023506	000207				RTS PC	
9667							

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ADDP,ADDN,SUBP,SUBN INSTRUCTIONS

9669						.SBTTL	ADDP,ADDN,SUBP,SUBN INSTRUCTIONS
9670	023510	012737	177777	026430	EADDP:	MOV #177777,EPAK	:INDICATE PACKED MODE
9671	023516	000430				BR EADSUB	
9672	023520	005037	026430		EADDN:	CLR EPAK	:INDICATE ZONED MODE
9673	023524	000425				BR EADSUB	
9674	023526	012737	177777	026430	ESUBP:	MOV #177777,EPAK	:INDICATE PACKED MODE
9675	023534	012737	177777	025232		MOV #177777,ESUBF	:SET SUBTRACT FLAG
9676	023542	005037	025220			CLR EODD	
9677	023546	032737	000001	017450		BIT #1,E0	:IS NUMBER ODD LENGTH
9678	023554	001411				BEQ EADSUB	:NO
9679	023556	012737	177777	025220		MOV #177777,EODD	
9680	023564	000405				BR EADSUB	
9681	023566	005037	026430		ESUBN:	CLR EPAK	:INDICATE ZONED MODE
9682	023572	012737	177777	025232		MOV #177777,ESUBF	:SET SUBTRACT FLAG
9683	023600	005037	025222		EADSUB:	CLR EAODD	:ODD SIZE INDICATORS
9684	023604	005037	025224			CLR EBODD	
9685	023610	005037	025226			CLR ECODD	
9686	023614	013737	017450	025242		MOV E0,TE0	:SAVE STRING LEN WORDS
9687	023622	013737	017454	025244		MOV E2,TE2	
9688	023630	013737	017460	025246		MOV E4,TE4	
9689	023636	032737	000001	017450		BIT #1,E0	:IF ODD SIZE SET INDICATOR
9690	023644	001403				BEQ 10\$:EVEN NO. OF DIGITS
9691	023646	012737	177777	025222		MOV #177777,EAODD	:SHOW ITS ODD
9692	023654	032737	000001	017454	10\$:	BIT #1,E2	:IF ODD SIZE SET INDICATOR
9693	023662	001403				BEQ 11\$:EVEN NO. OF DIGITS
9694	023664	012737	177777	025224		MOV #177777,EBODD	:SHOW ITS ODD
9695	023672	032737	000001	017460	11\$:	BIT #1,E4	:IS RESULT ODD LENGTH
9696	023700	001403				BEQ 12\$:NO
9697	023702	012737	177777	025226		MOV #177777,ECODD	:SET ODD INDICATOR
9698	023710	013700	017452		12\$:	MOV E1,R0	:FIND SIGN OF SRC1
9699	023714	013701	017450			MOV E0,R1	
9700	023720	013737	017450	025236		MOV E0,ELSD	
9701	023726	013737	025222	025220		MOV EAODD,EODD	
9702	023734	004737	021456			JSR PC,ESNK	
9703	023740	005037	025160			CLR ES1	
9704	023744	005737	025232			TST ESUBF	:SUBTRACT INST?
9705	023750	001007				BNE 1\$:BRANCH IF YES
9706	023752	005737	025170			TST ERSNEG	:IS SIGN NEGATIVE
9707	023756	001407				BEQ 2\$:BRANCH IF NO
9708	023760	012737	177777	025160	3\$:	MOV #177777,ES1	:SET NEGATIVE INDICATOR
9709	023766	000403				BR 2\$	
9710	023770	005737	025170		1\$:	TST ERSNEG	:SUBT INST - IS SIGN NEGATIVE
9711	023774	001771				BEQ 3\$:BRANCH IF NO TO SET NEG. INDICATOR
9712							:NOTE: FOR SUBT, THE SIGN OF SRC1
9713							: IS INVERTED AND THE ADD IS USED.
9714	023776	013700	017456		2\$:	MOV E3,R0	:FIND SIGN OF SRC2
9715	024002	013701	017454			MOV E2,R1	
9716	024006	013737	017454	025236		MOV E2,ELSD	
9717	024014	013737	025224	025220		MOV EBODD,EODD	
9718	024022	004737	021456			JSR PC,ESNK	
9719	024026	005037	025162			CLR ES2	
9720	024032	005737	025170			TST ERSNEG	:IS SIGN NEGATIVE?
9721	024036	001403				BEQ EADSB1	:BRANCH IF NO
9722	024040	012737	177777	025162		MOV #177777,ES2	:SET NEGATIVE INDICATOR

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ZK:EC,P-1

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ADDP,ADDN,SUBP,SUBN INSTRUCTIONS

9723									
9724	024046	005037	026440		EADSB1:	CLR EVTSSV			:RESET RESULT SIZE INDICATOR
9725	024052	005037	025164			CLR EANEG			:RESET SUBTRACT FLAGS
9726	024056	005037	025166			CLR EBNEG			
9727	024062	023737	025160	025162		CMP ES1,ES2			:ADD OR SUBTRACT DISPATCH
9728	024070	001527				BEQ EADAD			:LIKE SIGNS ADD
9729	024072	113703	017454			MOV B E2,R3			:UNLIKE SIGNS SUBTRACT
9730	024076	123737	017450	017454		CMP B E0,E2			:WHO IS LONGER
9731	024104	103402				BLO 1\$			
9732	024106	113703	017450			MOV B E0,R3			:MAXIMUM LENGTH
9733	024112	113704	017450		1\$:	MOV B E0,R4			:POSITION OF SCR1
9734	024116	113705	017454			MOV B E2,R5			:POSITION OF SCR2
9735	024122	160304				SUB R3,R4			:START POSITION
9736	024124	160305				SUB R3,R5			
9737	024126	123704	017450		6\$:	CMP B E0,R4			:EXIT HERE INDICATES
9738	024132	001470				BEQ EAIS			:RESULT = 0
9739	024134	005037	025154			CLR EOPA			:RESET DATA REGS
9740	024140	005037	025156			CLR EOPB			
9741	024144	005704				TST R4			:IS POSITION OF SCR1 VALID
9742	024146	100424				BMI 2\$:NO
9743	024150	013700	017452			MOV E1,R0			:GIT A OPERAND
9744	024154	010401				MOV R4,R1			
9745	024156	013737	017450	025236		MOV E0,ELSD			
9746	024164	013737	025222	025220		MOV EAODD,EODD			
9747	024172	013737	017450	025240		MOV E0,TEMPE			:SET TYPE FIELD
9748	024200	105037	025240			CLRB TEMPE			
9749	024204	053701	025240			BIS TEMPE,R1			
9750	024210	004737	021456			JSR PC,ESNK			
9751	024214	010237	025154			MOV R2,EOPA			:DATA FOR COMPARE
9752	024220	005705			2\$:	TST R5			:IS POSITION OF SCR2 VALID
9753	024222	100424				BMI 4\$:NO
9754	024224	013700	017456			MOV E3,R0			:GIT B OPERAND
9755	024230	010501				MOV R5,R1			
9756	024232	013737	017454	025236		MOV E2,ELSD			
9757	024240	013737	025224	025220		MOV EBODD,FODD			
9758	024246	013737	017454	025240		MOV E2,TEMPE			:SET TYPE FIELD
9759	024254	105037	025240			CLRB TEMPE			
9760	024260	053701	025240			BIS TEMPE,R1			
9761	024264	004737	021456			JSR PC,ESNK			
9762	024270	010237	025156			MOV R2,EOPB			:DATA FOR COMPARE
9763	024274	023737	025154	025156	4\$:	CMP EOPA,EOPB			:WHO IS LARGER
9764	024302	101004				BHI EAIS			:A IS
9765	024304	103412				BLO EBIS			:B IS
9766	024306	005204				INC R4			:OH NO THEIR THE SAME
9767	024310	005205				INC R5			
9768	024312	000705				BR 6\$			
9769	024314	012737	177777	025166	EAIS:	MOV #177777,EBNEG			:MAKE B NEGATIVE
9770	024322	013737	025160	025170		MOV ES1,ERSNEG			:IF A IS NEGATIVE THEN RESULT IS
9771	024330	000412				BR EADAD1			
9772	024332	012737	177777	025164	EBIS:	MOV #177777,EANEG			:MAKE A NEGATIVE
9773	024340	013737	025162	025170		MOV ES2,ERSNEG			:IF B IS NEGATIVE THEN RESULT IS
9774	024346	000403				BR EADAD1			
9775	024350	013737	025160	025170	EADAD:	MOV ES1,ERSNEG			:SIGN OF RESULT
9776	024356	005037	025212		EADAD1:	CLR EADSUM			:RESULT =0 INDICATOR

INST EXERCISER
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ADDP,ADDN,SUBP,SUBN INSTRUCTIONS

9777	024362	013737	025170	025234	MOV ERSNEG,SAVSGN	;SAVE SIGN OF RESULT
9778	024370	012700	026234		MOV #EVRTAB+^D40,R0	;CLEAR DATA AREA
9779	024374	005040		21\$:	CLR -(R0)	
9780	024376	020027	026164		CMP R0,#EVRTAB	
9781	024402	001374			BNE 21\$	
9782	024404	012703	026234		MOV #EVRTAB+^D40,R3	;DEST. POINTER
9783	024410	005037	025174		CLR ECARRY	;RESET CARRY
9784	024414	005037	026434		CLR EVTPAS	;RESET PASS COUNTER
9785	024420	005037	025172	20\$:	CLR ENOA	;NO A OPERAND FLAG
9786	024424	105337	017450		DECB E0	;A DIGIT POINTER
9787	024430	100005			BPL 1\$	
9788	024432	005237	025172		INC ENOA	;NO DIGITS LEFT
9789	024436	005037	025176		CLR EDCOPA	;DIGIT = 0
9790	024442	000404			BR 2\$	
9791	024444	004737	024550	1\$:	JSR PC,EGTOPA	;GIT A OPERAND
9792	024450	010237	025176		MOV R2,EDCOPA	;SAVE VALUE
9793	024454	105337	017454	2\$:	DECB E2	;B DIGIT POINTER
9794	024460	100006			BPL 3\$	
9795	024462	005737	025172		TST ENOA	;NO DIGITS LEFT
9796	024466	001077			BNE EXT	
9797	024470	005037	025200		CLR EDCOPB	
9798	024474	000404			BR 4\$	
9799	024476	004737	024602	3\$:	JSR PC,EGTOPB	;GIT B OPERAND
9800	024502	010237	025200		MOV R2,EDCOPB	;SAVE VALUE
9801	024506	005737	025164	4\$:	TST EANEG	;WANT A COMPLEMENTED
9802	024512	100004			BPL 5\$;NO
9803	024514	005137	025176		COM EDCOPA	;YES
9804	024520	005237	025176		INC EDCOPA	
9805	024524	005737	025166	5\$:	TST EBNEG	;WAN' B COMPLEMENTED
9806	024530	100004			BPL 6\$	
9807	024532	005137	025200		COM EDCOPB	;YES
9808	024536	005237	025200		INC EDCOPB	
9809	024542	004737	024634	6\$:	JSR PC,EADIT	;ADD DIGITS STORE RESULT
9810	024546	000724			BR 20\$	
9811						
9812	024550			EGTOPA:		;SUBROUTINE TO GET 'A' OPERAND
9813	024550	013700	017452		MOV E1,R0	;START ADDRESS OF NUMBER
9814	024554	013701	017450		MOV E0,R1	;DIGIT OF NUMBER
9815	024560	013737	025222	025220	MOV EAODD,EODD	
9816	024566	013737	025242	025236	MOV TE0,ELSD	
9817	024574	004737	021456		JSR PC,ESNK	;CALL ROUTINE TO RETRIEVE DIGIT
9818	024600	000207			RTS PC	
9819						
9820	024602			EGTOPB:		;SUBROUTINE TO GET 'B' OPERAND
9821	024602	013737	025224	025220	MOV EBODD,EODD	
9822	024610	013700	017456		MOV E3,R0	;START ADDRESS OF NUMBER
9823	024614	013701	017454		MOV E2,R1	;DIGIT OF NUMBER
9824	024620	013737	025244	025236	MOV TE2,ELSD	
9825	024626	004737	021456		JSR PC,ESNK	;CALL ROUTINE TO RETRIEVE DIGIT
9826	024632	000207			RTS PC	
9827						
9828	024634	004737	023364	EADIT:	JSR PC,EDCAD	;ADD TWO DECIMAL DIGITS
9829	024640	005237	026434		INC EVTPAS	;BUMP PASS COUNTER
9830	024644	005737	025200		TST EDCOPB	;SAVE POSITION OF LAST VALID DIGIT

PIP-11 IS INST EXERCISER
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 ADDP,ADDN,SUBP,SUBN INSTRUCTIONS

9831	024650	001403				BEQ 1\$	
9832	024652	013737	026434	026440		MOV EVTPAS,EVTSSV	;SAVE POSITION
9833	024660	113743	025200		1\$:	MOVB EDCOPB,-(R3)	;SAVE RESULT
9834	024664	000207				RTS PC	
9835	024666	005037	032254		EXT:	CLR ENZI	;INITIALIZE NONZERO DIGIT STORED INDICATOR TO ZF
9836	024672	105737	025174			TSTB ECARRY	;ANY CARRY FROM LAST ADD
9837	024676	100007				BPL 1\$;NO
9838	024700	112743	000001			MOVB #1,-(R3)	;ADD CARRY TO WORD
9839	024704	005237	026434			INC EVTPAS	;BUMP PASS COUNTER
9840	024710	013737	026434	026440		MOV EVTPAS,EVTSSV	;STORE POSITION
9841	024716	012703	026234		1\$:	MOV #EVRTAB+^D40,R3	;ADDRESS OF DATA
9842	024722	105337	017460		2\$:	DECB E4	;LAST TRANSFER COMPLETE
9843	024726	100423				BMI 3\$;YES
9844	024730	013700	017462			MOV E5,RO	;START ADDRESS OF DEST.
9845	024734	013701	017460			MOV E4,R1	;DIGIT POSITION
9846	024740	114302				MOVB -(R3),R2	;DATA TO DEPOSIT
9847	024742	005702				TST R2	;CHECK DIGIT BEING STORED IN DST
9848	024744	001403				BEQ 7\$	
9849	024746	012737	177777	032254		MOV #177777,ENZI	;DIGIT NOT = 0, SET INDICATOR
9850	024754	013737	025226	025220	7\$:	MOV ECODD,EODD	
9851	024762	013737	025246	025236		MOV TE4,ELSD	
9852	024770	004737	022540			JSR PC,EPUSH	;CALL ROUTINE TO PUSH DIGIT ONTO DST STRING
9853	024774	000752				BR 2\$	
9854	024776	013701	025246		3\$:	MOV TE4,R1	;POSITION OF SIGN
9855	025002	013737	025234	025170		MOV SAVSGN,ERSNEG	;SETUP ERSNEG WITH RESULT SIGN
9856	025010	013737	025246	025236		MOV TE4,ELSD	
9857	025016	005737	026440			TST EVTSSV	;IF ZERO, SIGN - +
9858	025022	001002				BNE 10\$	
9859	025024	005037	025170			CLR ERSNEG	;SET POSITIVE
9860	025030	013700	017462		10\$:	MOV E5,RO	;START OF DEST.
9861	025034	013737	025226	025220		MOV ECODD,EODD	
9862	025042	004737	022540			JSR PC,EPUSH	;SAVE SIGN
9863	025046	005077	172374		EXT1:	CLR @EOPSW	;RESET EMULATE PSW
9864	025052	005737	032254			TST ENZI	;IF = 0 SET Z BIT & SKIP OVER SETTING OF N BIT.
9865	025056	001407				BEQ 1\$	
9866	025060	005737	025170			TST ERSNEG	;IF (-) SET N BIT
9867	025064	100007				BPL 2\$	
9868	025066	052777	000010	172352		BIS #10,@EOPSW	;SET N BIT
9869	025074	000403				BR 2\$	
9870	025076	052777	000004	172342	1\$:	BIS #4,@EOPSW	;COMP. LENGTH FOR OVERFLOW
9871	025104	123737	025246	026440	2\$:	CMPB TE4,EVTSSV	;FIND LENGTH OF RESULT
9872	025112	103003				BHIS 4\$	
9873	025114	052777	000002	172324		BIS #2,@EOPSW	;SET OVERFLOW
9874	025122	013702	017444		4\$:	MOV EORSTK,R2	;REGISTER UNLOAD
9875	025126	005022				CLR (R2)+	;R0 = 0
9876	025130	005022				CLR (R2)+	;R1 = 0
9877	025132	005022				CLR (R2)+	;R2 = 0
9878	025134	005022				CLR (R2)+	;R3 = 0
9879	025136	013722	025246			MOV TE4,(R2)+	;R4 = R4
9880	025142	013722	017462			MOV E5,(R2)+	;R5 = R5
9881	025146	005037	025232			CLR ESUBF	;CLEAR SUBTRACT FLAG
9882	025152	000207				RTS PC	

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ADDP,ADDN,SUBP,SUBN INSTRUCTIONS

9884	025154	000000
9885	025156	000000
9886	025160	000000
9887	025162	000000
9888	025164	000000
9889	025166	000000
9890	025170	000000
9891	025172	000000
9892	025174	000000
9893	025176	000000
9894	025200	000000
9895	025202	000000
9896	025204	000000
9897	025206	000000
9898	025210	000000
9899	025212	000000
9900	025214	000000
9901	025216	000000
9902	025220	000000
9903	025222	000000
9904	025224	000000
9905	025226	000000
9906	025230	000000
9907	025232	000000
9908	025234	000000
9909	025236	000000
9910	025240	000000
9911	025242	000000
9912	025244	000000
9913	025246	000000
9914	025250	
9915	025250	173
9916	025251	101
9917	025252	102
9918	025253	103
9919	025254	104
9920	025255	105
9921	025256	106
9922	025257	107
9923	025260	110
9924	025261	111
9925	025262	175
9926	025263	112
9927	025264	113
9928	025265	114
9929	025266	115
9930	025267	116
9931	025270	117
9932	025271	120
9933	025272	121
9934	025273	122
9935	025274	000000

FOPA:	.WORD	0
EOPB:	.WORD	0
ES1:	.WORD	0
ES2:	.WORD	0
EANEG:	.WORD	0
EBNEG:	.WORD	0
ERSNEG:	.WORD	0
ENQA:	.WORD	0
ECARRY:	.WORD	0
EDCOPA:	.WORD	0
EDCOPB:	.WORD	0
EFINDA:	.WORD	0
ESGNA:	.WORD	0
ESGNB:	.WORD	0
ESGNC:	.WORD	0
EADSUM:	.WORD	0
EMASK:	.WORD	0
TEMP1:	.WORD	0
EGDD:	.WORD	0
EAODD:	.WORD	0
EBODD:	.WORD	0
ECODD:	.WORD	0
ESLSD:	.WORD	0
ESUBF:	.WORD	0
SAVSGN:	.WORD	0
ELSD:	.WORD	0
TEMPE:	.WORD	0
TE0:	.WORD	0
TE2:	.WORD	0
TE4:	.WORD	0
OPEPTB:		
	.BYTE	173
	.BYTE	101
	.BYTE	102
	.BYTE	103
	.BYTE	104
	.BYTE	105
	.BYTE	106
	.BYTE	107
	.BYTE	110
	.BYTE	111
OPENTB:	.BYTE	175
	.BYTE	112
	.BYTE	113
	.BYTE	114
	.BYTE	115
	.BYTE	116
	.BYTE	117
	.BYTE	120
	.BYTE	121
	.BYTE	122
SGNBYT:	.WORD	0

OVERPUNCH SIGN DIGIT (PREFERRED ENCODINGS)

..	+0
..	+1
..	+2
..	+3
..	+4
..	+5
..	+6
..	+7
..	+8
..	+9
..	-0
..	-1
..	-2
..	-3
..	-4
..	-5
..	-6
..	-7
..	-8
..	-9

PDP-11 C/S INST EXERCISER
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MACY11 27(655) 25-MAR-81 12:25 PAGE 89
CVTLP,Z INSTRUCTIONS

Address	Op1	Op2	Op3	Op4	Instruction	Comment
9937					.SBTTL	CVTLP,Z INSTRUCTIONS
9938					CONVERT LONG FORMAT NUMBERS INTO DECIMAL	
9939					IN EITHER PACKED OR ZONED FORMAT.	
9940					-----	
9941	025276	005037	026430		ECVTLN: CLR EPAK	:ZONED FORMATED OUTPUT
9942	025302	000403			BR ECVT	
9943	025304	012737	177777	026430	ECVTLP: MOV #177777,EPAK	:PACKED FORMAT OUTPUT
9944	025312	005037	025220		ECVT: CLR EODD	:RESET ODD INDICATORS
9945	025316	005037	026440		CLR EVTSSV	
9946	025322	005037	025176		CLR EDCOPA	
9947	025326	005037	025200		CLR EDCOPB	
9948	025332	005037	026436		CLR ESCF	
9949	025336	032737	000001	017450	BIT #1,E0	:IF ODD SET ODD FLAG
9950	025344	001403			BEQ 10\$:EVEN NO. OF DIGITS
9951	025346	012737	177777	025220	MOV #177777,EODD	:SET ODD FLAG
9952	025354	012700	026200		10\$: MOV #EVRTAB+14,R0	:CLEAR DATA TABLE
9953	025360	013702	07454		MOV E2,R2	:DATA TO BE CONVERTED
9954	025364	013703	017456		MOV E3,R3	
9955	025370	005040			1\$: CLR -(R0)	
9956	025372	022700	026164		CMP #EVRTAB,R0	:CLEAR COMPLETE
9957	025376	001374			BNE 1\$:NO
9958	025400	005037	026432		CLR EVTSGN	:CLEAR OLD SIGN INFO
9959	025404	005702			TST R2	:IS DATA NEGATIVE
9960	025406	100026			BPL 2\$:NO
9961	025410	112737	000377	026432	MOV B #377,EVTSGN	:YES, SAVE SIGN
9962	025416	005103			COM R3	:NEGATE DATA
9963	025420	005102			COM R2	
9964	025422	022703	177777		CMP #177777,R3	:CHECK FOR SPECIAL CASE - MOST NEG #.
9965	025426	001007			BNE 6\$:BRANCH IF THIS IS NOT THE SPECIAL CASE
9966	025430	022702	077777		CMP #077777,R2	:FOR MOST NEG # SRC HIGH -100000, SRC LOW 0.
9967	025434	001004			BNE 6\$:BRANCH IF NOT THE SPECIAL CASE
9968	025436	012737	177777	026436	MOV #177777,ESCF	:SET SPECIAL CASE FLAG
9969	025444	000405			BR 3\$	
9970	025446	000257			6\$: CCC	
9971	025450	062703	000001		ADD #1,R3	
9972	025454	103001			BCC 3\$:BRANCH IF NO CARRY FROM FIRST WORD
9973	025456	005202			INC R2	:YES
9974	025460	042702	100000		3\$: BIC #100000,R2	:CLEAR SIGN BIT
9975	025464	005037	026434		2\$: CLR EVTPAS	:RESET PASS COUNTER
9976	025470	023727	026434	000174	5\$: CMP EVTPAS,#^D124	:31 PASSES COMPLETE YET
9977	025476	001460			BEQ EVTWRP	:WRAP UP ROUTEEN
9978	025500	000257			CCC	:CLEAR CC BITS FOR 32 BIT SHIFT
9979	025502	006002			ROR R2	:SHIFT LOB INTO R3
9980	025504	006003			ROR R3	:SHIFT LOB FOR VALUE
9981	025506	103002			BCC 4\$:IF NOT SET BIT HAS NO VALUE
9982	025510	004737	025524		JSR PC,EVRTAD	:ADD BIT VALUE TO DECIMAL NUMBER
9983	025514	062737	000004	026434	4\$: ADD #4,EVTPAS	:BUMP PASS COUNTER
9984	025522	000762			BR 5\$:NEXT PASS
9985	025524	005037	025174		3\$: CLR ECARRY	:RESET CARRY/BORROW FLAGS
9986	025530	012700	026176		MOV #EVRTAB+12,R0	:A OPERAND POINTER
9987	025534	013704	026434		MOV EVTPAS,R4	:TABLE OFFSET
9988	025540	062704	026442		ADD #EVTABA,R4	:TABLE START ADDRESS
9989	025544	012401			MOV (R4),R1	:START ADDRESS OF DATA
9990	025546	061401			ADD (R4),R1	:END ADDRESS OF DATA

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CVTLP,Z INSTRUCTIONS

9991	025550	011404			MOV (R4),R4	;NO. OF DIGITS
9992	025552	010437	026440		MOV R4,EVTSSV	
9993	025556	114037	025176	1\$:	MOV B -(R0),EDCOPA	;FIND A OPERAND
9994	025562	114137	025200		MOV B -(R1),EDCOPB	;FIND B OPERAND
9995	025566	004737	023364		JSR PC,EDCAD	;ADD
9996	025572	113710	025200		MOV B EDCOPB,(R0)	;SAVE RESULT
9997	025576	005304			DEC R4	;IS THIS LAST DIGIT
9998	025600	001366			BNE 1\$;NO
9999	025602	105737	025174	2\$:	TSTB ECARRY	;ANY CARRY
10000	025606	100401			BMI 3\$;YES
10001	025610	000207			RTS PC	
10002	025612	005237	026440	3\$:	INC EVTSSV	
10003	025616	114037	025176		MOV B -(R0),EDCOPA	;A OPERAND
10004	025622	005037	025200		CLR EDCOPB	;NO B OPERAND
10005	025626	004737	023364		JSR PC,EDCAD	;ADD THE CARRY
10006	025632	113710	025200		MOV B EDCOPB,(R0)	;SAVE RESULT
10007	025636	000761			BR 2\$	
10008	025640	005037	026424		CLR ENULL	;RESET RESULT = 0 INDICATOR
10009	025644	013737	026432	025170	MOV EVTSGN,ERSNEG	;SETUP SIGN INDICATOR
10010	025652	012704	026176		MOV #EVRTAB+12,R4	;SETUP POINTER TO CONVERT RESULT
10011	025656	113701	017450		MOV B E0,R1	
10012	025662	160104			SUB R1,R4	
10013	025664	013737	017450	025236	MOV E0,ELSD	;SETUP POINTER TO LEAST SIGN. DIGIT
10014	025672	113737	017450	026426	MOV B E0,EPOPS	
10015	025700	005337	026426		DEC EPOPS	
10016	025704	013701	017450		MOV E0,R1	;SETUP POSITION OF # TO INSERT 0
10017	025710	042701	000377		BIC #377,R1	
10018	025714	013700	017452		MOV E1,R0	;SETUP ADDRESS OF # TO LOAD
10019	025720	005002		2\$:	CLR R2	;SETUP DATA TO LOAD
10020	025722	020427	026164		CMP R4,#EVRTAB	
10021	025726	103403			BLO 1\$	
10022	025730	111402			MOV B (R4),R2	
10023	025732	050237	026424		BIS R2,ENULL	
10024	025736	005204		1\$:	INC R4	
10025	025740	004737	022540		JSR PC,EPUSH	;CALL ROUTINE TO PUSH DIGIT INTO STRING
10026	025744	120137	026426		CMP B R1,EPOPS	;READY TO PUSH SIGN?
10027	025750	001004			BNE 3\$;BRANCH IF NO
10028	025752	005737	026436		TST ESCF	;SPECIAL CASE?
10029	025756	001401			BEQ 3\$;BRANCH IF NO
10030	025760	000405			BR EVTXT	;WORK WITH SPECIAL CASE BEFORE INSERTING SIGN.
10031	025762	020137	017450	3\$:	CMP R1,E0	;ALL DIGITS PLUS SIGN PUSHED?
10032	025766	001402			BEQ EVTXT	;BRANCH IF YES
10033	025770	005201			INC R1	
10034	025772	000752			BR 2\$;RETURN TO PUSH NEXT DIGIT
10035						
10036	025774	105737	017450	EVTXT:	TSTB E0	;IF DST.LEN=0 ,DON'T BOTHER TESTING
10037						; FOR SPECIAL CASE.
10038	026000	001425			BEQ 5\$	
10039	026002	005737	026436		TST ESCF	;SPECIAL CASE? (MOST NEG #).
10040	026006	001422			BEQ 5\$;BRANCH IF NO.
10041	026010	013737	017450	025236	MOV E0,ELSD	
10042	026016	013701	017450		MOV E0,R1	
10043	026022	005301			DEC R1	;SET R1=DST.LEN-1.
10044	026024	013700	017452		MOV E1,R0	;INCREMENT LEAST SIGN DIGIT TO 8.

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10045	026030	012702	000010		MOV #10,R2	
10046	026034	004737	022540		JSR PC,EPUSH	;CALL ROUTINE TO PUSH THE 8 INTO DEST.
10047	026040	005201			INC R1	;INSERT NEGATIVE SIGN
10048	026042	012737	177777	025170	MOV #177777,ERSNEG	
10049	026050	004737	022540		JSR PC,EPUSH	;CALL ROUTINE TO PUSH NEG SIGN INTO DEST.
10050	026054	005077	171366		CLR @EOPSW	;INIT EMULATE PSW
10051	026060	005737	026424		TST ENULL	;IF = 0 SET Z BIT; SKIP SETTING OF N BIT
10052	026064	001407			BEQ 1\$	
10053	026066	105737	025170		TSTB ERSNEG	;IF (-) SET N BIT
10054	026072	100007			BPL 2\$	
10055	026074	052777	000010	171344	BIS #10,@EOPSW	;SET N BIT
10056	026102	000403			BR 2\$	
10057	026104	052777	000004	171334	BIS #4,@EOPSW	;SET Z BIT
10058	026112	123737	017450	026440	CMPB E0,EVTSSV	
10059	026120	103003			BHIS 4\$	
10060	026122	052777	000002	171316	BIS #2,@EOPSW	;SET OVERFLOW
10061	026130	013702	017444		MOV EORSTK,R2	;REGISTER UNLOAD
10062	026134	013722	017450		MOV E0,(R2)+	;R0 = R0
10063	026140	013722	017452		MOV E1,(R2)+	;R1 = R1
10064	026144	005022			CLR (R2)+	;R2 = 0
10065	026146	005022			CLR (R2)+	;R3 = 0
10066	026150	013722	017460		MOV E4,(R2)+	;R4 = R4
10067	026154	013712	017462		MOV E5,(R2)	;R5 = R5
10068	026160	000207			RTS PC	
10069	026162	000000			.WORD 0	;MUST PRECEDE EVRTAB!!
10070	026164	000240			.BLKB ^D160	
10071	026424	000000			ENULL:	.WORD 0
10072	026426	000000			EPOPS:	.WORD 0
10073	026430	000000			EPAK:	.WORD 0
10074	026432	000000			EVTSGN:	.WORD 0
10075	026434	000000			EVTPAS:	.WORD 0
10076	026436	000000			ESCF:	.WORD 0
10077	026440	000000			EVTSSV:	.WORD 0
10078	026442	026636	000001		EVTABA:	.WORD E00,1
10079	026446	026637	000001			.WORD E01,1
10080	026452	026640	000001			.WORD E02,1
10081	026456	026641	000001			.WORD E03,1
10082	026462	026642	000002			.WORD E04,2
10083	026466	026644	000002			.WORD E05,2
10084	026472	026646	000002			.WORD E06,2
10085	026476	026650	000003			.WORD E07,3
10086	026502	026653	000003			.WORD E08,3
10087	026506	026656	000003			.WORD E09,3
10088	026512	026661	000004			.WORD E10,4
10089	026516	026665	000004			.WORD E11,4
10090	026522	026671	000004			.WORD E12,4
10091	026526	026675	000004			.WORD E13,4
10092	026532	026701	000005			.WORD E14,5
10093	026536	026706	000005			.WORD E15,5
10094	026542	026713	000005			.WORD E16,5
10095	026546	026720	000006			.WORD E17,6
10096	026552	026726	000006			.WORD E18,6
10097	026556	026734	000006			.WORD E19,6
10098	026562	026742	000007			.WORD E20,7

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10099	026566	026751	000007				.WORD	E21,7
10100	026572	026760	000007				.WORD	E22,7
10101	026576	026767	000007				.WORD	E23,7
10102	026602	026776	000010				.WORD	E24,10
10103	026606	027006	000010				.WORD	E25,10
10104	026612	027016	000010				.WORD	E26,10
10105	026616	027026	000011				.WORD	E27,11
10106	026622	027037	000011				.WORD	E28,11
10107	026626	027050	000011				.WORD	E29,11
10108	026632	027061	000012				.WORD	E30,12
10109	026636	001				E00:	.BYTE	^D1
10110	026637	002				E01:	.BYTE	^D2
10111	026640	004				E02:	.BYTE	^D4
10112	026641	010				E03:	.BYTE	^D8
10113	026642	001	006			E04:	.BYTE	^D1,^D6
10114	026644	003	002			E05:	.BYTE	^D3,^D2
10115	026646	006	004			E06:	.BYTE	^D6,^D4
10116	026650	001	002	010		E07:	.BYTE	^D1,^D2,^D8
10117	026653	002	005	006		E08:	.BYTE	^D2,^D5,^D6
10118	026656	005	001	002		E09:	.BYTE	^D5,^D1,^D2
10119	026661	001	000	002		E10:	.BYTE	^D1,^D0,^D2,^D4
	026664	004						
10120	026665	002	000	004		E11:	.BYTE	^D2,^D0,^D4,^D8
	026670	010						
10121	026671	004	000	011		E12:	.BYTE	^D4,^D0,^D9,^D6
	026674	006						
10122	026675	010	001	011		E13:	.BYTE	^D8,^D1,^D9,^D2
	026700	002						
10123	026701	001	006	003		E14:	.BYTE	^D1,^D6,^D3,^D8,^D4
	026704	010	004					
10124	026706	003	002	007		E15:	.BYTE	^D3,^D2,^D7,^D6,^D8
	026711	006	010					
10125	026713	006	005	005		E16:	.BYTE	^D6,^D5,^D5,^D3,^D6
	026716	003	006					
10126	026720	001	003	001		E17:	.BYTE	^D1,^D3,^D1,^D0,^D7,^D2
	026723	000	007	002				
10127	026726	002	006	002		E18:	.BYTE	^D2,^D6,^D2,^D1,^D4,^D4
	026731	001	004	004				
10128	026734	005	002	004		E19:	.BYTE	^D5,^D2,^D4,^D2,^D8,^D8
	026737	002	010	010				
10129	026742	001	000	004		E20:	.BYTE	^D1,^D0,^D4,^D8,^D5,^D7,^D6
	026745	010	005	007				
	026750	006						
10130	026751	002	000	011		E21:	.BYTE	^D2,^D0,^D9,^D7,^D1,^D5,^D2
	026754	007	001	005				
	026757	002						
10131	026760	004	001	011		E22:	.BYTE	^D4,^D1,^D9,^D4,^D3,^D0,^D4
	026763	004	003	000				
	026766	004						
10132	026767	010	003	010		E23:	.BYTE	^D8,^D3,^D8,^D8,^D6,^D0,^D8
	026772	010	006	000				
	026775	010						
10133	026776	001	006	007		E24:	.BYTE	^D1,^D6,^D7,^D7,^D7,^D2,^D1,^D6
	027001	007	007	002				

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10134	027004	001	006	005	E25:	.BYTE ^D3,^D3,^D5,^D5,^D4,^D4,^D3,^D2
	027006	003	003	004		
	027011	005	004	004		
10135	027014	003	002	001	E26:	.BYTE ^D6,^D7,^D1,^D0,^D8,^D8,^D6,^D4
	027016	006	007	010		
	027021	000	010			
10136	027024	006	004	004	E27:	.BYTE ^D1,^D3,^D4,^D2,^D1,^D7,^D7,^D2,^D8
	027026	001	003	007		
	027031	002	001	010		
10137	027034	007	002	010	E28:	.BYTE ^D2,^D6,^D8,^D4,^D3,^D5,^D4,^D5,^D6
	027037	002	006	010		
	027042	004	003	005		
10138	027045	004	005	006	E29:	.BYTE ^D5,^D3,^D6,^D8,^D7,^D0,^D9,^D1,^D2
	027050	005	003	006		
	027053	010	007	000		
	027056	011	001	002		
10139	027061	001	000	007	E30:	.BYTE ^D1,^D0,^D7,^D3,^D7,^D4,^D1,^D8,^D2,^D4
	027064	003	007	004		
	027067	001	010	002		
	027072	004				
10140	027074					.EVEN

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CONVERT PACKED OR ZONED TO LONG

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10142          .SBTTL          CONVERT PACKED OR ZONED TO LONG
10143          CONVERT A NUMBER THAT IS IN EITHER PACKED OR
10144          ZONED FORMAT INTO LONG FORMAT.          (CVTPL,CVTNL)
10145          -----
10146 027074 005037 026430 ECVTNL: CLR EPAK          ;ZONED FORMAT INPUT
10147 027100 000403          BR EZL1
10148 027102 012737 177777 026430 ECVTPL: MOV #177777,EPAK          ;PACKED FORMAT INPUT
10149 027110 005037 027634          EZL1: CLR EFLG          ;RESET OVERFLOW
10150 027114 005037 025220          CLR EODD          ;RESET ODD LENGTH INDICATOR
10151 027120 005003          CLR R3          ;CLEAR RESULT DATA AREA
10152 027122 005004          CLR R4
10153 027124 005037 026424          CLR ENULL          ;RESET NULL INDICATOR
10154 027130 032737 000001 017450          BIT #1,E0          ;IS SOURCE ODD OR EVEN NO. OF DIGITS
10155 027136 001403          BEQ 1$          ;ITS EVEN
10156 027140 012737 177777 025220          MOV #177777,EODD          ;ODD
10157          :
10158          :
10159 027146 013701 017450          :          $: FIND SIGN OF NUMBER
10160 027152 013737 017450 025236          MOV E0,R1          ;SETUP POSITION OF SIGN
10161 027160 013700 017452          MOV E0,ELSD          ;SETUP POSITION OF LEAST SIGN DIGIT.
10162 027164 004737 021456          JSR PC,ESNK          ;SETUP ADDRESS OF STRING
10163 027170 005037 025160          CLR E$1          ;CALL ROUTINE TO FIND SIGN
10164 027174 005737 025170          TST ERSNEG          ;IS SIGN NEGATIVE?
10165 027200 001403          BEQ EZL2          ;BRANCH IF NO
10166 027202 012737 177777 025160          MOV #177777,E$1          ;YES - SET NEGATIVE FLAG
10167          :
10168          :
10169          :          CONVERTER
10170          :          CLEAR RESULT
10171          :          FOR COUNT = 1 TO LENGTH
10172          :          RESULT = (RESULT*10)+DIGIT<MSD+COUNT>
10173 027210 013737 017450 027636          EZL2: MOV E0,ECOUN          ;RESET COUNT(UPPER BYTE OF ECOUN MUST
10174          :          ; CONTAIN TYPE)
10175 027216 042737 000377 027636          BIC #377,ECOUN
10176 027224 013737 017450 025236          MOV E0,ELSD
10177 027232 123737 027636 017450          10$: CMPB ECOUN,E0          ;CONVERSION COMPLETE YET
10178 027240 001474          BEQ EZLE          ;YES
10179 027242 013701 027636          MOV ECOUN,R1          ;POSITION OF SOURCE
10180 027246 013700 017452          MOV E1,R0          ;START ADDRESS OF SOURCE
10181 027252 004737 021456          JSR PC,ESNK          ;CALL ROUTINE TO FIND DIGIT
10182 027256 005237 027636          2$: INC ECOUN          ;BUMP COUNTER
10183 027262 050237 026424          BIS R2,ENULL          ;DIGIT SUM FOR NULL TEST
10184 027266 000257          CCC          ;MULTIPLY RESULT BY '0
10185 027270 006104          ROL R4
10186 027272 006103          ROL R3
10187 027274 103003          BCC 3$          ;ANY BIT SHIFTED OUT IS OVERFLOW
10188 027276 012737 177777 027634          MOV #177777,EFL0
10189 027304 010337 017466          3$: MOV R3,TEMP          ;TEMP DATA HOLD FOR MULTIPLY
10190 027310 010437 025216          MOV R4,TEMP1
10191 027314 000257          CCC
10192 027316 006104          ROL R4
10193 027320 006103          ROL R3
10194 027322 103003          BCC 4$
10195 027324 012737 177777 027634          MOV #177777,EFL0
    
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CONVERT PACKED OR ZONED TO LONG

10196	027332	000257		4\$:	CCC	
10197	027334	006104			ROL R4	
10198	027336	006103			RJL R3	
10199	027340	103003			BCC 5\$	
10200	027342	012737	177777 027634		MOV #177777,EFLO	
10201	027350	063704	025216	5\$:	ADD TEMP1,R4	;COMPLETE MULTIPLY
10202	027354	103007			BCC 6\$	
10203	027356	000257			CCC	
10204	027360	062703	000001		ADD #1,R3	
10205	027364	103003			BCC 6\$	
10206	027366	012737	177777 027634		MOV #177777,EFLO	
10207	027374	063703	017466	6\$:	ADD TEMP,R3	
10208	027400	103003			BCC 8\$	
10209	027402	012737	177777 027634		MOV #177777,EFLO	
10210	027410	060204		8\$:	ADD R2,R4	;ADD NEW DIGIT
10211	027412	103307			BCC 10\$	
10212	027414	062703	000001		ADD #1,R3	
10213	027420	103304			BCC 10\$	
10214	027422	012737	177777 027634		MOV #177777,EFLO	
10215	027430	000700			BR 10\$	
10216						
10217						
10218	027432	005703		EZLE:	SET CC BITS , SET RESULT REGISTERS	
10219					TST R3	;BIT 32= 1 IS OVERFLOW EXCEPT IF
10220						; ALL OTHER 31 BITS - 0 & SRC WAS NEGATIVE
10220	027434	100013			BPL 6\$;BRANCH IF OK
10221	027436	005704			TST R4	;ALL OTHER 31 BITS 0?
10222	027440	001006			BNE 7\$;BRANCH IF NO
10223	027442	032703	077777		BIT #77777,R3	
10224	027446	001003			BNE 7\$;BRANCH IF NO
10225	027450	005737	025160		TST ES1	;WAS SRC NEGATIVE?
10226	027454	100403			BMI 6\$;BRANCH IF YES
10227	027456	012737	177777 027634	7\$:	MOV #177777,EFLO	;ELSE OVERFLOW
10228	027464	005077	167756	6\$:	CLR @EOPSW	;RESET PSW
10229	027470	005737	027634		TST EFLO	;ANY OVERFLOW
10230	027474	001403			BEQ 1\$;NO
10231	027476	052777	000002 167742		BIS #2,@EOPSW	;SET V BIT
10232	027504	005704		1\$:	TST R4	;WAS RESULT 0
10233	027506	001006			BNE 5\$;NO
10234	027510	005703			TST R3	
10235	027512	001004			BNE 5\$;NO
10236	027514	052777	000004 167724		BIS #4,@EOPSW	;SET Z BIT
10237	027522	000412			BR 2\$	
10238	027524	005737	025160	5\$:	TST ES1	;WHAT SIGN
10239	027530	100007			BPL 2\$;POSITIVE
10240	027532	005103			COM R3	;COMPLEMENT VALUE
10241	027534	005104			COM R4	
10242	027536	000257			CCC	
10243	027540	062704	000001		ADD #1,R4	
10244	027544	103001			BCC 2\$	
10245	027546	005203			INC R3	
10246	027550	005703		2\$:	TST R3	;SET N BIT BASED ON SIGN OF RESULT
10247	027552	100003			BPL 3\$;IF RESULT SIGN => BRANCH
10248	027554	052777	000010 167664		BIS #10,@EOPSW	;SET N BIT
10249	027562	032777	000004 167656	3\$:	BIT #4,@EOPSW	;WAS DST - 0

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10250	027570	001006	
10251	027572	005737	025160
10252	027576	100003	
10253	027600	052777	000001 167640
10254	027606	013700	017444
10255	027612	005020	
10256	027614	005020	
10257	027616	010320	
10258	027620	010420	
10259	027622	013720	017460
10260	027626	013720	017462
10261	027632	000207	
10262	027634	000000	
10263	027636	000000	

```

BNE 4$
TST ESI
BPL 4$
BIS #1,@EOPSW
MOV EORSTK,R0
CLR (R0)+
CLR (R0)+
MOV R3,(R0)+
MOV R4,(R0)+
MOV E4,(R0)+
MOV E5,(R0)+
RTS PC
.word 0
.word 0

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: YES
: AND WAS SOURCE NEGATIVE
: NO
: YES , THEN SET C BIT
: REGISTER SAVE
: R0 = 0
: R1 = 0
: R2 = DST HIGH
: R3 = DST LOW
: R4 = R4
: R5 = R5

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EFLO:
ECOUN:

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CONVERT PACKED TO ZONED

10265						.SBTTL	CONVERT PACKED TO ZONED
10266	027640	012737	177777	026430	ECVTPN:	MOV #177777,EPAK	;SET PACKED MODE INDICATOR
10267	027646	005037	026440			CLR EVTSSV	;RESET PASS COUNTER
10268	027652	005037	026424			CLR ENULL	;RESET NULL INDICATOR
10269	027656	005077	167564			CLR @EOPSW	;RESET EMULATE PSW
10270	027662	013737	017450	025176		MOV E0,EDCOPA	;START POSITION OF SOURCE
10271	027670	013737	017454	025200		MOV E2,EDCOPB	;START POSITION OF DEST.
10272	027676	005037	025220			CLR EODD	;IS SOURCE ODD OR EVEN NUMBER
10273	027702	032737	000001	017450		BIT #1,E0	;OF DIGITS
10274	027710	001403				BEQ EPZ1	;ITS EVEN
10275	027712	012737	177777	025220		MOV #177777,EODD	;ITS ODD
10276	027720	004737	030662		EPZ*:	JSR PC,EFMSD	;DETERMINE POSITION OF MOST SIGN SRC DIGIT
10277	027724	005002				CLR R2	
10278	027726	105337	025176			DECB EDCOPA	;END OF SOURCE YET
10279	027732	100414				BMI 1\$;YES
10280	027734	042777	000001	167504		BIC #1,@EOPSW	;RESET END OF SOURCE FLAG
10281	027742	013700	017452			MOV E1,RO	;START ADDRESS OF SOURCE
10282	027746	013701	025176			MOV EDCOPA,R1	;POSITION OF DIGIT
10283	027752	013737	017450	025236		MOV E0,ELSD	
10284	027760	004737	021500			JSR PC,EFINDT	;GRAB DIGIT
10285	027764	105337	025200		*\$:	DECB EDCOPB	;END OF DEST. YET
10286	027770	100421				BMI EPZE	;YES
10287	027772	005237	026440			INC EVTSSV	;DIGIT POSITION
10288	027776	005702				TST R2	;IS DIGIT ZERO
10289	030000	001403				BEQ 2\$	
10290	030002	013737	026440	026424		MOV EVTSSV,ENULL	;POSITION OF LAST NON ZERO DIGIT STORED.
10291	030010	013700	017456		2\$:	MOV E3,RO	;START ADDRESS OF DEST
10292	030014	013701	025200			MOV EDCOPB,R1	;POSITION OF DIGIT
10293	030020	013737	017454	025236		MOV E2,ELSD	
10294	030026	004737	023016			JSR PC,EPUDTZ	;SAVE DIGIT
10295	030032	000732				BR EPZ1	;LOOP TILL COMPLETE
10296	030034	013700	017452		EPZE:	MOV E1,RO	;START ADDRESS OF SOURCE
10297	030040	013701	017450			MOV E0,R1	;POSITION OF SIGN
10298	030044	013737	017450	025236		MOV E0,ELSD	
10299	030052	004737	021500			JSR PC,EFINDT	;GRAB SIGN
10300	030056	005037	025160			CLR E\$1	;RESET SIGN FLAG
10301	030062	005737	025170			TST ERSNEG	;IS SOURCE NEG?
10302	030066	001406				BEQ 2\$;BRANCH IF NO
10303	030070	005737	030744			TST EMSDP	;IF SRC IS ZERO AND NEG TREAT IT AS POSITIVE
10304	030074	001403				BEQ 2\$	
10305	030076	012737	177777	025160		MOV #177777,E\$1	;SET NEGATIVE FLAG
10306	030104	005737	026424		2\$:	TST ENULL	;WAS RESULT STORED ZERO
10307	030110	001004				BNE 3\$;NO
10308	030112	052777	000004	167326		BIS #4,@EOPSW	;SET Z BIT
10309	030120	000406				BR 6\$;SKIP SETTING OF N BIT
10310	030122	005737	025160		3\$:	TST E\$1	;SIGN OF RESULT
10311	030126	001403				BEQ 6\$;POSITIVE
10312	030130	052777	000010	167310		BIS #10,@EOPSW	;SET N BIT
10313	030136	013737	025160	025170	6\$:	MOV E\$1,ERSNEG	;SETUP SIGN OF RESULT
10314	030144	013701	017454			MOV E2,R1	;POSITION OF SIGN
10315	030150	013737	017454	025236		MOV E2,ELSD	
10316	030156	013700	017456			MOV E3,RO	;START ADDRESS OF DEST.
10317	030162	004737	023016			JSR PC,EPUDTZ	;INSERT SIGN IN DST STRING
10318	030166	005737	025170			TST ERSNEG	;WAS SIGN STORED POSITIVE? UNZONED

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10319	030172	001003				BNE 4\$:BRANCH IF NO
10320	030174	042777	000010	167244		BIC #10,@EOPSW	:CLEAR PSW N BIT
10321	030202	023737	030744	026424	4\$:	CMP EMSDP,ENULL	:CAN DEST. CONTAIN ALL DIGITS
10322	030210	101403				BLOS 5\$:YES
10323	030212	052777	000002	167226		BIS #2,@EOPSW	:SET V BIT
10324	030220	013702	017444		5\$:	MOV EORSTK,R4	:SAVE REGISTERS
10325	030224	005022				CLR (R2)+	:R0 = 0
10326	030226	005022				CLR (R2)+	:R1 = 0
10327	030230	013722	017454			MOV E2,(R2)+	:R2 = R2
10328	030234	013722	017456			MOV E3,(R2)+	:R3 = R3
10329	030240	013722	017460			MOV E4,(R2)+	:R4 = R4
10330	030244	013722	017462			MOV E5,(R2)+	:R5 = R5
10331	030250	000207				RCS P	

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10333						.SBTTL	CONVERT ZONED TO PACKED
10334	030252	005037	026440			CLR EVTSSV	;RESET PASS COUNTER
10335	030256	005037	026430			CLR EPAK	;MODE = ZONED
10336	030262	005037	026424			CLR ENULL	;RESET NULL INDICATOR
10337	030266	005077	167154			CLR @EOPSW	;RESET EMULATE PSW
10338	030272	013737	017450	025176		MOV E0,EDCOPA	;START POSITION OF SOURCE
10339	030300	013737	017454	025200		MOV E2,EDCOPB	;START POSITION OF DEST.
10340	030306	005037	025220			CLR EODD	;IS DEST. ODD OR EVEN # OF DIGITS.
10341	030312	032737	000001	017454		BIT #1,E2	
10342	030320	001403				BEQ EZP1	;ITS EVEN
10343	030322	012737	177777	025220		MOV #177777,EODD	;ITS ODD
10344	030330	004737	030662		EZP1:	JSR PC,EFMSD	;FIND POSITION OF MOST SIGNIFICANT SOURCE DIGIT
10345	030334	005002				CLR R2	
10346	030336	105337	025176			DECB EDCOPA	;END OF SOURCE YET
10347	030342	100414				BMI 1\$	
10348	030344	042777	000001	167074		BIC #1,@EOPSW	;RESET END OF SOURCE FLAG
10349	030352	013700	017452			MOV E1,R0	;START ADDRESS OF SOURCE
10350	030356	013701	025176			MOV EDCOPA,R1	;POSITION OF DIGIT
10351	030362	013737	017450	025236		MOV E0,ELSD	
10352	030370	004737	021702			JSR PC,EFNDTZ	;GRAB DIGIT
10353	030374	105337	025200		1\$:	DECB EDCOPB	;END OF DEST. YET
10354	030400	100421				BMI EZPE	;YES
10355	030402	005237	026440			INC EVTSSV	;PASS COUNTER
10356	030406	005702				TST R2	;IS DIGIT ZERO
10357	030410	001403				BEQ 2\$	
10358	030412	013737	026440	026424		MOV EVTSSV,ENULL	;SAVE POSITION OF LAST NON ZERO DIGIT STORED.
10359	030420	013700	017456		2\$:	MOV E3,R0	;START ADDRESS OF DEST.
10360	030424	013701	025200			MOV EDCOPB,R1	;POSITION OF DIGIT
10361	030430	013737	017454	025236		MOV E2,ELSD	
10362	030436	004737	022562			JSR PC,EPUTD	;SAVE DIGIT
10363	030442	000732				BR EZP1	;LOOP TILL COMPLETE
10364	030444	013700	017452		EZPE:	MOV E1,R0	;START ADDRESS OF SOURCE
10365	030450	013701	017450			MOV E0,R1	;POSITION OF SIGN
10366	030454	013737	017450	025236		MOV E0,ELSD	
10367	030462	004737	021702			JSR PC,EFNDTZ	
10368	030466	005037	025160			CLR ESI	;RESET SIGN FLAG
10369	030472	005737	025170			TST ERSNEG	;IS SOURCE NEG?
10370	030476	001406				BEQ 2\$;NO
10371	030500	005737	030744			TST EMSDP	;IF SOURCE IS ZERO AND NEG TREAT IT AS POSITIVE
10372	030504	001403				BEQ 2\$	
10373	030506	012737	177777	025160		MOV #177777,ES1	;SET NEGATIVE FLAG
10374	030514	005737	026424		2\$:	TST ENULL	;WAS RESULT STORED ZERO
10375	030520	001004				BNE 3\$;NO
10376	030522	052777	000004	166716		BIS #4,@EOPSW	;SET Z BIT
10377	030530	000406				BR 4\$	
10378	030532	005737	025160		3\$:	TST ESI	;SET SIGN OF RESULT
10379	030536	001403				BEQ 4\$;POSITIVE
10380	030540	052777	000010	166700		BIS #10,@EOPSW	;SET N BIT
10381	030546	023737	030744	026424	4\$:	CMP EMSDP,ENULL	;CAN DEST. CONTAIN ALL DIGITS
10382	030554	101403				BLOS 5\$;YES
10383	030556	052777	000002	166662		BIS #2,@EOPSW	;SET V BIT
10384	030564	013701	017454		5\$:	MOV E2,R1	;POSITION OF SIGN
10385	030570	013700	017456			MOV E3,R0	;START ADDRESS OF NUMBER
10386	030574	013737	025160	025176		MOV ESI,ERSNEG	

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10387	030602	013737	017454	025236		MOV E2,ELSD	
10388	030610	004737	022562			JSR PC,EPUTDT	;SAVE SIGN
10389	030614	005737	025170			TST ERSNEG	;WAS SIGN STORED POSITIVE? (UNSIGNED)
10390	030620	001003				BNE 1\$;BRANCH IF NO
10391	030622	042777	000010	166616		BIC #10,@EOPSW	;CLEAR PSW N BIT
10392	030630	013702	017444		1\$:	MOV EORSTK,R2	;SAVE REGISTERS
10393	030634	005022				CLR (R2)+	;R0 = 0
10394	030636	005022				CLR (R2)+	;R1 = 0
10395	030640	013722	017454			MOV E2,(R2)+	;R2 = R2
10396	030644	013722	017456			MOV E3,(R2)+	;R3 = R3
10397	030650	013722	017460			MOV E4,(R2)+	;R4 = R4
10398	030654	013722	017462			MOV E5,(R2)+	;R5 = R5
10399	030660	000207				RTS PC	

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ZKEE.P11

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10401	030662	005037	030746		EMSD:	CLR ESDC	
10402	030666	005037	030744			CLR EMSDP	
10403	030672	013700	017452			MOV E1,RO	;SET R0=SRC.ADR
10404	030676	013701	01745C			MOV E0,R1	;SET R1=SRC.PTR
10405	030702	013737	017450	025236		MOV E0,ELSD	
10406	030710	005301			18:	DEC R1	
10407	030712	105701				*STB R1	;LOOKED AT ALL SRC DIGITS YET?
10408	030714	100412				BMI 28	;BRANCH IF YES
10409	030716	004737	021456			JSR PC,ESNK	;GET NEXT SRC DIGIT
10410	030722	005237	030746			INC ESDC	;INCREMENT DIGIT COUNTER
10411	030726	005702				TST R2	;IS DIGIT ZERO (NON-SIGNIFICANT)
10412	030730	001767				BEO 18	;BRANCH IF YES
10413	030732	013737	030746	030744		MOV ESDC,EMSDP	;SAVE POSITION OF DIGIT
10414	030740	000763			28:	BR 18	
10415	030742	000207				RTS PC	
10416							
10417	030744	000000			EMSLP:	.WORD 0	
10418	030746	000000			ESDC:	.WORD 0	

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ASHP,ASHN INSTRUCTIONS

Address	Op Code	Op Code	Op Code	Op Code	Label	Instruction	Comment
10420						.SBTTL	ASHP,ASHN INSTRUCTIONS
10421	030750	012737	177777	026430	EASHP:	MOV #177777,EPAK	:INDICATE PACKED MODE
10422	030756	005037	032244			CLR EODDS	
10423	030762	005037	032246			CLR EODDD	
10424	030766	032737	000001	017450		BIT #1,E0	:IS SRC ODD LENGTH?
10425	030774	001403				BEQ 1\$	
10426	030776	012737	177777	032244		MOV #177777,EODDS	:YES - SET ODD INDICATOR
10427	031004	032737	000001	017454	1\$:	BIT #1,E2	:IS DST ODD IN LENGTH?
10428	031012	001406				BEQ EASH	
10429	031014	012737	177777	032246		MOV #177777,EODDD	:YES-SET ODD INDICATOR
10430	031022	000402				BR EASH	
10431	031024	005037	026430		EASHN:	CLR EPAK	:INDICATE ZONE MODE
10432	031030	005037	032252		EASH:	CLR ENCC	:INIT. N CLEAR INDICATOR
10433	031034	005037	032254			CLR ENZI	:INIT. NON ZERO INDICATOR
10434	031040	005037	032256			CLR ETNZI	
10435	031044	005037	025174			CLR ECARRY	:INIT. CARRY INDICATOR
10436	031050	013703	017450			MOV EO,R3	:INIT. SCR.PTR TO SRC.LEN-1
10437	031054	105303				DECB R3	
10438	031056	005737	026430			TST EPAK	:ZONED STRING?
10439	031062	001003				BNE 2\$:BRANCH IF NO
10440	031064	012704	040237			MOV #40237,R4	:MAKE RESULT DATA TYPE - TRAILING SEPARATE
10441	031070	000406				BR 3\$	
10442	031072	013704	017454		2\$:	MOV E2,R4	:INITIALIZE RESULT PTR TO 127*31+1(MAX SHIFT CT+)
10443	031076	042704	000377			BIC #377,R4	
10444	031102	052704	000237			BIS #237,R4	
10445	031106	010437	033204		3\$:	MOV R4,ETLSD	
10446	031112	105304				DECB R4	
10447	031114	113705	017460			MOV E4,R5	:INITIALIZE SHIFT # TO SHIFT COUNT
10448	031120	100424				BMI EASHR	:SHIFT COUNT?
10449	031122	005705			1\$:	TST R5	:POSITIVE OR ZERO - SHIFT IN DIRECTION OF : LEAST TO MOST SIGNIFICANT DIGITS
10450							
10451	031124	003476				BLE ESISRC	:IS SHIFT # <=0?
10452	031126	122704	000377			CMPS #377,R4	:SHIFT #>0; IS RESULT.PTR=0?
10453	031132	001555				BEQ EDETSN	:IF RESULT.PTR<0 BRANCH TO COPY RESULT INTO DST.
10454	031134	012700	026164			MOV #EVRTAB,R0	:RESULT.PTR DOES NOT=0. PUSH A ZERO
10455	031140	010401				MOV R4,R1	: DIGIT INTO THE DESTINATION.
10456	031142	013737	033204	025236		MOV ETLSD,ELSD	
10457	031150	005002				CLR R2	:SET R0=RESULT.ADR, R1-RESULT.PTR, R2=0
10458	031152	012737	177777	025220		MOV #177777,EODD	
10459	031160	004737	022540			JSR PC,EPUSH	:CALL ROUTINE TO PUSH THE 0 DIGIT INTO RESULT.
10460	031164	105304				DECB R4	
10461	031166	005305				DEC R5	
10462	031170	000754				BR 1\$	
10463							
10464	031172				EASHR:		:SHIFT COUNT IS NEGATIVE
10465	031172	042703	177400			BIC #177400,R3	
10466	031176	113700	017460			MOV E4,R0	:GET SHIFT COUNT
10467	031202	060003				ADD R0,R3	:ADD SHIFT COUNT (NEGATIVE) TO SRC.PTR
10468	031204	042703	177400			BIC #177400,R3	
10469	031210	013700	017450			MOV EO,R0	
10470	031214	042700	000377			BIC #377,R0	
10471	031220	060003				ADD R0,R3	
10472	031222	122703	000177			CMPS #177,R3	:CHECK FOR SPECIAL CASE WHEN SRC.LEN=0 AND : SHIFT CNT=-128(200).
10473							

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ASHW,ASHW INSTRUCTIONS

10474	031226	001515				BEQ EFILZ	:BRANCH IF THIS IS THE SPECIAL CASE.
10475	031230	105703				TSTB R3	
10476	031232	100003				BPL 2\$:BRANCH IF SRC PTR IS POSITIVE
10477	031234	122703	177777			(MPB #-1,R3	
10478	031240	001110				BNE EFILZ	:IF SRC PTR IS <-1 FILL DST WITH ZERO
10479	031242	013700	017452		2\$:	MOV E1,R0	:FIND MOST SIGNIFICANT DIGIT TO BE
10480	031246	010301				MOV R3,R1	: SHIFTED OUT
10481	031250	013737	017450	025236		MOV E0,ELSD	
10482	031256	105201				INCB R1	:SET R0=SRC.ADR,R1=SRC.PTR+1
10483	031260	013737	032244	025220		MOV EODDS,EODD	
10484	031266	004737	021456			JSR PC,ESNK	:CALL ROUTINE TO FIND DIGIT
10485	031272	113700	017461			MOVB E4+1,R0	
10486	031276	060002				ADD R0,R2	:ADD RND.DGT TO DIGIT FOUND IN R2
10487	031300	022702	000012			CMP #12,R2	:IS RESULT LESS THAN 10
10488	031304	101004				BHI 1\$	
10489	031306	012737	000001	025174		MOV #1,ECARRY	:NO-SET CARRY
10490	031314	000402				BR ESISRC	
10491	031316	005037	025174		1\$:	CLR ECARRY	
10492							
10493	031322				ESISRC:		:SHIFT SRC DIGITS INTO DST.
10494	031322	122704	000377			CMPB #377,R4	:IS RESULT.PTR <0?
10495	031326	001457				BEQ EDETSN	:YES - BRANCH TO COPY RESULT INTO DEST
10496	031330	105703				TSTB R3	:NO - IS SRC.PTR <0?
10497	031332	100453				BMI EFILZ	
10498	031334	013700	017452			MOV E1,R0	:NO - FIND SRC DIGIT TO SHIFT INTO RESULT
10499	031340	010301				MOV R3,R1	:SET R0=SRC.ADR, R1=SRC.PTR
10500	031342	013737	017450	025236		MOV E0,ELSD	
10501	031350	013737	032244	025220		MOV EODDS,EODD	
10502	031356	004737	021456			JSR PC,ESNK	:CALL ROUTINE TO FIND SRC DIGIT
10503	031362	063702	025174			ADD ECARRY,R2	:ADD CARRY TO DIGIT FOUND
10504	031366	022702	000011			CMP #11,R2	:DIGIT OVERFLOW?
10505	031372	103005				BHIS 2\$:IF NO BRANCH
10506	031374	005002				CLR R2	:OVERFLOW - SET CARRY & SET DIGIT 0
10507	031376	012737	000001	025174		MOV #1,ECARRY	
10508	031404	000402				BR 3\$	
10509	031406	005037	025174		2\$:	CLR ECARRY	
10510	031412	012700	026164		3\$:	MOV #EVRTAB,R0	:PUSH DIGIT FOUND INTO RESULT.
10511	031416	010401				MOV R4,R1	:SET R0=RESULT.ADR, R1=RESULT.PTR, R2 CONTAINS D
10512	031420	013737	033204	025236		MOV ETLSD,ELSD	
10513	031426	012737	177777	025220		MOV #177777,EODD	
10514	031434	004737	022540			JSR PC,EPUSH	:CALL ROUTINE TO PUSH DIGIT INTO RESULT
10515	031440	042702	177760			BIC #177760,R2	:MASK OFF ALL BUT DIGIT PUSHED
10516	031444	001403				BEQ 1\$:IS DIGIT PUSHED=0?
10517	031446	012737	177777	032256		MOV #177777,ETNZI	:NO-SET NON ZERO INDICATOR
10518	031454	105303			1\$:	DECB R3	:DECREMENT SRC.PTR
10519	031456	105304				DECB R4	:DECREMENT RESULT.PTR
10520	031460	000720				BR ESISRC	
10521							
10522	031462	000137	032260		EFILZ:	JMP EFILLZ	
10523	031466				EDETSN:		:DETERMINE SIGN & STORE WITH RESULT
10524							:NOTE: THERE EXIST TWO CASES IN WHICH THE DST SIGN
10525							: WILL DIFFER FROM THE SRC SIGN. THESE CASES ARE
10526							: WHEN:
10527							: 1)SRC SIGN = -,SHIFT=RIGHT,AND RESULT(ETNZI) 0

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ASHP,ASHN INSTRUCTIONS

10582	031752	112737	000100	025237		MOV B #100,ELSD+1	
10583	031760	004737	021456		5\$:	JSR PC,ESNK	;CALL ROUTINE TO GET RESULT DIGIT
10584	031764	013700	017456			MOV E3,R0	;SETUP 'TO' ADDRESS (I.E. DST)
10585	031770	105037	025237			CLRB ELSD+1	
10586	031774	050337	025236			BIS R3,ELSD	
10587	032000	042701	177400			BIC #177400,R1	
10588	032004	050301				BIS R3,R1	
10589	032006	004737	022540			JSR PC,EPUSH	;CALL ROUTINE TO PUSH RESULT DIGIT INTO DST
10590	032012	005702				TS R2	;WAS DIGIT PUSHED NON ZERO?
10591	032014	001403				BEQ 3\$;BRANCH IF NO
10592	032016	012737	177777	032254		MOV #177777,ENZI	;SET NON ZERO INDICATOR
10593	032024	020137	017454		3\$:	CMP R1,E2	;COPY DONE?
10594	032030	001402				BEQ ESCC	;BRANCH IF YES
10595	032032	005201				INC R1	;UPDATE PTR AND RETURN TO COPY NXT DIGIT
10596	032034	000730				BR 2\$	
10597							
10598	032036				ESCC:		;SET CONDITION CODES
10599	032036	005077	165404			CLR @EOPSW	;RESET EMULATION PSW
10600	032042	005737	032254			TST ENZI	;SET Z BIT IF NON ZERO INDICATOR 0.
10601	032046	001004				BNE 1\$	
10602	032050	052777	000004	165370		BIS #4,@EOPSW	
10603	032056	000406				BR 2\$	
10604	032060	005737	025170		1\$:	TST ERSNEG	;IS SIGN NEGATIVE?
10605	032064	001403				BEQ 2\$;BRANCH IF NO
10606	032066	052777	000010	165352		BIS #10,@EOPSW	;SET N BIT
10607	032074				2\$:		;DETERMINE V BIT
10608	032074	113700	017454			MOV B E2,R0	;CALCULATE # OF DIGITS OF RESULT
10609	032100	012704	000237			MOV #237,R4	; THAT WOULD NOT FIT IN DEST.
10610	032104	160004				SUB R0,R4	
10611	032106	001437				BEQ 6\$	
10612	032110	005304				DEC R4	
10613	032112	012700	026164			MOV #EVRTAB,R0	;YES - WERE ANY SIGNIFICANT DIGITS
10614	032116	013701	017454			MOV E2,R1	; NOT STORED?
10615	032122	042701	000377			BIC #377,R1	
10616	032126	005737	026430			TST EPAK	;ZONED RESULT?
10617	032132	001004				BNE 3\$;BRANCH IF NO
10618	032134	042701	177400			BIC #177400,R1	;ZONED RESULT DATA TYPE -TRAILING SEPARATE
10619	032140	052701	040000			BIS #40000,R1	
10620	032144	012737	177777	025220		MOV #177777,EODD	
10621	032152	013737	033204	025236	3\$:	MOV ETLSD,ELSD	
10622	032160	004737	021456		5\$:	JSR PC,ESNK	; CALL ROUTINE TO FIND RESULT DIGIT
10623	032164	005702				TST R2	; NOT STORED.
10624	032166	001004				BNE 4\$;GO SET OVERFLOW - V BIT
10625	032170	120104				CMPB R1,R4	
10626	032172	001405				BEQ 6\$	
10627	032174	005201				INC R1	
10628	032176	000770				BR 5\$	
10629	032200	052777	000002	165240	4\$:	BIS #2,@EOPSW	;SET V BIT
10630	032206	013702	017444		6\$:	MOV EORSTK,R2	;REGISTER UNLOAD
10631	032212	005022				CLR (R2)+	;R0=0
10632	032214	005022				CLR (R2)+	;R1=0
10633	032216	013722	017454			MOV E2,(R2)+	;R2=R2
10634	032222	013722	017456			MOV E3,(R2)+	;R3=R3
10635	032226	005022				CLR (R2)+	;R4=0

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ASHP,ASHN*INSTRUCTIONS

10636	032230	013722	C17462		MOV E5,(R2)+		:R5=R5
10637	032234	000207			RIS PC		
10638							
10639	032236	000000		ETMPRO:	.WORD 0		
10640	032240	000000		ETMPR1:	.WORD 0		
10641	032242	000000		ETMPR2:	.WORD 0		
10642	032244	000000		EODDS:	.WORD 0		
10643	032246	000000		FODDD:	.WORD 0		
10644	032250	000000		ESGN:	.WORD 0		
10645	032252	000000		ENCC:	.WORD 0		
10646	032254	000000		ENZI:	.WORD 0		
10647	032256	000000		ETNZI:	.WORD 0		
10648							
10649	032260			EFILLZ:			:PAD REMAINING RESULT WITH ZERO DIGITS
10650	032260	122704	000377		CMPB #377,R4		:IS RESULT.PTR <0?
10651	032264	001426			BEG 1\$:IF YES BRANCH
10652	032266	012700	026164		MOV #EVRTAB,R0		:PUSH A ZERO DIGIT INTO RESULT.
10653	032272	010401			MOV R4,R1		:SET R0=RESULT.ADR, R1=RESULT.PTR, R2=0
10654	032274	013702	025174		MOV ECARRY,R2		
10655	032300	013737	033204	025236	MOV ETLSD,ELSD		
10656	032306	012737	177777	025220	MOV #177777,EODD		
10657	032314	004737	022540		JSR PC,EPUSH		:CALL ROUTINE TO PUSH ZERO + CARRY
10658							: DIGIT INTO RESULT.
10659	032320	005702			TST R2		:WAS DIGIT PUSHED = 0?
10660	032322	001403			BEQ 2\$:BRANCH IF YES
10661	032324	012737	177777	032256	MOV #177777,ETNZI		:DIGIT PUSHED NOT - 0;SET NONZERO INDICATOR
10662	032332	105304		2\$:	DECB R4		
10663	032334	005037	025174		CLR ECARRY		
10664	032340	000747			BR EFILLZ		
10665	032342	000137	031466		1\$:	JMP EDETSN	

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CMPP,CMPN INSTRUCTIONS

10667						.SBTTL	CMPP,CMPN INSTRUCTIONS
10668	032346	012737	177777	026430	ECMPP:	MOV #177777,EPAK	:INDICATE PACKED MODE
10669	032354	005037	033174			CLR EODDS1	
10670	032360	005037	033176			CLR EODDS2	
10671	032364	032737	000001	017450		BIT #1,E0	:IS SRC NUMBER ODD LENGTH?
10672	032372	001403				BEQ 1\$	
10673	032374	012737	177777	033174		MOV #177777,EODDS1	:YES - SET ODD INDICATOR
10674	032402	032737	000001	017454	1\$:	BIT #1,E2	:IS SRC2 ODD LENGTH?
10675	032410	001406				BEQ ECMP	
10676	032412	012737	177777	033176		MOV #177777,EODDS2	:YES SET ODD INDICATOR
10677	032420	000402				BR ECMP	
10678	032422	005037	026430		ECMPN:	CLR EPAK	:INDICATE ZONED MODE
10679							
10680	032426	013703	017450		ECMP:	MOV E0,R3	:INITIALIZE SRC.PTY TO 0
10681	032432	042703	000377			BIC #377,R3	
10682	032436	013704	017454			MOV E2,R4	:INITIALIZE DST.PTR TO 0
10683	032442	042704	000377			BIC #377,R4	
10684	032446	010337	033200			MOV R3,ELS1M	
10685	032452	010437	033202			MOV R4,ELS2M	
10686	032456	013700	017452		1\$:	MOV E1,R0	:FIND MOST SIGNIFICANT DIGIT IN SRC1
10687	032462	010301				MOV R3,R1	:SET R0=SRC1.ADR, R1=SRC1.PTR
10688	032464	120337	017450			CMPB R3,E0	:REACH END OF SRC1 STRING?
10689	032470	001416				BEQ 2\$:IF YES BRANCH
10690	032472	013737	017450	025236		MOV E0,ELSD	
10691	032500	013737	033174	025220		MOV EODDS1,EODD	
10692	032506	004737	021456			JSR PC,ESNK	:CALL ROUTINE TO FIND SRC DIGIT
10693	032512	005702				TST R2	:IS SRC1 DIGIT=0?
10694	032514	001004				BNE 2\$:IF NO BRANCH
10695	032516	005203				INC R3	:UPDATE SRC1.PTR TO NEXT DIGIT
10696	032520	010337	033200			MOV R3,ELS1M	:SAVE SRC1.PTR
10697	032524	000754				BR 1\$	
10698	032526	013705	017450		2\$:	MOV E0,R5	
10699	032532	160305				SUB R3,R5	:CALCULATE # OF SIGN DIGITS IN SRC1
10700	032534	010537	033170			MOV R5,ES1NSD	:SAVE # OF SIGN DIGITS IN ES1NSD
10701	032540	013700	017456		3\$:	MOV E3,R0	:FIND MOST SIGNIFICANT DIGIT IN SRC2
10702	032544	010401				MOV R4,R1	:SET R0=SRC2.ADR, R1=SRC2.PTR
10703	032546	120437	017454			CMPB R4,E2	:REACH END OF SRC2 STRING?
10704	032552	001416				BEQ 4\$:IF YES BRANCH
10705	032554	013737	017454	025236		MOV E2,ELSD	
10706	032562	013737	033176	025220		MOV EODDS2,EODD	
10707	032570	004737	021456			JSR PC,ESNK	:CALL ROUTINE TO FIND SRC DIGIT
10708	032574	005702				TST R2	:IS SRC2 DIGIT=0?
10709	032576	001004				BNE 4\$:IF NO BRANCH
10710	032600	005204				INC R4	:UPDATE SRC2.PTR TO NEXT DIGIT
10711	032602	010437	033202			MOV R4,ELS2M	:SAVE SRC2.PTR
10712	032606	000754				BR 3\$	
10713	032610	013705	017454		4\$:	MOV E2,R5	
10714	032614	160405				SUB R4,R5	:CALCULATE # OF SIGN DIGITS IN SRC2
10715	032616	010537	033172			MOV R5,ES2NSD	:SAVE # OF SIGN DIGITS IN ES2NSD
10716							
10717	032622				ECNSD:	CLR @EOPSW	:COMPARE # OF SIGN DIGITS IN SRC1
10718	032622	005077	164620			CMP ES1NSD,ES2NSD	:VERSUS SRC2
10719	032626	023737	033170	033172		BHI 5\$:BRANCH IF SRC1 HAS MORE SIGN DIGITS
10720	032634	101052					

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CMP,CMPI INSTRUCTIONS

10721	032636	103457			BLO 6\$;BRANCH IF SRC2 HAS MORE SIGN DIGITS
10722	032640	005737	033170		TST ES1NSD		;SRC1 & SRC2 CONTAIN THE SAME #
10723							; OF SIGNIFICANT DIGITS
10724	032644	001500			BEQ 3\$;BOTH SRC'S CONTAIN NO SIGNIFICANT DIGITS
10725	032646	013703	033200		MOV ELS1M,R3		;SETUP SRC1.PTR
10726	032652	013704	033202		MOV ELS2M,R4		;SETUP SRC2.PTR
10727	032656	013700	017452		MOV E1,R0	4\$:	;GET A SRC1 DIGIT
10728	032662	010301			MOV R3,R1		
10729	032664	013737	017450	025236	MOV E0,ELSD		
10730	032672	013737	033174	025220	MOV EODDS1,EODD		
10731	032700	004737	021456		JSR PC,ESNK		
10732	032704	010237	033166		MOV R2,ES1D		;SAVE SRC1 DIGIT
10733	032710	013700	017456		MOV E3,R0		;GET A SRC2 DIGIT
10734	032714	010401			MOV R4,R1		
10735	032716	013737	017454	025236	MOV E2,ELSD		
10736	032724	013737	033176	025220	MOV EODDS2,EODD		
10737	032732	004737	021456		JSR PC,ESNK		
10738	032736	023702	033166		CMP ES1D,R2		;COMPARE DIGITS
10739	032742	101007			BHI 5\$;BRANCH IF SRC1 DIGIT IS BIGGER
10740	032744	103414			BLO 6\$;BRANCH IF SRC2 DIGIT IS BIGGER
10741	032746	005203			INC R3		;DIGITS EQUAL - ALL DIGITS CHECKED?
10742	032750	120337	017450		CMPI R3,E0		;REV-C
10743	032754	001416			BEQ 7\$;BRANCH IF ALL CHECKED - I.E. ALL
10744							; DIGITS ARE EQUAL
10745	032756	005204			INC R4		
10746	032760	000736			BR 4\$		
10747	032762	004737	033102		JSR PC,EGS1S	5\$:	;CHECK SIGN OF SRC1
10748	032766	005737	025170		TST ERSNEG		;IS SRC1 NEG?
10749	032772	001021			BNE 2\$;BRANCH IF YES
10750	032774	000427			BR 1\$;SRC1 IS POSITIVE
10751							
10752	032776	004737	033134		JSR PC,EGS2S	6\$:	;CHECK SIGN OF SRC2
10753	033002	005737	025170		TST ERSNEG		;IS SRC2 NEGATIVE?
10754	033006	001022			BNE 1\$;BRANCH IF YES
10755	033010	000412			BR 2\$;SRC2 IS POSITIVE
10756							
10757	033012					7\$:	;COMPARE SIGNS
10758	033012	004737	033102		JSR PC,EGS1S		;GET SRC1 SIGN
10759	033016	013705	025170		MOV ERSNEG,R5		;SAVE IT IN R5
10760	033022	004737	033134		JSR PC,EGS2S		;GET SRC2 SIGN
10761	033026	023705	025170		CMP ERSNEG,R5		;SIGNS =?
10762	033032	001405			BEQ 3\$;BRANCH IF YES
10763	033034	000752			BR 5\$;SIGNS NOT EQUAL
10764							
10765	033036	052777	000010	164402	BIS #10,@EOPSW	2\$:	;SRC2>SRC1 SET N BIT.
10766	033044	000403			BR 1\$		
10767	033046	052777	000004	164372	BIS #4,@EOPSW	3\$:	;SRC2=SRC1 SET Z BIT
10768	033054	013702	017444		MOV EORSTK,R2	1\$:	;REGISTER JNLOAD
10769	033060	005022			CLR (R2)+		;R0=0
10770	033062	005022			CLR (R2)+		;R1=0
10771	033064	005022			CLR (R2)+		;R2=0
10772	033066	005022			CLR (R2)+		;R3=0
10773	033070	013722	017460		MOV E4,(R2)+		;R4=R4
10774	033074	013722	017462		MOV E5,(R2)+		;R5=R5

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(MPP,CMPN INSTRUCTIONS)

10775	033100	000207			RTS PC	
10776						
10777	033102	013700	017452		EG1S:	MOV E1,R0 ;ROUTINE TO GET SRC1 SIGN
10778	033106	013701	017450			MOV E0,R1 ;SET R0=SRC1.ADR,R1=SRC1.PTR
10779	033112	013737	017450	025236		MOV E0,ELSD
10780	033120	013737	033174	025220		MOV EODDS1,EODD
10781	033126	004737	021456			JSR PC,ESNK ;CALL ROUTINE TO FIND SRC1 SIGN
10782	033132	000207				RTS PC
10783						
10784	033134	013700	017456		EGS2S:	MOV E3,R0 ;ROUTINE TO GET SRC2 SIGN
10785	033140	013701	017454			MOV E2,R1 ;SET R0=SRC2.ADR,R1=SRC2.PTR
10786	033144	013737	017454	025236		MOV E2,ELSD
10787	033152	013737	033176	025220		MOV EODDS2,EODD
10788	033160	004737	021456			JSR PC,ESNK ;CALL ROUTINE TO FIND SRC2 SIGN
10789	033164	000207				RTS PC
10790						
10791	033166	000000			ES1D:	.WORD 0
10792	033170	000000			ES1NSD:	.WORD 0
10793	033172	000000			ES2NSD:	.WORD 0
10794	033174	000000			EODDS1:	.WORD 0
10795	033176	000000			EODDS2:	.WORD 0
10796	033200	000000			ELS1M:	.WORD 0
10797	033202	000000			ELS2M:	.WORD 0
10798	033204	000000			ETLSD:	.WORD 0

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MULP INSTRUCTION

10800					.SBTTL	MULP INSTRUCTION
10801						
10802	033206	004737	034250		EMULP:	JSR PC,ERSAV ;SAVE MULP CALL PARAMETERS
10803	033212	005037	035236			CLR EMVBR ;INITIALIZE MULP V-BIT RESULT
10804	033216	004737	034332			JSR PC,EIRT2 ;INITIALIZE TEMPORARY RESULT BUFFER (ERT2) TO 0*
10805	033222	004737	034406			JSR PC,ETSTS1 ;IS MULP SRC1=0?
10806	033226	032737	000004	034716		BIT #4,ETOPSW
10807	033234	001147				BNE EPMID
10808	033236	004737	034456			JSR PC,ETSTS2 ;IS MULP SRC2=0?
10809	033242	032737	000004	034716		BIT #4,ETOPSW
10810	033250	001141				BNE EPMID
10811						
10812	033252	005037	017454			CLR E2 ;FORM 1X,2X,3X, ETC TABLE
10813	033256	012737	034660	017456		MOV #EZDSC,E3 ; USE ADDP - SRC1=MULT.SRC1
10814	033264	012737	035166	035234		MOV #EXTBP,EVXTBP ; SRC2=PREVIOUS ADDP DST
10815	033272	012737	035210	035232		MOV #EXTVB,EVXTVB ; DST-E(N)XT TABLE
10816	033300	013737	034702	017450		MOV ESRO,E0
10817	033306	013737	034704	017452		MOV ESR1,E1
10818	033314	012737	000040	017460	1\$:	MOV #40,E4
10819	033322	017737	001706	017462		MOV @EVXTBP,E5
10820	033330	012737	034662	017444		MOV #ETRSTK,EORSTK
10821	033336	012737	034716	017444		MOV #ETOPSW,EOPSW
10822	033344	004737	023510			JSR PC,EADDP
10823	033350	042737	177775	034716		BIC #177775,ETOPSW ;CLEAR ALL BUT V BIT FROM ADDP
10824	033356	013777	034716	001644		MOV ETOPSW,@EVXTVB ; RESULT PSW; SAVE V BITS IN TABLE.
10825	033364	027727	001644	034720		CMP @EVXTBP,#E1XT ;FIRST TABLE ENTRY FORMATION?
10826	033372	001041				BNE 2\$;BRANCH IF NO
10827	033374	032737	000001	034706		BIT #1,ESR2 ;WORK ON TABLE ENTRY SIGNS
10828	033402	001404				BEQ 31\$
10829	033404	012737	177777	025220		MOV #177777,EODD
10830	033412	000402				BR 3\$
10831	033414	005037	025220		31\$:	CLR EODD
10832	033420	013700	034710		3\$:	MOV ESR3,R0
10833	033424	013701	034706			MOV ESR2,R1
10834	033430	013737	034706	025236		MOV ESR2,ELSD
10835	033436	004737	021456			JSR PC,ESNK
10836	033442	005737	025170			TST ERSNEG
10837	033446	001413				BEQ 2\$
10838	033450	132737	000001	034740		BITB #1,E1XT+20
10839	033456	001404				BEQ 4\$
10840	033460	142737	000001	034740		BICB #1,E1XT+20
10841	033466	000403				BR 2\$
10842	033470	152737	000001	034740	4\$:	BISB #1,E1XT+20
10843	033476	027727	001532	035140	2\$:	CMP @EVXTBP,#E9XT
10844	033504	001424				BEQ EISP ;ALL TABLE ENTRIES FORMED?
10845	033506	012737	000040	017450		MOV #40,E0 ;BRANCH IF YES
10846	033514	012737	034720	017452		MOV #E1XT,E1
10847	033522	012737	000040	017454		MOV #40,E2
10848	033530	017737	001500	017456		MOV @EVXTBP,E3 ;UPDATE ADDP SRC2 TO CURRENT
10849	033536	062737	000002	035234		ADD #2,EVXTBP ; DST POINTER
10850	033544	062737	000002	035232		ADD #2,EVXTVB ;UPDATE TABLE POINTERS
10851	033552	000660				BR 1\$;RETURN TO FORM NEXT ENTRY.
10852						
10853	033554	000565			EPMID:	BR EMID

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MULP INSTRUCTION

10854									
10855	033556	005037	035162		EISP:	CLR ESPOS		; INITIALIZE SHIFT POSITION TO ZERO	
10856	033562	032737	000001	034706		BIT #1,ESR2			
10857	033570	001404				BEQ 10\$			
10858	033572	012737	177777	025220		MOV #177777,EODD			
10859	033600	000402				BR 11\$			
10860	033602	005037	025220		10\$:	CLR EODD			
10861	033606	013737	025220	035240	11\$:	MOV EODD,SEODD		; SAVE EODD	
10862	033614	013737	034706	035164		MOV ESR2,EMS2D		; INITIALIZE MULP.SRC2 POINTER	
10863	033622	013737	035240	025220	1\$:	MOV SEODD,EODD		; RESTORE EODD	
10864	033630	105337	035164			DECB EMS2D			
10865	033634	100535				BMI EMID		; BRANCH IF NO MORE MULP.SRC2 DIGITS TO WORK ON	
10866	033636	013700	034710			MOV ESR3,R0			
10867	033642	013737	034706	025236		MOV ESR2,ELSD			
10868	033650	013701	035164			MOV EMS2D,R1			
10869	033654	004737	021456			JSR PC,ESNK		; CALL ROUTINE TO GET NEXT SRC2 DIGIT	
10870	033660	005702				TST R2			
10871	033662	001517				BEQ 2\$; BRANCH IF DIGIT = 0	
10872	033664	005302				DEC R2			
10873	033666	010237	035232			MOV R2,EVXTVB			
10874	033672	006337	035232			ASL EVXTVB			
10875	033676	062737	035210	035232		ADD #EXTVB,EVXTVB		; SETUP POINTER INTO V-BIT TABLE	
10876	033704	010237	035234			MOV R2,EVXTBP		; INDEX INTO 1X,2X,ETC TABLE USING	
10877	033710	006337	035234			ASL EVXTBP		; NEXT SRC2 DIGIT	
10878	033714	062737	035166	035234		ADD #EXTBP,EVXTBP			
10879	033722	012737	000040	017450		MOV #40,E0		; MULTIPLY TABLE VALUE BY PROPER	
10880	033730	017737	001300	017452		MOV @EVXTBP,E1		; POWER OF TEN INDICATOR BY SHIFT	
10881	033736	013737	035162	017460		MOV ESPOS,E4		; POSITION	
10882	033744	012737	000037	017454		MOV #37,E2		; USE ASHP - SRC=TABLE VALUE	
10883	033752	012737	034526	017456		MOV #ERT1,E3		; SHFT,CT-SHFT.POSITION	
10884	033760	012737	034662	017444		MOV #ETRSTK,EORSTK		; DST=ERT1	
10885	033766	012737	034716	017446		MOV #ETOPSW,EOPSW			
10886	033774	004737	030750			JSR PC,EASHP			
10887	034000	042737	177775	034716		BIC #177775,ETOPSW		; WORK ON V BIT	
10888	034006	053737	034716	035236		BIS ETOPSW,EMVBR		; 'OR' ASHP V BIT WITH RESULT V BIT.	
10889	034014	057737	001212	035236		BIS @EVXTVB,EMVBR		; 'OR' TABLE V BIT WITH RESULT V BIT	
10890	034022	012737	000037	017450		MOV #37,E0		; ADD SHIFTED VALUE TO RESULT	
10891	034030	012737	034550	017452		MOV #ERT2,E1		; USE ADDP - SRC1=ERT2	
10892	034036	012737	000037	017454		MOV #37,E2		; SRC2=ERT1	
10893	034044	012737	034526	017456		MOV #ERT1,E3		; DST=ERT2	
10894	034052	012737	000037	017460		MOV #37,E4			
10895	034060	012737	034550	017462		MOV #ERT2,E5			
10896	034066	012737	034662	017444		MOV #ETRSTK,EORSTK			
10897	034074	012737	034716	017446		MOV #ETOPSW,EOPSW			
10898	034102	004737	023510			JSR PC,EADDP			
10899	034106	042737	177775	034716		BIC #177775,ETOPSW		; WORK ON V BIT	
10900	034114	053737	034716	035236		BIS ETOPSW,EMVBR		; 'OR' ADDP V BIT WITH RESULT	
10901									
10902	034122	005237	035162		2\$:	INC ESPOS		; INCREMENT SHIFT POSITION FOR NEXT	
10903	034126	000635				BR 1\$; MULP SRC2 DIGIT.	
10904									
10905	034130	012737	000037	017450	EMID:	MOV #37,E0		; MOVE RESULT INTO MULP DST	
10906	034136	012737	034550	017452		MOV #ERT2,E1		; USE ASHP - SRC=ERT2	
10907	034144	005037	017460			CLR E4		; DST=MULP.DST	

PERFORM CIS INST EXERCISER
 ZKFEED.P11

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 MULP INSTRUCTION

10908	034150	005037	017462		CLR E5	
10909	034154	013737	034712	017454	MOV ESR4,E2	: SHFT.CT=0
10910	034162	013737	034714	017456	MOV ESR5,E3	
10911	034170	013737	034676	017444	MOV ESOSTK,EORSTK	
10912	034176	013737	034700	017446	MOV ESOPSW,EOPSW	
10913	034204	004737	030750		JSR PC,EASHP	
10914	034210	053777	035236	163230	BIS EMVBR,@EOPSW	:MULP CONDITION CODE RESULTS:
10915						: N,Z, AND C FROM LAST ASHP
10916						: V = 'OR' OF ALL PREVIOUS V'S
10917	034216	013702	017444	EXMD:	MOV EORSTK,R2	:REGISTER UNLOAD - NEEDED BECAUSE REGISTER
10918						:OUTPUTS FOR ASHP ARE R2 AND R3
10919						:WHEREAS THOSE FOR MULP AND DIVP ARE R4 AND R5.
10920	034222	016262	000004	000010	MOV 4(R2),10(R2)	:R4=R2
10921	034230	016262	000006	000012	MOV 6(R2),12(R2)	:R5=R3
10922	034236	005062	000004		CLR 4(R2)	:R2=0
10923	034242	005062	000006		CLR 6(R2)	:R3=0
10924	034246	000207			RTS PC	:EXIT MULP EMULATION ROUTINE

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2*FEEL.P11

MACY11 27(655) 25-MAR-87 12:25 PAGE 90-3
MULP/DIVP SUBROUTINES

10926						.SBTTL	MULP/DIVP SUBROUTINES
10927	034250	013737	017444	034676	ERSAV:	MOV EORSTK,ESOSTK	;SAVE MULP/DIVP CALL PARAMETERS
10928	034256	013737	017446	034700		MOV EOPSW,ESOPSW	;THIS PERMITS CALLING OTHER
10929	034264	013737	017450	034702		MOV E0,ESR0	; EMULATION ROUTINES WHILE
10930	034272	013737	017452	034704		MOV E1,ESR1	; IN THE MULP/DIVP EMULATION.
10931	034300	013737	017454	034706		MOV E2,ESR2	
10932	034306	013737	017456	034710		MOV E3,ESR3	
10933	034314	013737	017460	034712		MOV E4,ESR4	
10934	034322	013737	017462	034714		MOV E5,ESR5	
10935	034330	000207				RTS PC	
10936							
10937	034332	005037	017450		EIRT2:	CLR E0	;INITIALIZE ERT2 BUFFER TO 0.
10938	034336	012737	034660	017452		MOV #EZDSC,E1	; USE ASHP - SRC.LEN=0
10939	034344	005037	017460			CLR E4	; SHFT.CT=0
10940	034350	012737	000037	017454		MOV #37,E2	; DST.LEN=31
10941	034356	012737	034550	017456		MOV #ERT2,E3	; DST.ADR=ERT2
10942	034364	012737	034662	017444		MOV #ETRSTK,EORSTK	
10943	034372	012737	034716	017446		MOV #ETOPSW,EOPSW	
10944	034400	004737	030750			JSR PC,EASHP	
10945	034404	000207				RTS PC	
10946							
10947	034406	005037	017454		ETSTS1:	CLR E2	;COMPARE MULP/DIVP SRC1 WITH 0.
10948	034412	012737	034660	017456		MOV #EZDSC,E3	; USE CMPP - SRC2.LEN=0
10949	034420	013737	034702	017450		MOV ESRO,E0	; SRC1.LEN-MULT.SRC1.LEN
10950	034426	013737	034704	017452		MOV ESR1,E1	; SRC1.ADR-MULP.SRC1.ADR
10951	034434	012737	034662	017444		MOV #ETRSTK,EORSTK	
10952	034442	012737	034716	017446		MOV #ETOPSW,EOPSW	
10953	034450	004737	032346			JSR PC,ECMPP	
10954	034454	000207				RTS PC	
10955							
10956	034456	005037	017454		ETSTS2:	CLR E2	;COMPARE MULP/DIVP SRC2 WITH 0.
10957	034462	012737	034660	017456		MOV #EZDSC,E3	; USE CMPP - SRC2.LEN 0
10958	034470	013737	034706	017450		MOV ESR2,E0	; SRC1.LEN-MULP.SRC2.LEN
10959	034476	013737	034710	017452		MOV ESR3,E1	; SRC1.ADR-MULP.SRC2.ADR
10960	034504	012737	034662	017444		MOV #ETRSTK,EORSTK	
10961	034512	012737	034716	017446		MOV #ETOPSW,EOPSW	
10962	034520	004737	032346			JSR PC,ECMPP	
10963	034524	000207				RTS PC	
10964							

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REFC.P.1

MACY11 27(655) 25-MAR-81 12:25 PAGE 90-4
MULP/DIVP VARIABLES AND BUFFERS

			.SBTTL	MULP/DIVP VARIABLES AND BUFFERS
10966				
10967				
10968	034526	000011	ERT1:	.BLKW 11
10969	034550	000011	ERT2:	.BLKW 11
10970	034572	000011	ERT3:	.BLKW 11
10971	034614	000011	ERT4:	.BLKW 11
10972	034636	000011	ERT5:	.BLKW 11
10973	034660	000000	EZDSC:	.WORD 0
10974	034662	000006	FTSTK:	.BLKW 6
10975	034676	000000	ESOSTK:	.WORD 0
10976	034700	000000	ESOPSW:	.WORD 0
10977	034702	000000	ESR0:	.WORD 0
10978	034704	000000	ESR1:	.WORD 0
10979	034706	000000	ESR2:	.WORD 0
10980	034710	000000	ESR3:	.WORD 0
10981	034712	000000	ESR4:	.WORD 0
10982	034714	000000	ESR5:	.WORD 0
10983	034716	000000	ETOPSW:	.WORD 0
10984	034720	000011	E1XT:	.BLKW 11
10985	034742	000011	E2XT:	.BLKW 11
10986	034764	000011	E3XT:	.BLKW 11
10987	035006	000011	E4XT:	.BLKW 11
10988	035030	000011	E5XT:	.BLKW 11
10989	035052	000011	E6XT:	.BLKW 11
10990	035074	000011	E7XT:	.BLKW 11
10991	035116	000011	E8XT:	.BLKW 11
10992	035140	000011	E9XT:	.BLKW 11
10993	035162	000000	ESPOS:	.WORD 0
10994	035164	000000	EMS2D:	.WORD 0
10995	035166	034720	EXTBP:	.WORD E1XT
10996	035170	034742		.WORD E2XT
10997	035172	034764		.WORD E3XT
10998	035174	035006		.WORD E4XT
10999	035176	035030		.WORD E5XT
11000	035200	035052		.WORD E6XT
11001	035202	035074		.WORD E7XT
11002	035204	035116		.WORD E8XT
11003	035206	035140		.WORD E9XT
11004	035210	000011	EXTVB:	.BLKW 11
11005	035232	000000	EVXTVB:	.WORD 0
11006	035234	000000	EVXTBP:	.WORD 0
11007	035236	000000	EMVBR:	.WORD 0
11008	035240	000000	SEODD:	.WORD 0
11009	035242	000000	ESS2SN:	.WORD 0
11010	035244	000000	ESS1SN:	.WORD 0
11011	035246	000000	ESUBCT:	.WORD 0

:MULP/DIVP SRC1.LEN
:MULP/DIVP SRC1.ADR
:MULP/DIVP SRC2.LEN
:MULP/DIVP SRC2.ADR
:MULP/DIVP DST.LEN
:MULP/DIVP DST.ADR

: 1 X SRC1
: 2 X SRC1
: 3 X SRC1
: 4 X SRC1
: 5 X SRC1
: 6 X SRC1
: 7 X SRC1
: 8 X SRC1
: 9 X SRC1

:V-BIT TABLE

PDP-11 CIS INST EXERCISER
 (ZKFECP.11

MACY11 27(655) 25-MAR-81 12:25 PAGE 90-5
 DIVP INSTRUCTION

11013					.SBTTL	DIVP INSTRUCTION
11014						
11015	035250	004737	034250		EDIVP: JSR PC,ERSAV	;SAVE DIVP CALL PARAMETERS
11016	035254	005037	036316		CLR EZDF	;CLEAR ZERO DIVIDE FLAG
11017	035260	005037	035162		CLR ESPOS	;CLEAR SHIFT POSITION
11018	035264	004737	034332		JSR PC,EIRT2	;INITIALIZE TEMPORARY RESULT BUFFER (ERT2) TO 0+
11019	035270	004737	034406		JSR PC,ETSTS1	;IS DIVP SRC1 = 0?
11020	035274	032737	000004	034716	BIT #4,ETOPSW	;
11021	035302	001152			BNC E1XZD	;BRANCH IF YES
11022	035304	042737	177767	034716	BIC #177767,ETOPSW	
11023	035312	013737	034716	035244	MOV ETOPSW,ESS1SN	;SAVE SRC1 SIGN
11024	035320	004737	034456		JSR PC,ETSTS2	;IS DIVP SRC2=0?
11025	035324	032737	000004	034716	BIT #4,ETOPSW	
11026	035332	001134			BNE E1DID	;BRANCH IF YES
11027	035334	042737	177767	034716	BIC #177767,ETOPSW	
11028	035342	013737	034716	035242	MOV ETOPSW,ESS2SN	;SAVE SRC2 SIGN
11029						
11030	035350	013737	034702	017450	MOV ESR0,E0	;MOVE DIVP SRC1 INTO ERT3
11031	035356	013737	034704	017452	MOV ESR1,E1	; USE ASHP - SRC = DIVP.SRC1
11032	035364	005037	017460		CLR E4	; DST = ERT3
11033	035370	005037	017462		CLR E5	; SHFT.CT=0
11034	035374	012737	000040	017454	MOV #40,E2	
11035	035402	012737	034572	017456	MOV #ERT3,E3	
11036	035410	004737	030750		JSR PC,EASHP	
11037	035414	142737	000001	034612	BICB #1,@#ERT3+20	;MAKE ERT3 SIGN - +
11038						
11039	035422	013737	034706	017450	MOV ESR2,E0	;MOVE DIVP SRC2 INTO ERT4
11040	035430	013737	034710	017452	MOV ESR3,E1	; USE ASHP - SRC - DIVP SRC2
11041	035436	005037	017460		CLR E4	; DST = ERT4
11042	035442	005037	017462		CLR E5	; SHFT.CT = 0
11043	035446	012737	000037	017454	MOV #37,E2	
11044	035454	012737	034614	017456	MOV #ERT4,E3	
11045	035462	004737	030750		JSR PC,EASHP	
11046	035466	142737	000001	034633	BICB #1,@#ERT4+17	;MAKE ERT4 SIGN +
11047						
11048	035474	012737	000040	017450	MOV #40,E0	;SHIFT DIVP SRC1 LEFT UNTIL SRC2 - SRC1(SHIFTED)
11049	035502	012737	034572	017452	MOV #ERT3,E1	; IS NEGATIVE. NOTE: LEN 40 IS LEGAL FOR EMUL.
11050	035510	012737	000037	017454	MOV #37,E2	;SUBTRACT ERT3 FROM ERT4
11051	035516	012737	034614	017456	MOV #ERT4,E3	; USE SUBP - SRC1 = ERT3
11052	035524	012737	000037	017460	MOV #37,E4	; SRC2 = ERT4
11053	035532	012737	034526	017462	MOV #ERT1,E5	; DST = ERT1
11054	035540	004737	023526		JSR PC,ESUBP	
11055	035544	032777	000010	161674	BIT #10,@EOPSW	;IS RESULT NEGATIVE?
11056	035552	001030			BNE EPOSD	;BRANCH IF YES
11057	035554	012737	000040	017450	MOV #40,E0	;SHIFT DIVP SRC1 LEFT 1 PLACE
11058	035562	012737	034572	017452	MOV #ERT3,E1	; USE ASHP - SRC = ERT3
11059	035570	012737	000001	017460	MOV #1,E4	; DST = ERT3
11060	035576	012737	000040	017454	MOV #40,E2	; SHFT.CT = 1
11061	035604	012737	034572	017456	MOV #ERT3,E3	;NOTE - LEGAL FOR EMULATOR.
11062	035612	004737	030750		JSR PC,EASHP	
11063	035616	005237	035162		INC ESPOS	;INCREMENT SHIFT POSITION
11064	035622	000724			BR EPOSS1	
11065	035624	000137	036162		E1DID: JMP EDID	
11066	035630	000137	036246		E1XZD: JMP EXZD	

PDP-11 CIS INST EXERCISER
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DIVP INSTRUCTION

11067									
11068	035634	005737	035162		EPOSD:	TST ESPOS		;SHIFT POSITION = 0?	
11069	035640	001550				BEQ EDID		;BRANCH IF YES	
11070									
11071	035642	012737	000040	017450	EDIVL:	MOV #40,E0		;REPOSITION ERT3 BACK 1 PLACE(RIGHT)	
11072	035650	012737	034572	017452		MOV #ERT3,E1		; USE ASHP - SRC = ERT3	
11073	035656	012737	000377	017460		MOV #377,E4		; DST = ERT3	
11074	035664	012737	000040	017454		MOV #40,E2		; SHFT.CT=-1	
11075	035672	012737	034572	017456		MOV #ERT3,E3		;NOTE - THIS IS LEGAL FOR EMULATOR	
11076	035700	004737	030750			JSR PC,EASHP			
11077									
11078	035704	005037	035246			CLR ESUBCT		;CLEAR SUBTRACT COUNTER	
11079									
11080	035710	012737	000040	017450	1\$:	MOV #40,E0		;SUBTRACT DIVP SRC1(SHIFTED) FROM DIVP SRC2	
11081	035716	012737	034572	017452		MOV #ERT3,E1		; USE SUBP - SRC1 = ERT3	
11082	035724	012737	000037	017454		MOV #37,E2		; SRC2 = ERT4	
11083	035732	012737	034614	017456		MOV #ERT4,E3		; DST = ERT4	
11084	035740	012737	000037	017460		MOV #37,E4			
11085	035746	012737	034614	017462		MOV #ERT4,E5			
11086	035754	004737	023526			JSR PC,ESUBP			
11087	035760	032777	000010	161460		BIT #10,@EOPSW		;IS RESULT OF SUBP POSITIVE?	
11088	035766	001003				BNE ESBTD		;BRANCH IF NO	
11089	035770	005237	035246			INC ESUBCT		;INCREMENT SUBTRACT COUNTER	
11090	035774	000745				BR 1\$			
11091									
11092	035776	012737	000040	017450	ESBTD:	MOV #40,E0		;BACKUP TO LAST POSITIVE RESULT FROM SUBP	
11093	036004	012737	034572	017452		MOV #ERT3,E1		; USE ADDP - SRC1 = ERT3	
11094	036012	012737	000037	017454		MOV #37,E2		; SRC2 = ERT4	
11095	036020	012737	034614	017456		MOV #ERT4,E3		; DST = ERT4	
11096	036026	012737	000037	017460		MOV #37,E4			
11097	036034	012737	034614	017462		MOV #ERT4,E5			
11098	036042	004737	023510			JSR PC,EADDP			
11099									
11100	036046	012737	000037	017450		MOV #37,E0		;STORE SUBTRACT COUNTER IN RESULT(ERT2)	
11101	036054	012737	034550	017452		MOV #ERT2,E1		;SHIFT RESULT, THEN ENTER DIGIT	
11102	036062	012737	000001	017460		MOV #1,E4		; USE ASHP - SRC = ERT2	
11103	036070	012737	000037	017454		MOV #37,E2		; DST ERT2	
11104	036076	012737	034550	017456		MOV #ERT2,E3		; SHFT.CT 1	
11105	036104	004737	030750			JSR PC,EASHP			
11106	036110	006337	035246			ASL ESUBCT		;INSERT SUBTRACT COUNTER IN RESULT	
11107	036114	006337	035246			ASL ESUBCT			
11108	036120	006337	035246			ASL ESUBCT			
11109	036124	006337	035246			ASL ESUBCT			
11110	036130	153737	035246	034567		BISB ESUBCT,@#ERT2+17			
11111	036136	005337	035162			DEC ESPOS		;DECREMENT SHIFT POSITION	
11112	036142	001237				BNE EDIVL		;IS SHIFT POSITION=0? BRANCH IF NO	
11113	036144	023737	035242	035244		CMP ESS2SN,ESS1SN		;DIVP SRC1 SIGN = DIVP SRC2 SIGN?	
11114	036152	001403				BEQ EDID		;BRANCH IF YES	
11115	036154	152737	000001	034567		BISB #1,@#ERT2+17		;NO - MAKE SIGN IN ERT2 NEGATIVE	
11116									
11117	036162	012737	000037	017450	EDID:	MOV #37,E0		;MOVE RESULT INTO DST	
11118	036170	012737	034550	017452		MOV #ERT2,E1		; USE ASHP - SRC = ERT2	
11119	036176	005037	017460			CLR E4		; DST = DIVP.DST	
11120	036202	005037	017462			CLR E5		; SHFT.CT = 0	

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DIVP INSTRUCTION

11121	036206	013737	034712	017454		MOV ESR4,E2	
11122	036214	013737	034714	017456		MOV ESR5,E3	
11123	036222	013737	034676	017444		MOV ESOSTK,EORSTK	
11124	036230	013737	034700	017446		MOV ESOPSW,EOPSW	
11125	036236	004737	030750			JSR PC,EASHP	
11126	036242	000137	034216			JMP EXMD	;EXIT DIVP
11127							
11128	036246	013737	034700	017446	EXZD:	MOV ESOPSW,EOPSW	;EXIT FROM DIVIDE BY ZERO
11129	036254	052777	000003	161164		BIS #3,@EOPSW	;SET V & C COND. CODES
11130							;SET ZERO DIVIDE FLAG TO SIGNAL
11131	036262	012737	177777	036316		MOV #177777,EZDF	;TABLE DRIVER NOT TO COMPARE
11132							; ANYTHING EXCEPT V & C COND. CODE
11133							;SAVE POINTER TO START & # OF BYTES
11134	036270	013737	034704	036320		MOV ESR1,EZDBEG	; OF DST STRING
11135							;CONTENTS OF DST STRING UNPREDICTABLE
11136	036276	013737	034702	036322		MOV ESRO,EZDEND	; AFTER ZERO DIVP
11137	036304	006237	036322			ASR EZDEND	
11138	036310	005237	036322			INC EZDEND	
11139	036314	000207				RTS PC	;RESULTS
11140							
11141	036316	000000			EZDF:	.WORD 0	
11142	036320	000000			EZDBEG:	.WORD 0	
11143	036322	000000			EZDEND:	.WORD 0	
11144							

PDP-11 CIS INST EXERCISER
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LOAD DESCRIPTORS

11146					.SBTTL	LOAD DESCRIPTORS
11147	036324	013701	017450		MOV E0,R1	;GET REGISTER POINTER
11148	036330	012102		EL2D0:	MOV (R1)+,R2	;GET ADDRESS OF DESCRIPTOR
11149	036332	011237	017450	EL2:	MOV (R2),E0	;LOAD 1ST WORD OF DESC INTO E0
11150	036336	016237	000002	017452	MOV 2(R2),E1	;LOAD 2ND WORD OF DESC INTO E1
11151	036344	011102			MOV (R1),R2	;GET ADDRESS OF NEXT DESC
11152	036346	011237	017454		MOV (R2),E2	;LOAD 1ST WORD OF DESC INTO E2
11153	036352	016237	000002	017456	MOV 2(R2),E3	;LOAD 2ND WORD OF DESC INTO E3
11154	036360	013700	017444	EXL2:	MOV EORSTK,R0	;RETURN CLEAN UP
11155	036364	013720	017450		MOV E0,(R0)+	;R0=R0
11156	036370	013720	017452		MOV E1,(R0)+	;R1=R1
11157	036374	013720	017454		MOV E2,(R0)+	;R2=R2
11158	036400	013720	017456		MOV E3,(R0)+	;R3=R3
11159	036404	013720	017460		MOV E4,(R0)+	;R4=R4
11160	036410	013720	017462		MOV E5,(R0)+	;R5=R5
11161	036414	013720	017464		MOV E6,(R0)+	;R6=R6
11162	036420	012777	000017	161020	MOV #17,@EOPSW	;SET ALL COND. CODE BITS.
11163	036426	000207			RTS PC	
11164						
11165	036430			EL2D1:	MOV E1,R1	
11166	036430	013701	017452		BR EL2	
11167	036434	000735				
11168						
11169	036436			EL2D2:		
11170	036436	013701	017454		MOV E2,R1	
11171	036442	000732			BR EL2	
11172						
11173	036444			EL2D3:		
11174	036444	013701	017456		MOV E3,R1	
11175	036450	000727			BR EL2	
11176						
11177	036452			EL2D4:		
11178	036452	013701	017460		MOV E4,R1	
11179	036456	062737	000004	017460	ADD #4,E4	
11180	036464	000721			BR EL2	
11181						
11182	036466			EL2D5:		
11183	036466	013701	017462		MOV E5,R1	
11184	036472	062737	000004	017462	ADD #4,E5	
11185	036500	000713			BR EL2	
11186						
11187	036502			EL2D6:		
11188	036502	013701	017464		MOV E6,R1	
11189	036506	012102			MOV (R1)+,R2	
11190	036510	011237	017450		MOV (R2),E0	
11191	036514	016237	000002	017452	MOV 2(R2),E1	
11192	036522	012102			MOV (R1)+,R2	
11193	036524	011237	017454		MOV (R2),E2	
11194	036530	016237	000002	017456	MOV 2(R2),E3	
11195	036536	010137	017464		MOV R1,E6	;NOTE:L2D6 UPDATES R6 (POPS STACK)
11196	036542	000137	036360		JMP EXL2	
11197						
11198	036546			EL2D7:		
11199	036546	013701	050166		MOV TINST+2,R1	

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 91-1
LOAD DESCRIPTORS

11200	036552	011137	017450	
11201	036556	016137	000002	017452
11202	036564	013701	050170	
11203	036570	011137	017454	
11204	036574	016137	000002	017456
11205	036602	000137	036360	
11206				
11207				

MOV (R1),E0
MOV 2(R1),E1
MOV TINST+4,R1
MOV (R1),E2
MOV 2(R1),E3
JMP EXL2

PDP-11 CIS INST EXERCISER
CZKEEC.P11MACY11 27(655) 25-MAR-81 12:25 PAGE 92
LOAD DESCRIPTORS

11209	036606	013701	C17450		EL3D0:	MOV E0,R1	:GET REGISTER POINTER
11210	036612	012102			EL3:	MOV (R1)+,R2	:GET ADDRESS OF DESCRIPTOR
11211	036614	011237	017450			MOV (R2),E0	:LOAD 1ST WORD OF DESC INTO E0
11212	036620	016237	000002	017452		MOV 2(R2),E1	:LOAD 2ND WORD OF DESC INTO E1
11213	036626	012102				MOV (R1)+,R2	:GET ADDRESS OF NEXT DESC
11214	036630	011237	017454			MOV (R2),E2	:LOAD 1ST WORD OF DESC INTO E2
11215	036634	016237	000002	017456		MOV 2(R2),E3	:LOAD 2ND WORD OF DESC INTO E3
11216	036642	011102				MOV (R1),R2	:GET ADDRESS OF NEXT DESC
11217	036644	011237	017460			MOV (R2),E4	:LOAD 1ST WORD OF DESC INTO E4
11218	036650	016237	000002	017462		MOV 2(R2),E5	:LOAD 2ND WORD OF DESC INTO E5
11219	036656	000137	036360			JMP EXL2	
11220							
11221	036662				EL3D1:		
11222	036662	013701	017452			MOV E1,R1	
11223	036666	000751				BR EL3	
11224							
11225	036670				EL3D2:		
11226	036670	013701	017454			MOV E2,R1	
11227	036674	000746				BR EL3	
11228							
11229	036676				EL3D3:		
11230	036676	013701	017456			MOV E3,R1	
11231	036702	000743				BR EL3	
11232							
11233	036704				EL3D4:		
11234	036704	013701	017460			MOV E4,R1	
11235	036710	000740				BR EL3	
11236							
11237	036712				EL3D5:		
11238	036712	013701	017462			MOV E5,R1	
11239	036716	000735				BR EL3	
11240							
11241	036720				EL3D6:		
11242	036720	013701	017464			MOV E6,R1	
11243	036724	012102				MOV (R1)+,R2	
11244	036726	011237	017450			MOV (R2),E0	
11245	036732	016237	000002	017452		MOV 2(R2),E1	
11246	036740	012102				MOV (R1)+,R2	
11247	036742	011237	017454			MOV (R2),E2	
11248	036746	016237	000002	017456		MOV 2(R2),E3	
11249	036754	012102				MOV (R1)+,R2	
11250	036756	011237	017460			MOV (R2),E4	
11251	036762	016237	000002	017462		MOV 2(R2),E5	
11252	036770	010137	017464			MOV R1,E6	
11253	036774	000137	036360			JMP EXL2	:NOTE:L2D6 UPDATES R6 (POPS STACK)
11254							
11255	037000				EL3D7:		
11256	037000	013701	050166			MOV TINST+2,R1	
11257	037004	011137	017450			MOV (R1),E0	
11258	037010	016137	000002	017452		MOV 2(R1),E1	
11259	037016	013701	050170			MOV TINST+4,R1	
11260	037022	011137	017454			MOV (R1),E2	
11261	037026	016137	000002	017456		MOV 2(R1),E3	
11262	037034	013701	050172			MOV TINST+6,R1	

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 92-1
LOAD DESCRIPTORS

11263	037040	011137	C17460	
11264	037044	016137	000002	017462
11265	037052	000137	036360	
11266				

MOV (R1),E4
MOV 2(R1),E5
JMP EXL2

PDP-11 CIS INST EXERCISFR MACY11 27(655) 25-MAR-81 12:25 PAGE 92-2
 CZKFECC.P11 CIS INSTRUCTION TEST LOOP

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11268 .SBTTL CIS INSTRUCTION TEST LOOP
11269
11270 037056 012737 177777 001750 SEEDST: MOV #177777,ESEED ;SET ENTER RNG SEED FLAG
11271 037064 000504 BR DVTST
11273 037066 012737 177777 001754 START: MOV #177777,N200M ;SET FLAG TO INDICATE THAT PROG WAS
11274 ;STARTED AT LOC 200
11276 037074 012737 177777 002212 QVST: MOV #177777,QVMODE ;SET QVMODE FLAG
11282 037102 005037 001752 NST: CLR DENS ;CLEAR DON'T ENTER NORMAL RNG SEED FLAG.
11283 037106 005037 001120 CLR $TESTN ;CLEAR TEST COUNT
11284 .SBTTL INITIALIZE THE COMMON TAGS
(1) 037112 012706 001100 MOV #STACK,SP ;;SETUP THE STACK POINTER
(1) ;;INITIALIZE A FEW VECTORS
(1) 037116 012737 112176 000034 MOV #STRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
(1) 037124 012737 000340 000036 MOV #340,@#TRAPVEC+2;LEVEL 7
(1) 037132 012737 112244 000024 MOV #SPWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
(1) 037140 012737 000340 000026 MOV #340,@#PWRVEC+2 ;;LEVEL 7
(2) ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
(2) ;;EQUAL TO A '-1', SETUP FOR A SOFTWARE SWITCH REGISTER.
(2) 037146 013746 000004 MOV @#ERRVEC,-(SP) ;;SAVE ERROR VECTOR
(2) 037152 012737 037206 000004 MOV #64$,@#ERRVEC ;;SET UP ERROR VECTOR
(2) 037160 012737 177570 001736 MOV #DSWR,SWR ;;SETUP FOR A HARDWARE SWICH REGISTER
(2) 037166 012737 177570 001740 MOV #DDISP,DISPLAY ;;AND A HARDWARE DISPLAY REGISTER
(2) 037174 022777 177777 142534 CMP #-1,@SWR ;;TRY TO REFERENCE HARDWARE SWR
(2) 037202 001012 BNE 66$ ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
(2) ;;AND THE HARDWARE SWR IS NOT -1
(2) 037204 000403 BR 65$ ;;BRANCH IF NO TIMEOUT
(2) 037206 012716 037214 64$: MOV #65$,(SP) ;;SET UP FOR TRAP RETURN
(2) 037212 000002 RTI
(2) 037214 012737 000176 001736 65$: MOV #SWREG,SWR ;;POINT TO SOFTWARE SWR
(2) 037222 012737 000174 001740 MOV #DISPREG,DISPLAY
(2) 037230 012637 000004 66$: MOV (SP)+,@#ERRVEC ;;RESTORE ERROR VECTOR
(1)
(2) 037234 005037 001122 CLR $PASS ;;CLEAR PASS COUNT
(2) 037240 132737 000200 001135 BITB #APTSIZE,$ENVM ;;TEST USER SIZE UNDER APT
(2) 037246 001403 BEQ 67$ ;;YES,USE NON-APT SWITCH
(2) 037250 012737 001136 001736 67$: MOV #$$SWREG,SWR ;;NO,USE APT SWITCH REGISTER
(2) 037256
11285 ; NO QUESTIONS ASKED - EXERCISES FIXED TABLE TEST
11286 ; CONDITIONS FIRST THEN ENTERS RANDOM MODE TESTING
11287 037256 012737 177777 002100 MOV #177777,F$RUN
11288 037264 005037 001660 CLR INCSQ1 ;PRIOR TO EACH TEST, BUFFERS WILL BE INITIALIZED TO ZERO
11289 037270 005037 001662 CLR INCSQ2
11290 037274 000470 BR COMST
11291 037276 005037 002212 DVTST: CLR QVMODE
11292 037302 005037 001752 CLR DENS ;CLEAR DON'T ENTER NORMAL RNG SEED FLAG
11293 .SBTTL INITIALIZE THE COMMON TAGS
(1) 037306 012706 001100 MOV #STACK,SP ;;SETUP THE STACK POINTER
(1) ;;INITIALIZE A FEW VECTORS
(1) 037312 012737 112176 000034 MOV #STRAP,@#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
(1) 037320 012737 000340 000036 MOV #340,@#TRAPVEC+2;LEVEL 7
(1) 037326 012737 112244 000024 MOV #SPWRDN,@#PWRVEC ;;POWER FAILURE VECTOR
(1) 037334 012737 000340 000026 MOV #340,@#PWRVEC+2 ;;LEVEL 7
(2) ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
(2) ;;EQUAL TO A '-1', SETUP FOR A SOFTWARE SWITCH REGISTER.

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 92-3
 27KFECC.P11 INITIALIZE THE COMMON TAGS

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(2) 037342 013746 000004      MOV    @#ERRVEC,-(SP)    ;;SAVE ERROR VECTOR
(2) 037346 012737 037402 000004  MOV    #64$,@#ERRVEC    ;;SET UP ERROR VECTOR
(2) 037354 012737 177570 001736  MOV    #DSWR,SWR        ;;SETUP FOR A HARDWARE SWICH REGISTER
(2) 037362 012737 177570 001740  MOV    #DDISP,DISPLAY   ;;AND A HARDWARE DISPLAY REGISTER
(2) 037370 022777 177777 142340  CMP    #-1,@SWR         ;;TRY TO REFERENCE HARDWARE SWR
(2) 037376 001012                BNE    66$              ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
(2)                                ;;AND THE HARDWARE SWR IS NOT --1
(2) 037400 000403                BR     65$              ;;BRANCH IF NO TIMEOUT
(2) 037402 012716 037410        64$:  MOV    #65$,(SP)       ;;SET UP FOR TRAP RETURN
(2) 037406 000002                RTI
(2) 037410 012737 000176 001736  65$:  MOV    #SWREG,SWR       ;;POINT TO SOFTWARE SWR
(2) 037416 012737 000174 001740  MOV    #DISPREG,DISPLAY
(2) 037424 012637 000004        66$:  MOV    (SP)+,@#ERRVEC   ;;RESTORE ERROR VECTOR
(1)
(2) 037430 005037 001122                CLR    $PASS           ;;CLEAR PASS COUNT
(2) 037434 132737 000200 001135  BITB   #APTSIZE,$ENVM   ;;TEST USER SIZE UNDER APT
(2) 037442 001403                BEQ    67$             ;;YES,USE NON-APT SWITCH
(2) 037444 012737 001136 001736  MOV    #SSWREG,SWR     ;;NO,USE APT SWITCH REGISTER
(2) 037452                67$:
; RESULTS IN DIALOG WITH USER TO DETERMINE
; EXACT RUN MODE DESIRED.
11294
11295
11300 037452 005037 002100      CLR    FSRUN
11301 037456                COMST:
11302 037456 005077 142202      CLR    @TPSW           ;SET PROCESSOR PRIORITY TO ZERO
11303 037462 012737 037522 000010  MOV    #22$,@#RESVEC   ;CHECK FOR SWITCH ON CIS MODULE TO BE IN CORRECT POSITIO
11304 037470 005037 000012      CLR    @#RESVEC+2
11305 037474 076001                76001                ;THIS INST SHOULD TRAP TO LOC 10 IF
11306                                ; SWITCH POSITION IS OK; OTHERWISE
11307                                ; IT WILL ACT LIKE A 'NOP'.
11308 037476                PRINTB #SWNG           ;INDICATE THAT SWITCH POSITION IS INCORECT
(6) 037476 012746 013460      MOV    #SWNG,-(SP)
(3) 037502 010600                MOV    SP,R0
(4) 037504 004737 066232      JSR    PC,FPRINT
11309 037510 012737 000001 001114  MOV    #1,$MSGTY       ;TELL APT THERE IS A FATAL ERROR      ;;REV-C
11310 037516 000000                HALT
11311 037520 000756                BR    COMST
11318 037522 005726                22$:  TST (SP)+             ;FIX UP STACK
11319 037524 005726                TST (SP)+
11320 037526 005737 001750      TST    ESEED           ;GET NEW SEED CONSTANTS?
11321 037532 001437                BEQ    2$              ;BRANCH IF NO
11322 037534                111$:  PRINTB #ACCSEED       ;PRINT MESSAGE: ENTER RNG SEED CONSTANTS
(6) 037534 012746 016175      MOV    #ACCSEED,-(SP)
(3) 037540 010600                MOV    SP,R0
(4) 037542 004737 066232      JSR    PC,FPRINT
11323 037546 004737 065704      JSR    PC,ACCOCCT      ;GET OCTAL SEED
11324 037552 000770                BR    111$            ;<CR> RETURN
11325 037554 000240                NOP                    ;XXXXXX<CR> RETURN
11326 037556 000240                NOP                    ;XXXXXX<-> RETURN
11327 037560 012637 064414      MOV    (SP)+,RNCON     ;INSERT FIRST SEED CONSTANT
11328 037564 004737 065704      JSR    PC,ACCOCCT     ;GET SECOND SEED
11329 037570 000761                BR    111$
11330 037572 000240                NOP
11331 037574 000240                NOP
11332 037576 012637 064416      MOV    (SP)+,RP1      ;INSERT SECOND SEED CONSTAN

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PLP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 92-4
ZKEEC.P11 INITIALIZE THE COMMON TAGS

11333	037602	004737	065704			JSR PC,ACCOCT ;GET THIRD SEED
11334	037606	000752				BR 111\$
11335	037610	000240				NOP
11336	037612	000240				NOP
11337	037614	012637	064420			MOV (SP)+,RP2 ;INSERT THIRD SEED CONSTANT
11338	037620	012737	177777	001752		MOV #177777,DENS;SET DON'T ENTER NORMAL SEED FLAG
11339	037626	005037	001750			CLR ESEED
11340	037632	012737	060226	000010	2\$:	MOV #ILLSER,@#RESVEC ;SETUP ILLEGAL INST TRAP CATCHER
11342	037640	005037	000012			CLR @#RESVEC+2
11343	037644	012737	060424	000250		MOV @#MMVIOL,@#MMVEC ;SETUP MEMORY MANAGEMENT TRAP CATCHER
11344	037652	005037	000252			CLR @#MMVEC+2
11345	037656	012737	060100	000004		MOV #HLT SER,@#ERRVEC ;SETUP TIMEOUT INST. TRAP VECTOR
11346	037664	005037	000006			CLR @#ERRVEC+2
11347	037670	004737	054520			JSR PC,SIZEPT ;SETUP PROCESSOR DEPENDENT CONSTANTS
11348	037674	023727	000042	053672	1\$:	CMP @#42,#ENDAD ;IF IN ACT CHAIN MODE SKIP PRINTING OF PROG TITLE
11349	037702	001405				BEQ 14\$
11350	037704	005737	001122			TST \$PASS ;IDENTIFY PROGRAM ON 1ST PASS ONLY
11351	037710	001002				BNE 14\$
11352	037712	104401				TYPE
11353	037714	016705				PNAME ;TYPE PROGRAM NAME
11354	037716	005037	002474		14\$:	CLR ONEINS ;CLEAR SINGLE INST TEST FLAG
11355	037722	012737	000414	050072		MOV #414,TOLTC ;INHIBIT LTC TURN ON
11357	037730	012737	000207	062012		MOV #207,DI ;INHIBIT INTERRUPT DURING INTR SERVICE DIVPI
11358	037736	012737	000403	050124		MOV #403,TOPC2 ;INHIBIT LATENCY & INTERRUPTABILITY TURN ON
11359	037744	012737	000403	050134		MOV #403,TOPC1
11361	037752	005037	002060			CLR ERRCT ;CLEAR ERROR COUNT
11362	037756	005037	002166			CLR DEN ;CLEAR D-SPACE ENABLE FLAG
11363	037762	005037	003034			CLR LCNT ;CLEAR LTC COUNT
11364	037766	005037	002550			CLR LATEN ;CLEAR LATENCY TESTING FLAG
11365	037772	005037	002222			CLR STOPTF ;CLEAR FLAG WHICH WHEN CLR WILL TRIGGER
11366						; PROGRAM TO REQUEST STOP TEST NUMBER
11367	037776	005037	002136			CLR FATAL ;CLEAR FATAL ERROR INDICATOR
11368	040002	005037	001764			CLR RANDOM ;CLEAR RANDOM EXERCISE MODE FLAG
11369	040006	005037	002046			CLR NOERDS ;CLEAR 'NO-ERROR DISPLAY' SWITCH
11378	040012	004737	055760		66\$:	JSR PC,SETPAR ;SETUP PAR'S (MEM MGMT)
11379	040016	013700	001654			MOV PSEED,RO ;FORM RNG PRINT SEED MASK
11380	040022	005100				COM RO
11381	040024	005200				INC RO
11382	040026	010037	002102			MOV RO,MSEED
11384	040032	005737	001752			TST DENS ;ENTER NORMAL SEED?
11385	040036	001011				BNE 61\$;BRANCH IF NO
11387	040040	013737	064422	064414		MOV RANCON,RNCON ;INITIALIZE RANDOM # GENERATOR
11388	040046	013737	064424	064416		MOV KRP1,RP1
11389	040054	013737	064426	064420		MOV KRP2,RP2
11390	040062	012737	073054	073052	61\$:	MOV #IL2D,INPTBL ;INITIALIZE INPUT TABLE POINTER
11392	040070	005737	002100			TST FSRUN ;FIELD SERVICE TYPE RUN
11393	040074	001431				BEQ 13\$;BRANCH IF NO TO ENTER DIALOG WITH USER
11395						; DETERMINE IF LINE CLOCK IS AVAILABLE FOR
11396						; FIELD SERVICE TYPE RUN
11397	040076	004737	063212		31\$:	JSR PC,LTCP ;IS LTC ON SYSTEM?
11398	040102	000137	040142			JMP 32\$;NO - CANT TEST INTERRUPTABILITY
11399	040106	005737	001122			TST \$PASS ;IDENTIFY INTR SOURCE ON 1ST PASS
11400	040112	001005				BNE 103\$
11401	040114					PRINTB #KW11L ;INDICATE THAT LINE CLOCK WILL BE USED

POP-11 (15 INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 92-5
 72KREC.P11 INITIALIZE THE COMMON TAGS

(6)	040114	012746	013704	MOV	#KW11L,-(SP)	
(3)	040120	010600		MOV	SP,R0	
(4)	040122	004737	066232	JSR	PC,FPRINT	
11402						:FOR INTERRUPT SOURCE.
11403	040126	004737	063074	103\$:	JSR PC,LTCSUP	:SYNC UP TO LTC
11404	040132	004737	063136		JSR PC,LTCNT	:DETERMINE COUNT PER CLOCK TICK
11405	040136	000137	040712		JMP FDIALG	:SKIP OVER DIALOG WITH USER
11406	040142			32\$:	PRINTB #NOINT	:PRINT CANT TEST INTR MESSAGE
(6)	040142	012746	013405		MOV #NOINT,-(SP)	
(3)	040146	010600			MOV SP,R0	
(4)	040150	004737	066232		JSR PC,FPRINT	
11407	040154	000137	040712		JMP FDIALG	
11409	040160			13\$:	PRINTB #ASKINT	:ASK IF INTERRUPTABILITY MODE IS DESIRED?
(6)	040160	012746	012725		MOV #ASKINT,-(SP)	
(3)	040164	010600			MOV SP,R0	
(4)	040166	004737	066232		JSR PC,FPRINT	
11410	040172	004737	065350		JSR PC,YORN	:ACCEPT ASCIZ FROM TTY
11411	040176	000137	040502		JMP ARMQ	:N RESPONSE
11412	040202	000137	040216		JMP 5\$:Y RESPONSE
11413	040206	000137	040502		JMP ARMQ	:R OR H RESPONSE (ILLEGAL HERE)
11414	040212	000137	040502		JMP ARMQ	:C RESPONSE (ILLEGAL HERE)
11415						
11416	040216			5\$:	PRINTB #ASKSRC	:ASK FOR INTERRUPT SOURCE
(6)	040216	012746	013110		MOV #ASKSRC,-(SP)	
(3)	040222	010600			MOV SP,R0	
(4)	040224	004737	066232		JSR PC,FPRINT	
11417	040230	004737	065350		JSR PC,YORN	:ACCEPT ASCIZ
11418	040234	000137	040254		JMP 52\$:(N) KW11-P @100KHZ
11419	040240	000137	040300		JMP 53\$:(Y) KW11-P EXT OSC
11420	040244	000137	040340		JMP 54\$:(R) LINE TIME CLOCK
11421	040250	000137	040364		JMP 55\$:(C) KW11-P @10KHZ
11422						
11423	040254			52\$:		:MAKE KW11-P @100KHZ THE INTERRUPT SOURCE
11424	040254	004737	062420		JSR PC,PC1CK	:CHECK FOR (& SETUP) P-CLK 1
11425	040260	000137	040406		JMP MNOPC1	:NOT PRESENT ON SYSTEM RETURN
11426	040264	004737	062534		JSR PC,PC2CK	:P-CLK EXISTS RETURN - CHECK FOR (& SETUP) 2ND PCLK
11427						: FOR LATENCY TESTING
11428	040270	000137	040424		JMP MNOPC2	:NOT PRESENT ON SYSTEM RETURN
11429	040274	000137	040436		JMP ADIO	:2ND PCLK EXISTS
11430						
11431	040300			53\$:		:MAKE KW11-P WITH EXTERNAL OSCILLATOR THE
11432						: INTERRUPT SOURCE
11433	040300	004737	062420		JSR PC,PC1CK	:CHECK FOR (& SETUP) P-CLK ON SYSTEM
11434	040304	000137	040406		JMP MNOPC1	:NOT PRESENT ON SYSTEM RETURN
11435	040310	052777	000006	142206	BIS #6,@PC1CSR	:SET PCLK 1 FOR EXTERNAL OSCILLATOR
11436	040316	004737	062534		JSR PC,PC2CK	:CHECK FOR 2ND P-CLK FOR LATENCY TESTING
11437	040322	000137	040424		JMP MNOPC2	:NOT PRESENT RETURN
11438	040326	052777	000006	142200	BIS #6,@PC2CSR	:SET PCLK2 FOR EXTERNAL OSC
11439	040334	000137	040436		JMP ADIO	
11440						
11441	040340			54\$:		:MAKE LINE TIME CLOCK THE INTR SOURCE
11442	040340	004737	063212		JSR PC,LTC	:CHECK FOR LTC ON SYSTEM
11443	040344	000137	040406		JMP MNOLTC	:NOT PRESENT RETURN
11444	040350	004737	063074		JSR PC,LTCSUP	:SYNC UP TO LTC

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 92-6
CZKEEC.P11 INITIALIZE THE COMMON TAGS

11445 040354 004737 063136 JSR PC,LTCNT ; DETERMINE COUNT PER CLOCK TICK
11446 040360 000137 040502 JMP ARMQ
11447
11448 040364 55$: ; MAKE KW11-P @10KHZ THE INTERRUPT SOURCE
11449 040364 004737 062420 JSR PC,PC1CK ; CHECK FOR P-CLK ON SYSTEM
11450 040370 000137 040406 JMP MNOPC1 ; NOT PRESENT RETURN
11451 040374 052777 000002 142122 BIS #2,@PC1CSR ; SET PCLK FOR 10KHZ (NO LATENCY TESTING)
11452 040402 000137 040502 JMP ARMQ
11453
11454 040406 MNOLTC:
11455 040406 MNOPC1: PRINTB #NOINT ; PRINT CANT TEST INTERRUPTABILITY MESSAGE
(6) 040406 012746 013405 MOV #NOINT,-(SP)
(3) 040412 010600 MOV SP,R0
(4) 040414 004737 066232 JSR PC,FPRINT
11456 040420 000137 040502 JMP ARMQ
11457 040424 MNOPC2: PRINTB #NOLAT ; PRINT CANT TEST LATENCY MESSAGE
(6) 040424 012746 013334 MOV #NOLAT,-(SP)
(3) 040430 010600 MOV SP,R0
(4) 040432 004737 066232 JSR PC,FPRINT
11458 040436 ADIQ: PRINTB #ASKDI ; ASK IF USER ALLOWS AN INTERRUPT DURING CIS
(6) 040436 012746 013223 MOV #ASKDI,-(SP)
(3) 040442 010600 MOV SP,R0
(4) 040444 004737 066232 JSR PC,FPRINT
11459 ; INST EXECUTED ON NORMAL INTR SERVICE ROUTINE
11460 040450 004737 065350 JSR PC,YORN ; ACCEPT ASCIZ FROM TTY
11461 040454 000137 040502 JMP ARMQ ; N RESPONSE
11462 040460 000137 040474 JMP 1$ ; Y RESPONSE
11463 040464 000137 040502 JMP ARMQ ; ILLEGAL RESPONSE
11464 040470 000137 040502 JMP ARMQ ; ILLEGAL RESPONSE
11465 040474 013737 001670 062012 1$: MOV KNOP,DI ; OVERWRITE 'RTS PC' TO ALLOW P-CLK
11466 ; INTERRUPT DURING CIS INST EXECUTED
11467 ; WITHIN NORMAL P-CLK INTERRUPT SERVICE ROUTINE.
11468
11469
11470
11471 040502 ARMQ: PRINTB #ASKRM ; ASK IF RANDOM EXERCISE MODE IS DESIRED?
(6) 040502 012746 012465 MOV #ASKRM,-(SP)
(3) 040506 010600 MOV SP,R0
(4) 040510 004737 066232 JSR PC,FPRINT
11472 040514 004737 065350 JSR PC,YORN ; ACCEPT ASCIZ FROM TTY
11473 040520 000137 040556 JMP 2$ ; N RESPONSE
11474 040524 000137 040540 JMP 3$ ; Y RESPONSE
11475 040530 000137 040652 JMP 1$ ; R OR H RESPONSE (ILLEGAL HERE)
11476 040534 000137 040652 JMP 1$ ; C RESPONSE (ILLEGAL HERE)
11477 040540 012737 177777 001764 3$: MOV #177777,RANDOM ; SET RANDOM FLAG
11478 040546 012737 072776 073052 MOV #IDUM,INPTBL ; SET INPUT TABLE POINTER TO DUMMY INPUT TABLE
11479 040554 000436 BR 1$
11480 040556 2$: PRINTB #ASKMOD ; ASK FOR PROCESSOR TEST MODE
(6) 040556 012746 012533 MOV #ASKMOD,-(SP)
(3) 040562 010600 MOV SP,R0
(4) 040564 004737 066232 JSR PC,FPRINT
11481 040570 004737 060530 JSR PC,KSORU ; ACCEPT ASCIZ FROM TTY AND SETUP MODE WORD
11482 040574 000770 BR 2$ ; ILLEGAL CHAR RETURN - ASK AGAIN
11483 040576 2C$: PRINTB #ASKMM ; ASK FOR MEM MGMT TEST MODE

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PCP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 92-7
22REC.P11 INITIALIZE THE COMMON TAGS

 6) 040576 012746 012617      MOV #ASKMM,-(SP)
(3) 040602 010600      MOV SP,R0
(4) 040604 004737 066232      JSR PC,FPRINT
11484 040610 004737 065350      JSR PC,YORN
11485 040614 000137 040646      JMP 23$ ;N RESPONSE - MEM MGMT OFF
11486 040620 000137 040636      JMP 22$ ;D RESPONSE - D SPACE ENABLED
11487 040624 000137 040652      JMP 1$ ;H RESPONSE - D SPACE DISABLED
11488 040630 000137 040576      JMP 20$ ;ILLEGAL RESPONSE - ASK AGAIN
11489 040634 000406      BR 1$
11490 040636 012737 177777 002166 22$: MOV #177777,DEN ;SET D ENABLED FLAG
11491 040644 000402      BR 1$
11492 040646 005037 002162      23$: CLR MMFLG ;SET NO MEM MGMT FLAG
11493 040652 1$: PRINTB #ASK ;ASK FOR SPECIFIC INST TO TEST
(6) 040652 012746 012416      MOV #ASK,-(SP)
(3) 040656 010600      MOV SP,R0
(4) 040660 004737 066232      JSR PC,FPRINT
11494 040664 004737 070506      JSR PC,ACASZ ;ACCEPT ASCIZ FROM TTY
11495 040670 005737 002466      *ST ACINST ;DEFAULTED TO ALL INSTRUCTIONS?
11496 040674 001406      BEQ FDIALG ;BRANCH IF YES
11497 040676 004737 070404      JSR PC,SFCI ;LOOK FOR MATCH BETWEEN INST ENTERED
11498 ;AND LIST OF CIS INST ASCII.
11499 040702 000763      BR 1$ ;NO MATCH RETURN
11500 040704 012737 177777 002474      MOV #177777,ONEINS ;MATCH - SET SINGLE INST TESTING FLAG
11502 040712 013737 073052 002140 FDIALG: MOV INPTBL,INPT ;INITIALIZATION
11503 040720 005037 001420      CLR TOTTC ;ZERO COUNT OF TOTAL TESTS EXECUTED
11504 040724 005037 001416      CLR TOTTC
11505 040730 005037 001422      CLR INVTC ;ZERO COUNT OF INVALID TESTS - TESTS ABORTED
11506 040734 005037 001424      CLR REDTC ;ZERO COUNT OF REDUNDANT TESTS - TESTS ABORTED.
11507 040740 005002      CLR R2
11508 040742 013737 001670 050144      MOV KNOP,PREINS ;INSERT NOP BEFORE INST UNDER TEST.
11509 040750 012700 120606      MOV #XLTL1,R0 ;INITIALIZE MOVTC TRANSLATION TABLES
11510 040754 012701 121206      MOV #ELTL1,R1 ; AS FOLLOWS: 1 IN LOC 0, 2 IN LOC 1, ETC.
11511 040760 005202      11$: INC R2
11512 040762 110220      MOV R2,(R0)+
11513 040764 020001      CMP R0,R1
11514 040766 103774      BLO 11$
11515 040770 005737 002100      TST FSRUN ;NORMAL FIELD SERVICE TYPE RUN?
11516 040774 001426      BEQ NITE ;BRANCH IF NO
11518 040776 023727 000042 053672      CMP #42,#ENDAD ;IF IN ACT CHAIN MODE SKIP OVER PRINTING OF HEADER
11519 041004 001412      BEQ 15$
11520 041006 005737 002212      TST QVMODE ;IF IN QVMODE PRINT QV MODE
11521 041012 001403      BEQ 1$
11522 041014 104401      TYPE
11523 041016 016116      QVHDR
11524 041020 000404      BR 15$
11525 041022 104401      1$: TYPE
11526 041024 016004      FSHDR ;PRINT FIELD SERVICE HEADER INFO
11554 041026 104401      10$: TYPE ;PRINT PASS TIME MESSAGE
11555 041030 016260      FSHDR1
11557 041032 012737 072430 002146 15$: MOV #YL2D,EMPTR
11559 041040 042737 000007 050164      BIC #7,TINST ;CLEAR REGISTER FIELD (FOR L2D DISPLAY ONLY)
11560 041046 004737 064240      JSR PC,IDINST ;IDENTIFY INST UNDER TEST
11562
11563 041052 005037 042176      NITE: CLR MTYPE ;CONTROL IS PASSED TO THIS POINT WHENEVER

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PDP-11 CIS INST EXERCISER          MACY11 27(655) 25-MAR-81 12:25 PAGE 92-9
CZKEEC.P11      INITIALIZE THE COMMON TAGS

11619 041276 062701 004370          ADD #INSTID,R1
11620 041302 111137 042200          MOVB (R1),ID1
11621 041306 005201                   INC R1
11622 041310 111137 042202          MOVB (R1),ID2          ;ID1 AND ID2 CONTAIN OFFSETS INTO PTP TABLE
11623 041314 005737 042200          TST ID1
11624 041320 001445                   BEQ LDCOD             ;BRANCH IF OFFSET = 0. NO UPDATE REQUIRED
11625 041322 006337 042200          ASL ID1
11626 041326 062737 001566 042200  ADD #PTP,ID1          ;USE OFFSET TO GET PTP ENTRY
11627 041334 017701 000640          MOV @ID1,R1          ;USE ENTRY TO GET ADDRESS OF DATA DESCRIPTOR
11628 041340 011177 000634          MOV (R1),@ID1
11629 041344 005737 042202          TST ID2
11630 041350 001431                   BEQ LDCOD             ;BRANCH IF SECOND OFFSET = 0
11631 041352 006337 042202          ASL ID2
11632 041356 062737 001566 042202  ADD #PTP,ID2          ;HANDLE SECOND OFFSET SAME AS FIRST
11633 041364 017701 000612          MOV @ID2,R1
11634 041370 011177 000606          MOV (R1),@ID2
11635 041374 000417                   BR LDCOD
*1636
*1637 041376                    TYPE1:                ;INPUT PARAMETERS SPECIFIED IN TABLES
11638 041376 010001                MOV R0,R1              ;SETUP PARAMETER TABLE POINTERS
11639 041400 062701 000004          ADD #4,R1              ;R1 POINTS TO IP1
11640 041404 012702 001570          MOV #PTP01,R2         ;R2 POINTS TO TOP OF PARAMETER TABLE POINTER (PTP) LIST.
11641 041410 012112                    1$:                   MOV (R1)+,(R2)        ;LOAD PTP FROM IP
11642 041412 005712                    TST (R2)              ;PTP=0 ?
11643 041414 001402                    BEQ 2$                ;YES - DON'T ADVANCE IT
11644 041416 062712 000002          ADD #2,(R2)           ;ADVANCE PTP TO FIRST ENTRY
11645 041422 062702 000002          ADD #2,R2             ;UPDATE POINTER
11646 041426 020227 001640          CMP R2,#PTP24+2      ;ALL PTP'S LOADED?
11647 041432 002766                    BLT 1$                ;NO
11648
11649 041434 011001                LDCOD:                MOV (R0),R1            ;LOAD OCTAL CODING FOR CIS INST
11650 041436 010137 002302          MOV R1,OCTIC          ; UNDER TEST INTO FINST & TINST
11651 041442 010137 002136          MOV R1,FATAL          ;LOAD CODING FOR INST UNDER TEST INTO FATAL
11652                                     ; ERROR INDICATOR WORD
11653 041446 006301                    ASL R1
11654 041450 062701 003732          ADD #OINST,R1
11655 041454 011137 046310          MOV (R1),EINST
11656 041460 011137 050164          MOV (R1),TINST
11657 041464 004737 063442          JSR PC,SRNGSW        ;SAVE STATE OF RANDOM # GEN. AS STATE W
11658
11659 041470 004737 063466          NTC:                  JSR PC,RRNGSW        ;CONTROL IS PASSED TO THIS POINT TO EXECUTE
11660                                     ; NEXT TEST CONDITION FOR GIVEN INPUT
11661                                     ; TABLE. PARAMETER TABLE POINTERS
11662                                     ; HAVE BEEN UPDATED TO POINT TO NEXT
11663                                     ; TEST CONDITION PRIOR TO ENTRY
11664                                     ; TO THIS POINT.
11665                                     ;RESTORE RANDOM # GEN. TO STATE W.
11666 041474 013701 002302          MOV OCTIC,R1          ;LOAD # OF INST DESC INTO NDESC
11667 041500 006301                    ASL R1
11668 041502 006301                    ASL R1
11669 041504 063701 004266          ADD DECTYP,R1        ;LOAD DATA TYPE CONTROL WORDS
11670 041510 012137 002304          MOV (R1)+,TW1        ; PKPTW,ZPM,SXTYPE
11671 041514 113737 002304 002460  MOVB TW1,PKPTW
11672 041522 113737 002305 002462  MOVB TW1+1,NDESC    ;PKPTW IDENTIFIES STARTING DATA TYPE FOR EACH INST TESTI

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POP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 92-10
 ZKEEC.PT INITIALIZE THE COMMON TAGS

11673	041530	011137	002306		MOV (R1),TW2	
11674	041534	113701	002306		MOVB TW2,R1	
11675	041540	042701	177770		BIC #177770,R1	
11676	041544	010137	002446		MOV R1,S1TYPE	;S1TYPE IDENTIFIES 1ST STRING DESC DATA TYPE
11677	041550	113701	002306		MOVB TW2,R1	
11678	041554	042701	177707		BIC #177707,R1	
11679	041560	006201			ASR R1	
11680	041562	006201			ASR R1	
11681	041564	006201			ASR R1	
11682	041566	010137	002450		MOV R1,S2TYPE	
11683	041572	113701	002306		MOVB TW2,R1	
11684	041576	006301			ASL R1	
11685	041600	006301			ASL R1	
11686	041602	000301			SWAB R1	
11687	041604	010137	002452		MOV R1,S3TYPE	
11688	041610	113701	002307		MOVB TW2+1,R1	
11689	041614	006201			ASR R1	
11690	041616	010137	002464		MOV R1,ZPM	
11691	041622	005737	001764		TST RANDOM	;IN RANDOM EXERCISE MODE?
11692	041626	001447			BEQ NTCTS	;BRANCH IF NO
11693	041630	023727	002446	000006	CMP S1TYPE,#6	;RANDOMIZE STRING DATA TYPES
11694	041636	103405			BLO 1\$	
11695	041640	004737	064266		JSR PC,RPTYPE	;GET A RANDOM PACKED DATA TYPE
11696	041644	010037	002446		MOV R0,S1TYPE	;STORE IT IN S1TYPE
11697	041650	000404			BR 2\$	
11698	041652	004737	064314	1\$:	JSR PC,RZTYPE	;GET A RANDOM ZONED DATA TYPE
11699	041656	010037	002446		MOV R0,S1TYPE	;STORE IT IN S1TYPE
11700	041662	023727	002450	000006	2\$:	CMP S2TYPE,#6
11701	041670	103405			BLO 3\$	
11702	041672	004737	064266		JSR PC,RPTYPE	
11703	041676	010037	002450		MOV R0,S2TYPE	
11704	041702	000404			BR 4\$	
11705	041704	004737	064314	3\$:	JSR PC,RZTYPE	
11706	041710	010037	002450		MOV R0,S2TYPE	
11707	041714	023727	002452	000006	4\$:	CMP S3TYPE,#6
11708	041722	103405			BLO 5\$	
11709	041724	004737	064266		JSR PC,RPTYPE	
11710	041730	010037	002452		MOV R0,S3TYPE	
11711	041734	000404			BR NTCTS	
11712	041736	004737	064314	5\$:	JSR PC,RZTYPE	
11713	041742	010037	002452		MOV R0,S3TYPE	
11714						
11715	041746			NTCTS:		;CONTROL IS PASSED TO THIS POINT TO EXECUTE
11716						; THE GIVEN TEST CONDITION USING
11717						; THE NEXT DATA TYPE.
11718	041746	005237	001120		INC \$TESTN	;INCREMENT TEST # IN APT MAILBOX
11719	041752	005737	001764		TST RANDOM	;RUNNING IN RANDOM MODE?
11720	041756	001410			BEQ 2\$;BRANCH IF NO
11721	041760	023737	001120	001652	CMP \$TESTN,TPERP	;HAS TEST # REACHED MAX PER APT PASS?
11722	041766	101404			BLOS 2\$;BRANCH IF NO
11723	041770	005237	001122		INC \$PASS	;INCREMENT APT PASS COUNTER
11724	041774	005037	001120		CLR \$TESTN	
11725	042000	005237	001420	2\$:	INC TOTTC	;UPDATE TESTS EXECUTED COUNTER
11726	042004	001002			BNE 1\$;BRANCH IF TEST COUNT NOT ZERO

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PDP-11 CIS INST EXERCISER          MACY11 27(655) 25-MAR-81 12:25 PAGE 92-11
CZKEEC.P11      INITIALIZE THE COMMON TAGS

11727 042006 005237 001416          INC TOTTC          ;INCREMENT TEST CCJNT OVERFLOW EVERY TIME
11728                                     ; TEST COUNT (TOTTC) EXCEEDS 177777 OCTAL.
11729 042012 013777 001420 137720 1$: MOV TOTTC,@DISPLAY ;SET TEST # INTO DISPLAY LIGHTS
11730 042020 004737 063372          JSR PC,SRNGSY      ;SAVE STATE OF RANDOM # GEN AS STATE Y.
11731                                     ;
11732 042024                                     RTC:              ;CONTROL IS PASSED TO THIS POINT TO REPEAT
11733                                     ; THE PREVIOUS TEST USING THE SAME
11734                                     ; TEST CONDITION & DATA TYPES.
11735                                     ;SETUP MICRO BREAK REG (11/74)
11736 042024 000240          NOP                ;(11/74 MICROBREAK - REPLACE WITH 013737)
11737 042026 000240          NOP                ;( " " " " " " " " 177570)
11738 042030 000240          NOP                ;( " " " " " " " " 177770)
11739 042032 004737 063416          JSR PC,RRNGSY      ;RESTORE RANDOM # GEN TO STATE Y.
11740 042036 005037 002144          CLR SPHAND        ;CLEAR SPECIAL HANDLING REQUESTS
11741 042042 005037 002300          CLR FILLS2
11742 042046 012737 111111 120400   MOV #111111,PRECSK ;INITIALIZE STACK OVERFLOW CONSTANTS
11743 042054 012737 111111 120602   MOV #111111,PSTCSK
11744 042062 005037 002156          CLR ERRSTK        ;CLEAR STACK ERROR FLAG.
11745 042066 012700 120402          MOV #PRECSK+2,RO  ;INITIALIZE STACK CONTENTS BEFORE EACH TEST
11746 042072 020027 120602          CMP RO,#PSTCSK
11747 042076 001403          BEQ 2$
11748 042100 012720 055555          MOV #055555,(RO)+
11749 042104 000772          BR 1$
11750 042106 013700 002140          MOV INPTP,RO      ;RO POINTS TO ENTRY IN INPUT TABLE
11751 042112 011001          MOV (RO),R1       ;SETUP POINTER TO PROPER CIS
11752 042114 006301          ASL R1            ; INSTRUCTION FLOW TABLE
11753 042116 062701 001436          ADD #INO,R1
11754 042122 011137 001746          MOV (R1),FLOPTR
11755 042126 011001          MOV (RO),R1       ;SETUP POYNTER TO PROPER ERROR
11756 042130 006301          ASL R1            ; MESSAGE HEADER
11757 042132 062701 070704          ADD #INEM,R1
11758 042136 011137 002146          MOV (R1),EMPTR
11759
11760 042142                                     XINST:
11761 042142 017701 137600          MOV @FLOPTR,R1    ;GET NEXT ENTRY FROM INST. FLOW TABLE
11762 042146 006101          ROL R1
11763 042150 006101          ROL R1
11764 042152 006101          ROL R1
11765 042154 006101          ROL R1
11766 042156 006101          ROL R1
11767 042160 042701 177760          BIC #177760,R1    ;LOOK ONLY AT FLOW TABLE ENTRY COMMAND
11768 042164 006301          ASL R1            ; FORM INDEX INTO FLOW DISPATCH TABLE
11769 042166 062701 001526          ADD #FLODIS,R1
11770 042172 000171 000000          JMP @(R1)         ;DISPATCH ON FLOW COMMAND
11771 042176 000000          MTYPE:           .WORD 0
11772 042200 000000          ID1:             .WORD 0
11773 042202 000000          ID2:             .WORD 0
11774
11775 042204 005737 002100          CTLC:           TST FSRUN          ;DVT TYPE RUN?
11776 042210 001006          BNE NOCTC        ;BRANCH IF NO
11777 042212 000137 037276          JMP DVTST        ;RESTART DVT TYPE RUN
11778
11779
11780 042216          FC01:          ;FLOW COMMAND = 01 - COPY TEST OPERAND

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PDP-11 CIS INST EXERCISER          MACY11 27(655) 25-MAR-81 12:25 PAGE 92-13
CZKEEC.P11 INITIALIZE THE COMMON TAGS

11835 042422 000137 042142          JMP XINST
11836
11837 042426          FC02:          ;FLOW COMMAND = 02 - GENERATE TEST OPERAND
11838                                     ; FROM PARAMETER TABLE ENTRY.
11839 042426 032737 000100 050164   BIT #100,TINST          ;SKIP THIS FLOW COMMAND FOR INLINE CASE
11840 042434 001367          BNE FCRTN
11841 042436 005737 042176          TST MTYPE
11842 042442 001410          BEQ 1$
11843 042444 004737 054036          JSR PC,PF1              ;BRANCH IF NOT TYPE 0 ENTRY
11844                                     ;FORM PARAMETER TABLE POINTER FROM
11845 042450 004737 054252          JSR PC,RF4              ; PF1 FIELD OF FLOW TABLE ENTRY.
11846                                     ;FORM TEST OPERAND POINTER FROM
11847 042454 017711 137462          MOV @PTPTR,(R1)        ; RF4 FIELD OF FLOW TABLE ENTRY
11848 042460 000137 042414          JMP FCRTN              ;COPY TEST OPERAND FROM PARAMETER TABLE
11849 042464 004737 054036          JSR PC,PF1              ;FORM PARAMETER TABLE POINTER FROM PF1
11850                                     ; FIELD OF FLOW TABLE ENTRY.
11851 042470 004777 137446          JSR PC,@PTPTR          ;EXECUTE PARAMETER TABLE ENTRY TO
11852                                     ; GENERATE TEST OPERAND.
11853 042474 000137 042414          JMP FCRTN
11854
11855 042500 005237 001424          REDNTC: INC REDTC      ;TEST CONDITION REDUNDANT - ABORT TEST.
11856 042504 005737 001420          TST TOTTC              ;DID TEST COUNT OVERFLOW ON LAST INCREMENT?
11857 042510 001002          BNE 1$                  ;BRANCH IF NO
11858 042512 005337 001416          DEC TOTTC
11859 042516 005337 001420          1$: DEC TOTTC
11860 042522 000137 053122          JMP NXTTC
11861
11862 042526          FC03:          ;FLOW COMMAND = 03 - VERIFY THAT STRING'S
11863                                     ; LOWER ADDRESS LIMIT FALLS WITHIN TEST BUFFER.
11864 042526 032737 000100 050164   BIT #100,TINST          ;SKIP THIS FLOW COMMAND FOR INLINE CASE
11865 042534 001327          BNE FCRTN
11866 042536 032737 000010 002144   BIT #10,SPHAND          ;SPECIAL HANDLING REQUEST?
11867 042544 001323          BNE FCRTN              ;SKIP THIS FLOW COMMAND IF YES.
11868 042546 004737 054036          JSR PC,PF1              ;FORM PARAMETER TABLE POINTER TO STRING
11869                                     ; SURROUND LENGTH FROM PF1 FIELD OF FLOW
11870                                     ; TABLE ENTRY.
11871 042552 004737 054252          JSR PC,RF4              ;FORM TEST OPERAND POINTER TO STRING.ADR FROM
11872                                     ; RF4 FIELD OF FLOW TABLE ENTRY
11873 042556 011101          MOV (R1),R1
11874 042560 167701 137356          SUB @PTPTR,R1          ;SUBTRACT STRING.SURR.LEN FROM STRING.ADR
11875                                     ; TO GET STRING.SURR.ADR.
11876 042564 020127 000020          CMP R1,#20
11877 042570 002475          BLT NXTC                ;STRING.SURR.ADR < 20 -SKIP THIS TEST CONDITION
11878                                     ; (20 ALLOWS SPACE FOR IN-LINE DESCRIPTORS AT BEGINNING
11879 042572 000137 042414          JMP FCRTN
11880
11881 042576          FC04:          ;FLOW COMMAND = 04 - VERIFY THAT STRINGS
11882                                     ; UPPER ADDRESS LIMIT FALLS WITHIN TEST
11883                                     ; BUFFER.
11884 042576 032737 000100 050164   BIT #100,TINST          ;SKIP THIS FLOW COMMAND FOR INLINE CASE
11885 042604 001035          BNE 1$
11886 042606 032737 000001 002144   BIT #1,SPHAND          ;SPECIAL HANDLING REQUEST
11887 042614 001031          BNE 1$                  ;SKIP VERIFICATION IF YES
11888 042616 004737 054036          JSR PC,PF1              ;FORM PARAMETER TABLE POINTER TO STRING.SURR.LEN

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PDP-11 CZKEEC.P11	CIS INST INITIALIZE THE	EXERCISER COMMON TAGS	MACY11 27(655)	25-MAR-81 12:25	PAGE 92-14		
11889							: FROM PF1 FIELD OF FLOW TABLE ENTRY
11890	042622	004737	054222			JSR PC,RF3	: FORM TEST OPERAND POINTER TO STRING.LEN
11891							: FROM RF3 FIELD OF FLOW TABLE ENTRY
11892	042626	011101				MOV (R1),R1	
11893	042630	005737	002444			TST DECINS	: IS INST A DECIMAL INST?
11894	042634	001402				BEQ 2\$: BRANCH IF NO
11895	042636	043701	002454			BIC TYPFLD,R1	: CLEAR TYPE FIELD SO AS NOT TO
11896							: DISTORT UPPER ADDRESS CALCULATION.
11897	042642	017702	137274	2\$:		MOV @PTPTR,R2	
11898	042646	060102				ADD R1,R2	: R2 NOW CONTAINS SUM OF STRING.SURR.LEN
11899							: AND STRING.LEN
11900	042650	004737	054252			JSR PC,RF4	: FORM TEST OPERAND POINTER TO STRING.ADR
11901							: FROM RF4 FIELD OF FLOW TABLE ENTRY.
11902	042654	061102				ADD (R1),R2	: R2 NOW CONTAINS STRING.ADR + STRING.LEN
11903							: + STRING.SURR.ADR
11904	042656	005737	001764			TST RANDOM	: RANDOM EXERCISE MODE?
11905	042662	001403				BEQ 3\$: BRANCH IF NO.
11906	042664	020237	001644			CMP R2,RTBLEN	: COMPARE ADDRESS WITH END OF RANDOM TEST BUFFER
11907	042670	000402				BR 4\$	
11908	042672	020237	001642	3\$:		CMP R2,TBLEN	: DOES THIS ADDRESS EXCEED TEST BUFFER
11909							: LENGTH ?
11910	042676	003032		4\$:		BGT NXTC	: YES - SKIP THIS TEST CONDITION
11911	042700	000137	042414	1\$:		JMP FCRTN	
11912							
11913	042704			FC05:			: FLOW COMMAND 05 - ADJUST TEST OPERANDS
11914							: TO INCLUDE BASE ADDRESS OF TEST BUFFER.
11915	042704	032737	000100	050164		BIT #100,TINST	: SKIP THIS FLOW COMMAND FOR INLINE CASE
11916	042712	001022				BNE EC05	
11917	042714	004737	054134			JSR PC,RF1	: FORM 1ST TEST OPERAND POINTER FROM RF1
11918							: FIELD OF FLOW TABLE ENTRY
11919	042720	063711	001640			ADD TBADR,(R1)	: ADD TEST BUFFER BASE ADDRESS TO OPERAND
11920	042724	004737	054166			JSR PC,RF2	: FORM 2ND TEST OPERAND POINTER FROM RF2
11921							: FIELD OF FLOW TABLE ENTRY
11922	042730	020127	003634			CMP R1,#TRN	: IF R1 STILL POINTS TO #TRN THEN THERE WAS
11923							: ONLY ONE TEST OPERAND TO BE UPDATED
11924	042734	001411				BEQ EC05	: UPDATING COMPLETE
11925	042736	063711	001640			ADD TBADR,(R1)	: ADD TEST BUFFER BASE ADDRESS TO OPERAND
11926	042742	004737	054222			JSR PC,RF3	: FORM 3RD TEST OPERAND POINTER FROM RF3
11927							: FIELD OF FLOW TABLE ENTRY.
11928	042746	020127	003634			CMP R1,#TRN	: WAS THERE A THIRD ENTRY?
11929	042752	001402				BEQ EC05	: NO - UPDATING COMPLETE
11930	042754	063711	001640			ADD TBADR,(R1)	: ADD TEST BUFFER BASE ADDRESS TO OPERAND
11931	042760	000137	042414	EC05:		JMP FCRTN	
11932							
11933	042764	005237	001422	NXTC:		INC INVTC	: TEST CONDITION INVALID - ABORT TEST
11934	042770	005737	001420			TST TOTTC	: DID TEST COUNT OVERFLOW ON LAST INCREMENT?
11935	042774	001002				BNE 1\$: BRANCH IF NO
11936	042776	005337	001416			DEC TOTTC	
11937	043002	005337	001420	1\$:		DEC TOTTC	
11938	043006	000137	053122			JMP NXTTC	
11939							
11940	043012			FC06:			: FLOW COMMAND = 06 - INITIALIZE TEST BUFFER
11941							: TO AND INCREMENTING SEQUENCE.
11942	043012	032737	000100	050164		BIT #100,TINST	

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 ZKEEC.P11 INITIALIZE THE COMMON TAGS

11943	043020	001402			BEQ 4\$	
11944	043022	004737	063536		JSR PC,RRNGSV	;RESTORE RANDOM # GEN TO STATE V
11945	043026	004737	063512		JSR PC,SRNGSV	;SAVE RANDOM # GENERATOR STATE AS STATE V
11946	043032	013737	001640	001760	MOV TBADR,TBEND	
11947	043040	005737	001764		TST RANDOM	;RANDOM EXERCISE MODE?
11948	043044	001404			BEQ 2\$;BRANCH IF NC
11949	043046	063737	001644	001760	ADD RTBLEN,TBEND	;THE BUFFER SIZE FOR RANDOM EXERCISE MODE ; IS FIXED
11950						
11951	043054	000403			BR 3\$	
11952	043056	063737	001642	001760	ADD TBLEN,TBEND	;SETUP A POINTER TO END OF BUFFER
11953	043064	013701	001640		MOV TBADR,R1	
11954	043070	013702	001640		MOV TBADR,R2	;POINT R1 & R2 TO START OF BUFFER
11955	043074	013721	001660		MOV INCSQ1,(R1)+	
11956	043100	013721	001662		MOV INCSQ2,(R1)+	;LOAD THE FIRST TWO BUFFER LOCATIONS
11957	043104	012211			MOV (R2)+,(R1)	
11958	043106	061221			ADD (R2),(R1)+	;CONTENTS OF NEXT LOC - SUM OF CONTENTS ; OF PREVIOUS 2 LOCATIONS.
11959						
11960	043110	023701	001760		CMP TBEND,R1	
11961	043114	003373			BGT 1\$	
11962	043116	000137	042414		JMP FCRTN	

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 CZKEEC.P11 INITIALIZE THE COMMON TAGS

11964	043122				FC07:		:FLOW COMMAND = 07 - INSERT STRING IN
11965							: TEST BUFFER.
11966	043122	005037	002502		CLR SAVSRF		:RANDOM EXERCISE MODE?
11967	043126	005737	001764		TST RANDOM		:BRANCH IF NO
11968	043132	001406			BEQ 1\$:IS INST A CHAR STRING INST?
11969	043134	023727	002302	000011	CMP OCTIC,#11		:BRANCH IF NO
11970	043142	101002			BHI 1\$:IN RANDOM MODE, NO CHAR STRINGS NEED TO BE
11971	043144	000137	042414		2\$: JMP FCRTN		: INSERTED FOR CHAR TYPE INSTRUCTIONS.
11972							: RANDOM CHAR BYTES ARE DERIVED BY
11973							: RANDOMIZING THE 'SEED' CONSTANTS USED
11974							: TO INITIALIZE THE ENTIRE BUFFER.
11975							:SPECIAL HANDLING REQUEST?
11976	043150	032737	000020	002144	1\$: BIT #20,SPHAND		:SKIP INSERTING STRINGS IF YES
11977	043156	001372			BNE 2\$:FORM PARAMETER TABLE POINTER TO STRING
11978	043160	004737	054036		JSR PC,PF1		: DESCRIPTOR FROM PF1 FIELD OF FLOW TABLE ENTRY
11979							:FORM TEST OPERAND POINTER TO STRING.LEN
11980	043164	004737	054222		JSR PC,RF3		: FROM RF3 FIELD OF FLOW TABLE ENTRY
11981							:SAVE POINTER
11982	043170	010137	002110		MOV R1,TRL		:FORM TEST OPERAND POINTER TO STRING.ADR
11983	043174	004737	054252		JSR PC,RF4		: FROM RF4 FIELD OF FLOW
11984							: TABLE ENTRY.
11985							:SAVE POINTER
11986	043200	010137	002106		MOV R1,TRA		:SAVE RANDOM NUMBER GEN. STATE X
11987	043204	004737	063322		JSR PC,SRNGSX		:INSERT STRING IN TEST BUFFER
11988	043210	004537	043476		JSR R5,ISTG		:POINTER TO STRING DESCRIPTOR
11989	043214	002142			PTPTR		:POINTER TO STRING.LEN
11990	043216	002110			TRL		:POINTER TO STRING.ADR
11991	043220	002106			TRA		
11992							
11993	043222	005737	002502		TST SAVSRF		:SAVE STRING FOR ERROR PRINTOUT?
11994	043226	001436			BEQ A3X		
11995	043230	004737	054036		JSR PC,PF1		:YES - RESTORE POINTER TO STRING DESCRIPTOR
11996	043234	004737	054222		JSR PC,RF3		:RESTORE POINTER TO STRING LENGTH
11997	043240	010137	002110		MOV R1,TRL		
11998	043244	005737	002300		TST FILLS2		:WHERE SHOULD STRING BE STORED?
11999	043250	001406			BEQ 4\$		
12000	043252	012737	002512	002500	MOV #INSRC2+2,SAVPTR		:STORE STRING IN BUFSR2
12001	043260	011137	002510		MOV (R1),INSRC2		:SAVE STRING LEN IN BUFFER DESCRIPTOR
12002	043264	000410			BR 5\$		
12003	043266	012737	002506	002500	4\$: MOV #INSRC1+2,SAVPTR		:SAVE STRING IN BUFSR1
12004	043274	012737	177777	002300	MOV #177777,FILLS2		:SIGNAL THAT BUFSR1 IS OCCUPIED.
12005	043302	011137	002504		MOV (R1),INSRC1		:SAVE STRING LEN IN BUFFER DESCRIPTOR
12006	043306	004737	063346		5\$: JSR PC,RRNGSX		:RESTORE RANDOM NUMBER GEN TO STATE X.
12007	043312	004537	043476		JSR R5,ISTG		:INSERT STRING IN SAVE BUFFER
12008	043316	002142			PTPTR		:POINTER TO STRING DESCRIPTOR
12009	043320	002110			TRL		:POINTER TO STRING LEN
12010	043322	002500			SAVPTR		:POINTER TO STRING ADDRESS (EITHER BUFSR1 OR BUFSR2)
12011							
12012	043324	062737	000002	001746	A3X: ADD #2,FLOPTR		:LOOK AT NEXT FLOW COMMAND?
12013	043332	017701	136410		MOV @FLOPTR,R1		
12014	043336	042701	017777		BIC #017777,R1		
12015	043342	005701			TST R1		:IS IT = 0 - A CONTINUATION OF THE 07
12016							: COMMAND?
12017	043344	001050			BNE 2\$:NO - DON'T INSERT SURROUND STRINGS


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(ZKEEC.P11) INITIALIZE THE COMMON TAGS

12018 043346 004737 C54036 JSR PC,PF1 ;YES - FORM PARAMETER TABLE POINTER
12019 ; TO STRING.SURR.LEN
12020 043352 013737 002142 002052 MOV PTPTR,SURLEN
12021 043360 004737 054110 JSR PC,PF2 ;FORM PARAMETER TABLE POINTER TO SURR DATA
12022 ; DESCRIPTOR
12023 043364 017737 136520 002110 MOV @TRL,TRL ;FORM SURR.ADR (UPPER PORTION)
12024 043372 005737 002444 TST DECINS ;INST = DECIMAL?
12025 043376 001403 BEQ 3$ ;BRANCH IF NO
12026 043400 042737 070000 002110 BIC #070000,TRL ;CLEAR TYPE FIELD FROM STRING LENGTH
12027 043406 067737 136474 002110 3$: ADD @TRA,TRL ;SURR.ADR = STRING.ADR + STRING.LEN
12028 043414 012737 002110 002054 MOV #TRL,SURADR
12029 043422 004537 043476 JSR R5,ISTG ;INSERT UPPER HALF OF SURR STRING
12030 043426 002142 PTPTR ;POINTER TO SURR.DATA DESCRIPTOR
12031 043430 002052 SURLEN ;POINTER TO SURR.LEN
12032 043432 002054 SURADR ;POINTER TO SURR.ADR
12033 043434 017737 136446 002110 MOV @TRA,TRL ;FORM SURR STRING ADDRESS (LOWER PORTION)
12034 043442 167737 136404 002110 SUB @SURLEN,TRL ;SURR.ADR = STRING.ADR - SURR.LEN
12035 043450 004537 043476 JSR R5,ISTG ;INSERT LOWER HALF OF SURR STRING
12036 043454 002142 PTPTR
12037 043456 002052 SURLEN
12038 043460 002054 SURADR
12039 043462 000137 042414 1$: JMP FCRTN
12040 043466 162737 000002 001746 2$: SUB #2,FLOPTR ;RESTORE FLOW COMMAND POINTER
12041 043474 000772 BR 1$
12042
12043 043476 ISTG: ;SUBROUTINE TO INSERT STRING IN TEST BUFFER.
12044 043476 013501 MOV @(R5)+,R1
12045 043500 012137 002112 MOV (R1)+,STGDS1 ;GET STRING DATA DESCRIPTOR
12046 043504 011137 002114 MOV (R1),STGDS2
12047 043510 013501 MOV @(R5)+,R1 ;GET STRING.LEN
12048 043512 011137 002116 MOV (R1),STGLN
12049 043516 032737 000002 002144 BIT #2,SPHAND ;SPECIAL HANDLING REQUEST?
12050 043524 001403 BEQ 1$ ;BRANCH IF NO
12051 043526 042737 100000 002116 BIC #100000,STGLN ;YES - STRIP BIT 15 FROM LENGTH
12052 043534 013501 1$: MOV @(R5)+,R1 ;SETUP STRING STARTING ADDRESS
12053 043536 011137 002120 MOV (R1),STGAD
12054 043542 013701 002112 MOV STGDS1,R1
12055 043546 042737 160000 002112 BIC #160000,STGDS1 ;STRIP OFF 'TYPE' FROM 1ST WORD OF DATA DESCRIPTOR
12056 043554 042701 017777 BIC #17777,R1 ;LOOK ONLY AT DESCRIPTOR TYPE
12057 043560 005701 TST R1
12058 043562 001431 BEQ DSTYP0 ;DATA DESCRIPTOR IS TYPE 0.
12059 043564 022701 020000 CMP #020000,R1
12060 043570 001450 BEQ DSTYP1 ;DATA DESCRIPTOR IS TYPE 1
12061 043572 022701 040000 CMP #040000,R1
12062 043576 001464 BEQ DSTYP2 ;DATA DESCRIPTOR IS TYPE 2
12063 043600 022701 060000 CMP #060000,R1
12064 043604 001521 BEQ DSTYP3 ;DATA DESCRIPTOR IS TYPE 3
12065 043606 022701 100000 CMP #100000,R1
12066 043612 001407 BEQ 2$ ;DATA DESCRIPTOR IS TYPE 4
12067 043614 022701 120000 CMP #120000,R1
12068 043620 001410 BEQ 3$ ;DATA DESCRIPTOR IS TYPE 5
12069 043622 012737 000001 001114 MOV #1,$MSGTY ;TELL APT THERE IS A FATAL ERROR ;:REV-C
12070 043630 000000 HALT ;**DATA DESCRIPTOR NOT TYPE 0,1,2,3,4, OR 5.
12071 043632 005037 001774 2$: CLR RANDTA

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 CZKEEC.P11 INITIALIZE THE COMMON TAGS

12072	043636	000137	044746			JMP DSTYP4	
12073	043642	000137	046014			3\$: JMP DSTYP5	
12074							
12075	043646					DSTYP0:	:ALL BYTES OF STRING ARE IDENTICAL
12076	043646	005737	002444			TST DECINS	:INST = DECIMAL?
12077	043652	001403				BEQ 3\$:BRANCH IF NO
12078	043654	042737	070000	002116		BIC #070000,STGLN	:CLEAR TYPE FIELD STRING LENGTH WORD
12079	043662	013701	002120			3\$: MOV STGAD,R1	:R1 CONTAINS STRING STARTING ADDRESS
12080	043666	005737	002116			1\$: TST STGLN	:ENTIRE STRING BEEN INSERTED?
12081	043672	001405				BEQ 2\$:YES
12082	043674	113721	002112			MOVB STGDS1,(R1)+	:NO - MOVE STRING DATA BYTE INTO NEXT
12083							: TEST BUFFER LOCATION
12084	043700	005337	002116			DEC STGLN	
12085	043704	000770				BR 1\$	
12086	043706	000137	046112			2\$: JMP EISTG	
12087							
12088	043712					DSTYP1:	:STRING BYTE N = STRING BYTE N-1 + INC.
12089	043712	013701	002120			MOV STGAD,R1	:R1 CONTAINS STRING STARTING ADDRESS
12090	043716	005737	002116			1\$: TST STGLN	:ENTIRE STRING BEEN INSERTED?
12091	043722	001410				BEQ 2\$:YES
12092	043724	113721	002114			MOVB STGDS2,(R1)+	
12093	043730	063737	002112	002114		ADD STGDS1,STGDS2	:NO FORM AND INSERT NEXT STRING BYTE
12094	043736	005337	002116			DEC STGLN	
12095	043742	000765				BR 1\$	
12096	043744	000137	046112			2\$: JMP EISTG	
12097							
12098	043750					DSTYP2:	:INSERT BYTES FROM GIVEN STRING
12099	043750	013701	002120			MOV STGAD,R1	:SET R1 TO STARTING ADDRESS OF STRING TO BE
12100							: FORMED IN TEST BUFFER.
12101	043754	005737	002112			TST STGDS1	:IS GIVEN STRING LENGTH 0?
12102	043760	001431				BEQ 3\$:YES - DON'T DO ANY INSERTING
12103	043762	013737	002112	002122		MOV STGDS1,SAVSL	:NO - SAVE STRING LENGTH IN CASE STRING
12104	043770	013737	002114	002124		MOV STGDS2,SAVSA	: TO BE FORMED IS LONGER THAN GIVEN STRING.
12105	043776	005737	002116			1\$: TST STGLN	:ENTIRE STRING BEEN INSERTED?
12106	044002	001420				BEQ 3\$:YES
12107	044004	117721	136104			MOVB @STGDS2,(R1)+	:NO - INSERT STRING BYTE FROM GIVEN STRING
12108	044010	005237	002114			INC STGDS2	:UPDATE GIVEN STRING ADDRESS TO NEXT BYTE
12109	044014	005337	002112			DEC STGDS1	
12110	044020	001006				BNE 2\$:ALL BYTES IN GIVEN STRING USED?
12111	044022	013737	002122	002112		MOV SAVSL,STGDS1	:YES - STRING BEING FORMED IS LONGER THAN
12112	044030	013737	002124	002114		MOV SAVSA,STGDS2	: GIVEN STRING. RESET STRING ADDRESS
12113							: BACK TO BEGINNING OF GIVEN STRING.
12114	044036	005337	002116			2\$: DEC STGLN	:DECREMENT COUNT OF # OF CHARACTERS YET
12115							: TO BE INSERTED.
12116	044042	000755				BR 1\$	
12117	044044	000137	046112			3\$: JMP EISTG	
12118							
12119	044050					DSTYP3:	:DECIMAL STRING - ALL DIGITS IDENTICAL
12120	044050	022737	010000	002112		CMP #10000,STGDS1	:IS FORMED STRING TO BE PACKED OR ZONED DECIMAL?
12121	044056	101070				BHI PTYP3P	
12122	044060					TYP3Z:	:ZONED
12123	044060	013701	002116			MOV STGLN,R1	:GET STRING DESC. *TYPE FIELD
12124	044064	000301				SWAB R1	
12125	044066	006201				ASR R1	

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 (ZKREC.P11) INITIALIZE THE COMMON TAGS

12126	044070	006201			ASR R1	
12127	044072	006201			ASR R1	
12128	044074	006201			ASR R1	
12129	044076	042701	177770		BIC #177770,R1	
12130	044102	010137	002314		MOV R1,STGTYP	;SAVE TYPE
12131	044106	042737	177740	002116	BIC #177740,STGLN	;STRIP TYPE OFF STRING LENGTH WORD
12132	044114	013737	002112	002130	MOV STGDS1,SIGN	;STRIP OFF SIGN FROM DATA DESCRIPTOR WORD 1
12133	044122	042737	177760	002130	BIC #177760,SIGN	
12134	044130	006237	002112		ASR STGDS1	;GET AND RIGHT ADJUST ZONED DATA BYTE
12135	044134	006237	002112		ASR STGDS1	
12136	044140	006237	002112		ASR STGDS1	
12137	044144	006237	002112		ASR STGDS1	
12138	044150	042737	177400	002112	BIC #177400,STGDS1	;GOT ZONED DATA BYTE (HIGH NIBBLE & DIGIT)
12139						; RIGHT ADJUSTED IN STGDS1.
12140	044156	013702	002112		MOV STGDS1,R2	
12141	044162	042702	177760		BIC #177760,R2	
12142	044166	010237	002312		MOV R2,STGDIG	;SAVE JUST THE DIGIT IN STGDIG
12143	044172	005737	002116		ST STGLN	;STRING TO BE FORMED HAVE 0 LENGTH?
12144	044176	001535			BEQ TFS	;YES - NOTE: A ZERO LENGTH ZONED
12145						; STRING OCCUPIES NO MEMORY (EXCEPT SEPARATE TYPES).
12146	044200	013701	002120		MOV STGAD,R1	;SET R1 TO STARTING ADDRESS OF STRING
12147						; TO BE FORMED IN TEST BUFFER.
12148	044204	113721	002112	1\$:	MOVB STGDS1,(R1)+	;NO - INSERT NEXT ZONED DATA BYTE.
12149	044210	005337	002116		DEC STGLN	
12150	044214	005737	002116		TST STGLN	;ENTIRE STRING BEEN INSERTED?
12151	044220	001371			BNE 1\$;NO
12152	044222	013702	002314		MOV STGTYP,R2	;YES - INSERT SIGN BYTE
12153	044226	006302			ASL R2	
12154	044230	062702	002316		ADD #TYPTAB,R2	
12155	044234	000172	000000		JMP @ (R2)	;VECTOR TO APPROPRIATE STRING TYPE ROUTINE
12156						; TO ENTER SIGN BYTE.
12157						
12158	044240	000137	044526		PTYP3P: JMP TYP3P	
12159						
12160	044244	142741	000360		TYP3Z: BICB #360,-(R1)	;SIGNED ZONED
12161						;CLEAR OUT THE HIGH NIBBLE OF LEAST
12162						; SIGNIFICANT STRING BYTE.
12163	044250	006337	002130		ASL SIGN	
12164	044254	006337	002130		ASL SIGN	
12165	044260	006337	002130		ASL SIGN	
12166	044264	006337	002130		ASL SIGN	
12167	044270	153711	002130		BISB SIGN,(R1)	; 'OR' IN SIGN
12168	044274	000512			BR EXTYP	
12169	044276	000511			TYP3Z: BR EXTYP	;UNSIGNED ZONED - NO ACTION REQUIRED
12170						
12171	044300				TYP3O:	;TRAILING OVERPUNCHED
12172	044300	022737	000003	002130	CMP #3,SIGN	;IS SIGN = +?
12173	044306	001416			BEQ 1\$;BRANCH IF YES
12174	044310	004737	064334		JSR PC,RN	;RANDOMLY SELECT FROM 2 NEGATIVE SIGN TABLES
12175	044314	032700	000001		BIT #1,R0	
12176	044320	001403			BEQ 3\$	
12177	044322	012702	002352		MOV #NEGTB1,R2	
12178	044326	000402			BR 2\$	
12179	044330	012702	002340	3\$:	MOV #NEGTAB,R2	;SIGN IS NEGATIVE

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 EXERCISER INITIALIZE THE COMMON TAGS

ADDRESS	DISC	INST	EXERCISER	INITIALIZE	COMMON TAGS	ASSEMBLY	COMMENT
12180	044334	063702	002312			2\$: ADD STGDIG,R2	
12181	044340	111241				MOV B (R2),-(R1)	;COPY ENCODED SIGN FROM TABLE INTO STRING
12182	044342	000467				BR EXTYP	
12183	044344	004737	064334			1\$: JSR PC,RN	;RANDOMLY SELECT FROM 3 POSITIVE SIGN TABLES.
12184	044350	032700	000001			BIT #1,R0	
12185	044354	001403				BEQ 4\$	
12186	044356	012702	002376			MOV #POSTB1,R2	
12187	044362	000764				BR 2\$	
12188	044364	032700	000002			4\$: BIT #2,R0	
12189	044370	001403				BEQ 5\$	
12190	044372	012702	002410			MOV #POSTB2,R2	
12191	044376	000756				BR 2\$	
12192	044400	012702	002364			5\$: MOV #POSTAB,R2	
12193	044404	000753				BR 2\$	
12194							
12195	044406					TYPLO:	;LEADING OVERPUNCHED
12196	044406	013701	002120			MOV STGAD,R1	;SETUP POINTER TO MOST SIGN. BYTE OF STRING
12197	044412	005201				INC R1	
12198	044414	000731				BR TYPTD	
12199							
12200	044416					TYPTS:	;TRAILING SEPARATE
12201	044416	022737	000003	002130		CMP #3,SIGN	;IS SIGN +
12202	044424	001403				BEQ 1\$;BRANCH IF YES
12203	044426	112711	000055			MOV B #055,(R1)	;SIGN = -; COPY SIGN BYTE INTO STRING
12204	044432	000433				BR EXTYP	
12205	044434	004737	064334			1\$: JSR PC,RN	;RANDOMLY SELECT BETWEEN 2 POSITIVE SEPARATE SIGNS.
12206	044440	032700	000001			BIT #1,R0	
12207	044444	001403				BEQ 2\$	
12208	044446	112711	000040			MOV B #040,(R1)	
12209	044452	000423				BR EXTYP	
12210	044454	112711	000053			2\$: MOV B #053,(R1)	;SIGN = +; COPY SIGN BYTE INTO BYTE STRING
12211	044460	000420				BR EXTYP	
12212							
12213	044462					TYPLS:	;LEADING SEPARATE
12214	044462	013701	002120			MOV STGAD,R1	;SETUP POINTER TO BYTE BEFORE MOST SIGN.
12215							; DIGIT OF STRING.
12216	044466	005301				DEC R1	
12217	044470	000752				BR TYPTS	
12218							
12219	044472					TFS:	;0 LENGTH STRING
12220	044472	022737	000005	002314		CMP #5,STGTYP	;IS STRING TYPE = LEADING SEPARATE?
12221	044500	001001				BNE 1\$;BRANCH IF NO
12222	044502	000767				BR TYPLS	;INSERT SIGN AT 'A-1'
12223	044504	022737	000004	002314		1\$: CMP #4,STGTYP	;IS STRING TYPE = TRAILING SEPARATE
12224	044512	001003				BNE EXTYP	;BRANCH IF NO
12225	044514	013701	002120			MOV STGAD,R1	;INSERT SIGN AT 'A'
12226	044520	000736				BR TYPTS	
12227	044522	000737	046112			EXTYP: JMP E1STG	
12228							
12229	044526					TYP3P:	;PACKED
12230	044526	013701	002116			MOV STGLN,R1	;GET STRING DESC. TYPE FIELD
12231	044532	000301				SWAB R1	
12232	044534	006201				ASR R1	
12233	044536	006201				ASR R1	

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12234	044540	006201			ASR R1	
12235	044542	006201			ASR R1	
12236	044544	042701	177770		BIC #177770,R1	
12237	044550	010137	002314		MOV R1,STGTYP	;SAVE TYPE
12238	044554	042737	177740	002116	BIC #177740,STGLN	;STRIP TYPE OFF STRING LENGTH WORD
12239	044562	113737	002112	002130	MOVB STGDS1,SIGN	;LOAD SIGN WITH DIGIT-SIGN BYTE
12240	044570	113701	002112		MOVB STGDS1,R1	;FORM DIGIT-DIGIT BYTE
12241	044574	006201			ASR R1	;RIGHT ADJUST DIGIT
12242	044576	006201			ASR R1	
12243	044600	006201			ASR R1	
12244	044602	006201			ASR R1	
12245	044604	042701	177760		BIC #177760,R1	;CLEAR OUT ALL BUT DIGIT
12246	044610	042737	177417	002112	BIC #177417,STGDS1	;CLEAR OUT ALL BUT DIGIT IN DATA DESCRIPTOR WORD 1
12247	044616	050137	002112		BIS R1,STGDS1	;STGDS1 NOW CONTAINS DIGIT-DIGIT BYTE
12248	044622	110137	002114		MOVB R1,STGDS2	;SAVE 0000-DIGIT BYTE IN CASE STRING LENGTH
12249						; IS EVEN - I.E. MOST SIGNIF DIGIT BYTE CONTAINS
12250						; ONLY A SINGLE DIGIT.
12251	044626	013701	002120		MOV STGAD,R1	;SET R1 TO STARTING ADDRESS OF STRING
12252						; TO BE FORMED IN TEST BUFFER.
12253	044632	005737	002116		TST STGLN	;STRING TO BE FORMED HAVE ZERO LENGTH?
12254	044636	001004			BNE 3\$;NO
12255	044640	042737	177760	002130	BIC #177760,SIGN	;YES - INSERT SIGN. NOTE: A ZERO LENGTH
12256	044646	000424			BR INSIGN	; PACKED STRING OCCUPIES 1 BYTE.
12257	044650	013737	002116	002122	MOV STGLN,SAVSL	;STRING TO BE FORMED HAVE EVEN LENGTH?
12258	044656	042737	177776	002122	BIC #177776,SAVSL	
12259	044664	001003			BNE 1\$	
12260	044666	113721	002114		MOVB STGDS2,(R1)+	;YES - INSERT 0000-DIGIT BYTE
12261	044672	000404			BR 2\$	
12262	044674	113721	002112	1\$:	MOVB STGDS1,(R1)+	;INSERT NEXT PACKED DATA BYTE
12263	044700	005337	002116		DEC STGLN	
12264	044704	005337	002116	2\$:	DEC STGLN	
12265	044710	005737	002116		TST STGLN	;ENTIRE STRING BEEN INSERTED?
12266	044714	003367			BGT 1\$;NO - CONTINUE INSERTING
12267	044716	005301			DEC R1	;YES - BACKUP
12268	044720	022737	000007	002314	INSIGN: CMP #7,STGTYP	;IS STRING TYPE UNSIGNED?
12269	044726	001003			BNE 1\$;BRANCH IF NO
12270	044730	052737	000017	002130	BIS #17,SIGN	;UNSIGNED PACKED STRING SIGN MUST (1111)
12271	044736	113711	002130	1\$:	MOVB SIGN,(R1)	;INSERT SIGN
12272	044742	000137	046112		JMP E1STG	
12273						
12274	044746				DSTYP4:	;DECIMAL STRING - USER DEFINED DIGIT STRING
12275	044746	032737	000002	002464	BIT #2,ZPM	;IS FORMED STRING TO BE PACKED OR ZONED
12276	044754	001002			BNE TYP4Z	;BRANCH IF ZONED
12277	044756	000137	045466		JMP TYP4P	
12278						
12279	044762				TYP4Z:	;ZONED
12280	044762	013701	002116		MOV STGLN,R1	;GET STRING DESC. TYPE FIELD
12281	044766	000301			SWAB R1	
12282	044770	006201			ASR R1	
12283	044772	006201			ASR R1	
12284	044774	006201			ASR R1	
12285	044776	006201			ASR R1	
12286	045000	042701	177770		BIC #177770,R1	
12287	045004	010137	002314		MOV R1,STGTYP	;SAVE TYPE

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12288	045010	042737	177740	002116	BIC #177740,STGLN	;STRIP TYPE OFF STRING LENGTH WORD
12289	045016	042737	010000	002112	BIC #10000,STGDS1	;STRIP OFF ALL BUT LENGTH
12290	045024	013701	002120		MOV STGAD,R1	;INSERTION IS DONE FROM LS TO MS DIGIT
12291	045030	063701	002116		ADD STGLN,R1	;FORM IN R1 ADDRESS WHERE FIRST BYTE IS TO BE INSERTED
12292	045034	010137	002442		MOV R1,ONEBEY	;SAVE PTR TO 1 BYTE BEYOND LS END OF STRING
12293	045040	013737	002114	002124	MOV STGDS2,SAVSA	;SAVE GIVEN STRING DESCRIPTOR WORDS
12294	045046	013737	002112	002122	MOV STGDS1,SAVSL	;
12295	045054	063737	002112	002114	ADD STGDS1,STGDS2	;FORM IN STGDS2 ADDRESS WHERE FIRST BYTE IS TO BE
12296						; TAKEN FROM
12297	045062	005337	002114		DEC STGDS2	
12298	045066	005737	001774		TST RANDTA	;USE RANDOM SIGN?
12299	045072	001403			BEQ 4\$	
12300	045074	004737	045326		JSR PC,GETSGN	;YES
12301	045100	000416			BR 5\$	
12302	045102	117737	135006	002130	4\$: MOVB @STGDS2,SIGN	
12303	045110	006237	002130		ASR SIGN	
12304	045114	006237	002130		ASR SIGN	
12305	045120	006237	002130		ASR SIGN	
12306	045124	006237	002130		ASR SIGN	
12307	045130	042737	177760	002130	BIC #177760,SIGN	
12308	045136	005737	002116	5\$:	TST STGLN	;STRING TO BE FORMED HAVE 0 LENGTH?
12309	045142	001002			BNE 1\$;BRANCH IF NO
12310	045144	000137	044472		JMP TFS	
12311	045150	005737	002116	1\$:	TST STGLN	;ENTIRE STRING BEEN INSERTED?
12312	045154	001432			BEQ WONGSGN	;BRANCH IF YES
12313	045156	005737	001774		TST RANDTA	;USE RANDOM DATA?
12314	045162	001404			BEQ 3\$;BRANCH IF NO
12315	045164	004737	046026		JSR PC,GRZDB	;GENERATE IN R0 A RANDOM ZONED DATA BYTE
12316	045170	110041			MOVB R0,-(R1)	;INSERT BYTE
12317	045172	000420			BR 2\$	
12318	045174	117741	134714	3\$:	MOVB @STGDS2,-(R1)	;INSERT NEXT BYTE
12319	045200	005337	002114		DEC STGDS2	;UPDATE POINTERS
12320	045204	005337	002112		DEC STGDS1	
12321	045210	001011			BNE 2\$;GIVEN STRING EXHAUSTED? BRANCH IF NO
12322	045212	013737	002122	002112	MOV SAVSL,STGDS1	;RESET POINTERS BACK TO BEGINNING OF GIVEN STRING
12323	045220	013737	002124	002114	MOV SAVSA,STGDS2	
12324	045226	063737	002112	002114	ADD STGDS1,STGDS2	
12325	045234	005337	002116	2\$:	DEC STGLN	;DECREMENT COUNT OF # OF DIGITS TO BE INSERTED
12326	045240	000743			BR 1\$;RETURN
12327	045242	013702	002314	WONGSGN:	MOV STGTYP,R2	;WORK ON INSERTING SIGN BYTE
12328	045246	006302			ASL R2	
12329	045250	062702	002422		ADD #PTYPTA,R2	
12330	045254	000172	000000		JMP @(R2)	
12331						
12332	045260			PTYPTO:		;FIX UP POINTERS TO ENABLE USE OF
12333						; TYP3Z ROUTINES.
12334	045260	013701	002442		MOV ONEBEY,R1	;GET LEAST SIGN DIGIT
12335	045264	114101			MOVB -(R1),R1	
12336	045266	042701	177760	PTO:	BIC #177760,R1	
12337	045272	010137	002312		MOV R1,STGDIG	;SAVE IN STGDIG
12338	045276	004737	045326		JSR PC,GETSGN	
12339	045302	013701	002442		MOV ONEBEY,R1	;SETUP R1 TO ONE BYTE BEYOND STRING
12340	045306	023727	002314	000002	CMP STGTYP,#2	
12341	045314	001402			BEQ 1\$	

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12342	045316	000137	044406			JMP TYPLO	
12343	045322	000137	044300	1\$:		JMP TYPTO	
12344							
12345	045326	005737	001774	GETSGN:		TST RANDTA	;USE RANDOM SIGN?
12346	045332	001415				BEQ 1\$;BRANCH IF NO
12347	045334	004737	064334			JSR PC,RN	;GET A RANDOM #
12348	045340	032700	000001			BIT #1,R0	;USE LEAST SIGN BIT TO PICK A SIGN
12349	045344	001404				BEQ 2\$	
12350	045346	012737	000007	002130		MOV #7,SIGN	;LS BIT = 1; MAKE SIGN NEG.
12351	045354	000417				BR 3\$	
12352	045356	012737	000003	002130	2\$:	MOV #3,SIGN	;LS BIT = 0;MAKE SIGN POS.
12353	045364	000413				BR 3\$	
12354	045366	013701	002442	1\$:		MOV ONEBEY,R1	;SUBROUTINE TO GET SIGN FROM INSERTED STRING
12355	045372	114101				MOVB -(R1),R1	
12356	045374	042701	177417			BIC #177417,R1	
12357	045400	006201				ASR R1	
12358	045402	006201				ASR R1	;RIGHT ADJUST
12359	045404	006201				ASR R1	
12360	045406	006201				ASR R1	
12361	045410	010137	002130			MOV R1,SIGN	;SAVE SIGN IN 'SIGN'
12362	045414	000207		3\$:		RTS PC	
12363							
12364	045416			PTYPSZ:			;INSERT SIGN TYPE SIGN
12365	045416	013701	002442			MOV ONEBEY,R1	
12366	045422	000137	044244			JMP TYPSZ	
12367							
12368	045426			PTYPLO:			;INSERT LEADING OVERPUNCH SIGN
12369	045426	117701	134466			MOVB @STGAD,R1	;GET MOST SIGN. DIGIT
12370	045432	000137	045266			JMP PTO	
12371							
12372	045436			PTYPTS:			;INSERT TRAILING SEPARATE SIGN
12373	045436	004737	045326			JSR PC,GETSGN	;GET SIGN TO INSERT
12374	045442	013701	002442			MOV ONEBEY,R1	
12375	045446	000137	044416			JMP TYPTS	
12376							
12377	045452			PTYPLS:			;INSERT LEADING SEPARATE SIGN
12378	045452	004737	045326			JSR PC,GETSGN	
12379	045456	013701	002442			MOV ONEBEY,R1	
12380	045462	000137	044462			JMP TYPLS	
12381							
12382	045466	013701	002116	TYP4P:		MOV STGLN,R1	;GET STRING DESC. TYPE FIELD
12383	045472	000301				SWAB R1	
12384	045474	006201				ASR R1	
12385	045476	006201				ASR R1	
12386	045500	006201				ASR R1	
12387	045502	006201				ASR R1	
12388	045504	042701	177770			BIC #177770,R1	
12389	045510	010137	002314			MOV R1,STGYP	;SAVE TYPE
12390	045514	042737	177740	002116		BIC #177740,STGLN	;STRIP TYPE OFF STRING LENGTH WORD
12391	045522	013737	002116	002126		MOV STGLN,SAVSGL	;PACKED - SAVE STRING LENGTH
12392	045530	006237	002116			ASR STGLN	;INSERTION IS DONE FROM LS TO MS DIGIT
12393	045534	013701	002116			MOV STGLN,R1	;FORM IN R1 ADDRESS WHERE 1ST BYTE IS TO BE INSERTED
12394	045540	063701	002120			ADD SIGAD,R1	
12395	045544	006237	002112			ASR STGDS1	

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12396	045550	013737	002112	002122	MOV STGDS1,SAVSL	
12397	045556	013737	002114	002124	MOV STGDS2,SAVSA	;SAVE GIVEN STRING DESCRIPTOR WORDS
12398	045564	063737	002112	002114	ADD STGDS1,STGDS2	;FORM IN STGDS2 ADDRESS WHERE 1ST BYTE
12399	045572	005201			INC R1	;IS TO BE TAKEN FROM
12400	045574	005737	002116		TST STGLN	;ENTIRE STRING BEEN INSERTED?
12401	045600	100432			BMI 3\$;BRANCH IF YES
12402	045602	005737	001774		TST RANDTA	;USE RANDOM DATA?
12403	045606	001404			BEQ 5\$;BRANCH IF NO
12404	045610	004737	046072		JSR PC,GRPDB	;GENERATE IN RO A RANDOM PACKED DATA BYTE
12405	045614	110041			MOVB R0,-(R1)	;INSERT BYTE
12406	045616	000420			BR 2\$	
12407	045620	117741	134270		MOVB @STGDS2,-(R1)	;INSERT NEXT BYTE
12408	045624	005337	002114		DEC STGDS2	
12409	045630	005337	002112		DEC STGDS1	;UPDATE POINTERS
12410	045634	002011			BGE 2\$;GIVEN STRING EXHAUSTED? BRANCH IF NO
12411	045636	013737	002122	002112	MOV SAVSL,STGDS1	;RESET POINTERS BACK TO BEGINNING OF GIVEN STRING
12412	045644	013737	002124	002114	MOV SAVSA,STGDS2	
12413	045652	063737	002112	002114	ADD STGDS1,STGDS2	
12414	045660	005337	002116		DEC STGLN	;DECREMENT COUNT OF # OF BYTES TO BE INSERTED
12415	045664	000743			BR 1\$	
12416	045666	032737	000001	002126	BIT #1,SAVSGL	;IS STRING LENGTH ODD?
12417	045674	001002			BNE 4\$;BRANCH IF YES - DONE
12418	045676	142721	000360		BICB #360,(R1)+	;ZERO NIBBLE IN MOST SIGN BYTE
12419	045702	013701	002126		MOV SAVSGL,R1	;CALCULATE SIGN ADDRESS
12420	045706	006201			ASR R1	
12421	045710	063701	002120		ADD STGAD,R1	
12422	045714	022737	000007	002314	CMP #7,STGTYP	;IS STRING TYPE UNSIGNED?
12423	045722	001431			BEQ 6\$;BRANCH IF YES
12424	045724	005737	001774		TST RANDTA	;USE RANDOM SIGN?
12425	045730	001470			BEQ EISTG	;BRANCH IF NO
12426	045732	142711	000017		BICB #17,(R1)	;CLEAR OUT FOR SIGN
12427	045736	004737	064334		JSR PC,RN	
12428	045742	032700	000001		BIT #1,R0	
12429	045746	001403			BEQ 7\$	
12430	045750	152711	000013		BISB #13,(R1)	;MAKE SIGN NEGATIVE
12431	045754	000456			BR EISTG	
12432	045756	032700	000002		BIT #2,R0	
12433	045762	001403			BEQ 10\$	
12434	045764	152711	000016		BISB #16,(R1)	;MAKE SIGN +
12435	045770	000450			BR EISTG	
12436	045772	032700	000004		BIT #4,R0	
12437	045776	001403			BEQ 6\$	
12438	046000	152711	000012		BISB #12,(R1)	;MAKE SIGN +
12439	046004	000442			BR EISTG	
12440	046006	152711	000017		BISB #17,(R1)	;OVERWRITE SIGN TO (1111)
12441	046012	000437			BR EISTG	
12442						
12443	046014				DSTYP5:	;DECIMAL STRING - RANDOM DATA & SIGN
12444	046014	012737	177777	001774	MOV #177777,RANDTA	;SET RANDOM DATA FLAG
12445	046022	000137	044746		JMP DSTYP4	;USE DSTYP4 ROUTINES.
12446						
12447	046026				GRZDB:	;SUBROUTINE TO GENERATE A RANDOM ZONED
12448						;DATA BYTE IN RO.
12449	046026	004737	064334		JSR PC,RN	;GET A RANDOM #.

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12450	046032	042700	177740	BIC #BS128,R0	;STRIP OFF ALL BUT LS NIBBLE
12451	046036	020027	000011	CMP R0,#11	;VALID NIBBLE = 0 TO 11.
12452	046042	101402		BLOS 1\$;BRANCH IF NIBBLE IS VALID
12453	046044	042700	000010	BIC #10,R0	;CONVERT INVALID NIBBLE TO A VALID ONE
12454	046050	010037	002000	1\$: MOV R0,RNIB	;SAVE NIBBLE
12455	046054	004737	064334	JSR PC,RN	;GET ANOTHER RANDOM #
12456	046060	043700	001772	BIC ZMSK,R0	;MASK OFF ALL BUT ZONE FIELD
12457	046064	053700	002000	BIS RNIB,R0	;OR - IN THE DECIMAL NIBBLE
12458	046070	000207		RTS PC	;RETURN WITH ZONED DATA BYTE IN R0
12459					
12460	046072			GRPDB:	;SUBROUTINE TO GENERATE A RANDOM PACKED
12461					;DATA BYTE IN R0.
12462	046072	004737	046026	JSR PC,GRZDB	;GET A RANDOM ZONED DATA BYTE
12463	046076	020027	000231	CMP R0,#231	;HIGH NIBBLE MUST BE <=9
12464	046102	101402		BLOS 1\$;BRANCH IF VALID
12465	046104	042700	000200	BIC #200,R0	;CONVERT TO VALID
12466	046110	000207		1\$: RTS PC	
12467	046112	000205		EISTG: RTS R5	
12468					

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12470	046114				FC10:		:FLOW COMMAND - 10 - COPY TEST BUFFER INTO
12471							: EMULATION BUFFER
12472	046114	032737	000100	050164		BIT #100,TINST	:THE IN-LINE TEST CASE ALWAYS FOLLOWS
12473							: THE SAME REGISTER TEST CASE - THEREFORE
12474							: THEIR IS NO NEED TO REEMULATE.
12475	046122	001010				BNE 2\$	
12476	046124	013701	001640			MOV TBADR,R1	:R1 POINTS TO START OF TEST BUFFER
12477	046130	013702	001646			MOV EBADR,R2	:R2 POINTS TO START OF EMULATION BUFFER
12478	046134	012122			1\$:	MOV (R1)+,(R2)+	:COPY NEXT WORD
12479	046136	023701	001760			CMP TBEND,R1	:COPY COMPLETE ?
12480	046142	003374				BGT 1\$:NO
12481	046144	000137	042414		2\$:	JMP FCRTN	:YES
12482							
12483	046150				FC11:		:FLOW COMMAND = 11 - SETUP EMULATION
12484							: OPERANDS IN ER0 - ER5 AND EMULATE
12485							: THE CIS INSTRUCTION UNDER TEST.
12486	046150	032737	000100	050164		BIT #100,TINST	:THE IN-LINE TEST CASE ALWAYS FOLLOWS THE SAME
12487							: REGISTER TEST CASE - THEREFORE THEIR IS NO
12488							: NEED TO REEMULATE.
12489	046156	001060				BNE FINEM	
12490	046160	013737	003634	003674		MOV TR0,ER0	:COPY ERN DIRECTLY FROM TRN
12491	046166	013737	003636	003676		MOV TR1,ER1	
12492	046174	013737	003640	003700		MOV TR2,ER2	
12493	046202	013737	003642	003702		MOV TR3,ER3	
12494	046210	013737	003644	003704		MOV TR4,ER4	
12495	046216	013737	003646	003706		MOV TR5,ER5	
12496	046224	013737	003650	003710		MOV TR6,ER6	
12497							
12498							:ADJUST ERN SPECIFIED IN FLOW TABLE ENTRY
12499							: TO ACCOUNT FOR EMULATION VERSUS TEST
12500							: BUFFER STARTING ADDRESS
12501	046232	004737	054134			JSR PC,RF1	:FORM POINTER TO FIRST TEST OPERAND TO
12502							: BE ADJUSTED.
12503	046236	020127	003634			CMP R1,#TRN	:ANY OPERANDS TO BE ADJUSTED?
12504	046242	001420				BEQ EC11	:BRANCH IF NO.
12505	046244	004737	046324			JSR PC,ADJEOP	:ADJUST OPERAND
12506	046250	004737	054166			JSR PC,RF2	:FORM POINTER TO SECOND TEST OPERAND TO
12507							: BE ADJUSTED.
12508	046254	020127	003634			CMP R1,#TRN	:IF R1 STILL POINTS TO #TRN THEN THERE
12509							: WAS ONLY ONE OPERAND TO BE ADJUSTED.
12510	046260	001411				BEQ EC11	:ADJUSTING COMPLETE
12511	046262	004737	046324			JSR PC,ADJEOP	:ADJUST NEXT EMULATION OPERAND
12512	046266	004737	054222			JSR PC,RF3	:FORM POINTER TO THIRD TEST OPERAND TO
12513							: BE ADJUSTED.
12514	046272	020127	003634			CMP R1,#TRN	:WAS THERE A THIRD OPERAND TO BE ADJUSTED?
12515	046276	001402				BEQ EC11	:NO - ADJUSTING COMPLETE
12516	046300	004737	046324			JSR PC,ADJEOP	:YES - ADJUST IT.
12517							
12518	046304				EC11:		:EMULATION OPERANDS ALL SET.
12519							:EMULATE CIS INST.
12520	046304	004737	017230			JSR PC,EMULATE	:CALL EMULATOR
12521	046310	000000			EINSTR: 0		:INSTRUCTION
12522	046312	003674			ERN		:POINTER TO REGISTER OPERANDS
12523	046314	003712			ERNR		:POINTER TO REGISTER RESULTS

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PDP-11 CIS INST EXERCISER          MACY11 27(655) 25-MAR-81 12:25 PAGE 94-1
^ZKEEC.P11 INITIALIZE THE COMMON TAGS
12524 046316 003730                ECCR                ; POINTER TO COND. CODE RESULTS
12525 046320 000137 042414        FINEM: JMP FCRTN
12526
12527 046324                ADJEOP:                ; SUBROUTINE TO UPDATE EMULATION OPERANDS
12528                                ; TO REFLECT EMULATION BUFFER STARTING ADDRESS.
12529 046324 162701 003634        SUB #TRN,R1
12530 046330 062701 003674        ADD #ERN,R1                ; POINT R1 TO EMULATION OPERAND RATHER THAN
12531                                ; TEST OPERAND.
12532 046334 163711 001640        SUB TBADR,(R1)            ; SUBTRACT OUT TEST BUFFER STARTING ADDRESS
12533 046340 063711 001646        ADD EBADR,(R)            ; ADD IN EMULATION BUFFER STARTING ADDRESS
12534 046344 000207                RTS PC
12535
12536 046346                FC12:                ; FLOW COMMAND = 12 - SETUP REGISTERS (OR INLINE POINTERS
12537                                ; AND COND CODES AND EXECUTE CIS INSTRUCTION.
12538                                ; SAVE RESULTS.
12539 046346 013737 003634 002240    MOV TR0,TTR0                ; SAVE TRNS IN TEMPORARY STORAGE
12540 046354 013737 003636 002242    MOV TR1,TTR1
12541 046362 013737 003640 002244    MOV TR2,TTR2
12542 046370 013737 003642 002246    MOV TR3,TTR3
12543 046376 013737 003644 002250    MOV TR4,TTR4
12544 046404 013737 003646 002252    MOV TR5,TTR5
12545 046412 032737 000100 050164    BIT #100,TINST                ; INST TYPE (REG OR IN-LINE)?
12546 046420 001014                BNE INLINE                ; BRANCH IF INLINE TYPE
12547 046422 023727 050164 076027    CMP TINST,#76027
12548 046430 001406                BEQ NONOP
12549 046432 023727 050164 076067    CMP TINST,#76067
12550 046440 001402                BEQ NONOP
12551 046442 000137 047276                JMP REGOP
12552 046446 000137 047342                JMP LTSTOP
12553 046452 004737 054146        NONOP: JSR PC,RF1X                ; GET # OF IN-LINE DESCRIPTOR POINTERS
12554 046456 006201                ASR R1
12555 046460 012702 000005        MOV #5,R2                ; CALCULATE BRANCH TO INSERT IMMEDIATELY
12556                                ; FOLLOWING IN LINE DESCRIPTORS.
12557 046464 160102                SUB R1,R2
12558 046466 062702 000400                ADD #400,R2
12559 046472 010237 001762                MOV R2,SBR                ; SAVE BRANCH INST
12560 046476 005002                CLR R2
12561 046500 013703 001640                MOV TBADR,R3
12562 046504 005701                2$: TST R1
12563 046506 001410                BEQ 1$                    ; BRANCH IF ALL IN-LINE PTRS HAVE BEEN INSERTED.
12564 046510 010362 050166                MOV R3,TINST+2(R2)        ; INSERT DESCRIPTOR POINTERS IN-LINE
12565 046514 005301                DEC R1                    ; UPDATE FOR NEXT IN-LINE PTR
12566 046516 062702 000002                ADD #2,R2
12567 046522 062703 000004                ADD #4,R3
12568 046526 000766                BR 2$                    ; RETURN TO WORK ON NEXT IN-LINE PTR.
12569 046530 012737 000001 002236 1$: MOV #1,NXFLD                ; INITIALIZE FIELD PTR TO SECOND FIELD
12570 046536 004737 054400                11$: JSR PC,RFN                ; GET NEXT FIELD CONTENTS.
12571 046542 020127 003634                CMP R1,#TRN                ; ALL OPERANDS INSERTED IN-LINE?
12572 046546 001407                BEQ 3$                    ; BRANCH IF YES
12573 046550 005337 001762                DEC SBR
12574 046554 011162 050166                MOV (R1),TINST+2(R2)        ; MOVE REGISTER OPERAND INTO IN-LINE LOC
12575 046560 062702 000002                ADD #2,R2                ; UPDATE TO NEXT IN-LINE LOC
12576 046564 000764                BR 11$                    ; RETURN TO WORK ON NEXT IN-LINE OPERAND
12577 046566 013762 001762 050166 3$: MOV SBR,TINST+2(R2)        ; INSERT BRANCH

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PDP-11 (IS INST EXERCISER          MACY11 27(655) 25-MAR-81 12:25 PAGE 94-2
CZKEEC.P11      INITIALIZE THE COMMON TAGS

12578 046574 012737 050166 002220      MOV #TINST+2,ICOMPC      ;SAVE BRANCH LOCATION FOR PC
12579 046602 060237 002220              ADD R2,ICOMPC           ;      CHECK ON IN-LINE INSTRUCTION COMPLETION
12580 046606 062702 000002              12$: ADD #2,R2           ;INSERT HALTS FOLLOWING BRANCH
12581 046612 022702 000014              CMP #14,R2
12582 046616 001404              BEQ 4$
12583 046620 013762 001672 050166      MOV KHALT,TINST+2(R2)
12584 046626 000767              BR 12$
12585
12586 046630 062737 000002 001746 4$: ADD #2,FLOPTR          ;LOOK AT NEXT FLOW COMMAND (-00)
12587 046636 013702 001640              MOV EBADR,R2           ;INITIALIZE POINTERS TO TEST & EMULATION BUFFERS
12588 046642 013703 001646              MOV EBADR,R3
12589 046646 005037 002236              CLR NXFLD              ;INITIALIZE FIELD PTR TO 1ST FIELD
12590 046652 004737 054400              41$: JSR PC,RFN          ;GET NEXT FIELD CONTENTS
12591 046656 020127 003634              CMP R1,#TRN           ;ALL BUFFER DESCRIPTORS FILLED?
12592 046662 001441              BEQ 5$                ;BRANCH IF YES
12593 046664 020127 003642              CMP R1,#TR3           ;FOR CVTLN & CVTLP THE MEMORY ORDER
12594 046670 001021              BNE 42$               ; OF THE LONG INTEGER LOW & HIGH
12595 046672 023727 050164 076157      CMP TINST,#76157      ; IS REVERSED FROM THE REGISTER ORDER
12596 046700 001404              BEQ 43$
12597 046702 023727 050164 076177      CMP TINST,#76177
12598 046710 001011              BNE 42$
12599 046712 011112              43$: MOV (R1),(R2)
12600 046714 011113              MOV (R1),(R3)
12601 046716 162701 000002              SUB #2,R1
12602 046722 011162 000002              MOV (R1),2(R2)
12603 046726 011163 000002              MOV (R1),2(R3)
12604 046732 000410              BR 44$
12605 046734 011162 000002              42$: MOV (R1),2(R2)          ;COPY BUFFER DESCRIPTORS FROM REGISTER
12606 046740 011163 000002              MOV (R1),2(R3)        ; DESCRIPTORS.
12607 046744 162701 000002              SUB #2,R1
12608 046750 011112              MOV (R1),(R2)
12609 046752 011113              MOV (R1),(R3)
12610 046754 062702 000004              44$: ADD #4,R2          ;UPDATE BUFFER DESCRIPTOR POINTERS
12611 046760 062703 000004              ADD #4,R3
12612 046764 000732              BR 41$                ;RETURN TO FILL NEXT DESCRIPTOR WORDS.
12613 046766 062737 000002 001746 5$: ADD #2,FLOPTR          ;LOOK AT NEXT FLOW COMMAND (-00)
12614 046774 005737 002276              TST RPTFLG            ;IS TEST BEING REPEATED??
12615 047000 001025              BNE 6$                ;BRANCH IF YES (DONT UPDATE EMUL BUFFER
12616                                ; DESCRIPTORS - THEY ARE ALREADY UP-TO-DATE).
12617 047002 013703 001646              MOV EBADR,R3          ;INITIALIZE POINTER TO EMULATION BUFFER.
12618 047006 005037 002236              CLR NXFLD             ;INITIALIZE FIELD PTR TO 1ST FIELD
12619 047012 004737 054300              51$: JSR PC,RFN          ;GET NEXT FIELD CONTENTS
12620 047016 005701              TST R1                ;ALL RESULT EMULATOR BUFFER DESCRIPTORS UPDATED?
12621 047020 001415              BEQ 6$                ;BRANCH IF YES
12622 047022 020127 000016              CMP R1,#16            ;DESCRIPTOR TO BE UPDATED?
12623 047026 001407              BEQ 52$               ;BRANCH IF NO
12624 047030 062701 003712              ADD #ERNR,R1          ;FORM POINTER INTO EMUL. RESULT STACK
12625 047034 011113              MOV (R1),(R3)         ;COPY EMUL. RESULT INTO BUFFER
12626 047036 162701 000002              SUB #2,R1
12627 047042 011163 000002              MOV (R1),2(R3)
12628 047046 062703 000004              52$: ADD #4,R3          ;UPDATE EMUL. BUFFER POINTER
12629 047052 000757              BR 51$                ;RETURN TO WORK ON NEXT EMUL. RESULT.
12630
12631

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PLD-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12-25 PAGE 94-3
CZKEEC.P11 INITIALIZE THE COMMON TAGS

12632 047054 013737 001720 003634 6$: MOV PAT0,TR0 ;INITIALIZE TRX'S TO #PATTERN
12633 047062 013737 001722 003636 MOV PAT1,TR1
12634 047070 013737 001724 003640 MOV PAT2,TR2
12635 047076 013737 001725 003642 MOV PAT3,TR3
12636 047104 013737 001730 003644 MOV PAT4,TR4
12637 047112 013737 001732 003646 MOV PAT5,TR5
12638
12639 047120 062737 000002 001746 7$: ADD #2,FLOPTR ;OVERWRITE WITH #PATTERN ALL ERNRS EXCEPT
12640 ; THOSE THAT CONTAIN A REGISTER RESULT.
12641 ;LOOK AT NEXT FLOW COMMAND (-00)
12642 047126 013737 003712 002256 MOV ER0R,TER0R ;COPY ERNRS INTO TEMP SPACE AT TERNR
12643 047134 013737 003714 002260 MOV ER1R,TER1R
12644 047142 013737 003716 002262 MOV ER2R,TER2R
12645 047150 013737 003720 002264 MOV ER3R,TER3R
12646 047156 013737 003722 002266 MOV ER4R,TER4R
12647 047164 013737 003724 002270 MOV ER5R,TER5R
12648
12649 047172 013737 001720 003712 8$: MOV PAT0,ER0R ;OVERWRITE ERNR STACK WITH # PATTERN
12650 047200 013737 001722 003714 MOV PAT1,ER1R
12651 047206 013737 001724 003716 MOV PAT2,ER2R
12652 047214 013737 001726 003720 MOV PAT3,ER3R
12653 047222 013737 001730 003722 MOV PAT4,ER4R
12654 047230 013737 001732 003724 MOV PAT5,ER5R
12655
12656 047236 005037 002236 9$: CLR NXFLD ;INITIALIZE FIELD PTR TO 1ST FIELD
12657 047242 004737 054300 91$: JSR PC,RFNX ;GET NEXT FIELD CONTENTS
12658 047246 020127 000016 CMP R1,#16 ;END OF REGISTER RESULT LIST?
12659 047252 001407 BEQ 10$ ;BRANCH IF YES
12660 047254 010102 MOV R1,R2
12661 047256 062701 003712 ADD #ERNR,R1
12662 047262 062702 002256 ADD #TER0R,R2
12663 047266 011211 MOV (R2),(R1) ;COPY REGISTER RESULT BACK INTO ERNR STACK
12664 ; FOR TEMPORARY STORAGE.
12665 047270 000764 BR 91$ ;RETURN TO WORK ON NEXT REGISTER RESULT.
12666 047272 000137 047342 10$: JMP LTSTOP
12667
12668 047276 013737 001674 050166 REGOP: MOV KBR5,TINST+2
12669 047304 013737 001672 050170 MOV KHALT,TINST+4
12670 047312 013737 001672 050172 MOV KHALT,TINST+6
12671 047320 013737 001672 050174 MOV KHALT,TINST+10
12672 047326 013737 001672 050176 MOV KHALT,TINST+12
12673 047334 013737 001672 050200 MOV KHALT,TINST+14
12674
12675 047342 010637 002234 LTSTOP: MOV SP,TSP ;SAVE STACK POINTER
12676 047346 022737 076026 050164 CMP #076026,TINST ;IS INST A L2D6?
12677 047354 001003 BNE 2$ ;BRANCH IF NO
12678 047356 013706 003650 3$: MOV TR6,SP ;LOAD DESC 6 INST - USE TR6 CONTENTS AS SP
12679 047362 000411 BR 1$
12680 047364 022737 076066 050164 2$: CMP #076066,TINST ;IS INST A L3D6?
12681 047372 001771 BEQ 3$ ;BRANCH IF YES
12682 047374 012737 120602 003726 MOV #CSTACK,ER6R
12683 047402 012706 120602 MOV #CSTACK,SP
12684 047406 010637 003650 1$: MOV SP,TR6 ;LOAD TR6 FOR INPUT REG DISPLAY
12685 047412 013737 003730 003652 MOV FCCR,TCC ;SETUP CONDITION CODES

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 94-4
 C/KFECC.P11 INITIALIZE THE COMMON TAGS

12686	047420	013701	050164			MOV TINST,R1	;IS INST A L2D OR L3D?
12687	047424	042701	000007			BIC #7,R1	
12688	047430	022701	076020			CMP #076020,R1	;IF YES SETUP CONDITION CODES=EXPECTED CODES.
12689	047434	001405				BEQ 4\$	
12690	047436	022701	076060			CMP #076060,R1	
12691	047442	001402				BEQ 4\$	
12692	047444	005137	003652			COM TCC	;OTHERWISE SETUP CC=COMPLEMENT OF EXPECTED CC.
12693	047450	004737	055252	4\$:		JSR PC,SELREG	;SELECT REGISTER SET AND SETUP CONTENTS OF
12694							; REGISTER SET NOT SELECTED.
12695	047454	012737	000240	050202		MOV #NOP,TINRET	;RESTORE NOP TO CIS INST RETURN POINT
12696	047462	004737	056446			JSR PC,SELMD	;SELECT MODE & I/D ENABLES; LOAD MMR3 TO
12697							; REFLECT D-SPACE ENABLE/DIS SELECTION
12698	047466	005737	002164			TST MODE	;TEST MODE - KERNEL?
12699	047472	001403				BEQ 17\$;BRANCH IF YES
12700	047474	012737	000000	050202		MOV #HALT,TINRET	;LOAD HALT AT INST UNDER TEST RETURN ADDRESS
12701							; (ALLOWS TRAPPING BACK TO KERNEL MODE
12702							; AFTER CIS INST EXECUTION).
12703	047502	005737	002162	17\$:		TST MMFLG	;IS MEMORY MGMT AVAILABLE?
12704	047506	001411				BEQ 8\$;BRANCH IF NO
12705	047510	004737	056672			JSR PC,SETPDR	;SETUP MEM MGMT PDR'S
12706							;NOTE: PAR'S ARE SETUP AT BEGINNING OF PROG
12707							; KERNEL,USER & SUPV SPACES ARE ALWAYS MAPPED
12708							; TO SAME PHYSICAL MEMORY)
12709	047514	012737	000240	050146		MOV #NOP,TOMM	;ALLOW MEMORY MANAGEMENT TURN ON
12710	047522	012737	000240	050212		MOV #NOP,TOFMM	;ALLOW MEMORY MANAGEMENT TURN OFF
12711	047530	000406				BR 9\$	
12712	047532	012737	000403	050146	8\$:	MOV #403,TOMM	;INHIBIT MEM MGMT TURN ON
12713	047540	012737	000402	050212		MOV #402,TOFMM	
12714	047546	013700	003637		9\$:	MOV TRO,RO	;LOAD TEST OPERANDS INTO REGISTERS
12715	047552	010037	002572			MOV RO,STATRO	;SAVE STATE OF CISP
12716	047556	013701	003636			MOV TR1,R1	
12717	047562	010137	002574			MOV R1,STATR1	
12718	047566	013702	003640			MOV TR2,R2	
12719	047572	010237	002576			MOV R2,STATR2	
12720	047576	013703	003642			MOV TR3,R3	
12721	047602	010337	002600			MOV R3,STATR3	
12722	047606	013704	003644			MOV TR4,R4	
12723	047612	010437	002602			MOV R4,STATR4	
12724	047616	013705	003646			MOV TR5,R5	
12725	047622	010537	002604			MOV R5,STATR5	
12726	047626	010637	002606			MOV SP,STATR6	
12727	047632	005737	002164			TST MODE	;IS MODE = KERNEL?
12728	047636	001003				BNF 5\$;BRANCH IF NO
12729	047640	162737	000006	002606		SUB #6,STATR6	;ADJUST SAVED STACK POINTER TO ACCOUNT FOR
12730							; INTERRUPT STACK PUSH (KERNEL = CIS INST STACK)
12731	047646	042737	177760	003652	5\$:	BIC #177760,TCC	;FORM PSW TO BE USED UPON ENTRY TO CIS INST
12732	047654	017737	132004	001756		MOV @TPSW,TSTPSW	
12733	047662	042737	170017	001756		BIC #170017,TSTPSW	
12734	047670	053737	003652	001756		BIS TCC,TSTPSW	
12735	047676	022737	000001	002164		CMP #1,MODE	;TEST MODE = SUPERVISOR?
12736	047704	001004				BNE 6\$;BRANCH IF NO
12737	047706	052737	040000	001756		BIS #040000,TSTPSW	;SET CURRENT MODE = SUPV IN TSTPSW
12738	047714	000407				BR 7\$	
12739	047716	022737	000003	002164	6\$:	CMP #3,MODE	;TEST MODE - USER?

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 94-5
CZKFE.C.P11 INITIALIZE THE COMMON TAGS

12740 047724 001015 BNE 10$ ;BRANCH IF NO
12741 047726 052737 140000 001756 BIS #140000,TSTPSW ;SET CURR MODE USER IN TSTPSW
12742 047734 013777 001756 131722 7$: MOV TSTPSW,@TSPW ;MODE = USER + SUPV; SWITCH TO TEST MODE
12743 047742 013706 002606 MOV STATR6,SP ;SETUP TEST MODE R6
12744 047746 042777 140000 131710 BIC #140000,@TSPW ;SWITCH BACK TO KERNEL
12745 047754 013706 002234 MOV TSP,SP ;SETUP KERNEL MODE R6
12746 047760 013737 001756 002570 10$: MOV TSTPSW,STATPS
12747 047766 005037 002552 CLR INTCT ;CLEAR INTERRUPT COUNT
12748 047772 042737 040000 002136 BIC #40000,FATAL ;CLEAR INTERRUPT INDICATOR IN FATAL ERROR WORD
12749 050000 005037 002544 CLR PROGCT ;CLEAR PROGRESS COUNT
12750 050004 022777 000001 131724 CMP #1,@SWR ;CHECK FOR REQUEST TO STOP ON A TEST
12751 050012 001027 BNE TOLTC ;DON'T STOP
12752 050014 005737 002222 TST STOPTF ;HAS TEST BEEN ENTERED?
12753 050020 001015 BNE 11$ ;BRANCH IF YES
12754 050022 012737 177777 002222 MOV #177777,STOPTF ;SFT FLAG TO INDICATE THAT TEST HAS BEEN ENTERED
12755 050030 010046 MOV R0,-(SP) ;SAVE R0 - PRINT CALL DESTROYS IT
12756 050032 PRINTB #ASKST ;ASK USER FOR TEST # TO STOP ON
(6) 050032 012746 013040 MOV #ASKST,-(SP)
(3) 050036 010600 MOV SP,R0
(4) 050040 004737 066232 JSR PC,FPRINT
12757 050044 012600 MOV (SP)+,R0 ;RESTORE R0
12758 050046 104404 RDDEC ;READ DECIMAL #
12759 050050 012637 002224 MOV (SP)+,STOPT ;SAVE STOP TEST #
12760 050054 023737 002224 001420 11$: CMP STOPT,TOTTC ;IS CURRENT TEST - STOP TEST
12761 050062 001003 BNE TOLTC ;BRANCH IF NO
12762 050064 012737 177777 002046 MOV #177777,NOERDS ;SET FLAGS TO CAUSE CURRENT TEST TO BE
12763 ;DISPLAYED AND USER TO BE QUERIED FOR FURTHER ACTION.
12764 050072 000414 TOLTC: BR TOPC2 ;OVERWRITTEN WITH A NOP IF LTC IS USED FOR
12765 ; INTERRUPT TESTING
12766 050074 013737 003034 003036 MOV LCNT,VLCNT ;RESET LTC COUNTER
12767 050102 004737 063074 JSR PC,LTC SUP ;SYNC UP TO LTC
12768 050106 052777 000100 132716 BIS #100,@CLKS ;ENABLE LTC INTR
12769 050114 005337 003036 1$: DEC VLCNT ;KILL MOST OF TIME BEFORE EXPECTED
12770 ; INTERRUPT
12771 050120 001375 BNE 1$
12772 050122 000410 BR PREINS
12773 050124 TOPC2:
12775 050124 000403 BR TOPC1 ;OVERWRITTEN WITH A NOP IF LATENCY IS BEING TESTED
12776 050126 052777 000001 132400 BIS #001,@PC2CSR ;TURN ON P-CLK2
12777 050134 000403 TOPC1: BR PREINS ;OVERWRITTEN WITH A NOP IF INTERRUPTABILITY IS B
12778 050136 052777 000101 132360 BIS #101,@PC1CSR ;TURN ON P-CLK1
12780 050144 000240 PREINS: NOP ;REPLACED WITH A HALT IF OPERATOR REQUESTED
12781 ; 'HALT AT CIS INST'.
12782 050146 000403 TOMM: BR GO ;OVERWRITTEN WITH A NOP IF MEM MGMT TEST STATE ON
12783 050150 052737 000001 177572 BIS #1,@MMR0 ;TURN ON MEMORY MGMT
12784 050156 013777 001756 131500 GO: MOV TSTPSW,@TSPW ;SET PSW TO DESIRED STATE (PRIOR TO THIS MODE=KERNEL)
12785 050164 000000 TINST: .WORD 0 ;EXECUTE CIS INST UNDER TEST.
12786 050166 000405 BR TINRET
12787 050170 000000 HALT
12788 050172 000000 HALT ;IF PROGRAM STOPS AT ANY ONE OF THESE HALTS,
12789 050174 000000 HALT ; THEN THE CIS INSTRUCTION EXECUTION
12790 050176 000000 HALT ; RETURNED WITH INCORRECT PC.
12791 050200 000000 HALT
12792 050202 000240 TINRET: NOP ;OVERWRITTEN WITH A HALT IF MODE = USER OR SUPV

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 94-9
CZKEEC.P11 INITIALIZE THE COMMON TAGS

12948 051216 001020 BNE CISERR
12949 051220 005737 002152 TST ERRREG
12950 051224 001015 BNE CISERR
12951 051226 005737 002154 TST ERRBUF
12952 051232 001012 BNE CISERR
12953 051234 005737 002156 TST ERRSTK
12954 051240 001007 BNE CISERR
12955 051242 005037 002276 CLR RPTFLG ;CLEAR THE REPEAT TEST FLAG
12956 051246 005737 002046 TST NOERDS ;DISPLAY EVEN THOUGH THERE WAS NO ERROR?
12957 051252 001017 BNE NOER ;BRANCH IF YES
12958 051254 000137 051560 JMP SWOPC
12959
12960 051260 CISERR:
12961 051260 005237 002060 INC ERRCT ;INCREMENT ERROR COUNT
12962 051264 005037 002210 CLR QRYFLG ;ASSURE PRINTOUT ON ERROR
12963 051270 012737 000001 001114 MOV #1,$MSGTY ;SET APT MESSAGE TYPE TO 1
12964 051276 013737 002136 001116 MOV FATAL,$FATAL ;SET APT FATAL ERROR WORD
12965 051304 012737 177777 002062 MOV #177777,ERRS ;SET ERROR INDICATOR
12966 051312
12968 051312 005737 001764 NOER:
12969 051316 001413 TST RANDOM ;IN RANDOM MODE ?
12970 051320 BEQ 40$ ;BRANCH IF NO
PRINTB #FORM36,STRNC,STRP1,STRP2 ;PRINT 3 SEED CONSTANTS
(9) 051320 013746 002006 MOV STRP2,-(SP)
(8) 051324 013746 002004 MOV STRP1,-(SP)
(7) 051330 013746 002002 MOV STRNC,-(SP)
(6) 051334 012746 014400 MOV #FORM36,-(SP)
(3) 051340 010600 MOV SP,RO
(4) 051342 004737 066232 JSR PC,FPRINT
12972 051346 013737 002240 003634 40$: MOV TTR0,TRO ;RESTORE TRN'S - NECESSARY IN CASE OPERATOR
12973 051354 013737 002242 003636 MOV TTR1,TR1 ; REQUESTS THE REPEAT OF AN IN-LINE TEST CONDITION.
12974 051362 013737 002244 003640 MOV TTR2,TR2
12975 051370 013737 002246 003642 MOV TTR3,TR3
12976 051376 013737 002250 003644 MOV TTR4,TR4
12977 051404 013737 002252 003646 MOV TTR5,TR5
12978 051412 005737 002062 TST ERRS ;ERROR INDICATOR SET?
12979 051416 001410 BEQ 1$ ;BRANCH IF NO
12980 051420 PRINTB #FORM37,ERRCT ;PRINT 'ERROR # XXXXXX'
(7) 051420 013746 002060 MOV ERRCT,-(SP)
(6) 051424 012746 014462 MOV #FORM37,-(SP)
(3) 051430 010600 MOV SP,RO
(4) 051432 004737 066232 JSR PC,FPRINT
12981 051436 000405 BR 2$
12982 051440 1$: PRINTB #SDASH ;PRINT DASHES
(6) 051440 012746 016663 MOV #SDASH,-(SP)
(3) 051444 010600 MOV SP,RO
(4) 051446 004737 066232 JSR PC,FPRINT
12983 051452 2$: PRINTB #DASH
(6) 051452 012746 016563 MOV #DASH,-(SP)
(3) 051456 010600 MOV SP,RO
(4) 051460 004737 066232 JSR PC,FPRINT
12984 051464 004737 064430 JSR PC,INSERR
12985 051470 000137 042024 JMP RTC ;REPEAT TEST RETURN
12986 051474 000137 051560 JMP SWOPC ;NORMAL RETURN
12987 051500 005737 002100 TST FSRUN ;RESTART RETURN

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PDP-11 CIS INST EXERCISER          MACY11 27(655) 25-MAR-81 12:25 PAGE 94-10
CZKEEC.P11      INITIALIZE THE COMMON TAGS

12988
12989 051504 001402                BEQ 3$                ;FIELD SERVICE OR DESIGN VERIF TYPE RUN?
12991 051506 000137 037066        JMP START              ;BRANCH IF DESIGN VERIF TYPE RUN
12996 051512 000137 037276        3$: JMP DVTST          ;RESTART FIELD SERVICE TYPE RUN
12997                                     ;RESTART DESIGN VERIF TYPE RUN
12998
12999
13000 051516                        ADJR: .EVEN          ;SUBROUTINE TO SUBTRACT OUT BUFFER STARTING
13001                                     ; ADDRESSES FROM SPECIFIED TEST AND EMULATION
13002                                     ; RESULTS.
13003 051516 162701 003634          SUB #TRN,R1
13004 051522 062701 003654          ADD #TRNR,R1
13005 051526 163711 001640          SUB TBADR,(R1)        ;SUBTRACT OUT TEST BUFFER STARTING ADDRESS
13006                                     ; FROM TEST OPERAND
13007 051532 032737 000100 050164  BIT #100,TINST        ;NOTE: FOR INLINE CASE THE EMULATION STEP WAS
13008                                     ; SKIPPED. THEREFORE DONT 'RE' ADJUST
13009                                     ; EMULATION OPERANDS.
13010 051540 001006
13011 051542 162701 003654          SUB #TRNR,R1          ;POINT R1 TO EMULATION OPERAND RATHER THAT
13012 051546 062701 003712          ADD #ERNR,R1          ; TEST OPERAND.
13013 051552 163711 001646          SUB EBADR,(R1)        ;SUBTRACT OUT EMULATION BUFFER STARTING
13014                                     ; ADDRESS FROM EMULATION OPERAND.
13015 051556 000207                1$: RTS PC
13016
13017
13018
13019 051560                        FC14:              ;FLOW COMMAND - 14 - UPDATE POINTERS
13020                                     ; FOR NEXT TEST CONDITION.
13021 051560                        SWOPC:
13022 051560 013701 050164          MOV TINST,R1          ;IS INST = L2D OR L3D ??
13023 051564 042701 000007          BIC #7,R1
13024 051570 022701 076020          CMP #076020,R1
13025 051574 001437                BEQ 1$                ;BRANCH IF YES (NO INLINE CASE)
13026 051576 022701 076060          CMP #076060,R1
13027 051602 001434                BEQ 1$
13028 051604 032737 140000 002144  BIT #140000,SPHAND   ;SKIP INLINE AND ADDITIONAL DATA TYPE TESTING
13029 051612 001030                BNE 1$                ;BRANCH IF YES
13030 051614 005737 001764          TST RANDOM            ;RANDOM EXERCISE MODE?
13031 051620 001027                BNE 2$                ;BRANCH IF YES
13032                                     ; NOTE: IN RANDOM EXERCISE MODE DATA TYPES ARE
13033                                     ; SELECTED RANDOMLY FOR EACH TEST CONDITION.
13034 051622 005737 002444          TST DECINS            ;DECIMAL INST?
13035 051626 001424                BEQ 2$                ;BRANCH IF NO
13036 051630 032737 000100 050164  BIT #100,TINST        ;INLINE INST JUST TESTED
13037 051636 001020                BNE 2$                ;BRANCH IF YES
13038 051640 023727 002464 000001  CMP ZPM,#1            ;IS INST ZONED ,PACKED, OR MIXED?
13039 051646 001420                BEQ PACKED            ;BRANCH IF PACKED
13040 051650 023727 002464 000002  CMP ZPM,#2
13041 051656 001536                BEQ ZONED              ;BRANCH IF ZONED
13042 051660 023727 002464 000003  CMP ZPM,#3
13043 051666 001406                BEQ 3$                ;BRANCH IF MIXED ZONED PACKED
13044 051670 000137 052530          JMP MIXDPZ            ;MIXED PACKED ZONED
13045 051674 000137 053122          1$: JMP NXTTC
13046 051700 000137 053046          2$: JMP CFINL

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PDP-11 C15 INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 94-11
CZKEEC.P11 INITIALIZE THE COMMON TAGS

13047 051704 000137 052674 3$: JMP MIXDZP
13048
13049 051710 032737 000001 002460 PACKED: BIT #1,PKPTW ;SET STRING 1 DESC TYPE BASED ON BIT 0
13050 051716 001004 BNE 1$ ; CONTENTS OF PKPTW
13051 051720 012737 000006 002446 MOV #6,S1TYPE
13052 051726 000403 BR 2$
13053 051730 012737 000007 002446 1$: MOV #7,S1TYPE
13054
13055 051736 032737 000002 002460 2$: BIT #2,PKPTW ;SET STRING 2 DESC TYPE BASED ON
13056 051744 001004 BNE 3$ ; BIT 1 CONTENTS OF PKPTW
13057 051746 012737 000006 002450 MOV #6,S2TYPE
13058 051754 000403 BR 4$
13059 051756 012737 000007 002450 3$: MOV #7,S2TYPE
13060
13061 051764 032737 000004 002460 4$: BIT #4,PKPTW ;SET STRING 3 DESC TYPE BASED
13062 051772 001004 BNE 5$ ; BIT 2 CONTENTS OF PKPTW
13063 051774 012737 000006 002452 MOV #6,S3TYPE
13064 052002 000403 BR 6$
13065 052004 012737 000007 002452 5$: MOV #7,S3TYPE
13066
13067 052012 005737 002456 6$: TST MIXTYP ;MIX TYPES WITHIN INSTRUCTION?
13068 052016 001011 BNE 61$ ;BRANCH IF YES
13069 052020 005137 002460 COM PKPTW ;NO-SWITCH ALL DESC FROM SIGNED
13070 ; TO UNSIGNED (OR VICE VERSA)
13071 052024 005737 002460 TST PKPTW ;ALL TYPES TESTED?
13072 052030 001002 BNE 60$ ;BRANCH IF NO
13073 052032 000137 053046 JMP CFINL ;EXIT TO IN LINE TESTING
13074 052036 000137 052150 60$: JMP TYPSET
13075 052042 005237 002460 61$: INC PKPTW ;CHANGE TO NEXT MIXED CASE
13076 052046 023727 002462 000001 CMP NDESC,#1 ;IS THERE ONLY 1 DESC FOR THIS INST?
13077 052054 001010 BNE 7$ ;BRANCH IF NO
13078 052056 032737 000002 002460 BIT #2,PKPTW ;ALL TYPE MIXTURES TESTED?
13079 052064 001431 62$: BEQ TYPSET ;BRANCH IF NO
13080 052066 005037 002460 CLR PKPTW ;CLEANUP FOR NEXT TEST CONDITION
13081 052072 000137 053046 JMP CFINL ;EXIT TO TEST IN-LINE INST.
13082
13083 052076 023727 002462 000002 7$: CMP NDESC,#2 ;ARE THERE 2 DESC. FOR THIS INST?
13084 052104 001004 BNE 8$ ;BRANCH IF NO
13085 052106 032737 000004 002460 BIT #4,PKPTW ;ALL TYPE MIXTURES TESTED?
13086 052114 000763 BR 62$
13087
13088 052116 023727 002462 000003 8$: CMP NDESC,#3 ;ARE THERE 3 DESC FOR THIS INST?
13089 052124 001404 BEQ 81$
13090 052126 012737 000001 001114 MOV #1,$MSGTY ;TELL APT THERE IS A FATAL ERROR ;:REV-C
13091 052134 000000 HALT ;# OF DESCRIPTORS FOR INST UNDER TEST
13092 ; DOES NOT MAKE SENSE.
13093 052136 032737 000010 002460 81$: BIT #10,PKPTW
13094 052144 000137 052064 JMP 62$
13095
13096 052150 000137 041746 TYPSET: JMP NTCTS ;REPEAT TEST CONDITION WITH A DIFFERENT
13097 ; DATA TYPE.
13098
13099
13100 052154 005737 002456 ZONED: TST MIXTYP ;MIX DATA TYPES WITHIN INST??

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PDP-11 CIS INST EXERCISER          MACY11 27(655) 25-MAR-81 12:25 PAGE 94-12
CZKEEC.P11      INITIALIZE THE COMMON TAGS

13101 052160 001003                BNE 1$                ;BRANCH IF YES
13102 052162 062737 000110 002460  ADD #110,PKPTW
13103 052170 005237 002460          1$: INC PKPTW
13104 052174 013701 002460          11$: MOV PKPTW,R1        ;SET STRING 1 DESC TYPE FROM
13105 052200 042701 177770          BIC #177770,R1       ; BITS 0,1,2 OF PKPTW
13106 052204 010137 002446          MOV R1,S1TYPE
13107
13108 052210 013701 002460          MOV PKPTW,R1        ;SET STRING 2 DESC TYPE FROM
13109 052214 042701 177707          BIC #177707,R1       ; BITS 3,4,5 OF PKPTW.
13110 052220 006201
13111 052222 006201
13112 052224 006201
13113 052226 010137 002450          MOV R1,S2TYPE
13114
13115 052232 013701 002460          MOV PKPTW,R1        ;SET STRING 3 DESC TYPE FROM
13116 052236 042701 177077          BIC #177077,R1       ; BITS 6,7,8 OF PKPTW.
13117 052242 006301
13118 052244 006301
13119 052246 000301
13120 052250 010137 002452          MOV R1,S3TYPE
13121
13122 052254 005737 002456          TST MIXTYP          ;MIX TYPES WITHIN INST?
13123 052260 001016                BNE 61$              ;BRANCH IF YES
13124 052262 023727 002460 000666  CMP PKPTW,#666      ;ALL TYPES TESTED?
13125 052270 001327                BNE TYPSET          ;BRANCH IF NO
13126 052272 005037 002460          2$: CLR PKPTW
13127 052276 005037 002446          12$: CLR S1TYPE
13128 052302 005037 002450          CLR S2TYPE
13129 052306 005037 002452          CLR S3TYPE
13130 052312 000137 053046          JMP CFINL           ;EXIT TO TEST IN-LINE INST
13131
13132 052316 023727 002462 000001 61$: CMP NDESC,#1        ;IS THERE ONLY 1 DESC FOR THIS INST
13133 052324 001007                BNE 7$              ;BRANCH IF NO
13134 052326 013701 002460          MOV PKPTW,R1
13135 052332 042701 177770          BIC #177770,R1
13136 052336 020127 000006          CMP R1,#6           ;ALL TYPES TESTED?
13137 052342 000752                BR 2$
13138
13139 052344 023727 002462 000002 7$: CMP NDESC,#2        ;ARE THERE 2 DESC FOR THIS INST?
13140 052352 001022                BNE 8$              ;BRANCH IF NO
13141 052354 013701 002460          MOV PKPTW,R1
13142 052360 042701 177770          BIC #177770,R1
13143 052364 020127 000006          CMP R1,#6
13144 052370 001267                BNE TYPSET
13145 052372 062737 000002 002460  ADD #2,PKPTW
13146 052400 013701 002460          MOV PKPTW,R1
13147 052404 042701 177707          BIC #177707,R1
13148 052410 020127 000060          CMP R1,#60         ;ALL TYPE MIXTURES TESTED?
13149 052414 001267                BNE 11$
13150 052416 000725                BR 12$
13151
13152 052420 023727 002462 000003 8$: CMP NDESC,#3        ;ARE THERE 3 DESC FOR THIS INST?
13153 052426 001404                BEQ 81$             ;BRANCH IF YES
13154 052430 012737 000001 001114  MOV #1,$MSGTY       ;TELL APT THERE IS A FATAL ERROR

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 94-14
 CZKEEC.P11 INITIALIZE THE COMMON TAGS

13209	052722	001003				BNE 1\$	
13210	052724	062737	000002	002460		ADD #2,PKPTW	
13211	052732	013701	002460		1\$:	MOV PKPTW,R1	;SET STRING 1 DESC TYPE FROM
13212	052736	042701	177770			BIC #177770,R1	; BITS 0,1,2 OF PKPTW
13213	052742	010137	002446			MOV R1,S1TYPE	
13214							
13215	052746	013701	002460			MOV PKPTW,R1	;SET STRING 2 DESC TYPE FROM
13216	052752	042701	177707			BIC #177707,R1	; BITS 3,4,5 OF PKPTW
13217	052756	006201				ASR R1	
13218	052760	006201				ASR R1	
13219	052762	006201				ASR R1	
13220	052764	010137	002450			MOV R1,S2TYPE	
13221	052770	005737	002456			TST MIXTYP	;MIX TYPES WITHIN INST
13222	052774	001016				BNE 61\$;BRANCH IF YES
13223	052776	023727	002460	000066		CMP PKPTW,#66	;ALL TYPES TESTED?
13224	053004	001016			60\$:	BNE 62\$;BRANCH IF NO
13225	053006	012737	000060	002460		MOV #60,PKPTW	
13226	053014	005037	002446			CLR S1TYPE	
13227	053020	012737	000006	002450		MOV #6,S2TYPE	
13228	053026	000137	053046			JMP CFINL	;EXIT TO TEST IN-LINE INST
13229							
13230	053032	022737	000100	002460	61\$:	CMP #100,PKPTW	
13231	053040	000761				BR 60\$	
13232	053042	000137	052150		62\$:	JMP TYPSET	
13233							
13234	053046	032737	000100	050164	CFINL:	BIT #100,TINST	;INST TYPE (REG OR IN-LINE)?
13235	053054	001022				BNE NXTTC	;BRANCH IF IN-LINE TYPE
13236	053056	005737	001764			TST RANDOM	;RANDOM EXERCISE MODE?
13237	053062	001407				BEQ 1\$;BRANCH IF NO
13238	053064	004737	064334			JSR PC,RN	;GET A RANDOM #
13239	053070	042700	177770			BIC #177770,R0	;LOOK AT 3 LEAST SIGN BITS
13240	053074	020027	000003			CMP R0,#3	;IF THEY ARE = TO 3 (ARBITRARY CONSTANT) THEN DO IN-LINE
13241	053100	001010				BNE NXTTC	
13242	053102	052737	000100	050164	1\$:	BIS #100,TINST	;SWITCH REG OP-CODE AT TINST TO IN-LINE OP-CODE.
13243	053110	052737	000100	002136		BIS #100,FATAL	;SET IN-LINE FIELD IN FATAL ERROR INDICATOR WORD
13244	053116	000137	041470			JMP NTC	;REPEAT TEST CONDITION WITH IN-LINE OPCODE.
13245	053122	042737	000100	050164	NXTTC:	BIC #100,TINST	
13246	053130	042737	000100	002136		BIC #100,FATAL	;CLR IN-LINE FIELD IN FATAL ERROR INDICATOR
13247	053136	005737	042176			TST MTYPE	;IF TYPE = 0 THEN READY FOR NEXT INPUT TABLE ENTRY
13248	053142	001402				BEQ 1\$;BRANCH IF TYPE NOT = 0
13249	053144	000137	053442			JMP RFNITE	
13250	053150	013737	001656	002132	1\$:	MOV IPNU,VIP	;SETUP A POINTER TO LAST PARAMETER IN
13251	053156	063737	001656	002132		ADD IPNU,VIP	; INPUT TABLE ENTRY.
13252	053164	013703	002132		UPTP:	MOV VIP,R3	
13253	053170	062703	001566			ADD #PTP,R3	;R3 POINTS TO PARAMETER TABLE POINTER
13254	053174	013701	002140			MOV INPTP,R1	
13255	053200	063701	002132			ADD VIP,R1	
13256	053204	062701	000002			ADD #2,R1	
13257	053210	005711				TST (R1)	; (R1) POINTS TO 1ST ENTRY IN PARAMETER TABLE
13258	053212	001464				BEQ TNXP	
13259	053214	017137	000000	002134		MOV @ (R1),PTW1	;PTW1 CONTAINS TYPE,SIZE, AND # OF ENTRIES
13260							; IN PARAMETER TABLE
13261	053222	042737	177400	002134		BIC #177400,PTW1	;STRIP OFF TYPE AND ENTRY SIZE
13262	053230	122737	000001	002134		CMPB #1,PTW1	;# OF ENTRIES = 1?

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 94-15
 (ZKEEC.P11 INITIALIZE THE COMMON TAGS

13263	053236	001452			BEQ TNXP		;YES - NO UPDATING. TRY NEXT PARAMETER
13264	053240	005737	002134		TST PTW1		;# OF ENTRIES = 0?
13265	053244	001447			BEQ TNXP		;YES - NO UPDATING. TRY NEXT PARAMETER
13266	053246	017102	000000		MOV @(R1),R2		;PARAMETER TABLE CONTAINS MORE THAN 1 ENTRY.
13267	053252	042702	037777		BIC #037777,R2		;LOOK AT ENTRY TYPE
13268	053256	005702			TST R2		
13269	053260	001401			BEQ FLE		;FIXED LENGTH ENTRIES
13270	053262	000447			BR VLE		;VARIABLE LENGTH ENTRIES
13271							
13272	053264				FLE:		;PARAMETER TABLE CONTAINS FIXED
13273							; LENGTH ENTRIES.
13274	053264	017137	000000	002134	MOV @(R1),PTW1		
13275	053272	000337	002134		SWAB PTW1		
13276	053276	113704	002134		MOVB PTW1,R4		;LOAD R4 WITH ENTRY SIZE IN WORDS
13277	053302	006304			ASL R4		;CONVERT SIZE IN WORDS TO BYTES
13278	053304	005002			CLR R2		
13279	053306	000337	002134		SWAB PTW1		
13280	053312	042737	177400	002134	BIC #177400,PTW1		;PTW1 CONTAINS # OF ENTRIES IN
13281							; PARAMETER TABLE.
13282	053320	005337	002134	1\$:	DEC PTW1		; CALCULATE SIZE OF PARAMETER TABLE
13283	053324	005737	002134		TST PTW1		; SIZE = ENTRY SIZE X # OF ENTRIES
13284	053330	001402			BEQ GPTE SZ		;CALCULATION COMPLETE - R2 CONTAINS SIZE
13285							; OF PARAMETER TABLE (MINUS 1 ENTRY)
13286	053332	060402			ADD R4,R2		
13287	053334	000771			BR 1\$		
13288							
13289	053336				GPTE SZ:		
13290	053336	061102			ADD (R1),R2		;UPDATE R2 TO CONTAIN ADDRESS OF
13291	053340	062702	000002		ADD #2,R2		; LAST ENTRY IN PARAMETER TABLE
13292	053344	021302			CMP (R3),R2		
13293	053346	001403			BEQ RESPTP		;CURRENT PTP POINTS TO LAST ENTRY IN
13294							; PARAMETER TABLE. RESET TO 1ST ENTRY
13295	053350	060413			ADD R4,(R3)		;STILL MORE ENTRIES TO TRY IN PARAMETER
13296							; TABLE. UPDATE PTP TO NEXT ENTRY.
13297	053352	000137	041470		JMP NTC		;TRY NEXT TEST CONDITON FOR SAME CIS INST.
13298							
13299	053356				RESPTP:		;RESET PTP BACK TO 1ST ENTRY IN TABLE
13300	053356	011113			MOV (R1),(R3)		
13301	053360	062713	000002		ADD #2,(R3)		
13302	053364	162737	000002	002132	TNXP: SUB #2,VIP		;BACKUP TO NEXT PARAMETER TABLE POINTER
13303							; AND UPDATE IT.
13304	053372	005737	002132		TST VIP		
13305	053376	001421			BEQ RFNITE		;ALL TEST CONDITIONS ASSOCIATED WITH CURRENT
13306							; INPUT TABLE ENTRY EXERCISED.
13307	053400	000671			BR UPTP		
13308							
13309	053402				VLE:		;PARAMETER TABLE CONTAINS VARIABLE LENGTH ENTRIES
13310	053402	113704	002134		MOVB PTW1,R4		;R4 CONTAINS # OF ENTRIES IN PARAMETER TABLE
13311	053406	005304			DEC R4		;DETERMINE ADDRESS OF LAST ENTRY IN PARAMETER TABLE
13312	053410	011102			MOV (R1),R2		;R2 POINTS TO 1ST WORD IN PARAMETER TABLE
13313	053412	005722		1\$:	TST (R2)+		;SEARCH FOR 0 WORDS
13314	053414	001376			BNE 1\$		
13315	053416	005304			DEC R4		;AT LAST ENTRY YET?
13316	053420	001374			BNE 1\$;NO

POP-11 LIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 94-16
ZFECC.P11 INITIALIZE THE COMMON TAGS

13317 053422 021302
13318 053424 001754
13319 053426 011304
13320 053430 005724
13321 053432 001376
13322 053434 010413
13323 053436 000137 041470
13324
13325

2\$:

CMP (R3),R2
BEQ RESPTP
MOV (R3),R4
TST (R4)+
BNE 2\$
MOV R4,(R3)
JMP NTC

;YES - IS CURRENT PTP POINTING TO LAST ENTRY?
;YES - RESET PTP TO 1ST ENTRY
;NO - UPDATE PTP TO NEXT ENTRY.

;TRY NEXT TEST CONDITION FOR SAME INPUT
; TABLE ENTRY.


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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 95-1
CZKEEC.P11 INITIALIZE THE COMMON TAGS

13405 053702 000137 C37066 JMP START
13407 053706 HERE:
13409 053706 005737 002100 TST FSRUN ;NORMAL FIELD SERVICE RUN?
13410 053712 001445 BEQ NFS ;BRANCH IF NO
13411 053714 005737 002212 TST QVMODE ;RUNNING IN QV MODE
13412 053720 001411 BEQ 1$ ;BRANCH IF NO
13413 053722 005737 001754 TST N200M ;PROG STARTED AT LOC 200?
13414 053726 001404 BEQ 2$ ;BRANCH IF NO
13415 053730 005037 002212 CLR QVMODE
13416 053734 000137 037456 JMP COMST
13417 053740 000137 037074 2$: JMP QVST
13418 053744 104401 1$: TYPE
13419 053746 016313 FSHDR2 ;PRINT ENTERING RANDOM MODE HEADER
13420 053750 104401 TYPE
13421 053752 016347 FSHDR3
13422 053754 104401 TYPE
13423 053756 016430 FSHDR4
13424 053760 104401 TYPE
13425 053762 016514 FSHDR5
13427 053764 012737 000001 001660 MOV #1,INCSQ1 ;INITIALIZE BUFFER INITIALIZATION CONSTANTS
13428 053772 012737 000002 001662 MOV #2,INCSQ2
13429 054000 012737 177777 001764 MOV #177777,RANDOM ;SET RANDOM MODE FLAG
13430 054006 012737 072776 073052 MOV #IDUM,INPTBL ;POINT TO DUMMY INPUT TABLE
13431 054014 013737 073052 002140 MOV INPTBL,INPT
13432 054022 000137 041052 JMP NITE
13433 054026 000137 037276 NFS: JMP DVTST
13434
13435 054032 FC00: ;FLOW COMMAND = 00 -IGNORE ENTRY.
13436 054032 000137 042414 JMP FCRTN
13437
13438
13439 ;SUBROUTINES TO EXTRACT VARIOUS DATA FIELDS FROM FLOW TABLE ENTRY.
13440
13441 054036 PF1: ;LOAD PTPTR WITH CONTANTS OF PTP
13442 ; SPECIFIED IN THE PF1 FIELD OF FLOW
13443 ; TABLE ENTRY.
13444 054036 017701 125704 MOV @FLOPTR,R1 ;FLOPTR POINTS TO FLOW TABLE ENTRY
13445 054042 032701 004000 BIT #004000,R1 ;SAVE STRING INSERTED FOR POSSIBLE ERROR PRINTOUT?
13446 054046 001405 BEQ 1$
13447 054050 042701 004000 BIC #004000,R1 ;YES
13448 054054 012737 177777 002502 MOV #177777,SAVSRF ;SET SAVE STRING FLAG
13449 054062 042701 170077 1$: BIC #170077,R1 ;STRIP OFF ALL BUT DESIRED FIELD
13450 054066 006301 ASL R1
13451 054070 006301 ASL R1
13452 054072 000301 SWAB R1 ;ADJUST DESIRED FIELD TO BIT 0
13453 054074 006301 ASL R1
13454 054076 062701 001566 ADD #PTP,R1 ;ADD # IN FIELD TO TOP OF PTP TABLE
13455 054102 011137 002142 MOV (R1),PTPTR ;SAVE CONTENTS OF DESIRED PTP IN PTPTR
13456 054106 000207 RTS PC
13457
13458 054110 PF2: ;SAME AS PF1 SUBROUTINE EXCEPT FOR FIELD.
13459 054110 017701 125632 MOV @FLOPTR,R1
13460 054114 042701 177700 BIC #177700,R1
13461 054120 006301 ASL R1

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 CZKEEC.P11 INITIALIZE THE COMMON TAGS

13462	054122	062701	001566		ADD #PTP,R1	
13463	054126	011137	002142		MOV (R1),PTPTR	
13464	054132	000207			RTS PC	
13465						
13466	054134			RF1:		;LOAD R1 WITH ADDRESS OF TEST
13467						; OPERAND SPECIFIED.
13468	054134	004737	054146		JSR PC,RF1X	;GET FIELD ONE CONTENTS
13469	054140	062701	003634		ADD #TRN,R1	;ADD IN ADDRESS OF TEST OPERAND TABLE
13470	054144	000207			RTS PC	
13471						
13472	054146			RF1X:		;GET FIELD ONE CONTENTS FROM FLOW TABLE ENTRY
13473	054146	017701	125574		MOV @FLOPTR,R1	;FLOPTR POINTS TO FLOW TABLE ENTRY
13474	054152	042701	170777		BIC #170777,R1	;STRIP OFF ALL BUT DESIRED FIELD
13475	054156	006201			ASR R1	
13476	054160	000301			SWAB R1	;RIGHT ADJUST FIELD
13477	054162	006301			ASL R1	
13478	054164	000207			RTS PC	
13479						
13480	054166			RF2:		;SAME AS RF1 SUBROUTINE EXCEPT FOR FIELD.
13481	054166	004737	054200		JSR PC,RF2X	
13482	054172	062701	003634		ADD #TRN,R1	
13483	054176	000207			RTS PC	
13484						
13485	054200			RF2X:		;SAME AS RF2X SUBROUTINE EXCEPT FOR FIELD.
13486	054200	017701	125542		MOV @FLOPTR,R1	
13487	054204	042701	177077		BIC #177077,R1	
13488	054210	006301			ASL R1	
13489	054212	006301			ASL R1	
13490	054214	000301			SWAB R1	
13491	054216	006301			ASL R1	
13492	054220	000207			RTS PC	
13493						
13494	054222			RF3:		;SAME AS RF1 SUBROUTINE EXCEPT FOR FIELD
13495	054222	004737	054234		JSR PC,RF3X	
13496	054226	062701	003634		ADD #TRN,R1	
13497	054232	000207			RTS PC	
13498						
13499	054234			RF3X:		;SAME AS RF1X SUBROUTINE EXCEPT FOR FIELD
13500	054234	017701	125506		MOV @FLOPTR,R1	
13501	054240	042701	177707		BIC #177707,R1	
13502	054244	006201			ASR R1	
13503	054246	006201			ASR R1	
13504	054250	000207			RTS PC	
13505						
13506	054252			RF4:		;SAME AS RF1 SUBROUTINE EXCEPT FOR FIELD
13507	054252	004737	054264		JSR PC,RF4X	
13508	054256	062701	003634		ADD #TRN,R1	
13509	054262	000207			RTS PC	
13510						
13511	054264			RF4X:		;SAME AS RF1X SUBROUTINE EXCEPT FOR FIELD
13512	054264	017701	125456		MOV @FLOPTR,R1	
13513	054270	042701	177770		BIC #177770,R1	
13514	054274	006301			ASL R1	
13515	054276	000207			RTS PC	

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 EXERCISER INITIALIZE THE COMMON TAGS

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13516
13517 054300          RFNX:          ;SUBROUTINE TO RETURN CONTENTS OF FLOW
13518                                     ; TABLE ENTRY FIELD POINTED TO BY THE
13519                                     ; CONTENTS OF NXFLD+1.
13520 054300 005237 002236          INC NXFLD
13521 054304 022737 000001 002236  CMP #1,NXFLD          ;FIELD REQUESTED = 1?
13522 054312 001003                                     ;BRANCH IF NO
13523 054314 004737 054146          JSR PC,RF1X          ;GET CONTENTS OF FIELD ONE.
13524 054320 000426          BR 10$          ;EXIT
13525 054322 022737 000002 002236 1$:  CMP #2,NXFLD          ;FIELD REQUESTED=2?
13526 054330 001003                                     ;BRANCH IF NO
13527 054332 004737 054200          JSR PC,RF2X          ;GET CONTENTS OF FIELD 2
13528 054336 000417          BR 10$          ;EXIT
13529 054340 022737 000003 002236 2$:  CMP #3,NXFLD          ;FIELD REQUESTED - 3?
13530 054346 001003                                     ;BRANCH IF NO
13531 054350 004737 054234          JSR PC,RF3X          ;GET CONTENTS OF FIELD 3
13532 054354 000410          BR 10$          ;EXIT
13533 054356 022737 000004 002236 3$:  CMP #4,NXFLD          ;FIELD REQUESTED = 4?
13534 054364 001003                                     ;BRANCH IF NO
13535 054366 004737 054264          JSR PC,RF4X          ;GET CONTENTS OF FIELD 4
13536 054372 000401          BR 10$          ;EXIT
13537 054374 005001          9$: CLR R1          ;FIELD REQUESTED INVALID - RETURN 0.
13538 054376 000207          10$: RTS PC
13539
13540 054400          RFN:          ;SUBROUTINE TO RETURN CONTENTS OF FLOW
13541                                     ; TABLE ENTRY FIELD PLUS TEST OPERAND TABLE
13542                                     ; OFFSET POINTED TO BY THE
13543                                     ; CONTENTS OF NXFLD+1.
13544 054400 005237 002236          INC NXFLD
13545 054404 022737 000001 002236  CMP #1,NXFLD          ;FIELD REQUESTED = 1?
13546 054412 001003                                     ;BRANCH IF NO
13547 054414 004737 054134          JSR PC,RF1          ;GET CONTENTS OF FIELD ONE PLUS TRN OFFSET.
13548 054420 000427          BR 10$          ;EXIT
13549 054422 022737 000002 002236 1$:  CMP #2,NXFLD          ;FIELD REQUESTED=2?
13550 054430 001003                                     ;BRANCH IF NO
13551 054432 004737 054166          JSR PC,RF2          ;GET CONTENTS OF FIELD 2 PLUS TRN OFFSET.
13552 054436 000420          BR 10$          ;EXIT
13553 054440 022737 000003 002236 2$:  CMP #3,NXFLD          ;FIELD REQUESTED = 3?
13554 054446 001003                                     ;BRANCH IF NO
13555 054450 004737 054222          JSR PC,RF3          ;GET CONTENTS OF FIELD 3 PLUS TRN OFFSET.
13556 054454 000411          BR 10$          ;EXIT
13557 054456 022737 000004 002236 3$:  CMP #4,NXFLD          ;FIELD REQUESTED = 4?
13558 054464 001003                                     ;BRANCH IF NO
13559 054466 004737 054252          JSR PC,RF4          ;GET CONTENTS OF FIELD 4 PLUS TRN OFFSET.
13560 054472 000402          BR 10$          ;EXIT
13561 054474 012701 003634          9$: MOV #TRN,R1          ;FIELD REQUESTED INVALID - RETURN #TRN.
13562 054500 000207          10$: RTS PC
13563
13564 054502          FC15:          ;FLOW COMMAND = 15 - SETUP SPECIAL HANDLING WORD
13565                                     ; BIT 0 = 1 MEANS SKIP 04 FLOW COMMANDS
13566                                     ; BIT 1 = 1 MEANS 07 FLOW COMMAND IGNORE BIT 15
13567                                     ; OF STRING LENGTH
13568                                     ; BIT 2 = 1 MEANS DON'T CHECK BUFFER RESULTS
13569 054502 004737 054036          JSR PC,PF1          ;FORM PARAMETER TABLE POINTER TO SPECIAL HANDLING REQES

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 95-4
ZKEEC.P11 INITIALIZE THE COMMON TAGS

13570 054506 017737 125430 002144
13571 054514 000137 042414
13572

MOV @PTPTR,SPHAND
JMP FCRTN

;COPY SPECIAL HANDLING REQUEST INTO SPECIAL HANDLING WOR

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 95-5
 CZKEEC.P11 SETUP MACHINE DEPENDENT CONSTANTS

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13574          .SBTTL          SETUP MACHINE DEPENDENT CONSTANTS
13575          :
13576          :SIZE FOR PROCESSOR TYPE - SETUP MACHINE DEPENDENT CONSTANTS BASED UPON RESULT.
13577          :
13578 054520          SIZEPT:
13579 054520 012737 055036 000010      MOV #3$,@#RESVEC          ;SETUP RESERVED INST TRAP VECTOR
13580                                     ; IN CASE MACHINE UNDER TEST DOES NOT HAVE MFPT
13581 054526 005037 000012      CLR @#RESVEC+2
13582 054532 000007      MFPT          ;WHAT IS THE PROCESSOR TYPE?
13583 054534 123700 001710      CMPB EL2324,R0
13584 054540 001525      BEQ 6$          ;BRANCH IF PROCESSOR = 11/23 OR 11/24
13585 054542 123700 001704      CMPB EL74,R0
13586 054546 001025      BNE 1$          ;BRANCH IF NOT AN 11/74 TYPE PROCESSOR
13587 054550 005737 001122      TST $PASS
13588 054554 001002      BNE 10$
13589 054556 104401      TYPE          ;TYPE 11/74 TYPE PROCESSOR (1ST PASS ONLY)
13590 054560 017066      MPT74
13591 054562 012737 177777 002162 10$: MOV #177777,MMFLG          ;SET MEM MANAGEMENT FLAG SIGNALING THAT SYS
13592                                     ; UNDER TEST HAS 11/70 TYPE MEM MGMT
13593 054570 012737 000003 002170      MOV #3,NMODES          ;PROC UNDER TEST HAS 3 MODES (K,S,U)
13594 054576 012737 177777 002064      MOV #177777,TWOSSET    ;PROCESSOR UNDER TEST HAS 2 REGISTER SETS
13595 054604 012737 000002 002216      MOV #2,PTQV          ;INPUT TABLE ENTRY TYPE WORD BIT 1
13596                                     ; IDENTIFIES TABLE RUN IN QV MODE FOR 11/74
13597                                     ; (1=RUN,0=SKIP)
13598 054612 012737 000003 003042      MOV #3,LTCCLY          ;INITIALIZE COUNTER USED BY LINE TIME CLOCK
13599                                     ; ROUTINES - COUNT IS A MEASURE OF
13600                                     ; TIME REMAINING BEFORE INTERRUPT FROM
13601                                     ; LTC WHEN STARTING EXECUTION OF CIS
13602                                     ; INSTRUCTION UNDER TEST.
13603 054620 000571          BR 4$
13604 054622 123700 001706      1$: CMPB EL44,R0          ;IS THIS AN 11/44?
13605 054626 001024          BNE 2$          ;BRANCH IF NO
13606 054630 005737 001122      TST $PASS
13607 054634 001002      BNE 12$
13608 054636 104401      TYPE          ;TYPE 11/44 PROCESSOR (1ST PASS ONLY)
13609 054640 017044      MPT44
13610 054642 012737 177777 002162 12$: MOV #177777,MMFLG          ;SET MEM MGMT FLAG
13611 054650 012737 000003 002170      MOV #3,NMODES          ;PROC UNDER TEST HAS 3 MODES
13612 054656 005037 002064      11$: CLR TWOSSET          ;INITIALIZE FOR SINGLE REGISTER SET
13613 054662 012737 000002 002216      MOV #2,PTQV          ;INPUT TABLE ENTRY TYPE WORD BIT 2
13614                                     ; IDENTIFIES TABLE RUN IN QV MODE FOR 11/44
13615 054670 012737 000013 003042      MOV #13,LTCCLY          ;INITIALIZE COUNTER USED FOR LTC
13616 054676 000542          BR 4$
13617 054700 005037 002162      2$: CLR MMFLG
13618 054704 005737 001122      TST $PASS
13619 054710 001002      BNE 13$
13620 054712 104401      TYPE          ;TYPE NO MEM MGMT AVAILABLE (1ST PASS ONLY)
13621 054714 017150      NMM
13622 054716          13$:
13624 054716 012737 000240 060662      MOV #NOP,PCIS2          ;OVERWRITE ACCESS TO MEM MGMT REGISTERS
13625 054724 012737 000240 060664      MOV #NOP,PCIS2+2
13626 054732 012737 000240 060706      MOV #NOP,PCIS1
13627 054740 012737 000240 060710      MOV #NOP,PCIS1+2
13629 054746 012737 000405 062662      MOV #405,LTCIS

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PDP-11 (IS INST EXERCISER
CZKEEC.P11MACY11 27(655)
SETUP MACHINE DEPENDENT25-MAR-81 12:25 PAGE 95-6
CONSTANTS

13630	054754	012737	000240	060226		MOV #NOP, ILLSER		
13631	054762	012737	000240	060230		MOV #NOP, ILLSER+2		
13632	054770	012737	000240	060100		MOV #NOP, HLT SER		
13633	054776	012737	000240	060102		MOV #NOP, HLT SER+2		
13634	055004	012737	000002	002170		MOV #2, NMODES		
13635	055012	000721				BR 11\$		
13636								
13637								
13638								
13639	055014	005737	001122		6\$:	TST \$PASS		
13640	055020	001010				BNE 7\$		
13641	055022	012737	030071	016304		MOV #'90, FSHDR1+24		;MACHINE TYPE UNKNOWN - DEFAULT TO SINGLE
13642	055030	104401				TYPE		; REG SET ,NO MEM MGMT, 2 PROC MODES (K & U)
13643	055032	017115				MPT2324		; AND A LTC DELAY OF 13
13644	055034	000402				BR 7\$; (NEW MACHINES MAY REQUIRE CHANGES HERE)
13645	055036	005726			3\$:	TST (SP)+		
13646	055040	005726				TST (SP)+		;FIX UP STACK
13647	055042	012737	055110	000004	7\$:	MOV #33\$, @#ERRVEC		; DOES MACHINE UNDER TEST HAVE (11/34 TYPE) MEM MGMT?
13648	055050	005737	172340			TST @#KIPARO		; IF SO NO TRAP HERE
13649	055054	005737	177640			TST @#UIPARO		; IF SO NO TRAP HERE
13650	055060	012737	055116	000004		MOV #34\$, @#ERRVEC		
13651	055066	005737	172240			TST @#SIPARO		; IF SO, TRAP HERE
13652	055072	000702				BR 2\$		
13653	055074	012737	055124	000004	5\$:	MOV #35\$, @#ERRVEC		; IF SO, TRAP HERE
13654	055102	005737	172360			TST @#KDPARO		
13655	055106	000674				BR 2\$		
13656	055110	005726			33\$:	TST (SP)+		;FIX UP STACK
13657	055112	005726				TST (SP)+		
13658	055114	000671				BR 2\$		
13659	055116	005726			34\$:	TST (SP)+		;FIX UP STACK
13660	055120	005726				TST (SP)+		
13661	055122	000764				BR 5\$		
13662	055124	005726			35\$:	TST (SP)+		;FIX UP STACK
13663	055126	005726				TST (SP)+		
13664	055130	005737	001122			TST \$PASS		
13665	055134	001002				BNE 14\$		
13666	055136	104401				TYPE		;TYPE 'MEMORY MANAGEMENT ON SYS UNDER TEST''(1ST PASS ONL
13667	055140	016761				MPT34		
13668	055142	012737	000002	002170	14\$:	MOV #2, NMODES		;PROC = 11/23 OR 11/24 OR 11/34
13669	055150	012737	177777	002162		MOV #177777, MMFLG		
13670	055156	005037	002064			CLR TWOSSET		
13671	055162	012737	000002	002216		MOV #2, PTQV		
13672	055170	012737	177777	002160		MOV #177777, PT34		
13673	055176	012737	000013	003042		MOV #13, LTCDLY		
13674	055204	012737	060226	000010	4\$:	MOV #ILLSER, @#RESVEC		;RESTORE RESERVED INST TRAP CATCHER
13675	055212	012737	055234	000004		MOV #50\$, @#ERRVEC		;CHECK FOR A CPU ERROR REG ON UUT
13676	055220	005737	177766			TST @#177766		;IF NONE TRAP HERE
13677	055224	012737	177777	001742		MOV #177777, CERFLG		;SET FLAG INDICATING EXISTANCE
13678	055232	000403				BR 51\$;REV-C
13679	055234	005037	001742		50\$:	CLR CERFLG		;CLR FLAG: INDICATES NO ERR REG
13680	055240	022626				CMP (SP)+, (SP)+		;CLEAN UP STACK
13681	055242	012737	060100	000004	51\$:	MOV #HLT SER, @#ERRVEC		;RESTORE HALT SERVICE TRAP CATCHER
13682	055250	000207				RTS PC		;REV-C

PDP-11 CIS INST EXERCISER
CZKEEC.P11MACY11 27(655) 25-MAR-81 12:25 PAGE 95-7
REGISTER SET SELECTION ROUTINES

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13684          .SBTTL          REGISTER SET SELECTION ROUTINES
13685
13686          ;
13687          ;IF PROCESSOR UNDER TEST HAS 2 REGISTER SETS
13688          ;SELECT REGISTER SET TO BE USED BASED ON LEAST SIGNIFICANT BIT OF
13689          ;TEST # (TOTTC), AND LOAD REGISTER SET WHICH WAS NOT
13690          ;SELECTED WITH A FIXED PATTERN <NOTREG>.
13691          ;
13692
13693          SELREG:
13694          055252 005737 002064          TST TWOSET          ;DOES MACHINE UNDER TEST HAVE 2 REG SETS?
13695          055256 001506          BEQ 1$          ;BRANCH IF NO
13696          055260 032737 000001 001420          BIT #1,TOTTC          ;PROCESSOR IS AN 11/74 - HAS 2 REG SETS;USE
13697          ; LEAST SIGNIF. BIT OF TEST COUNT TO LOAD
13698          ; PSW BIT 11 (REG SET BIT).
13699          055266 001041          BNE 2$          ;BRANCH TO USE REGISTER SET 1.
13700          055270 052777 004000 124366          BIS #4000,@TPSW          ;CIS INST WILL BE TESTED USING GPR SET 0.
13701          055276 042737 001000 002136          BIC #1000,FATAL          ;INDICATE GPR SET 0 IN FATAL ERROR WORD
13702          ;LOAD SET 1 WITH PATTERN IN NOTREG.
13703          055304 013700 001702          MOV NOTREG,R0
13704          055310 013701 001702          MOV NOTREG,R1
13705          055314 013702 001702          MOV NOTREG,R2
13706          055320 013703 001702          MOV NOTREG,R3
13707          055324 013704 001702          MOV NOTREG,R4
13708          055330 013705 001702          MOV NOTREG,R5
13709          055334 042777 004000 124322          BIC #4000,@TPSW          ;SET REGISTER SET TO 0
13710          055342 042777 004000 125152          BIC #4000,@PCLK1P          ;ASSURE CORRECT REGISTER USAGE ON INTERRUPT
13711          055350 042777 004000 125452          BIC #4000,@LTC1P
13712          055356 042737 004000 000006          BIC #4000,@#6
13713          055364 005037 002056          CLR REGSET          ;SET REG SET INDICATOR TO 0
13714          055370 000441          BR 1$          ;BRANCH TO RETURN
13715          055372 042777 004000 124264 2$:          BIC #4000,@TPSW          ;CIS INST WILL BE TESTED USING GPR SET 1.
13716          055400 052737 001000 002136          BIS #1000,FATAL          ;INDICATE GPR SET 1 IN FATAL ERROR WORD
13717          ;LOAD SET 0 WITH PATTERN IN NOTREG.
13718          055406 013700 001702          MOV NOTREG,R0
13719          055412 013701 001702          MOV NOTREG,R1
13720          055416 013702 001702          MOV NOTREG,R2
13721          055422 013703 001702          MOV NOTREG,R3
13722          055426 013704 001702          MOV NOTREG,R4
13723          055432 013705 001702          MOV NOTREG,R5
13724          055436 052777 004000 124220          BIS #4000,@TPSW          ;SET REGISTER SET TO 1
13725          055444 052777 004000 125050          BIS #4000,@PCLK1P          ;ASSURE CORRECT REGISTER USAGE ON INTERRUPT
13726          055452 052777 004000 125350          BIS #4000,@LTC1P
13727          055460 052737 004000 000006          BIS #4000,@#6
13728          055466 012737 000001 002056          MOV #1,REGSET          ;SET REG SET INDICATOR TO 1
13729          055474 000207          RTS PC
13730
13731          ;
13732          ;ROUTINE TO VERIFY THAT REGISTER SET WHICH WAS NOT SELECTED
13733          ;(PROVIDED PROCESSOR UNDER TEST HAS 2) DID NOT GET CHANGED, AND
13734          ;SWITCH TO REGISTER SET 0.
13735          ;
13736
13737          055476          CKUREG:

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 CZKEEC.P11 REGISTER SET SELECTION ROUTINES

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13738 055476 005737 002064          TST TWOSET          ;PROCESSOR UNDER TEST HAVE TWO REGISTER SETS?
13739 055502 001435          BEQ 1$              ;BRANCH IF NO
13740 055504 005737 002056          TST REGSET         ;DETERMINE WHICH REG SET WAS IN USE
13741 055510 001426          BEQ 2$              ;BRANCH IF REG SET 0 WAS USED
13742 055512 042777 004000 124144    BIC #4000,@TPSW    ;VERIFY CONTENTS OF REG SET 0
13743 055520 020037 001702          CMP R0,NOTREG
13744 055524 001030          BNE 4$
13745 055526 020137 001702          CMP R1,NOTREG
13746 055532 001025          BNE 4$
13747 055534 020237 001702          CMP R2,NOTREG
13748 055540 001022          BNE 4$
13749 055542 020337 001702          CMP R3,NOTREG
13750 055546 001017          BNE 4$
13751 055550 020437 001702          CMP R4,NOTREG
13752 055554 001014          BNE 4$
13753 055556 020537 001702          CMP R5,NOTREG
13754 055562 001011          BNE 4$
13755 055564 000404          BR 1$
13756 055566 052777 004000 124070 2$:  BIS #4000,@TPSW    ;VERIFY CONTENTS OF REG SET 1
13757 055574 000751          BR 3$
13758 055576 042777 004000 124060 1$:  BIC #4000,@TPSW    ;SET REG SET TO ZERO
13759 055604 000207          RTS PC              ;RETURN
13760 055606          4$:  PRINTB #HLTMSG
      (6) 055606 012746 012173          MOV #HLTMSG,-(SP)
      (3) 055612 010600          MOV SP,R0
      (4) 055614 004737 066232          JSR PC,FPRINT
13761 055620 012737 055710 002174    MOV #100$,HLTLOC
13762 055626 004737 055714          JSR PC,IDINFO      ;IDENTIFY FAILING INST
13763 055632          PRINTB #FORM38,REGSET
      (7) 055632 013746 002056          MOV REGSET,-(SP)
      (6) 055636 012746 014501          MOV #FORM38,-(SP)
      (3) 055642 010600          MOV SP,R0
      (4) 055644 004737 066232          JSR PC,FPRINT
13764 055650          PRINTB #FORM39,NOTREG,R0,R1,R2,R3,R4,R5
      (13) 055650 010546          MOV R5,-(SP)
      (12) 055652 010446          MOV R4,-(SP)
      (11) 055654 010346          MOV R3,-(SP)
      (10) 055656 010246          MOV R2,-(SP)
      (9) 055660 010146          MOV R1,-(SP)
      (8) 055662 010046          MOV R0,-(SP)
      (7) 055664 013746 001702          MOV NOTREG,-(SP)
      (6) 055670 012746 014560          MOV #FORM39,-(SP)
      (3) 055674 010600          MOV SP,R0
      (4) 055676 004737 066232          JSR PC,FPRINT
13765 055702 012737 000001 001114 100$:  MOV #1,$MSGTY      ;TELL APT THERE IS A FATAL ERROR ;:REV-C
13766 055710 000000          HALT                ;REGISTER SET ERROR;PRESS CONTINUE SWITCH TO CONTINUE
13767          ; TESTING
13768 055712 000731          BR 1$
13769
13770 055714          IDINFO: PRINTB #TRPINF,HLTLOC,MODE,DEN,TINST,TOTTC,TOTTC
      (12) 055714 013746 001420          MOV TOTTC,-(SP)
      (11) 055720 013746 001416          MOV TOTTC,-(SP)
      (10) 055724 013746 050164          MOV TINST,-(SP)
      (9) 055730 013746 002166          MOV DEN,-(SP)

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REP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 95-9
2-REC_P11 REGISTER SET SELECTION ROUTINES

8)	055734	013746	002164	MOV	MODE,-(SP)
(7)	055740	013746	002174	MOV	HLTLOC,-(SP)
(6)	055744	012746	012310	MOV	#TRPINF,-(SP)
(3)	055750	010600		MOV	SP,R0
(4)	055752	004737	066232	JSR	PC,FPRINT
13771	055756	000207		RTS	PC
13772					

PDP-11 CIS INST EXERCISER
CZKEEC.P11MACY11 27(655) 25-MAR-81 12:25 PAGE 95-10
MEMORY MANAGEMENT SUBROUTINES

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13774          .SBTTL          MEMORY MANAGEMENT SUBROUTINES
13775          :
13776          :MEMORY MANAGEMENT SUBROUTINES
13777          :
13778          :
13779          :
13780          :
13781          :SETUP PAR'S
13782 055760     SETPAR:          ;SETUP PAR'S FOR USER, SUPV, AND KRNEL I & D SPACES
13783 055760     005737     002162     TST MMFLG          ;DOES SYSTEM UNDER TEST HAVE MEMORY MANAGEMENT?
13784 055764     001002          BNE 2$          ;BRANCH IF YES
13785 055766     000137     056444     JMP 1$
13786 055772     005737     002160     2$: TST PT34          ;IS THIS AN 11/34 TYPE PROCESSOR
13787          :
13788 055776     001142          BNE 3$          ; (I.E. K, U MODES AND 18 BIT MEM MGMT)
13789 056000     005037     172516     CLR @MMMR3       ;BRANCH IF YES
13790 056004     012737     000000     177660     MOV #0,@UDPAR0   ;CLEAR OUT D-SPACE ENABLES
13791 056012     012737     000200     177662     MOV #200,@UDPAR1 ;SETUP USER D PAR'S
13792 056020     012737     000400     177664     MOV #400,@UDPAR2
13793 056026     012737     000600     177666     MOV #600,@UDPAR3
13794 056034     012737     001000     177670     MOV #1000,@UDPAR4
13795 056042     012737     001200     177672     MOV #1200,@UDPAR5
13796 056050     012737     001400     177674     MOV #1400,@UDPAR6
13797 056056     012737     177600     177676     MOV #177600,@UDPAR7
13798          :
13799 056064     012737     000000     172240     MOV #0,@SIPAR0   ;SETUP SUPERVISOR I PAR'S
13800 056072     012737     000200     172242     MOV #200,@SIPAR1
13801 056100     012737     000400     172244     MOV #400,@SIPAR2
13802 056106     012737     000600     172246     MOV #600,@SIPAR3
13803 056114     012737     001000     172250     MOV #1000,@SIPAR4
13804 056122     012737     001200     172252     MOV #1200,@SIPAR5
13805 056130     012737     001400     172254     MOV #1400,@SIPAR6
13806 056136     012737     177600     172256     MOV #177600,@SIPAR7
13807          :
13808 056144     012737     000000     172260     MOV #0,@SDPAR0   ;SETUP SUPERVISOR D PAR'S
13809 056152     012737     000200     172262     MOV #200,@SDPAR1
13810 056160     012737     000400     172264     MOV #400,@SDPAR2
13811 056166     012737     000600     172266     MOV #600,@SDPAR3
13812 056174     012737     001000     172270     MOV #1000,@SDPAR4
13813 056202     012737     001200     172272     MOV #1200,@SDPAR5
13814 056210     012737     001400     172274     MOV #1400,@SDPAR6
13815 056216     012737     177600     172276     MOV #177600,@SDPAR7
13816          :
13817 056224     012737     000000     172360     MOV #0,@KDPAR0   ;SETUP KERNEL D PAR'S
13818 056232     012737     000200     172362     MOV #200,@KDPAR1
13819 056240     012737     000400     172364     MOV #400,@KDPAR2
13820 056246     012737     000600     172366     MOV #600,@KDPAR3
13821 056254     012737     001000     172370     MOV #1000,@KDPAR4
13822 056262     012737     001200     172372     MOV #1200,@KDPAR5
13823 056270     012737     001400     172374     MOV #1400,@KDPAR6
13824 056276     012737     177600     172376     MOV #177600,@KDPAR7
13825          :
13826 056304     012737     000000     177640     3$: MOV #0,@UIPAR0   ;SETUP USER I PAGE ADDRESS REGISTERS
13827 056312     012737     000200     177642     MOV #200,@UIPAR1

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 95-11
 CZKEEC.P11 MEMORY MANAGEMENT SUBROUTINES

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13828 056320 012737 000400 177644      MOV #400,@#UIPAR2
13829 056326 012737 000600 177646      MOV #600,@#UIPAR3
13830 056334 012737 001000 177650      MOV #1000,@#UIPAR4
13831 056342 012737 001200 177652      MOV #1200,@#UIPAR5
13832 056350 012737 001400 177654      MOV #1400,@#UIPAR6
13833 056356 012737 177600 177656      MOV #177600,@#UIPAR7
13834
13835 056364 012737 000000 172340      MOV #0,@#KIPARO          ;SETUP KERNEL I PAR'S
13836 056372 012737 000200 172342      MOV #200,@#KIPAR1
13837 056400 012737 000400 172344      MOV #400,@#KIPAR2
13838 056406 012737 000600 172346      MOV #600,@#KIPAR3
13839 056414 012737 001000 172350      MOV #1000,@#KIPAR4
13840 056422 012737 001200 172352      MOV #1200,@#KIPAR5
13841 056430 012737 001400 172354      MOV #1400,@#KIPAR6
13842 056436 012737 177600 172356      MOV #177600,@#KIPAR7
13843
13844 056444 000207          1$:      RTS PC
13845
13846
13847          ;SELECT MODE AND D-SPACE ENABLE/DISABLE
13848
13849          ;
13850          ;BOTH MODE AND D-SPACE ENABLE ARE SELECTED RANDGMLY FOR EACH TEST
13851          ;IF EXECUTING IN RANDOM MODE OR IN A NORMAL FIELD SERVICE TYPE RUN.
13852          ;IF IN A DESIGN VERIFICATION TYPE RUN (ST @ 204) AND NOT RANDOM MODE
13853          ;THEN THESE VARIABLES WERE SET VIA OPERATOR DIAGLOG ABOVE.
13854          ;REGARDLESS OF THE RUN TYPE, IF MEMORY MANAGEMENT IS AVAILABLE
13855          ;(MMFLG=NONZERO) THEN MMR3 IS LOADED TO PROPER D-SPACE STATE.
13856          ;
13857          ;SELMD:
13857 056446 005737 002100          TST FSRUN          ;NORMAL FFIELD SERVICE TYPE RUN?
13858 056452 001003          BNE 10$          ;BRANCH IF YES
13859 056454 005737 001764          TST RANDOM          ;RANDOM TESTING?
13860 056460 001443          BEQ 11$          ;BRANCH IF NO
13861 056462 022737 000001 002170 10$:  CMP #1,MMODES          ;DOES SYSTEM UNDER TEST HAVE MORE THAN ONE
13862          ;PROCESSOR MODE?
13863 056470 001003          BNE 2$          ;BRANCH IF YES
13864 056472 005037 002164          CLR MODE
13865 056476 000422          BR 4$
13866 056500 004737 064334          2$:  JSR PC,RN          ;GENERATE A RANDOM #
13867 056504 042700 177774          BIC #177774,R0      ;USE BITS 1 & 0 TO SELECT MODE
13868          ; (I.E 00=KERNEL,01=SUPV,11=USER)
13869 056510 022700 000002          CMP #2,R0          ;ILLEGAL MODE (10)?
13870 056514 001771          BEQ 2$          ;YES - TRY AGAIN
13871 056516 022737 000002 002170  CMP #2,MMODES          ;DOES SYSTEM UNDER TEST HAVE ONLY 2 PROC MODES?
13872 056524 001005          BNE 6$          ;BRANCH IF NO
13873 056526 022700 000001          CMP #1,R0          ;ON 2 MODE MACHINE MODES ASSUMED TO BE
13874          ;KERNEL & USER
13875 056532 001002          BNE 6$          ;BRANCH IF MODE IS LEGAL
13876 056534 052700 000002          BIS #2,R0          ;IF RANDOM MODE = SUPV THEN SWITCH IT TO USER
13877 056540 010037 002164          6$:  MOV R0,MODE          ;MODE VALID - SET INTO MODE WORD
13878 056544 005037 002166          4$:  CLR DEN
13879 056550 004737 064334          JSR PC,RN          ;GENERATE A RANDOM #
13880 056554 032700 000001          BIT #1,R0          ;USE BIT 0 OF RANDOM NUMBER TO SELECT D ENABLE
13881 056560 001403          BEQ 11$          ;BRANCH TO DISABLE D SPACE

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PDP-11 C/S INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 95-12
 C/ZKFECC.P11 MEMORY MANAGEMENT SUBROUTINES

13882	056562	012737	177777	002166		MOV #177777,DEN	;SET D ENABLE FLAG
13883	056570	005737	002162		11\$:	TST MMFLG	;MEMORY MGMT AVAILABLE?
13884	056574	001435				BEQ 1\$;NO - EXIT
13885	056576	005737	002160			TST PT34	;11/34 TYPE MEM MGMT?
13886	056602	001403				BEQ 7\$;BRANCH IF NO
13887	056604	005037	002166			CLR DEN	
13888	056610	000427				BR 1\$	
13889	056612	005037	172516		7\$:	CLR @MMR3	;DISABLE ALL D-SPACES
13890	056616	005737	002166			TST DEN	;ENABLE D SPACE IN MMR3?
13891	056622	001422				BEQ 1\$;BRANCH IF NO
13892	056624	005737	002164		13\$:	TST MODE	;MODE SELECTED = KERNEL?
13893	056630	001004				BNE 3\$;BRANCH IF NO
13894	056632	052737	000004	172516		BIS #4,@MMR3	;ENABLE KERNEL D SPACE
13895	056640	000413				BR 1\$	
13896	056642	022737	000003	002164	3\$:	CMP #3,MODE	;MODE SELECTED - USER
13897	056650	001004				BNE 5\$;BRANCH IF NO
13898	056652	052737	000001	172516		BIS #1,@MMR3	;ENABLE USER D SPACE
13899	056660	000403				BR 1\$;MODE SLECTED = SUPERVISOR
13900	056662	052737	000002	172516	5\$:	BIS #2,@MMR3	;ENABLE SUPERVISOR D SPACE
13901	056670	000207			1\$:	RTS PC	
13902		.					
13903							
13904							;SETUP PDR'S
13905							
13906	056672					SETPDR:	
13907	056672	005737	002160			TST PT34	;11/34 TYPE MEM MGMT?
13908	056676	001022				BNE 8\$;BRANCH IF YES
13909							;FIRST CLEAR ALL PDR'S (ABORT ALL ACCESSES)
13910							
13911	056700	012700	172200			MOV #SIPDR0,R0	
13912	056704	005020			2\$:	CLR (R0)+	;CLEAR SUPERVISOR PDR'S
13913	056706	020027	172236			CMP R0,#SDPDR7	
13914	056712	101774				BLOS 2\$	
13915							
13916	056714	012700	177620			MOV #UDPDR0,R0	;CLEAR USER D-PDR'S
13917	056720	005020			1\$:	CLR (R0)+	
13918	056722	020027	177636			CMP R0,#UDPDR7	
13919	056726	101774				BLOS 1\$	
13920							
13921	056730	012700	172320			MOV #KDPDR0,R0	;CLEAR KERNEL D-PDR'S
13922	056734	005020			99\$:	CLR (R0)	
13923	056736	020027	172336			CMP R0,#KDPDR7	
13924	056742	101774				BLOS 99\$	
13925							
13926	056744	012700	177600		8\$:	MOV #UIPDR0,R0	;CLEAR USER I-PDR'S
13927	056750	005020			9\$:	CLR (R0)+	
13928	056752	020027	177616			CMP R0,#UIPDR7	
13929	056756	101774				BLOS 9\$	
13930							
13931	056760	012700	172300			MOV #KIPDR0,R0	
13932	056764	005020			3\$:	CLR (R0)+	;CLEAR KERNEL PDR'S
13933	056766	020027	172316			CMP R0,#KIPDR7	
13934	056772	101774				BLOS 3\$	
13935							

REF-11 IS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 95-13
 2 REEC.P1 MEMORY MANAGEMENT SUBROUTINES

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13936                               ;SETUP KERNEL MODE PDR'S
13937
13938 056774 012737 077406 172316      MOV #77406,@#KIPDR7      ;ALLOW R/W ACCESS OF I/O PAGE
13940 057002 012737 077402 172310      MOV #77402,@#KIPDR4      ; AND R ONLY ACCESS OF PHYSICAL ADDRESS
13941 057010 012737 077402 172306      MOV #77402,@#KIPDR3      ; 20 TO 120K
13943 057016 012737 077402 172304      MOV #77402,@#KIPDR2
13944 057024 012737 077402 172302      MOV #77402,@#KIPDR1
13945 057032 005737 002164          TST MODE                ;IS MODE = KERNEL?
13946 057036 001404          BEQ 31$                ;BRANCH IF YES
13947 057040 012737 077406 172300      MOV #77406,@#KIPDR0
13948 057046 000403          BR 32$
13949 057050 012737 077402 172300      MOV #77402,@#KIPDR0      31$:
13950 057056 005737 002164          TST MODE                32$:
13951 057062 001021          BNE 5$                ;IF MODE= KERNEL & D-SPACE IS DISABLED
13952 057064 005737 002166          TST DEN                ; THEN ALLOW R/W OF STACK & TEST BUFFER AREA
13953 057070 001004          BNE 4$
13955 057072 012737 077406 172312      MOV #77406,@#KIPDR5
13960 057100 000455          BR 11$
13961 057102 012737 077406 172336      MOV #77406,@#KDPDR7      4$:
13963 057110 012737 077406 172332      MOV #77406,@#KDPDR5      ;IF MODE IS KERNEL & D-SPACE IS ENABLED
13968 057116 012737 077402 172320      MOV #77402,@#KDPDR0      ; THEN SETUP KERNEL D-SPACE PDRS
13969                               ;ALLOW R/W ACCESS OF I/O PAGE AND TEST BUFFER
13973 057124 000443          BR 11$                ; AREA; R-ONLY ACCESS OF PHYS 0-20K
13974 057126 022737 000001 002164      CMP #1,MODE            5$:
13975 057134 001016          BNE 7$                ;SETUP SUPERVISOR MODE PDR'S
13976 057136 012737 077402 172204      MOV #77402,@#SIPDR2     ;BRANCH IF TEST MODE IS NOT SUPERVISOR
13977                               ;ALLOW R ONLY ACCESS OF SPACE INCLUDING
13981 057144 005737 002166          TST DEN                ; CIS INST TO BE EXECUTED
13982 057150 001004          BNE 6$                ;IF D-SPACE IS NOT ENABLED ALLOW
13983                               ; R/W ACCESS OF TEST BUFFER AREA IN SUPERVISOR
13985 057152 012737 077406 172212      MOV #77406,@#SIPDR5     ; I-SPACE
13990 057160 000425          BR 11$
13992 057162 012737 077406 172232      MOV #77406,@#SDPDR5     6$:
13997 057170 000421          BR 11$                ;D-SPACE IS ENABLED; ALLOW R/W ACCESS
13998 057172 022737 000003 002164      CMP #3,MODE            ; TO TEST BUFFER AREA IN SUPERVISOR D-SPACE
13999 057200 001015          BNE 11$                ;SETUP USER MODE PDR'S
14000 057202 012737 077402 177604      MOV #77402,@#UIPDR2     ;BRANCH IF TEST MODE IS NOT USER
14001                               ;ALLOW R ONLY ACCESS OF SPACE INCLUDING
14005 057210 005737 002166          TST DEN                ; CIS INST TO BE EXECUTED
14006 057214 001004          BNE 10$               ;IF D-SPACE IS NOT ENABLED ALLOW R/W
14008 057216 012737 077406 177612      MOV #77406,@#UIPDR5     ; ACCESS OF TEST BUFFER AREA IN USER
14013 057224 000403          BR 11$                ; I SPACE
14015 057226 012737 077406 177632      MOV #77406,@#UDPDR5     10$:
14020                               ;D-SPACE IS ENABLED; ALLOW R/W ACCESS
14021 057234 005737 001764          TST RANDOM            11$:
14022                               ; TO TEST BUFFER AREA IN USER D-SPACE
14023 057240 001454          BEQ 12$                ;ASSURE THAT XLATION BUFFER (MOVTC) IS IN READABLE SPACE
14024 057242 022737 076032 050164      CMP #76032,TINST       ;IN RANDOM MODE?
14025 057250 001404          BEQ 20$                ;BRANCH IF NO
14026 057252 022737 076132 050164      CMP #76132,TINST       ;IS INST UNDER TEST = MOVTC?
14027 057260 001044          BNE 12$                ;BRANCH IF YES
14028 057262 005737 002166          TST DEN                20$:
14029 057266 001017          BNE 13$                ;IS D-SPACE ENABLED?
14030 057270 005737 002164          TST MODE                ;BRANCH IF YES
                               ;IS MODE = KERNEL?

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 95-14
 ZKFECC.P11 MEMORY MANAGEMENT SUBROUTINES

14031	057274	001436			BEQ 12\$;BRANCH IF YES - NO PDR CHANGE REQUIRED FOR XLATION BUFF
14032	057276	022737	000001	002164	CMP #1,MODE		;IS MODE = SUPERVISOR?
14033	057304	001004			BNE 14\$;BRANCH IF NO
14034	057306	012737	077402	172202	MOV #77402,@#SIPDR1		;ALLOW R-ONLY ACCESS TO XLATION BUFFER
14035	057314	000426			BR 12\$		
14036	057316	012737	077402	177602	14\$: MOV #77402,@#UIPDR1		;USER MODE- ALLOW R-ONLY ACCESS TO XLATION BUFFER
14037	057324	000422			BR 12\$		
14038	057326	005737	002164		13\$: TST MODE		
14039	057332	001004			BNE 15\$		
14040	057334	012737	077402	172322	MOV #77402,@#KDPDR1		;KERNEL MODE,D-EN - ALLOW R-ONLY ACCESS TO XLATI
14041	057342	000413			BR 12\$		
14042	057344	022737	000001	002164	15\$: CMP #1,MODE		
14043	057352	001004			BNE 16\$		
14044	057354	012737	077402	172222	MOV #77402,@#SDPDR1		;SUPERVISOR MODE,D-EN - ALLOW READ OF XLATION BU
14045	057362	000403			BR 12\$		
14046	057364	012737	077402	177622	16\$: MOV #77402,@#UDPDR1		;USER MODE,D-EN - ALLOW R-ONLY ACCESS OF X. ATION
14047	057372	000207			12\$: RTS PC		
14048							
14049							
14050							
14052							
14053							
14054							
14055							
14056							
14057							
14058							
14059							
14060							
14061		06u100					
14062							
14063							
14065							
14066							
14067							
14068	060100	005037	177572		HLT SER: CLR @#MMRO		;TURN OFF MEM MGMT - OVERWRITTEN WITH NOPS
14069							; IF NO MEM MGMT ON SYSTEM (REF SIZEPT ROUTINE)
14070	060104	021627	050204		CMP (SP),#TINRET+2		;WAS HALT AT CIS INST RETURN LOC?
14071	060110	001437			BEQ 1\$;BRANCH IF YES
14072	060112	011637	002172		MOV (SP),TRPLOC		;GET TRAP LOCATION
14073	060116	162737	000002	002172	SUB #2,TRPLOC		
14074	060124				PRINTB #TRAP4		;PRINT - TRAP TO LOC 4
(6)	060124	012746	012136		MOV #TRAP4,-(SP)		
(3)	060130	010600			MOV SP,RO		
(4)	060132	004737	066232		JSR PC,FPRINT		
14075	060136				PRINTB #TRPINF,TRPLOC,MODE,DEN,TINST,TOTTCH,TOTTC		;PRINT - ADDITIONAL TRAP
(12)	060136	013746	001420		MOV TOTTC,-(SP)		
(11)	060142	013746	001416		MOV TOTTCH,-(SP)		
(10)	060146	013746	050164		MOV TINST,-(SP)		
(9)	060152	013746	002166		MOV DEN,-(SP)		
(8)	060156	013746	002164		MOV MODE,-(SP)		
(7)	060162	013746	002172		MOV TRPLOC,-(SP)		
(6)	060166	012746	012310		MOV #TRPINF,-(SP)		
(3)	060172	010600			MOV SP,RO		

;NOTE LOCATIONS 57670-60070 ARE RESERVED FOR STACK USAGE
 ; DURING EXECUTION OF CIS STACK PROBEAHEAD MEMORY MGMT
 ; ABORT TESTS.

MACY11 27(655) 25-MAR-81 12:25 PAGE 95-15
 CIS INST EXERCISER MEMORY MANAGEMENT SUBROUTINES

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(4) 060174 004737 066232 JSR PC,FPRINT
14076 060200 012737 000001 001114 MOV #1,$MSGTY ;TELL APT THERE IS A FATAL ERROR ;;REV-C
14077 060206 000000 HALT
14078 060210 016637 000002 003672 1$: MOV 2(SP),TCCR ;SAVE CIS INST RETURN CONDITON CODES
14079 060216 005726 TST (SP)+
14080 060220 005726 TST (SP)+
14081 060222 000137 050226 JMP SUHRET
14082
14083
14084 ;
14085 ;ILLEGAL INSTRUCTION TRAP SERVICE ROUTINE
14086 ;
14087 060226 005037 177572 ILLSER: CLR @MMRO ;TURN OFF MEM MGMT - OVERWRITTEN WITH NOPS
14088 ; IF NO MEM MGMT ON SYSTEM (REF SIZEPT ROUTINE)
14089 060232 005737 002160 TST PT34 ;11/34 TYPE PROCESSOR?
14090 060236 001403 BEQ 2$ ;BRANCH IF NO
14091 ;NOTE:ON 11/34 HALT IN USER MODE TRAPS TO 10 (NOT 4)
14092 060240 021627 050204 CMP (SP),#TINRET+2 ;WAS HALT AT CIS INST RETURN LOC?
14093 060244 004600 BEQ 3$ ;BRANCH IF YES
14094 060246 022737 000001 001420 2$: CMP #1,TOTTC ;WAS ILLEGAL INST TRAP DURING TEST #1 ?
14095 060254 001014 BNE 1$ ;BRANCH IF NO
14096 060256 021627 050166 CMP (SP),#TINST+2 ;WAS ILLEGAL INST THE CIS INST?
14097 060262 001011 BNE 1$ ;BRANCH IF NO
14098 060264 PRINTB #CISO ;PRINT CISP PRESENT? WARNING
(6) 060264 012746 012013 MOV #CISO,-(SP)
(3) 060270 010600 MOV SP,R0
(4) 060272 004737 066232 JSR PC,FPRINT
14099 060276 012737 000001 001114 MOV #1,$MSGTY ;TELL APT THERE IS A FATAL ERROR ;;REV-C
14100 060304 000000 HALT
14101 060306 011637 002172 1$: MOV (SP),TRPLOC ;GET LOCATION THAT CAUSED TRAP
14102 060312 162737 000002 002172 SUB #2,TRPLOC
14103 060320 PRINTB #TRAP10 ;PRINT TRAP TO 10
(6) 060320 012746 012154 MOV #TRAP10,-(SP)
(3) 060324 010600 MOV SP,R0
(4) 060326 004737 066232 JSR PC,FPRINT
14104 060332 PRINTB #TRPINF,TRPLOC,MODE,DEN,TINST,TOTTC,TOTTC ;PRINT ADDITIONAL TRAP I
(12) 060332 013746 001420 MOV TOTTC,-(SP)
(11) 060336 013746 001416 MOV TOTTC,-(SP)
(10) 060342 013746 050164 MOV TINST,-(SP)
(9) 060346 013746 002166 MOV DEN,-(SP)
(8) 060352 013746 002164 MOV MODE,-(SP)
(7) 060356 013746 002172 MOV TRPLOC,-(SP)
(6) 060362 012746 012310 MOV #TRPINF,-(SP)
(3) 060366 010600 MOV SP,R0
(4) 060370 004737 066232 JSR PC,FPRINT
14105 060374 012737 000001 001114 MOV #1,$MSGTY ;TELL APT THERE IS A FATAL ERROR ;;REV-C
14106 060402 000000 HALT
14107 060404 000002 RTI
14108 060406 016637 000002 003672 3$: MOV 2(SP),TCCR ;SAVE CIS INST RETURN CONDITON CODES
14109 060414 005726 TST (SP)+
14110 060416 005726 TST (SP)+
14111 060420 000137 050226 JMP SUHRET
14112
14113

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 ZKFECC.P11 MEMORY MANAGEMENT SUBROUTINES

```

14114
14115
14116
14117 060424 005037 177572
14118 060430 011637 002172
14119 060434 162737 000002 002172
14120 060442
      (6) 060442 012746 012116
      (5) 060446 010600
      (4) 060450 004737 066232
14121 060454
      (12) 060454 013746 001420
      (11) 060460 013746 001416
      (10) 060464 013746 050164
      (9) 060470 013746 002166
      (8) 060474 013746 002164
      (7) 060500 013746 002172
      (6) 060504 012746 012310
      (3) 060510 010600
      (4) 060512 004737 066232
14122 060516 012737 000001 001114
14123 060524 000000
14124 060526 000002
14125
14126
14127
14128
14129 060530
14130 060530 105777 121132
14131 060534 100375
14132 060536 117737 121150 065600
14133 060544 042737 177600 065600
14134 060552 022737 000021 065600
14135 060560 001763
14136 060562 004737 065562
14137 060566 123727 065600 000113
14138 060574 001411
14139 060576 123727 065600 000123
14140 060604 001410
14141 060606 123727 065600 000125
14142 060614 001410
14143 060616 000414
14144 060620 005037 002164 6$:
14145 060624 000407
14146 060626 012737 000001 002164 3$:
14147 060634 000403
14148 060636 012737 000003 002164 4$:
14149 060644 062716 000002 2$:
14150 060650 000207 5$:
14151
14152

;MEMORY MANAGEMENT VIOLATION TRAP SERVICE ROUTINE
MMVIOL: CLR @#MMRO ;TURN OFF MEM MGMT
        MOV (SP),TRPLOC ;GET LOCATION WHICH CAUSED TRAP
        SUB #2,TRPLOC
        PRINTB #MMVMSG ;PRINT MEMORY MANAGEMENT VIOL
        MOV #MMVMSG,-(SP)
        MOV SP,R0
        JSR PC,FPRINT
        PRINTB #TRPINF,TRPLOC,MODE,DEN,TINST,TOTTC,TOTTC
        MOV TOTTC,-(SP)
        MOV TOTTC,-(SP)
        MOV TINST,-(SP)
        MOV DEN,-(SP)
        MOV MODE,-(SP)
        MOV TRPLOC,-(SP)
        MOV #TRPINF,-(SP)
        MOV SP,R0
        JSR PC,FPRINT
        MOV #1,$MSGTY ;TELL APT THERE IS A FATAL ERROR ;;REV-C
        HALT
        RTI

;ACCEPT ASCII (K,S, OR U) FROM TTY AND SETUP MODE WORD
KSORU:
1$: TSTB @TKS ;WAIT FOR A CHARACTER
   BPL 1$
   MOVB @TKB,RCHAR ;READ & SAVE CHAR
   BIC #^C177,RCHAR ;GET RID OF JUNK IF ANY
   CMP #021,RCHAR ;SEE IF A RANDOM ^Q WAS INPUTED ;;REV-C
   BEQ 1$ ;BRANCH IF SO - INPUT NOT WANTED ;;REV-C
   JSR PC,ECHAR ;ECHO CHARACTER
   CMPB RCHAR,#113 ;IS CHAR A 'K'
   BEQ 6$ ;BRANCH IF YES
   CMPB RCHAR,#123 ;IS CHAR AN 'S'
   BEQ 3$ ;BRANCH IF YES
   CMPB RCHAR,#125 ;IS CHAR A 'U' ?
   BEQ 4$ ;BRANCH IF YES
   BR 5$ ;CHAR IS ILLEGAL :RETURN TO CALL +2
6$: CLR MODE ;SET MODE TO KERNEL (0)
   BR 2$
3$: MOV #1,MODE ;SET MODE WORD TO SUPERVISOR (1)
   BR 2$
4$: MOV #3,MODE ;SET MODE WORD TO USER (3)
   BR 2$
2$: ADD #2,(SP)
5$: RTS PC

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 7*EEC.P11 PROGRAMMABLE CLOCK SERVICE ROUTINE

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14155          .SBTTL          PROGRAMMABLE CLOCK SERVICE ROUTINE
14156          :
14157          : KW11-P (PROGRAMMABLE CLOCK) INTERRUPT SERVICE ROUTINES (ALWAYS ENTERED IN KERNEL MODE)
14158          :
14159 060652     PCIS3:          ;P CLK SERVICE ROUTINE USED FOR INTR DURING
14160          : EXECUTION OF 'STATE DISTURBING' DIVPI
14161          : INSTRUCTION BELOW.
14162 060652 042777 000001 121644      BIC #1,@PC1CSR      ;TURN OFF PCLK1
14163 060660 000002          RTI
14164          :
14165 060662 005037 177572     PCIS2: CLR @#MMRO      ;P CLK INTR SERVICE ROUTINE USED WHEN
14166          : TESTING LATENCY
14167          : THIS CLR INSTRUCTION TURNS OFF MEMORY MANAGEMENT
14168          : THE CLR IS OVERWRITTEN WITH NOPS IF NOT 11/44
14169          : (SEE SIZEPT ROUTINE).
14170 060666 017737 121646 002546     MOV @PC2CTR,LATCT    ;SAVE P-CLK2 COUNTER FOR LATENCY CALCULATION
14171 060674 042777 000001 121632     BIC #1,@PC2CSR      ;TURN OFF PCLK2
14172 060702 005077 121630     CLR @PC2CSB         ;CLEAR PCLK2 COUNTER
14173          :
14174 060706 005037 177572     PCIS1: CLR @#MMRO      ;NORMAL P CLK INTERRUPT SERVICE ROUTINE
14175          : THIS CLR TURNS OFF MEM MGMT.
14176          : THIS CLR GETS OVERWRITTEN WITH NOPS IF NOT 11/44
14177 060712 042777 000001 121604     BIC #1,@PC1CSR      ;TURN OFF P-CLK1
14178 060720 004737 062024     JSR PC,SGPRO6        ;SAVE GENERAL PURPOSE REGS 0-6
14179 060724 021627 050164     CMP (SP),#TINST      ;INTERRUPTED THE TEST INST???
14180 060730 001162          BNE 1$                ;BRANCH IF NO
14181 060732 032766 000400 000002     BIT #400,2(SP)        ;IS PSW BIT 8 SET?
14182 060740 001407          BEQ 4$                ;BRANCH IF NO
14183 060742 005237 002552          INC INTCT            ;UPDATE INTERRUPT COUNT
14184 060746 052737 040000 002136     BIS #40000,FATAL      ;SET INTERRUPT INDICATOR IN FATAL ERROR WORD
14185 060754 004737 061650     JSR PC,RECLAT        ;RECORD LATENCY
14186 060760 004737 062252     4$: JSR PC,STATCG        ;HAS THE 'STATE' OF CIS INST CHANGED?
14187 060764 000507          BR 5$                ;NO RETURN
14188 060766 005237 002544          INC PROGCT          ;YES RETURN - UPDATE PROGRESS COUNT
14189 060772 032766 000400 000002     BIT #400,2(SP)        ;IS PSW BIT 8 SET?
14190 061000 001030          BNE 6$                ;BRANCH IF YES
14191 061002          PRINTB #HLTMSG
14192 (6) 061002 012746 012173          MOV #HLTMSG,-(SP)
14193 (3) 061006 010600          MOV SP,R0
14194 ( ) 061010 004737 066232          JSR PC,FPRINT
14195 061014 012737 061060 002174     MOV #100$,HLTLOC
14196 061022 004737 055714          JSR PC,IDINFO        ;IDENTIFY FAILING INST
14197 061026          PRINTB #FORM42      ;MSG: CIS INST WAS SUSPENDED TO SERVICE INTR
14198 (6) 061026 012746 015031          MOV #FORM42,-(SP)
14199 (3) 061032 010600          MOV SP,R0
14200 (4) 061034 004737 066232          JSR PC,FPRINT
14201 061040          PRINTB #FORM43      ;MSG: PSW BIT 8 SHOULD HAVE BEEN SET BUT WAS NOT
14202 (6) 061040 012746 015120          MOV #FORM43,-(SP)
14203 (3) 061044 010600          MOV SP,R0
14204 (4) 061046 004737 066232          JSR PC,FPRINT
14205 14196 061052 012737 000001 001114     MOV #1,$MSGTY        ;TELL APT THERE IS A FTAL ERROR      ;;REV-C
14206 14197 061060 000000          100$: HALT          ;BIT 8 OF PSW SHOULD HAVE BEEN SET!!!
14207 14198          ;PRESS CONTINUE TO PROCEED WITH TESTING
14208 14199
    
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PROGRAMMABLE CLOCK SERVICE ROUTINE

14245	061334					PRINTB #FORM44	:MSG: BIT 8 OF PSW SET WITH PC < CIS INST PC
(6)	061334	012746	015201			MOV #FORM44,-(SP)	
(3)	061340	010600				MOV SP,R0	
(4)	061342	004737	066232			JSR PC,FPRINT	
14246	061346					PRINTB #FORM45	:MSG: SUSPECT THAT CIS INST BACKED UP TOO FAR
(6)	061346	012746	015254			MOV #FORM45,-(SP)	
(3)	061352	010600				MOV SP,R0	
(4)	061354	004737	066232			JSR PC,FPRINT	
14247	061360					PRINTB #FORM46	:MSG: WHEN SERVICING INTERRUPT
(6)	061360	012746	015333			MOV #FORM46,-(SP)	
(3)	061364	010600				MOV SP,R0	
(4)	061366	004737	066232			JSR PC,FPRINT	
14248	061372	012737	000001	001114		MOV #1,\$MSGTY	:TELL APT THERE IS A FATAL ERROR ;:REV-C
14249	061400	000000			102\$:	HALT	:BIT 8 OF PSW SET WITH PC < CIS INST PC.
14250	061402	042766	000400	000002		BIC #400,2(SP)	:SUSPECT THAT CIS INST BACKED UP PC TOO FAR
14251							: WHEN SERVICING INTERRUPT.
14252							:PRESS CONTINUE TO PROCEED WITH TESTING
14253	061410	005237	002562		17\$:	INC INTRVL	
14254	061414	013777	002562	121104	13\$:	MOV INTRVL,@PC1CSB	:INCREASE INTERVAL
14255	061422	004737	062102			JSR PC,RGPRO6	:RESTORE REGISTERS
14256	061426	005726				TST (SP)+	:FIX UP STACK POINTER
14257	061430	005726				TST (SP)+	
14258	061432	000137	050124			JMP TOPC2	:RETURN TO TURN ON PCLK-1 POINT
14259							
14260	061436	004737	061650		15\$:	JSR PC,RECLAT	:RECORD LATENCY
14261	061442	032737	000100	050164		BIT #100,TINST	:IS INST UNDER TEST AN IN-LINE INST
14262	061450	001433				BEQ 20\$:BRANCH IF NO
14263	061452	021637	002220			CMP (SP),ICOMPC	:VERIFY THAT PC HAS BEEN ADJUSTED TO POINT
14264							: TO NEXT INST
14265	061456	103030				BHIS 20\$:BRANCH IF PC IS OK
14266	061460					PRINTB #HLTMSG	
(6)	061460	012746	012173			MOV #HLTMSG,-(SP)	
(3)	061464	010600				MOV SP,R0	
(4)	061466	004737	066232			JSR PC,FPRINT	
14267	061472	012737	061536	002174		MOV #103\$,HLTLOC	
14268	061500	004737	055714			JSR PC,IDINFO	:IDENTIFY FAILING INST
14269	061504					PRINTB #FORM48	:MSG: IN-LINE CIS INST COMPLETED WITH PC
(6)	061504	012746	015465			MOV #FORM48,-(SP)	
(3)	061510	010600				MOV SP,R0	
(4)	061512	004737	066232			JSR PC,FPRINT	
14270	061516					PRINTB #FORM49	:MSG: POINTING AT IN-LINE OPERANDS RATHER
(6)	061516	012746	015543			MOV #FORM49,-(SP)	
(3)	061522	010600				MOV SP,R0	
(4)	061524	004737	066232			JSR PC,FPRINT	
14271	061530	012737	000001	001114		MOV #1,\$MSGTY	:TELL APT THERE IS A FATAL ERROR ;:REV-C
14272							: THAN NEXT INST.
14273	061536	000000			103\$:	HALT	:PRESS CONTINUE TO PROCEED WITH TESTING
14274	061540	004737	062102		20\$:	JSR PC,RGPRO6	:RESTORE REGISTERS
14275	061544	032766	000400	000002		BIT #400,2(SP)	:CIS INST COMPLETE - VERIFY THAT PSW BIT 8
14276							: IS NOT SET
14277	061552	001423				BEQ 16\$	
14278	061554					PRINTB #HLTMSG	
(6)	061554	012746	012173			MOV #HLTMSG,-(SP)	
(3)	061560	010600				MOV SP,R0	

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PROGRAMMABLE CLOCK SERVICE ROUTINE

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(4) 061562 004737 066232 JSR PC,FPRINT
14279 061566 012737 061620 002174 MOV #104$,HLTLOC
14280 061574 004737 055714 JSR PC,IDINFO ;IDENTIFY FAILING INST
14281 061600 PRINTB #FORM47 ;MSG: CIS INST COMPLETED BUT PSW BIT 8 STILL SET
(6) 061600 012746 015404 MOV #FORM47,-(SP)
(3) 061604 010600 MOV SP,R0
(4) 061606 004737 066232 JSR PC,FPRINT
14282 061612 012737 000001 001114 MOV #1,$MSGTY ;TELL APT THERE IS A FATAL ERROR ;:REV-C
14283 061620 000000 104$: HALT ;CIS INST COMPLETED BUT PSW BIT 8 STILL SET
14284 ;PRESS CONTINUE TO PROCEED WITH TESTING
14285 061622 042766 000400 000002 16$: BIC #400,2(SP)
14286 061630 012777 000001 120670 MOV #1,@PC1CSB ;SET UP FOR NEXT PASS
14287 061636 012737 000001 002562 MOV #1,INTRVL
14288 061644 000137 061202 JMP 14$
14289
14290 ;KW11-P INTERRUPT SERVICE ROUTINE SUBROUTINES
14291 ;
14292 ;ROUTINE TO RECORD INTERRUPT LATENCY
14293 ;
14294 061650 163737 002562 002546 RECLAT: SUB INTRVL,LATCT ;CALCULATE LATENCY
14295 061656 005737 002564 TST STOPLA ;STOP ON EXCESSIVE LATENCY?
14296 061662 001427 BEQ 2$ ;BRANCH IF NO
14297 061664 023737 002564 002546 CMP STOPLA,LATCT ;IS LATENCY EXCESSIVE?
14298 061672 101023 BHI 2$ ;BRANCH IF NO
14299 061674 PRINTB #HLTMSG
(6) 061674 012746 012173 MOV #HLTMSG,-(SP)
(3) 061700 010600 MOV SP,R0
(4) 061702 004737 066232 JSR PC,FPRINT
14300 061706 012737 000100 002174 MOV #100,HLTLOC
14301 061714 004737 055714 JSR PC,IDINFO ;IDENTIFY FAILING INST
14302 061720 PRINTB #LATEXC
(6) 061720 012746 012260 MOV #LATEXC,-(SP)
(3) 061724 010600 MOV SP,R0
(4) 061726 004737 066232 JSR PC,FPRINT
14303 061732 012737 000001 001114 MOV #1,$MSGTY ;TELL APT THERE IS A FATAL ERROR ;:REV-C
14304 061740 000000 100$: HALT ;LATENCY EXCEEDED USER DEFINED
14305 ; 'MAXIMUM ALLOWABLE'
14306
14307 061742 013701 002302 2$: MOV OCTIC,R1 ;RECORD LATENCY
14308 061746 006301 ASL R1
14309 061750 062701 004112 ADD #ILATEN,R1 ;FORM POINTER INTO INST LATENCY TABLE
14310 061754 021137 002546 CMP (R1),LATCT ;IS LATENCY BIGGER THAN THAT ALREADY
14311 ; RECORDED FOR INST?
14312 061760 101002 BHI 1$ ;BRANCH IF NO
14313 061762 013711 002546 MOV LATCT,(R1) ;SAVE NEW LATENCY VALUE
14314 061766 000207 1$: RTS PC
14315
14316 ;ROUTINE TO TURN ON P-CLK DURING DIVPI 'STATE DISTURBING' INST
14317 ;
14318 061770 017737 120524 002042 DIC: MOV @PCLK1V,SPCV ;SAVE CONTENTS OF P CLK INTERRUPT VECTOR
14319 061776 013737 120400 002044 MOV PRECSK,TPRECS ;SAVE CONTENTS OF 65TH STACK WORD
14320 062004 012777 060652 120506 MOV #PCIS3,@PCLK1V ;SETUP INTR VECTOR
14321 052012 000207 DI: RTS PC ;OVERWRITTEN WITH A NOP IF USER REQUESTS
14322 062014 052777 000001 120502 BIS #1,@PC1CSR ;TURN ON P-CLK1 - ENABLE INTR DURING

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14323
14324 062027 000207

RTS PC

; SUBSEQUENT (STATE DISTURBING) CIS INST

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14327

PDP-11 CIS INST EXERCISER
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PROGRAMMABLE CLOCK SERVICE ROUTINE

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14329          ;ROUTINE TO SAVE GENERAL PURPOSE REGISTERS 0 THROUGH 6.
14330          ;
14331 062024          ;SGPR06:
14332 062024 010037 003010      MOV R0,SGPRO
14333 062030 010137 003012      MOV R1,SGPR1
14334 062034 010237 003014      MOV R2,SGPR2
14335 062040 010337 003016      MOV R3,SGPR3
14336 062044 010437 003020      MOV R4,SGPR4
14337 062050 010537 003022      MOV R5,SGPR5
14338 062054 032737 030000 177776  BIT #30000,PSW          ;WAS PREVIOUS MODE USER OR SUPV?
14339 062062 001404          BEQ 1$          ;BRANCH IF NO
14340 062064 006506          MFPI SP          ;GET PREVIOUS MODE SP
14341 062066 012637 003024      MOV (SP)+,SGPR6      ;STORE PREVIOUS MODE SP IN SGPR6
14342 062072 000402          BR 2$
14343 062074 010637 003024      1$: MOV SP,SGPR6
14344 062100 000207          2$: RTS PC
14345
14346          ;
14347          ;ROUTINE TO RESTORE GENERAL PURPOSE REGISTERS 0 THROUGH 5
14348          ;
14349 062102          ;RGPR06:
14350 062102 013700 003010      MOV SGPR0,R0
14351 062106 013701 003012      MOV SGPR1,R1
14352 062112 013702 003014      MOV SGPR2,R2
14353 062116 013703 003016      MOV SGPR3,R3
14354 062122 013704 003020      MOV SGPR4,R4
14355 062126 013705 003022      MOV SGPR5,R5
14356          ;NOTE NO NEED TO RESTORE R6 BECAUSE IT HAS NOT CHANGED.
14357 062132 000207          RTS PC
14358
14359          ;
14360          ;ROUTINE TO SAVE STATE OF CISP - STATE=STACK POINTER,GENERAL PURPOSE REGISTER
14361          ; CONTENTS & STACK CONTENTS.
14362          ;
14363 062134          ;SAVST:
14364 062134 016637 000004 002570  MOV 4(SP),STATPS      ;SAVE PSW STATE
14365 062142 013737 003010 002572  MOV SGPR0,STATR0      ;SAVE STATE OF GENERAL PURPOSE REGS 0-6
14366 062150 013737 003012 002574  MOV SGPR1,STATR1
14367 062156 013737 003014 002576  MOV SGPR2,STATR2
14368 062164 013737 003016 002600  MOV SGPR3,STATR3
14369 062172 013737 003020 002602  MOV SGPR4,STATR4
14370 062200 013737 003022 002604  MOV SGPR5,STATR5
14371 062206 013737 003024 002606  MOV SGPR6,STATR6
14372 062214 013700 003024          MOV SGPR6,R0          ;SAVE STACK CONTENTS
14373 062220 062700 000006          ADD #6,R0
14374 062224 020027 120602          CMP R0,#CSTACK      ;DID CIS INST PUSH ANYTHING ONTO STACK?
14375 062230 103007          BHIS 1$          ;BRANCH IF NO
14376 062232 012702 003010          MOV #CSTK,R2        ;COPY USED PORTION OF STACK INTO A
14377 062236 012701 120602          MOV #CSTACK,R1      ; SAVE AREA.
14378 062242 014142          2$: MOV -(R1),-(R2)
14379 062244 020100          CMP R1,R0          ;ALL OF USED PORTION OF STACK COPIED?
14380 062246 103375          BHIS 2$          ;BRANCH IF NO
14381 062250 000207          1$: RTS PC
14382

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 CZKEEC.P11 PROGRAMMABLE CLOCK SERVICE ROUTINE

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14383
14384 ;ROUTINE TO CHECK FOR A CISP STATE CHANGE
14385 ; RETURNS TO CALL ON NO CHANGE; CALL+2 ON CHANGE
14386 ;
14387 ;STATCG:
14388 062252 026637 000004 002570 CMP 4(SP),STATPS ;DID PSW CHANGE?
14389 062260 001054 BNE STHASC ;BRANCH IF YES
14390 062262 023737 003024 002606 CMP SGPR6,STATR6 ;DID STACK POINTER CHANGE?
14391 062270 001050 BNE STHASC ;BRANCH IF YES
14392 062272 023737 003010 002572 CMP SGPRO,STATRO ;DID ANY OF THE GENERAL PURPOSE REGISTER
14393 ;CONTENTS CHANGE?
14394 062300 001044 BNE STHASC ;BRANCH IF RO CHANGED
14395 062302 023737 003012 002574 CMP SGPR1,STATR1
14396 062310 001040 BNE STHASC ;BRANCH IF R1 HAS CHANGED
14397 062312 023737 003014 002576 CMP SGPR2,STATR2
14398 062320 001034 BNE STHASC ;BRANCH IF R2 HAS CHANGED
14399 062322 023737 003016 002600 CMP SGPR3,STATR3
14400 062330 001030 BNE STHASC ;BRANCH IF R3 HAS CHANGED
14401 062332 023737 003020 002602 CMP SGPR4,STATR4
14402 062340 001024 BNE STHASC ;BRANCH IF R4 HAS CHANGED
14403 062342 023737 003022 002604 CMP SGPR5,STATR5
14404 062350 001020 BNE STHASC ;BRANCH IF R5 HAS CHANGED
14405 062352 013700 003024 MOV SGPR6,RO ;DID THE STACK CONTENTS CHANGE
14406 062356 062700 000006 ADD #6,RO
14407 062362 020027 120602 CMP RO,#CSTACK ;DID ANYTHING GET PUSHED ONTO THE STACK?
14408 062366 103010 BHIS 1$ ;BRANCH IF NO
14409 062370 012702 003010 MOV #SCSTK,R2
14410 062374 012701 120602 MOV #CSTACK,R1
14411 062400 024142 2$: CMP -(R1),-(R2) ;DID ANY OF THE INFORMATION ON THE STACK GET CHANGED?
14412 062402 001003 BNE STHASC ;BRANCH IF YES
14413 062404 020100 CMP R1,RO ;ALL OF STACK CHECKED?
14414 062406 103374 BHIS 2$ ;BRANCH IF NO
14415 062410 000402 1$: BR NOSCHG
14416 062412 062716 000002 STHASC: ADD #2,(SP)
14417 062416 000207 NOSCHG: RTS PC
14418
14420 ;ROUTINE TO CHECK FOR AND SETUP P-CLK 1
14421 062420 PC1CK: ;TEST FOR P-CLKS PRESENT
14422 062420 013701 002542 MOV TIMEOUT,R1 ;SAVE TIME OUT VECTOR CONTENTS
14423 062424 011146 MOV (R1),-(SP)
14424 062426 012721 062514 MOV #1$,(R1)+
14425 062432 011146 MOV (R1),-(SP)
14426 062434 005011 CLR (R1)
14427
14428 062436 005777 120062 TST @PC1CSR ;ATTEMPT ACCESS P-CLK1 CSR
14429 ;PCLK1 IS RESPONDING
14430 062442 012777 060706 120050 MOV #PCIS1,@PCLK1V ;SET UP P-CLK1 INTERRUPT SERVICE VECTOR
14431 062450 005077 120050 CLR @PC1CSR ;CLEAR P-CLK1 CSR
14432 062454 012777 000000 120042 MOV #000,@PC1CSR ;SET P-CLK1 FOR SINGLE INT,COUNT DOWN,100K HZ
14433 ; CLOCK, INT ENABLE
14434 062462 012777 000001 120036 MOV #1,@PC1CSB ;SET COUNTER TO 1 (1 MICRO SEC INTERVAL
14435 ; WITH 1 MHZ EXTERNAL CLOCK.
14436 062470 012737 000001 002562 MOV #1,INTRVL ;SAVE INTERVAL SETTING
14437 062476 013737 002554 050134 MOV KNOPI,TOPCI ;OVERWRITE BRANCH TO ALLOW TURNING ON OF

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PROGRAMMABLE CLOCK SERVICE ROUTINE

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14438                                     : PCLK1 PRIOR TO CIS INST EXECUTION
14439 062504 062766 000004 000004      ADD #4,4(SP)          ;ADJUST STACK FOR 'EXISTS RETURN'
14440 062512 000402                      BR 2$
14441 062514 005726                      1$: TST (SP)+         ;FIX UP STACK POINTER
14442 062516 005726                      TST (SP)+
14443 062520 013701 002542              2$: MOV TIMEOUT,R1    ;RESTORE TIME OUT INTR VECTOR TO ORIGINAL STATE
14444 062524 012661 000002              MOV (SP)+,2(R1)
14445 062530 012611                      MOV (SP)+,(R1)
14446 062532 000207                      RTS PC
14447
14448                                     ;ROUTINE TO CHECK FOR AND SETUP P-CLK2
14449 062534 013701 002542              PC2CK: MOV TIMEOUT,R1 ;SAVE TIME OUT VECTOR CONTENTS
14450 062540 011146                      MOV (R1),-(SP)
14451 062542 012721 062642              MOV #1$, (R1)+
14452 062546 011146                      MOV (R1),-(SP)
14453 062550 005011                      CLR (R1)
14454 062552 005777 117756              TST @PC2CSR          ;ATTEMPT ACCESS OF PCLK 2 CSR
14455 062556 012737 177777 002550      MOV #177777,LATEN   ;SET LATENCY TESTING FLAG
14456 062564 012700 004112              MOV #1LATEN,R0      ;CLEAR INTERRUPT LATENCY TABLE
14457 062570 005020                      12$: CLR (R0)+
14458 062572 020027 004202              CMP R0,#LATEND+2
14459 062576 001374                      BNE 12$
14460 062600 012777 060662 117712      MOV #PCIS2,@PCLK1V
14461 062606 005077 117722              CLR @PC2CSR          ;CLEAR P-CLK2 CSR
14462 062612 012777 000020 117714      MOV #20,@PC2CSR     ;SET P-CLK2 FOR INT. DISABLE, COUNT UP
14463                                     : 100KHZ CLOCK
14464 062620 005077 117712              CLR @PC2CSB         ;SET COUNTER TO 0
14465 062624 013737 002556 050124      MOV KNOP2,TOPC2     ;OVERWRITE BRANCH TO ALLOW TURNING ON OF
14466                                     : PCLK2 PRIOR TO CIS INST EXECUTION
14467 062632 062766 000004 000004      ADD #4,4(SP)        ;ADJUST STACK FOR 'EXISTS RETURN'
14468 062640 000402                      BR 2$
14469 062642 005726                      1$: TST (SP)+         ;FIX UP STACK POINTER
14470 062644 005726                      TST (SP)+
14471 062646 013701 002542              2$: MOV TIMEOUT,R1    ;RESTORE TIME OUT INTERRUPT VECTOR TO
14472 062652 012661 000002              MOV (SP)+,2(R1)     ; ORIGINAL STATE
14473 062656 012611                      MOV (SP)+,(R1)
14474 062660 000207                      RTS PC

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CZKEEC.P11

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LINE TIME CLOCK ROUTINES

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14492          .SBTTL          LINE TIME CLOCK ROUTINES
14493          :
14494          : KW11-L (LINE TIME CLOCK) INTERRUPT SERVICE ROUTINE
14495          :
14496 062662 013746 177572      LTCIS:  MOV @#MMRO,-(SP)          ;SAVE MEM MGMT STATE ON STACK - OVERWRITTEN WITH A
14497          :                                     ; BRANCH (405) IF NO MEM MGMT ON SYSTEM
14498 062666 005037 177572          CLR @#MMRO          ;TURN OFF MEM MGMT
14499 062672 012637 002214          MOV (SP)+,MMSTAT    ;RESTORE STACK TO PROPER POINT
14500 062676 042777 000100 120126 BIC #100,@CLKS     ;TURN OFF LTC
14501 062704 004737 062024          JSR PC,SGPRO6      ;SAVE GENERAL PURPOSE REGS 0-6
14502 062710 021627 050164          CMP (SP),#TINST    ;INTERRUPTED THE CIS INST UNDER TEST?
14503 062714 001056          BNE EXLTCS        ;NO - EXIT LTC SERVICE
14504 062716 004737 062252          JSR PC,STATCG     ;HAS THE STATE OF CIS INST CHANGED?
14505 062722 000453          BR EXLTCS        ;NO RETURN - EXIT LTC SERVICE
14506 062724 032766 000400 000002 BIT #400,2(SP)     ;YES RETURN - IS PSW BIT 8 SET?
14507 062732 001030          BNE 1$          ;BRANCH IF YES
14508 062734          PRINTB #HLTMSG
14509 (6) 062734 012746 012173          MOV #HLTMSG,-(SP)
14510 (3) 062740 010600          MOV SP,R0
14511 (4) 062742 004737 066232          JSR PC,FPRINT
14512 062746 012737 063012 002174 MOV #100$,HLTLOC
14513 062754 004737 055714          JSR PC,IDINFO     ;IDENTIFY FAILING INST
14514 062760          PRINTB #FORM42      ;MSG: CIS INST WAS SUSPENDED TO SERVICE INTR
14515 (6) 062760 012746 015031          MOV #FORM42,-(SP)
14516 (3) 062764 010600          MOV SP,R0
14517 (4) 062766 004737 066232          JSR PC,FPRINT
14518 062772          PRINTB #FORM43      ;MSG: PSW BIT 8 SHOULD HAVE BEEN SET BUT WAS NOT
14519 (6) 062772 012746 015120          MOV #FORM43,-(SP)
14520 (3) 062776 010600          MOV SP,R0
14521 (4) 063000 004737 066232          JSR PC,FPRINT
14522 063004 012737 000001 001114 MOV #1,$MSGTY     ;TELL APT THERE IS A FATAL ERROR      ;;REV-C
14523 063012 000000          100$: HALT
14524 063014 005237 002552          1$: INC INTCT          ;UPDATE INTERRUPT COUNT
14525 063020 052737 040000 002136 BIS #40000,FATAL   ;SET INTR INDICATION IN FATAL ERROR WORD
14526 063026 013737 120400 002044 MOV PRECSK,TPRECS ;SAVE CONTENTS OF 65TH STACK WORD
14527 063034 076175          DIVPI            ;DISTURB INTERNAL CISP STATE BY
14528 063036 003156          DIVDS           ; EXECUTING A DIVP IN-LINE INST.
14529 063040 003156          DIVDS
14530 063042 003162          DIVDD
14531 063044 013737 002044 120400 MOV TPRECS,PRECSK ;RESTORE 65TH STACK WORD
14532 063052 004737 062102          JSR PC,RGPRO6    ;RESTORE GENERAL PURPOSE REGS 0-6
14533 063056 005737 002162          TST MMFLG        ;TESTING WITH MEM MGMT ON ?
14534 063062 001403          BEQ 1$          ;BRANCH IF NO
14535 063064 013737 002214 177572 MOV MMSTAT,@#MMRO ;TURN ON MEM MGMT
14536 063072 000002          1$: RTI          ;RETURN FROM SERVICE

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 CZKFEED.P11 LINE TIME CLOCK ROUTINES

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14530
14531
14532 ;LTC SYNC UP ROUTINE
14533 ;
14534 063074 ;LTC SUP:
14535 063074 012777 063116 117724 MOV #LSUPR,@LTCIV ;SETUP LTC INTERRUPT VECTOR
14536 063102 005077 117724 CLR @CLKS
14537 063106 052777 000100 117716 BIS #100,@CLKS ;ENABLE INTERRUPTS
14538
14539 063114 000001 1$: WAIT ;WAIT FOR CLOCK SIGNAL
14540 063116 005077 117710 LSUPR: CLR @CLKS ;DISABLE LTC INTERRUPTS
14541 063122 012777 062662 117676 MOV #LTCIS,@LTCIV ;RESTORE LTC INTERRUPT VECTOR
14542 063130 005726 TST (SP)+ ;FIX UP STACK
14543 063132 005726 TST (SP)+
14544 063134 000207 RTS PC
14545
14546
14547 ;LTC - DETERMINE COUNT PER CLOCK TICK
14548 ;
14549 063136 ;LTC CNT:
14550 063136 012777 063164 117662 MOV #LTCINT,@LTCIV ;SETUP LTC INTERRUPT SERVICE
14551 063144 005077 117662 CLR @CLKS
14552 063150 052777 000100 117654 BIS #100,@CLKS ;ENABLE INTERRUPTS
14553 063156 005237 003034 1$: INC LCNT ;COUNT TILL LTC INTERRUPTS
14554 063162 000775 BR 1$
14555 063164 005077 117642 LTCINT: CLR @CLKS ;DISABLE LTC INTERRUPTS
14556 063170 163737 003042 003034 SUB LTC DLY,LCNT ;INTERRUPT RETURN
14557 063176 012777 062662 117622 MOV #LTCIS,@LTCIV ;RESTORE LTC INTERRUPT VECTOR
14558 063204 005726 TST (SP)+
14559 063206 005726 TST (SP)+ ;FIX UP STACK
14560 063210 000207 RTS PC
14561
14562
14563 ;LTC - ROUTINE TO CHECK FOR LINE TIME CLOCK ON SYSTEM
14564 ;
14565 063212 ;LTC P:
14566 063212 013701 002542 MOV TIMEOUT,R1 ;SAVE TIME OUT VECTOR
14567 063216 011146 MOV (R1),-(SP) ;SETUP INTERRUPT VECTOR
14568 063220 012721 063256 MOV #1$, (R1)+
14569 063224 011146 MOV (R1),-(SP)
14570 063226 005011 CLR (R1)
14571 063230 005777 117576 TST @CLKS ;ATTEMPT ACCESS OF LTC
14572 063234 005077 117572 CLR @CLKS ;CLEAR LTC CSR
14573 063240 013737 003040 050072 MOV KNOP4,TOLTC ;OVERWRITE BRANCH TO ALLOW TURNING ON OF
; OF LTC PRIOR TO CIS INST EXECUTION.
14574
14575 063246 062766 000004 000004 ADD #4,4(SP) ;ADJUST RETURN TO CALL + 4
14576 063254 000402 BR 2$
14577 063256 005726 1$: TST (SP)+ ;FIX UP STACK POINTER
14578 063260 005726 TST (SP)+
14579 063262 013701 002542 2$: MOV TIMEOUT,R1 ;RESTORE TIME OUT INTR VECTOR TO
14580 063266 012661 000002 MOV (SP)+,2(R1) ; ORIGINAL STATE
14581 063272 012611 MOV (SP)+,(R1)
14582 063274 000207 RTS PC
14583 ;

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 C7KEEC.P11 LINE TIME CLOCK ROUTINES

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14584 ;RANDOM EXERCISE MODE SUBROUTINES
14585 ;
14586
14587 063276 SRNGST: ;SUBROUTINE TO SAVE RANDOM # GEN STATE
14588 ;AT START OF EACH TEST
14589 063276 013737 064414 002002 MOV RNCON,STRNC
14590 063304 013737 064416 002004 MOV RP1,STRP1
14591 063312 013737 064420 002006 MOV RP2,STRP2
14592 063320 000207 RTS PC
14593
14594 063322 SRNGSX: ;SUBROUTINE TO SAVE RANDOM # GEN. STATE X.
14595 063322 013737 064414 002010 MOV RNCON,SXRNC
14596 063330 013737 064416 002012 MOV RP1,SXRP1
14597 063336 013737 064420 002014 MOV RP2,SXRP2
14598 063344 000207 RTS PC
14599
14600 063346 RRNGSX: ;SUBROUTINE TO RESTORE RANDOM # GEN STATE X.
14601 063346 013737 002010 064414 MOV SXRNC,RNCON
14602 063354 013737 002012 064416 MOV SXRP1,RP1
14603 063362 013737 002014 064420 MOV SXRP2,RP2
14604 063370 000207 RTS PC
14605
14606 063372 SRNGSY: ;SUBROUTINE TO SAVE RANDOM # GEN STATE Y.
14607 063372 013737 064414 002016 MOV RNCON,SYRNC
14608 063400 013737 064416 002020 MOV RP1,SYRP1
14609 063406 013737 064420 002022 MOV RP2,SYRP2
14610 063414 000207 RTS PC
14611
14612 063416 RRNGSY: ;SUBROUTINE TO RESTORE RANDOM # GEN STATE Y.
14613 063416 013737 002016 064414 MOV SYRNC,RNCON
14614 063424 013737 002020 064416 MOV SYRP1,RP1
14615 063432 013737 002022 064420 MOV SYRP2,RP2
14616 063440 000207 RTS PC
14617
14618 063442 SRNGSW: ;SUBROUTINE TO SAVE RANDOM # GEN STATE W.
14619 063442 013737 064414 002024 MOV RNCON,SWRNC
14620 063450 013737 064416 002026 MOV RP1,SWRP1
14621 063456 013737 064420 002030 MOV RP2,SWRP2
14622 063464 000207 RTS PC
14623
14624 063466 RRNGSW: ;SUBROUTINE TO RESTORE RANDOM # GEN STATE W.
14625 063466 013737 002024 064414 MOV SWRNC,RNCON
14626 063474 013737 002026 064416 MOV SWRP1,RP1
14627 063502 013737 002030 064420 MOV SWRP2,RP2
14628 063510 000207 RTS PC
14629
14630 063512 SRNGSV: ;SUBROUTINE TO SAVE RANDOM # GEN STATE V.
14631 063512 013737 064414 002032 MOV RNCON,SVRNC
14632 063520 013737 064416 002034 MOV RP1,SVRP1
14633 063526 013737 064420 002036 MOV RP2,SVRP2
14634 063534 000207 RTS PC
14635
14636 063536 RRNGSV: ;SUBROUTINE TO RESTORE RANDOM # GEN STATE V.
14637 063536 013737 002032 064414 MOV SVRNC,RNCON

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CZKEEC.P11 LINE TIME CLOCK ROUTINES

14638	063544	013737	002034	.064416	MOV SVRP1,RP1
14639	063552	013737	002036	064420	MOV SVRP2,RP2
14640	063560	000207			RTS PC
14641					

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 CZKEEC.P11 RANDOM MODE SUBROUTINES

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14643      .SBTTL          RANDOM MODE SUBROUTINES
14644      :
14645      :SUBROUTINE TO GENERATE A RANDOM CIS INST AND LOAD ITS IDENTIFIER
14646      : (REFERENCE THE OINST TABLE) INTO THE FIRST WORD OF THE DUMMY
14647      : INPUT TABLE. THIS ROUTINE ONLY GENERATES CIS INSTS WHICH HAVE A NON-ZERO
14648      : ENCODING IN THE OINST TABLE. ZERO OINST TABLE ENTRIES ASSOC WITH CIS INST
14649      : NOT TO BE INCLUDED IN THE RANDOM EXERCISING.
14650      :
14651      GENRI:
14652      063562 004737 064334      JSR PC,RN          ;GET A RANDOM #
14653      063566 042700 177740      BIC #BS128,R0      ;MASK OFF ALL BUT LEAST SIGNIF 5 BITS
14654      063572 005200              INC R0
14655      063574 020027 000031      CMP R0,#31         ;VALID IDENTIFIERS = 1 TO 31
14656      063600 101370              BHI GENRI          ;BRANCH IF IDENTIFIER IS INVALID
14657      063602 010037 072776      MOV R0,IDUM        ;LOAD INST IDENTIFIER INTO DUMMY INPUT TABLE
14658      063606 006300              ASL R0
14659      063610 062700 003732      ADD #OINST,R0     ;VERIFY THAT GENERATED INST IS
14660      063614 005710              TST (R0)           ;A MEMBER OF THE SET OF CIS INSTS
14661      063616 001761              BEQ GENRI          ;TO BE RANDOMLY EXERCISED.
14662      063620 000207              RTS PC
14663      :
14664      :ROUTINE TO LOAD UP DUMMY INPUT TABLE USING RANDOM NUMBER GENERATOR.
14665      :ROUTINE USES THE RANDOM EXERCISE MASK TABLES TO LIMIT OPERANDS
14666      : (LENGTHS,ADDRESSES,ETC) TO THE PROPER RANGE.
14667      :
14668      063622 012702 073002      LDINPT: MOV #IDUM+4,R2      ;SETUP POINTER INTO DUMMY TABLE
14669      063626 013701 072776      MOV IDUM,R1
14670      063632 006301              ASL R1
14671      063634 062701 004202      ADD #MINST,R1
14672      063640 011101              MOV (R1),R1
14673      063642 012137 001770      1$: MOV (R1)+,PMASK          ;GET MASK FOR GIVEN INPUT PARAMETER
14674      063646 022737 125252 001770  CMP #EOT,PMASK      ;IS MASK=END OF MASK TABLE (EOT)
14675      063654 001431              BEQ IDFLD          ;BRANCH IF YES
14676      063656 022737 152525 001770  CMP #DSCPTR,PMASK   ;DOES MASK INDICATE THAT INPUT
14677      :                          ;PARAMETER IS A DESCRIPTOR POINTER?
14678      063664 001003              BNE 2$            ;BRANCH IF NO
14679      063666 012722 002514      MOV #RANDSC,(R2)+ ;FILL TABLE ENTRY WITH A RANDOM
14680      063672 000763              BR 1$             ;DESCRIPTOR POINTER.
14681      063674 032737 100000 001770  2$: BIT #100000,PMASK   ;MASK AND OFFSET?
14682      063702 001010              BNE 3$            ;BRANCH IF NO(MASK ONLY).
14683      063704 004737 064334      JSR PC,RN          ;GENERATE A RANDOM #
14684      063710 042700 176000      BIC #BS4,R0        ;MASK WITH 176000
14685      063714 063700 001770      ADD PMASK,R0       ;ADD IN OFFSET
14686      063720 010022              MOV R0,(R2)+     ;STORE INPUT PARAMETER
14687      063722 000747              BR 1$
14688      063724 004737 064334      3$: JSR PC,RN          ;GENERATE A RANDOM NUMBER
14689      063730 043700 001770      BIC PMASK,R0       ;MASK TO VALID RANGE
14690      063734 010022              MOV R0,(R2)+     ;STORE INPUT PARAMETER IN DUMMY TABLE
14691      063736 000741              BR 1$
14692      063740 005022              IDFLD: CLR (R2)+     ;CLEAR REMAINDER OF DUMMY INPUT TABLE
14693      063742 020227 073050      CMP R2,#IDUME
14694      063746 001374              BNE IDFLD
14695      063750 022737 000020 072776  CMP #20,IDUM
14696      063756 001404              BEQ 1$            ;IS RANDOM MODE INST = ASHP OR ASHN?
14697      :                          ;BRANCH IF YES

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CZKEEC.P11          RANDOM MODE SUBROUTINES

14702 063760 022737 000030 072776      CMP #30,IDUM
14703 063766 001007                      BNE 2$
14704 063770 123727 073007 000011 1$:  CMPB IDUM+11,#11      ;BRANCH IF NO
14705 063776 101403                      RI OS 2$              ;YES - LIMIT ROUND DIGIT TO 0 - 9
14706 064000 142737 000010 073007      BICB #10,IDUM+11      ;CONVERT INVALID DIGIT TO A VALID ONE
14707 064006 022737 000003 072776 2$:  CMP #3,IDUM           ;IS RANDOM INST = MOVTC
14708 064014 001006                      BNE 3$              ;BRANCH IF NO
14709 064016 013737 073032 002176      MOV IDUM+34,IRXLT     ;ADJUST IP15 FOR PROPER LEVEL OF INDIRECTING
14710 064024 012737 002176 073032      MOV #IRXLT,IDUM+34
14711 064032 000207 3$:      RTS PC
14712
14713      ;ROUTINE TO LOAD MISCELLANEOUS CONSTANTS USING RANDOM NUMBER GENERATOR
14714      ;
14715      LDCON:
14716 064034 004737 064334      JSR PC,RN
14717 064040 010037 001660      MOV RO,INCSQ1        ;LOAD TEST BUFFER INCREMENTING SEQUENCE
14718 064044 004737 064334      JSR PC,RN            ; SEED WITH A RANDOM #
14719 064050 010037 001662      MOV RO,INCSQ2
14720 064054 000207      RTS PC
14721
14722      ;
14723      ;ROUTINE TO ACKNOWLEDGE OPERATOR REQUESTS
14724      ;
14725      ; CNTL T - DISPLAY CURRENT TEST #(DECIMAL) THEN RETURN TO CALL+6
14726      ; CNTL C - RETURN TO CALL+2
14727      ; CNTL D - SET DISPLAY AND NO QUERY SWITCH. THEN RETURN TO CALL + 6
14728      ; CNTL E - SET DISPLAY SWITCH. THEN RETURN TO CALL + 6
14729      ; CNTL N - CLEAR DISPLAY SWITCH. THEN RETURN TO CALL + 6
14730      ; CNTL O - TOGGLE PROGRESS DISPLAY SWITCH. THEN RETURN TO CALL +6
14731      ; OTHER - RETURN TO CALL+6
14732      ;
14733      ;EXTBK:
14734 064056 105777 115604      TSTB @TKS           ;CHAR THERE?
14735 064062 100063                      BPL 1$              ;NO - EXIT ROUTINE
14736 064064 117737 115622 065600      MOVB @TKB,RCHAR     ;READ AND SAVE ITY CHAR
14737 064072 042737 177600 065600 8$:  BIC #^C177,RCHAR    ;GET RID OF JUNK IF ANY
14738 064100 023727 065600 000003      CMP RCHAR,#003      ;IS CHAR A CNTL C?
14739 064106 001453                      BEQ 2$              ;BRANCH IF YES
14740 064110 023727 065600 000024      CMP RCHAR,#024      ;IS CHAR A CNTL T?
14741 064116 001003                      BNE 3$
14742 064120 004737 064240      JSR PC,IDINST
14743 064124 000442                      BR 1$
14744 064126 023727 065600 000004 3$:  CMP RCHAR,#004      ;IS CHAR A CNTL D?
14745 064134 001007                      BNE 5$
14746 064136 012737 177777 002046      MOV #177777,NOERDS  ;SET DISPLAY SWITCH
14747 064144 012737 177777 002210      MOV #177777,QRFLG   ;SET QUERY FOR DISPLAY BUFFER FLAG
14748 064152 000427                      BR 1$
14749 064154 023727 065600 000005 5$:  CMP RCHAR,#005      ;IS CHAR A CNTL E?
14750 064162 001004                      BNE 6$              ;BRANCH IF NO
14751 064164 012737 177777 002046      MOV #177777,NOERDS  ;SET DISPLAY SWITCH
14752 064172 000417                      BR 1$
14753 064174 023727 065600 000017 6$:  CMP RCHAR,#017      ;IS CHAR A CNTL O?
14754 064202 001003                      BNE 4$              ;BRANCH IF NO
14755 064204 005137 002050      COM PROGD           ;TOGGLE PROGRESS DISPLAY SWITCH
14755 064210 000410                      BR 1$

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CZKEEC.P11          RANDOM MODE SUBROUTINES

14756 064212 023727 065600 000016 4$:   CMP RCHAR,#016           ;IS CHAR A CNTL N?
14757 064220 001004                BNE 1$
14758 064222 005037 002046                CLR NOERDS             ;YES - CLEAR NO ERROR DISPLAY SWITCH
14759 064226 005037 002210                CLR QRYFLG            ;CLEAR QUERY SWITCH
14760 064232 062716 000004                1$:   ADD #4,(SP)         ;RETURN TO CALL+6
14761 064236 000207                2$:   RTS PC
14762
14763                ;ROUTINE TO DISPLAY CURRENT INST AND TEST #
14764
14765 064240                IDINST:
14766 064240 012737 177777 001766        MOV #177777,CTACT     ;SET CONTROL T ACTIVE FLAG
14767 064246                PRINTB #FORM21         ;PRINT A CRLF
(6) 064246 012746 014160                MOV #FORM21,-(SP)
(3) 064252 010600                MOV SP,R0
(4) 064254 004737 066232                JSR PC,FPRINT
14768 064260 004777 115662                JSR PC,@EMPTR        ;PRINT INST & TEST #
14769 064264 000207                RTS PC
14770
14771                ;ROUTINE TO RANDOMIZE PACKED STRING DATA TYPE
14772
14773                ;
14774 064266                RPTYPE:
14775 064266 004737 064334                JSR PC,RN             ;GET A RANDOM #
14776 064272 032700 000001                BIT #1,R0             ;USE BIT 0 OF THE RANDOM # TO SELECT BETWEEN
14777 064276 001403                BEQ 1$                ; THE TWO TYPES FOR PACKED STRINGS (6,7).
14778 064300 012700 000007                MOV #7,R0
14779 064304 000402                BR 10$
14780 064306 012700 000006                1$:   MOV #6,R0
14781 064312 000207                10$:  RTS PC
14782
14783                ;ROUTINE TO RANDOMIZE ZONED STRING DATA TYPES
14784
14785 064314                RZTYPE:
14786 064314 004737 064334                JSR PC,RN             ;GET A RANDOM #
14787 064320 042700 177770                BIC #177770,R0       ;USE BITS 0,1 & 2 TO SELECT BETWEEN
14788 064324 020027 000005                CMP R0,#5             ; THE 6 TYPES FOR ZONED STRINGS
14789 064330 101371                BHI RZTYPE
14790 064332 000207                RTS PC
14791
14792                ;ROUTINE TO GENERATE A PSEUDO RANDOM NUMBER
14793
14794                ;
14795                ;INPUTS:          NONE
14796                ;OUTPUTS:         PSEUDO RANDOM VALUE IN R0
14797                ;
14798                ;
14799 064334                RN:
14800 064340 000241                MOV RP1,R0
14801 064342 005337 064414                CLC
14802 064346 006100                DEC RNCON
14803 064350 006100                ROL R0
14804 064352 063700 064414                ROL R0
14805 064356 063700 064420                ADD RNCON,R0
14806 064362 010037 064416                ADD RP2,R0
14806 064362 010037 064416                MOV R0,RP1

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CZKEEC.P11 RANDOM MODE SUBROUTINES

14807	064366	006100		ROL R0
14808	064370	006100		ROL R0
14809	064372	063700	064420	ADD RP2,R0
14810	064376	006100		ROL R0
14811	064400	006100		ROL R0
14812	064402	010037	064420	MOV R0,RP2
14813	064406	013700	064416	MOV RP1,R0
14814	064412	000207		RTS PC
14815	064414	000000		RNCON: .WORD 0
14816	064416	001233		RP1: .WORD 1233
14817	064420	007622		RP2: .WORD 7622
14818	064422	000000		KRNCON: .WORD 0
14819	064424	001233		KRP1: .WORD 1233
14820	064426	007622		KRP2: .WORD 7622
14821				

;RANDOM # GENERATOR SEEDS

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 CZKEEC.P11 MESSAGE PRINT ROUTINES

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14823          .SBTTL          MESSAGE PRINT ROUTINES
14824          ++++++
14825          :
14826          :ERROR MESSAGE PRINT ROUTINES
14827          :           RETURNS TO CALL +2 FOR REPEAT TEST
14828          :           RETURNS TO CALL +6 FOR NORMAL RETURN
14829          :
14830          :-----
14831          INSERR:
14832 064430      JSR          PC,@EMPTR          ;PRINT ERROR MESSAGE HEADER
14833 064430      BIT          #100,TINST        ;INST UNDER TEST TYPE?
14834 064434      BEQ          11$              ;BRANCH IF REGISTER TYPE
14835 064442      PRINTB       #INMEM           ;IN-LINE TYPE
14835 064444      MOV          #INMEM,-(SP)
14835 064444      MOV          SP,R0
14835 064444      JSR PC,FPRINT
14836 064444      BR          12$
14836 064450      (6) 064444 012746 011124
14836 064450      (3) 064450 010600
14836 064452      (4) 064452 004737 066232
14836 064456      000405
14837 064460      11$: PRINTB #INREG
14837 064460      (6) 064460 012746 011076
14837 064460      (3) 064464 010600
14837 064466      (4) 064466 004737 066232
14838 064472      12$: PRINTB #FORM13,ER0,ER1,ER2,ER3,ER4,ER5,TR6,<B,TCC>
14838 064472      (14) 064472 005046
14838 064474      (14) 064474 153716 003652
14838 064500      (13) 064500 013746 003650
14838 064504      (12) 064504 013746 003706
14838 064510      (11) 064510 013746 003704
14838 064514      (10) 064514 013746 003702
14838 064520      (9) 064520 013746 003700
14838 064524      (8) 064524 013746 003676
14838 064530      (7) 064530 013746 003674
14838 064534      (6) 064534 012746 011200
14838 064540      (3) 064540 010600
14838 064542      (4) 064542 004737 066232
14839 064546      14839 064546
14839 064546      (6) 064546 012746 011152
14839 064552      (3) 064552 010600
14839 064554      (4) 064554 004737 066232
14840 064560      14840 064560
14840 064560      (14) 064560 005046
14840 064562      (14) 064562 153716 003730
14840 064566      (13) 064566 013746 003726
14840 064572      (12) 064572 013746 003724
14840 064576      (11) 064576 013746 003722
14840 064602      (10) 064602 013746 003720
14840 064606      (9) 064606 013746 003716
14840 064612      (8) 064612 013746 003714
14840 064616      (7) 064616 013746 003712
14840 064622      (6) 064622 012746 011260
14840 064626      (3) 064626 010600
14840 064630      (4) 064630 004737 066232
14841 064634      14841 064634 005737 002152
14842 064640      14842 064640 001440
14843 064642      14843 064642

          JSR          PC,@EMPTR          ;PRINT ERROR MESSAGE HEADER
          BIT          #100,TINST        ;INST UNDER TEST TYPE?
          BEQ          11$              ;BRANCH IF REGISTER TYPE
          PRINTB       #INMEM           ;IN-LINE TYPE
          MOV          #INMEM,-(SP)
          MOV          SP,R0
          JSR PC,FPRINT
          BR          12$
          PRINTB #INREG
          MOV          #INREG,-(SP)
          MOV          SP,R0
          JSR PC,FPRINT
          PRINTB #FORM13,ER0,ER1,ER2,ER3,ER4,ER5,TR6,<B,TCC>
          CLR          -(SP)
          BISB        TCC,(SP)
          MOV          TR6,-(SP)
          MOV          ER5,-(SP)
          MOV          ER4,-(SP)
          MOV          ER3,-(SP)
          MOV          ER2,-(SP)
          MOV          ER1,-(SP)
          MOV          ER0,-(SP)
          MOV          #FORM13,-(SP)
          MOV          SP,R0
          JSR PC,FPRINT
          PRINTB #EMOUT
          MOV          #EMOUT,-(SP)
          MOV          SP,R0
          JSR PC,FPRINT
          PRINTB #FORM14,ER0R,ER1R,ER2R,ER3R,ER4R,ER5R,ER6R,<B,ECCR>
          CLR          -(SP)
          BISB        ECCR,(SP)
          MOV          ER6R,-(SP)
          MOV          ER5R,-(SP)
          MOV          ER4R,-(SP)
          MOV          ER3R,-(SP)
          MOV          ER2R,-(SP)
          MOV          ER1R,-(SP)
          MOV          ER0R,-(SP)
          MOV          #FORM14,-(SP)
          MOV          SP,R0
          JSR PC,FPRINT
          TST          ERRREG            ;WAS THERE A REGISTER ERROR?
          BEQ          1$
          PRINTB #ACOUT                  ;YES - PRINT OUT DISCREPANCIES
    
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 CZKEEC.P11 MESSAGE PRINT ROUTINES

(6)	064642	012746	011340	MOV	#ACOUT,-(SP)	
(3)	064646	010600		MOV	SP,RO	
(4)	064650	004737	066232	JSR	PC,FPRINT	
14844	064654	012701	003654	MOV	#TROR,R1	
14845	064660	012702	003712	MOV	#EROR,R2	
14846	064664	021122		5\$:	CMP	(R1),(R2)+ ;COMPARE ACTUAL WITH EMULATOR REGS.
14847	064666	001412			BEQ	2\$
14848	064670	011137	002274	MOV	(R1),TERR ;NOT EQUAL - PRINT ACTUAL	
14849	064674			PRINTB	#FORM15,TERR	
(7)	064674	013746	002274	MOV	TERR,-(SP)	
(6)	064700	012746	011366	MOV	#FORM15,-(SP)	
(3)	064704	010600		MOV	SP,RO	
(4)	064706	004737	066232	JSR	PC,FPRINT	
14850	064712	000405		BR	3\$	
14851	064714			2\$:	PRINTB	#FORM16 ;EQUAL - PRINT SPACES
(6)	064714	012746	011375	MOV	#FORM16,-(SP)	
(3)	064720	010600		MOV	SP,RO	
(4)	064722	004737	066232	JSR	PC,FPRINT	
14852	064726	020127	003670	3\$:	CMP	R1,#TR6R ;ALL REGISTERS COMPARED?
14853	064732	001424			BEQ	4\$;BRANCH IF YES
14854	064734	062701	000002	ADD	#2,R1	
14855	064740	000751		BR	5\$;LOOK AT NEXT REGISTER	
14856	064742	005737	002150	1\$:	TST	ERRCC ;WAS THERE A CONDITION CODE ERROR?
14857	064746	001431			BEQ	6\$
14858	064750			PRINTB	#ACOUT ;YES - PRINT ACTUAL COND. CODES	
(6)	064750	012746	011340	MOV	#ACOUT,-(SP)	
(3)	064754	010600		MOV	SP,RO	
(4)	064756	004737	066232	JSR	PC,FPRINT	
14859	064762			PRINTB	#FORM17,<B,TCCR>	
(7)	064762	005046		CLR	-(SP)	
(7)	064764	153716	003672	BISB	TCCR,(SP)	
(6)	064770	012746	011401	MOV	#FORM17,-(SP)	
(3)	064774	010600		MOV	SP,RO	
(4)	064776	004737	066232	JSR	PC,FPRINT	
14860	065002	000413		BR	6\$	
14861	065004	005737	002150	4\$:	TST	ERRCC
14862	065010	001410			BEQ	6\$
14863	065012			PRINTB	#FORM18,<B,TCCR>	
(7)	065012	005046		CLR	-(SP)	
(7)	065014	153716	003672	BISB	TCCR,(SP)	
(6)	065020	012746	011411	MOV	#FORM18,-(SP)	
(3)	065024	010600		MOV	SP,RO	
(4)	065026	004737	066232	JSR	PC,FPRINT	
14864	065032	004737	067170	6\$:	JSR	PC,PRNIB ;GO CHECK FOR POSSIBLE NIBBLE PRINTOUT.
14865	065036	005037	002300	CLR	FILLS2	
14866	065042	005737	002154	TST	ERRBUF ;WAS THERE A BUFFER ERROR?	
14867	065046	001422		BEQ	LODT	
14868	065050			PRINTB	#EBUFO,EMADR,EMDTA ;YES PRINT FIRST BUFFER	
(8)	065050	013746	002206	MOV	EMDTA,-(SP)	
(7)	065054	013746	002204	MOV	EMADR,-(SP)	
(6)	065060	012746	011415	MOV	#EBUFO,-(SP)	
(3)	065064	010600		MOV	SP,RO	
(4)	065066	004737	066232	JSR	PC,FPRINT	
14869	065072			PRINTB	#ABUFO,AADR,AEDTA ; BYTE DISCREPANCY.	

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CZKEEC.P11 MESSAGE PRINT ROUTINES

(8) 065072 013746 002202 MOV AEDTA,-(SP)
(7) 065076 013746 002200 MOV AEADR,-(SP)
(6) 065102 012746 011452 MOV #ABUFO,-(SP)
(3) 065106 010600 MOV SP,RO
(4) 065110 004737 066232 JSR PC,FPRINT
14870 065114 LODT:
14871 065114 005737 002210 TST QRYFLG ;INHIBIT BUFFER QUERY?
14872 065120 001110 BNE ERMDON ;YES
14873 065122 104401 TYPE
14874 065124 011503 QDISP
14875 065126 004737 065350 JSR PC,YORN ;DISPLAY BUFFER?
14876 065132 000137 065316 JMP 3$ ;CONTINUE (C) RETURN
14877 065136 000137 065152 JMP 1$ ;DISPLAY MEMORY (D) RETURN
14878 065142 000137 065346 JMP LERMC ;REPEAT TEST (R) RETURN
14879 065146 000137 065336 JMP RTSUPV ;RESTART (S) RETURN
14880 065152 104401 1$: TYPE ;PRINT 'ADDR(S)?'
14881 065154 013767 AST
14882 065156 004737 065602 JSR PC,RANGE ;GET RANGE OF LOCATIONS TO DISPLAY
14883 065162 000754 BR LODT ;NO MORE DISPLAY REQUESTED-RETURN
14884 065164 PRINTB #ADDHDR ;PRINT BYTE HEADER
(6) 065164 012746 014041 MOV #ADDHDR,-(SP)
(3) 065170 010600 MOV SP,RO
(4) 065172 004737 066232 JSR PC,FPRINT
14885 065176 004737 066156 2$: JSR PC,FIL1.PB ;FILL PRINT BUFFER
14886 065202 000763 BR '$ ;RANGE EXHAUSTED RETURN
14887 065204 PRINTB #FORM19,BAD,<B,PB0>,<B,PB1>,<B,PB2>,<B,PB3>
(11) 065204 005046 CLR -(SP)
(11) 065206 153716 003151 BISB PB3,(SP)
(10) 065212 005046 CLR -(SP)
(10) 065214 153716 003150 BISB PB2,(SP)
(9) 065220 005046 CLR -(SP)
(9) 065222 153716 003147 BISB PB1,(SP)
(8) 065226 005046 CLR -(SP)
(8) 065230 153716 003146 BISB PB0,(SP)
(7) 065234 013746 002232 MOV BAD,-(SP)
(6) 065240 012746 014002 MOV #FORM19,-(SP)
(3) 065244 010600 MOV SP,RO
(4) 065246 004737 066232 JSR PC,FPRINT
14888 065252 PRINTB #FORM20,<B,PB4>,<B,PB5>,<B,PB6>,<B,PB7>
(10) 065252 005046 CLR -(SP)
(10) 065254 153716 003155 BISB PB7,(SP)
(9) 065260 005046 CLR -(SP)
(9) 065262 153716 003154 BISB PB6,(SP)
(8) 065266 005046 CLR -(SP)
(8) 065270 153716 003153 BISB PB5,(SP)
(7) 065274 005046 CLR -(SP)
(7) 065276 153716 003152 BISB PB4,(SP)
(6) 065302 012746 014125 MOV #FORM20,-(SP)
(3) 065306 010600 MOV SP,RO
(4) 065310 004737 066232 JSR PC,FPRINT
14889 065314 000730 BR 2$
14890 065316 005737 002222 3$: TST STOPTF ;IS THE STOP TEST FLAG SET?
14891 065322 001404 BEQ 4$ ;BRANCH IF NO
14892 065324 005037 002222 CLR STOPTF ;CLEAR FLAG WHICH WILL CAUSE PROG TO

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CZKEEC.P11 MESSAGE PRINT ROUTINES

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14893                                     ; TO QUERY FOR STOP TEST # AGAIN
14894 065330 005037 002046                CLR NOERDS
14895 065334 000402                        4$: BR ERMDON
14896 065336 062716 000004                RTSUPV: ADD #4,(SP) ;RETURN TO RESTART AT LOC 'START'
14897 065342 062716 000004                ERMDON: ADD #4,(SP) ;NORMAL RETURN TO CALL +6
14898 065346 000207                        LERMD: RTS PC ;REPEAT TEST RETURN TO CALL +2
14899
14900                                     ; SUBROUTINE TO ACCEPT Y,N,C,R,S,D OR H RESPONSE FROM TTY. RETURNS TO CALL +2
14901                                     ; ON N OR C RESPONSE; CALL +4 ON A Y OR D RESPONSE; CALL +6 ON AN R OR H RESPONSE;
14902                                     ; AND CALL +10 ON AN S RESPONSE.
14903 065350                                YORN:
14904 065350 105777 114312                1$: TSTB @TKS ;WAIT FOR A CHARACTER
14905 065354 100375                        BPL 1$
14906 065356 117737 114330 065600          MOVB @TKB,RCHAR ;READ & SAVE CHAR
14907 065364 032737 000100 065600          BIT #100,RCHAR ;CONVERT LOWER CASE INPUT TO UPPER
14908 065372 001403                        BEQ 12$ ; CASE LETTERS
14909 065374 042737 000040 065600          BIC #40,RCHAR ;
14910 065402 042737 177600 065600          12$: BIC #^C177,RCHAR ;GET RID OF JUNK IF ANY
14911 065410 023727 065600 000123          CMP RCHAR,#123 ;IS CHAR AN S ?
14912 065416 001450                        BEQ 5$ ;BRANCH IF YES
14913 065420 023727 065600 000110          CMP RCHAR,#110 ;IS CHAR A H
14914 065426 001003                        BNE 6$ ;BRANCH IF NO
14915 065430 005037 050144                CLR PREINS ;INSERT A HALT IMMEDIATELY BEFORE
14916                                     ; THE CIS INST UNDER TEST. THEN REPEAT TEST.
14917 065434 000407                        BR 10$
14918 065436 023727 065600 000122          6$: CMP RCHAR,#122 ;IS CHAR R
14919 065444 001011                        BNE 7$ ;BRANCH IF NO
14920 065446 013737 001670 050144          MOV KNOP,PREINS ;RESTORE NOP TO INST IMMED BEFOR CIS INST UNDER TEST
14921 065454 012737 177777 002276          10$: MOV #177777,RPTFLG ;SET REPEAT TEST FLAG
14922 065462 005337 002060                DEC ERRCT ;DECREMENT ERROR COUNT SO THAT ERROR COUNT
14923                                     ; DOESN'T ADVANCE ON REPEAT OF TEST
14924 065466 000426                        BR 4$
14925 065470 023727 065600 000131          7$: CMP RCHAR,#131 ;IS CHAR = Y
14926 065476 001424                        BEQ 2$
14927 065500 023727 065600 000104          CMP RCHAR,#104 ;IS CHAR = D?
14928 065506 001420                        BEQ 2$
14929 065510 023727 065600 000116          CMP RCHAR,#116 ;NO - IS CHAR = N
14930 065516 001404                        BEQ 11$
14931 065520 023727 065600 000103          CMP RCHAR,#103 ;IS CHAR = C?
14932 065526 001310                        BNE 1$
14933 065530 013737 001670 050144          11$: MOV KNOP,PREINS ;RESTORE NOP TO INST IMMED BEFORE CIS INST UNDER TEST
14934 065536 000406                        BR 3$ ;YES - RETURN - CALL +2
14935 065540 062716 000004                5$: ADD #4,(SP)
14936 065544 062716 000004                4$: ADD #4,(SP)
14937 065550 062716 000004                2$: ADD #4,(SP)
14938 065554 004737 065562                3$: JSR PC,ECHAR ;CHAR = Y OR D SETUP RETURN - CALL +4
14939 065560 000207                        RTS PC ;ECHO CHARACTER - WAIT FOR
14940                                     ; PRINTER READY
14941 065562 105777 114126                ECHAR: TSTB @TPS ;LOAD CHAR TO BE TYPED INTO DATA REG.
14942 065566 100375                        BPL ECHAR ;SUBROUTINE TO PRINT CHAR IN 'RCHAR'
14943 065570 113777 065600 114120          MOVB RCHAR,@TPB ;WAIT UNTIL PRINTER IS READY
14944 065576 000207                        RTS PC ;LOAD CHAR INTO DATA REG
14945
14946 065600 000000                RCHAR: .WORD 0

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CZKEEC.P11 MESSAGE PRINT ROUTINES

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14947
14948 ;SUBROUTINE TO GET RANGE OF LOCATIONS TO DISPLAY.
14949 ; RETURNS TO CALL +2 ON NO MORE DISPLAY REQUESTED - USER
14950 ; RESPONDED WITH IMMEDIATE 'CR'.
14951 ; NORMAL RETURN IS TO CALL +4 WITH LOWER DISPLAY LIMIT
14952 ; IN 'RLL' AND UPPER DISPLAY LIMIT IN 'RUL'.
14953 RANGE: ;NORMAL RETURN = CALL +4.
14954 065602 004737 065704 JSR PC,ACCOCT ;GET RANGE LOWER LIMIT
14955 065606 000207 RTS PC ;RETURN - EXIT DISPLAY
14956 065610 000411 BR 1$ ;RETURN - SINGLE LIMIT SPECIFIED
14957 065612 012637 002226 MOV (SP)+,RLL ;NORMAL RETURN - SAVE LOWER LIMIT
14958 065616 004737 065704 JSR PC,ACCOCT ;GET RANGE UPPER LIMIT
14959 065622 000207 RTS PC ;RETURN - EXIT DISPLAY
14960 065624 000411 BR 2$ ;NORMAL RETURN - SAVE UPPER LIMIT
14961 065626 104401 TYPE ;RETURN - TYPE? <CR><LF>REENTER:
14962 065630 015636 QUES
14963 065632 000763 BR RANGE ;TRY AGAIN
14964 065634 012637 002226 1$: MOV (SP)+,RLL ;SINGLE LIMIT SPECIFIED - SAVE AS
14965 065640 013737 002226 002230 MOV RLL,RUL ; BOTH LOWER & UPPER LIMIT
14966 065646 000402 BR 3$ ;EXIT
14967 065650 012637 002230 2$: MOV (SP)+,RUL ;SAVE UPPER LIMIT
14968 065654 042737 000007 002226 3$: BIC #7,RLL ;ROUND OFF RANGE TO GROUP OF
14969 065662 042737 000007 002230 BIC #7,RUL ;TEN BYTES.
14970 065670 062737 000010 002230 ADD #10,RUL
14971 065676 062716 000002 ADD #2,(SP) ;EXIT TO CALL +4
14972 065702 000207 RTS PC
14973
14974 ;SUBROUTINE TO ACCEPT OCTAL # FROM TTY. RETURNS TO CALL +2 ON INITIAL CR.
14975 ; RETURNS TO CALL +4 ON <CR> OR / WITH LIMIT ON STACK. RETURNS TO CALL +6 ON <-> WITH
14976 ; LIMIT ON STACK.
14977 ACCOCT:
14978 065704 005046 CLR -(SP) ;CLEAR STORAGE FOR OCTAL #
14979 065706 105777 113754 1$: TSTB @TKS ;CHAR THERE?
14980 065712 100375 BPL 1$ ;NO - WAIT
14981 065714 117746 113772 MOVB @TKB,-(SP) ;SAVE THE CHAR
14982 065720 042716 177600 BIL #^C177,(SP) ;STRIP-OFF THE ASCII
14983 065724 022716 000021 CMP #021,(SP) ;SEE IF A RANDOM ^Q WAS INPUTED ;:REV-C
14984 065730 001002 BNE 50$ ;BRANCH TO CONTINUE IF NOT ;:REV-C
14985 065732 005726 TST (SP)+ ;POP THIS ^Q CHAR OFF STACK ;:REV-C
14986 065734 000764 BR 1$ ;BRANCH BACK - INPUT NOT WANTED ;:REV-C
14987 065736 022726 000015 50$: CMP #15,(SP)+ ;IS IT A 'CR'? ;:REV-C
14988 065742 001005 BNE 2$
14989 065744 104401 TYPE ;YES - ECHO CR & LF
14990 065746 015652 XCRLF
14991 065750 062706 000002 ADD #2,SP ;RETURN TO CALL +2
14992 065754 000207 RTS PC
14993 065756 024627 000055 2$: CMP -(SP),#55 ;IS CHAR = '-'
14994 065762 001465 BEQ 6$ ;BRANCH IF YES
14995 065764 021627 000057 3$: CMP (SP),#57 ;IS CHAR A / ?
14996 065770 001403 BEQ 31$
14997 065772 021627 000015 CMP (SP),#15 ;IS CHAR A <CR>?
14998 065776 001016 BNE 4$
14999 066000 104401 31$: TYPE ;YES - ECHO/<CR> AND <LF>
15000 066002 015655 SLCRLF

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CZKEEC.P11                          MESSAGE PRINT ROUTINES

15001 066004 016616 000002          7$:  MOV 2(SP), (SP)      ;SWAP POSITION OF OCTAL #
15002 066010 016666 000004 000002  MOV 4(SP), 2(SP)    ;AND RETURN PC ON STACK
15003 066016 011666 000004          MOV (SP), 4(SP)
15004 066022 062706 000002          ADD #2, SP
15005 066026 062716 000002          ADD #2, (SP)        ;UPDATE RETURN POINTER
15006 066032 000207          RTS PC              ;RETURN WITH OCTAL LIMIT ON STACK
15007 066034 011637 065600          4$:  MOV (SP), RCHAR    ;ECHO CHAR ACCEPTED
15008 066040 004737 065562          JSR PC, ECHAR
15009
15010 066044 021627 000060          CMP (SP), #60      ;CHAR <0?
15011 066050 002425          BLT 5$             ;BRANCH IF YES
15012 066052 021627 000067          CMP (SP), #67      ;CHAR >7?
15013 066056 003022          BGT 5$             ;BRANCH IF YES
15014 066060 042726 000060          BIC #60, (SP)+     ;STRIP OFF ASCII
15015 066064 006316          ASL (SP)           ;SHIFT PRESENT DATA OVER TO
15016 066066 006316          ASL (SP)           ; MAKE ROOM FOR NEW DIGIT
15017 066070 006316          ASL (SP)
15018 066072 056616 177776          BIS -2(SP), (SP)  ;SET IN NEW DIGIT
15019 066076 105777 113564          10$: TSTB @TKS     ;CHAR THERE
15020 066102 100375          BPL 10$           ;NO - WAIT
15021 066104 117746 113602          MOV @TKB, -(SP)   ;SAVE CHAR
15022 066110 042716 177600          BIC #^C177, (SP)
15023 066114 022726 000021          CMP #021, (SP)+   ;SEE IF A RANDOM ^Q WAS INPUTED      ;;REV-C
15024 066120 001766          BEQ 10$           ;BRANCH BACK IF SO - INPUT NOT WANTED ;;REV-C
15025 066122 000715          BR 2$
15026 066124 104401          5$:  TYPE          ;TYPE ?<CR><LF>*
15027 066126 015636          QUES
15028 066130 062706 000002          ADD #2, SP
15029 066134 000664          BR 1$
15030 066136 011637 065600          6$:  MOV (SP), RCHAR ;ECHO '-'
15031 066142 004737 065562          JSR PC, ECHAR
15032 066146 062766 000002 000004  ADD #2, 4(SP)     ;UPDATE RETURN POINTER
15033 066154 000713          BR 7$
15034
15035 ; SUBROUTINE TO FILL BYTE PRINT BUFFER. RETURNS TO CALL +2 WHEN DISPLAY REQUEST IS
15036 ; COMPLETE (RLL=RUL). NORMAL RETURN TO CALL+4 WITH RLL-RLL +10 & PRINT BUFFER FILLED.
15037 066156 023737 002226 002230  FILLPB: CMP RLL, RUL
15038 066164 001421          BEQ 1$            ; NORMAL RETURN TO CALL +4
15039 066166 013701 002226          MOV RLL, R1      ;SETUP POINTER TO DISPLAY LOCS
15040 066172 010137 002232          MOV R1, BAD     ;SAVE BUFFER ADDRESS FOR PRINTOUT
15041 066176 012137 003146          MOV (R1)+, PB0  ;TRANSFER 10 BYTES AT DISPLAY
15042 066202 012137 003150          MOV (R1)+, PB2  ; LOC ADDRESS TO PRINT
15043 066206 012137 003152          MOV (R1)+, PB4  ; BUFFER.
15044 066212 012137 003154          MOV (R1)+, PB6
15045 066216 062737 000010 002226  ADD #10, RLL     ;UPDATE LOWER LIMIT DISPLAY POINTER
15046 066224 062716 000002          ADD #2, (SP)    ;UPDATE RETURN POINTER
15047 066230 000207          1$:  RTS PC
15048
15049 ; .EVEN
15050
15051 ; SUBROUTINE TO TYPE FORMATED 'PRINTB' STATEMENTS
15052
15053 ; FPRINT:
15054 066232 010537 002066          MOV R5, FSAVR5  ;SAVE REGISTERS

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15055	066236	010437	002070		MOV R4, FSAVR4	
15056	066242	010337	002072		MOV R3, FSAVR3	
15057	066246	010237	002074		MOV R2, FSAVR2	
15058	066252	010137	002076		MOV R1, FSAVR1	
15059	066256	012001			MOV (R0)+, R1	: SETUP R1 AS POINTER INTO FORMAT STATEMENT
15060	066260	112102		1\$:	MOVB (R1)+, R2	: GET NEXT FORMAT BYTE
15061	066262	020227	000045		CMP R2, #'%	: IS BYTE = % ?
15062	066266	001774			BEQ 1\$: BRANCH IF YES
15063	066270	020227	000117		CMP R2, #'0	: IS BYTE = 0 ? (OCTAL)
15064	066274	001426			BEQ 2\$: BRANCH IF YES
15065	066276	020227	000101		CMP R2, #'A	: IS BYTE = A ? (ASCII)
15066	066302	001432			BEQ 3\$: BRANCH IF YES
15067	066304	020227	000116		CMP R2, #'N	: IS BYTE = N ? (CRLF)
15068	066310	001443			BEQ 4\$: BRANCH IF YES
15069	066312	020227	000131		CMP R2, #'Y	: IS BYTE = Y ? (BINARY)
15070	066316	001446			BEQ 5\$: BRANCH IF YES
15071	066320	020227	000104		CMP R2, #'D	: IS BYTE = D ? (DECIMAL)
15072	066324	001452			BEQ 6\$: BRANCH IF YES
15073	066326	020227	000123		CMP R2, #'S	: IS BYTE = S ? (SPACE)
15074	066332	001463			BEQ 7\$: BRANCH IF YES
15075	066334	020227	000000		CMP R2, #0	: IS BYTE = 0 ? (END OF FORMAT STATEMENT)
15076	066340	001512			BEQ 10\$: BRANCH IF YES
15077	066342	020227	000102		CMP R2, #'B	: IS BYTE = B ? (BYTE)
15078	066346	001524			BEQ 11\$: BRANCH IF YES
15079	066350	000743			BR 1\$: BYTE = NONE OF THE ABOVE - IGNORE IT.
15080						
15081	066352	112102		2\$:	MOVB (R1)+, R2	: SET R2 = COUNT OF # OF DIGITS TO PRINT
15082	066354	042702	177770		BIC #177770, R2	
15083	066360	012003			MOV (R0)+, R3	: SET R3 = WORD OF DIGITS TO PRINT
15084	066362	004737	066642		JSR PC, POCT	: CALL ROUTINE TO PRINT OCTAL DIGITS
15085	066366	000734			BR 1\$	
15086	066370	112102		3\$:	MOVB (R1)+, R2	: SET R2 = NEXT ASCII CHAR TO PRINT
15087	066372	022702	000045		CMP #'%, R2	: IS CHAR = %
15088	066376	001730			BEQ 1\$: BRANCH IF YES
15089	066400	022702	000000		CMP #0, R2	: END OF FORMAT BYTES?
15090	066404	001470			BEQ 10\$: BRANCH IF YES
15091	066406	110237	066744		MOVB R2, TDIG	: YES - PREPARE TO EXIT ROUTINE
15092	066412	104401	066744		TYPE ,TDIG	: CALL ROUTINE TO PRINT ASCII BYTE
15093	066416	000764			BR 3\$	
15094	066420	012737	000200	066744	4\$: MOV #CRLF, TDIG	: CALL ROUTINE TO PRINT CRLF
15095	066426	104401	066744		TYPE ,TDIG	
15096	066432	000712			BR 1\$	
15097	066434	112102		5\$:	MOVB (R1)+, R2	: SET R2 = COUNT OF # OF DIGITS TO PRINT
15098	066436	042702	177770		BIC #177770, R2	
15099	066442	012003			MOV (R0)+, R3	: SET R3 = WORD OF DIGITS TO PRINT
15100	066444	004737	066746		JSR PC, PBIN	: CALL ROUTINE TO PRINT BINARY DIGITS
15101	066450	000703			BR 1\$	
15102	066452	112102		6\$:	MOVB (R1)+, R2	: SET R2 = COUNT OF DIGITS TO PRINT
15103	066454	042702	177770		BIC #177770, R2	
15104	066460	020227	000006		CMP R2, #6	: IF REQUEST IS TO PRINT MORE THAN 5 DIGITS
15105	066464	103402			BLO 61\$: PRINT 5 INSTEAD
15106	066466	012702	000005		MOV #5, R2	
15107	066472	012003		61\$:	MOV (R0)+, R3	: SET R3 = WORD OF DIGITS TO PRINT
15108	066474	004737	067040		JSR PC, PDEC	: CALL ROUTINE TO CONVERT (R3) TO DECIMAL

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15109 066500 000667          BR 1$
15110 066502 112102          7$: MOVB (R1)+,R2          ; AND PRINT DECIMAL DIGITS
15111                                ;GET MOST SIGN DIGIT OF 1 OR 2 DIGIT
15112 066504 042702 177770    BIC #177770,R2          ; COUNT OF # OF SPACES TO PRINT
15113 066510 121127 000045    CMPB (R1),#1$          ;IS NEXT BYTE = % ?
15114 066514 001415          BEQ 12$
15115 066516 121127 000000    CMPB (R1),#0
15116 066522 001412          BEQ 12$
15117 066524 006302          ASL R2
15118 066526 006302          ASL R2
15119 066530 006302          ASL R2
15120 066532 112137 066742    MOVB (R1)+,OCNT
15121 066536 142737 000370    066742 BICB #370,OCNT
15122 066544 153702 066742    BISB OCNT,R2
15123 066550 012737 000040    066744 12$: MOV #',TDIG          ;GET LEAST SIGN DIGIT INTO R2
15124 066556 104401 066744    TYPE ,TDIG          ;PRINT A SPACE
15125 066562 077206          SOB R2,12$
15126 066564 000635          BR 1$
15127 066566 011640          10$: MOV (SP),-(R0)
15128 066570 010006          MOV R0,SP
15129 066572 013705 002066    MOV FSAVR5,R5
15130 066576 013704 002070    MOV FSAVR4,R4
15131 066602 013703 002072    MOV FSAVR3,R3
15132 066606 013702 002074    MOV FSAVR2,R2
15133 066612 013701 002076    MOV FSAVR1,R1
15134 066616 000207          RTS PC
15135
15136 066620 112102          11$: MOVB (R1)+,R2          ;SET R2 = COUNT OF # OF DIGITS TO PRINT
15137 066622 042702 177770    BIC #177770,R2
15138 066626 012003          MOV (R0)+,R3          ;SET R3 = BYTE TO PRINT
15139 066630 042703 177400    BIC #177400,R3
15140 066634 004737 066642    JSR PC,POCT
15141 066640 000607          BR 1$
15142
15143          ;SUBROUTINE TO CONVERT A BINARY # TO OCTAL (ASCII) AN TYPE IT
15144          ;ENTER WITH R2 = # OF OCTAL DIGITS TO TYPE
15145          ;
15146          ;
15147          ;
15147 066642 112737 000005    066742 POCT: MOVB #5,OCNT          ;SET THE ITERATION COUNT
15148 066650 005402          NEG R2
15149 066652 062702 000006    ADD #6,R2          ;SUBTRACT # OF DIGITS TO TYPE FROM MAX ALLOWED
15150 066656 110237 066743    MOVB R2,OMODE          ;SAVE IT FOR USE
15151 066662 005004          CLR R4
15152 066664 006103          1$: ROL R3          ;ROTATE MSB INTO 'C'
15153 066666 000404          BR 3$
15154 066670 006103          2$: ROL R3          ;FORM THIS DIGIT
15155 066672 006103          ROL R3
15156 066674 006103          ROL R3
15157 066676 010304          MOV R3,R4
15158 066700 006104          3$: ROL R4          ;GET LSB OF THIS DIGIT
15159 066702 105337 066743    DECB OMODE          ;TYPE THIS DIGIT
15160 066706 100010          BPL 7$          ;BRANCH IF NO
15161 066710 042704 177770    BIC #177770,R4          ;GET RID OF JUNK
15162 066714 052704 000060    BIS #'0,R4          ;MAKE THIS DIGIT ASCII

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15163 066720 110437 066744          MOVB R4,TDIG          ;SAVE FOR TYPING
15164 066724 104401 066744          TYPE ,TDIG           ;TYPE THIS DIGIT
15165 066730 105337 066742          7$: DECIB OCNT        ;COUNT BY 1
15166 066734 002401                    BLT 6$               ;BRANCH IF DONE
15167 066736 000754                    BR 2$                ;BRANCH IF MORE TO DO
15168 066740 000207          6$: RTS PC
15169
15170 066742      000          OCNT: .BYTE 0
15171 066743      000          OMODE: .BYTE 0
15172 066744      000          TDIG: .BYTE 0
15173 066745      000          .BYTE 0
15174
15175          ;SUBROUTINE TO CHANGE A BINARY # TO ASCII AND TYPE IT
15176          ;ENTER WITH R2 = # OF BINARY DIGITS TO TYPE
15177          ;R3 = BINARY #
15178
15179 066746 112737 000017 066742 PBIN: MOVB #17,OCNT          ;SET THE ITERATION COUNT
15180 066754 005402          NEG R2
15181 066756 062702 000020          ADD #20,R2          ;SUBTRACT # OF DIGITS TO TYPE FROM MAX ALLOWED
15182 066762 110237 066743          MOVB R2,OMODE      ;SAVE IT FOR USE
15183 066766 005004          CLR R4             ;CLEAR THE OUTPUT WORD
15184 066770 006103          1$: ROL R3
15185 066772 012704 000000          MOV #0,R4
15186 066776 006104          ROL R4             ;GET BINARY DIGIT
15187 067000 105337 066743          DECIB OMODE        ;TYPE THIS DIGIT?
15188 067004 100010          BPL 7$             ;BRANCH IF NO
15189 067006 042704 177776          BIC #177776,R4    ;GET RID OF JUNK
15190 067012 052704 000060          BIS #'0,R4        ;MAKE THIS BIT ASCII
15191 067016 010437 066744          MOV R4,TDIG        ;SAVE FOR TYPING
15192 067022 104401 066744          TYPE ,TDIG         ;TYPE THIS DIGIT
15193 067026 105337 066742          7$: DECIB OCNT        ;COUNT BY 1
15194 067032 002401                    BLT 6$               ;BRANCH IF DONE
15195 067034 000755                    BR 1$                ;BRANCH IF MORE TO DO
15196 067036 000207          6$: RTS PC
15197
15198          ;
15199          ;SUBROUTINE TO CONVERT A BINARY # TO DECIMAL (ASCII) AND TYPE DECIMAL DIGITS
15200          ;ENTER WITH R3 = BINARY #
15201          ;R2 = # OF DECIMAL DIGITS TO TYPE
15202          ;
15203 067040 010146          PDEC: MOV R1,-(SP)   ;SAVE R1
15204 067042 010046          MOV R0,-(SP)       ;SAVE R0
15205 067044 012700 000005          MOV #5,R0
15206 067050 160200          SUB R2,R0          ;R0 CONTAINS # OF DIGITS TO SKIP BEFORE PRINTING
15207 067052 005004          CLR R4             ;ZERO CONSTANTS TABLE INDEX
15208 067054 012705 067160          MOV #DBLK,R5       ;SETUP THE OUTPUT POINTER
15209 067060 005002          2$: CLR R2          ;CLEAR THE BCD #
15210 067062 016401 067150          MOV DTBL(R4),R1    ;GET THE CONSTANT
15211 067066 160103          3$: SUB R1,R3       ;FORM THIS BCD DIGIT
15212 067070 103402          BLO 4$             ;BRANCH IF DONE
15213 067072 005202          INC R2             ;INCREASE THE BCD DIGIT BY 1
15214 067074 000774          BR 3$
15215 067076 060103          4$: ADD R1,R3       ;ADD BACK THE CONSTANT
15216 067100 052702 000060          6$: BIS #'0,R2     ;MAKE THE BCD DIGIT ASCII

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15217 067104 005700          TST R0          ;PRINT THIS DIGIT?
15218 067106 001402          BEQ 61$        ;BRANCH IF YES
15219 067110 005300          DEC R0          ;DECREMENT SKIP COUNT
15220 067112 000401          BR 62$
15221 067114 110225          61$: MOVB R2,(R5)+ ;PUT THIS CHAR IN THE OUTPUT BUFFER
15222 067116 005724          62$: TST (R4)+  ;JUST INCREMENTING
15223 067120 020427 000010    CMP R4,#10     ;CHECK THE TABLE INDEX
15224 067124 002755          BLT 2$        ;GO DO THE NEXT DIGIT
15225 067126 003002          BGT 8$        ;GO TO EXIT
15226 067130 010302          MOV R3,R2     ;GET LSD
15227 067132 000762          BR 6$        ;GO CHANGE TO ASCII
15228 067134 105015          8$: CLRB (R5)   ;SET THE TERMINATOR
15229 067136 104401 067160    TYPE ,DBLK    ;NOW TYPE THE #
15230 067142 012600          MOV (SP)+,R0 ;RESTORE R0
15231 067144 012601          MOV (SP)+,R1 ;RESTORE R1
15232 067146 000207          RTS PC       ;EXIT
15233 067150 023420          DTBL: 10000.
15234 067152 001750          1000.
15235 067154 000144          100.
15236 067156 000012          10.
15237 067160 000004          DBLK: .BLKW 4
15238
15239
15240          ;SUBROUTINE TO DISPLAY DECIMAL STRING SOURCES AND RESULTS IN
15241          ;DECIMAL FORM. STRINGS TO BE DISPLAYED ARE IDENTIFIED BY THE
15242          ;CONTENTS OF PZCODE AS FOLLOWS:
15243
15244          BIT 0 = 1          DISPLAY ZONED SOURCE STRING
15245          BIT 1 = 1          .. .. SRC1 ..
15246          BIT 2 = 1          .. .. SRC2 ..
15247          BIT 3 = 1          .. .. DEST .. (DESC IN ER4,ER5)
15248          BIT 4 = 1          .. .. DEST .. (DESC IN ER2,ER3)
15249          BIT 5 = 1          .. .. DEST .. (DESC IN ER0,ER1)
15250          BIT 8 = 1          .. PACKED SOURCE ..
15251          BIT 9 = 1          .. .. SRC1 ..
15252          BIT10 = 1         .. .. SRC2 ..
15253          BIT11 = 1         .. .. DEST .. (DESC IN ER4,ER5)
15254          BIT12 = 1         .. .. DEST .. (DESC IN ER2,ER3)
15255          BIT13 = 1         .. .. DEST .. (DESC IN ER0,ER1)
15256
15257          NOTE: ALL SOURCE STRINGS MUST BE STORED IN THE INPUT
15258          SOURCE BUFFER DESCRIBED BY THE DESCRIPTOR(S) AT
15259          INSR1 AND INSR2.
15260
15261          IF THE DIVP BY 0 FLAG IS SET (EZDF) OR BIT 2 OF THE
15262          SPECIAL HANDLING CODE IS SET (SPHAND) THEN THIS SUBROUTINE
15263          RETURNS WITHOUT DISPLAYING ANY STRINGS.
15264
15265
15266 067170 005737 036316    PRNIB: TST EZDF ;IS TEST CONDITION A 'DIVIDE BY ZERO'
15267 067174 001401          BEQ 1$
15268 067176 000207          RTS PC
15269 067200 032737 000004 002144 1$: BIT #4,SPHAND ;IS SPECIAL HANDLING BIT 2 SET?
15270 067206 001401          BEQ 2$

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15271	067210	000207			RTS PC	;YES - EXIT WITHOUT DISPLAYING ANY BUFFER STRINGS.
15272	067212	005737	002476	2\$:	TST PZCODE	;ARE ANY STRINGS TO BE DISPLAYED?
15273	067216	001001			BNE 3\$	
15274	067220	000207			RTS PC	;NO - EXIT WITHOUT DISPLAY.
15275	067222	005037	026430	3\$:	CLR EPAK	
15276	067226	032737	000001	002476	BIT #1,PZCODE	;PRINT A ZONED SRC STRING?
15277	067234	001402			BEQ 4\$	
15278	067236	004737	067410		JSR PC,SN	;YES
15279	067242	032737	000002	002476	BIT #2,PZCODE	;PRINT A ZONED SRC1 STRING?
15280	067250	001402			BEQ 5\$	
15281	067252	004737	067440		JSR PC,S1N	;YES
15282	067256	032737	000004	002476	BIT #4,PZCODE	;PRINT A ZONED SRC2 STRING?
15283	067264	001402			BEQ 6\$	
15284	067266	004737	067530		JSR PC,S2N	;YES
15285	067272	012737	177777	026430	MOV #177777,EPAK	
15286	067300	032737	000400	002476	BIT #400,PZCODE	;PRINT A PACKED SOURCE STRING?
15287	067306	001402			BEQ 7\$	
15288	067310	004737	067410		JSR PC,SN	;YES
15289	067314	032737	001000	002476	BIT #1000,PZCODE	;PRINT A PACKED SRC1 STRING?
15290	067322	001402			BEQ 10\$	
15291	067324	004737	067440		JSR PC,S1N	;YES
15292	067330	032737	002000	002476	BIT #2000,PZCODE	;PRINT A PACKED SRC2 STRING?
15293	067336	001402			BEQ 11\$	
15294	067340	004737	067530		JSR PC,S2N	;YES
15295	067344	032737	000070	002476	BIT #70,PZCODE	;PRINT A ZONED DEST. STRING?
15296	067352	001404			BEQ 12\$	
15297	067354	005037	026430		CLR EPAK	
15298	067360	004737	067620		JSR PC,SN	;YES
15299	067364	032737	034000	002476	BIT #34000,PZCODE	;PRINT A PACKED DEST. STRING?
15300	067372	001405			BEQ 13\$	
15301	067374	012737	177777	026430	MOV #177777,EPAK	
15302	067402	004737	067620		JSR PC,SN	;YES
15303	067406	000207		13\$:	RTS PC	;EXIT DECIMAL DISPLAY SUBROUTINE.
15304						
15305						
15306	067410			SN:	PRINTB #FORM22	;PRINT 'SRC'
(6)	067410	012746	014163		MOV #FORM22,-(SP)	
(3)	067414	010600			MOV SP,RO	
(4)	067416	004737	066232		JSR PC,FPRINT	
15307	067422	013701	002504		MOV INSR1,R1	;LOAD R1 WITH STRING LEN
15308	067426	013700	002506		MOV INSR1+2,RO	;LOAD RO WITH STRING ADD
15309	067432	004737	070006		JSR PC,DECPRT	;PRINT DECIMAL DIGIT STRING
15310	067436	000207			RTS PC	
15311	067440	013701	050164	S1N:	MOV TINST,R1	
15312	067444	042701	177700		BIC #177700,R1	
15313	067450	020127	000052		CMP R1,#52	;IS INST = CMPN?
15314	067454	001403			BEQ 1\$;BRANCH IF YES
15315	067456	020127	000072		CMP R1,#72	;IS INST = CMPP?
15316	067462	001006			BNE 2\$;BRANCH IF NO
15317	067464			1\$:	PRINTB #FORM24	;PRINT 'SRC2'
(6)	067464	012746	014216		MOV #FORM24,-(SP)	
(3)	067470	010600			MOV SP,RO	
(4)	067472	004737	066232		JSR PC,FPRINT	
15318	067476	000405			BR 3\$	

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15319	067500			2\$:	PRINTB #FORM23	;PRINT 'SRC1'
(6)	067500	012746	014200		MOV #FORM23,-(SP)	
(3)	067504	010600			MOV SP,R0	
(4)	067506	004737	066232		JSR PC,FPRINT	
15320	067512	013701	002504	3\$:	MOV INSRC1,R1	;LOAD R1 WITH STRING LEN
15321	067516	013700	002506		MOV INSRC1+2,R0	;LOAD R0 WITH STRING ADD
15322	067522	004737	070006		JSR PC,DECPRT	;PRINT DECIMAL DIGIT STRING
15323	067526	000207			RTS PC	
15324	067530	013701	050164	S2N:	MOV TINST,R1	
15325	067534	042701	177700		BIC #177700,R1	
15326	067540	020127	000052		CMP R1,#52	;IS INST = CMPN?
15327	067544	001403			BEQ 1\$;BRANCH IF YES
15328	067546	020127	000072		CMP R1,#72	;IS INST = CMPN?
15329	067552	001006			BNE 2\$;BRANCH IF NO
15330	067554			1\$:	PRINTB #FORM23	;PRINT 'SRC1'
(6)	067554	012746	014200		MOV #FORM23,-(SP)	
(3)	067560	010600			MOV SP,R0	
(4)	067562	004737	066232		JSR PC,FPRINT	
15331	067566	000405			BR 3\$	
15332	067570			2\$:	PRINTB #FORM24	;PRINT 'SRC2'
(6)	067570	012746	014216		MOV #FORM24,-(SP)	
(3)	067574	010600			MOV SP,R0	
(4)	067576	004737	066232		JSR PC,FPRINT	
15333	067602	013701	002510	3\$:	MOV INSRC2,R1	;LOAD R1 WITH STRING LENGTH
15334	067606	013700	002512		MOV INSRC2+2,R0	;LOAD R0 WITH STRING ADD
15335	067612	004737	070006		JSR PC,DECPRT	;PRINT DECIMAL DIGIT STRING
15336	067616	000207			RTS PC	
15337	067620			DN:	PRINTB #FORM25	;PRINT 'EM RESULT'
(6)	067620	012746	014234		MOV #FORM25,-(SP)	
(3)	067624	010600			MOV SP,R0	
(4)	067626	004737	066232		JSR PC,FPRINT	
15338	067632	032737	020040	002476	BIT #20040,PZCODE	;LOAD R1 WITH STRING LEN
15339	067640	001405			BEQ 1\$;LOAD R0 WITH STRING ADDRESS
15340	067642	013701	003674		MOV ER0,R1	
15341	067646	013700	003676		MOV ER1,R0	
15342	067652	000415			BR 4\$	
15343	067654	032737	010020	002476	1\$:	BIT #10020,PZCODE
15344	067662	001405			BEQ 2\$	
15345	067664	013701	003700		MOV ER2,R1	
15346	067670	013700	003702		MOV ER3,R0	
15347	067674	000404			BR 4\$	
15348	067676	013701	003704	2\$:	MOV ER4,R1	
15349	067702	013700	003706		MOV ER5,R0	
15350	067706	004737	070006	4\$:	JSR PC,DECPRT	;PRINT DECIMAL DIGIT STRING
15351	067712				PRINTB #FORM26	;PRINT 'ACT RESULT'
(6)	067712	012746	014257		MOV #FORM26,-(SP)	
(3)	067716	010600			MOV SP,R0	
(4)	067720	004737	066232		JSR PC,FPRINT	
15352	067724	032737	020040	002476	BIT #20040,PZCODE	;LOAD R1 WITH STRING LEN
15353	067732	001405			BEQ 11\$;LOAD R0 WITH STRING ADDRESS
15354	067734	013701	002240		MOV TTR0,R1	
15355	067740	013700	002242		MOV TTR1,R0	
15356	067744	000415			BR 44\$	
15357	067746	032737	010020	002476	11\$:	BIT #10020,PZCODE

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15358 067754 001405          BEQ 22$
15359 067756 013701 002244    MOV TTR2,R1
15360 067762 013700 002246    MOV TTR3,R0
15361 067766 000404          BR 44$
15362 067770 013701 002250    22$: MOV TTR4,R1
15363 067774 013700 002252    MOV TTR5,R0
15364 070000 004737 070006    44$: JSR PC,DECPRT          ;PRINT DECIMAL DIGIT STRING
15365 070004 000207          RTS PC
15366
15367
15368 ; SUBROUTINE TO PRINT A DECIMAL STRING OF DIGITS; MSD FIRST ....
15369 ; LEAST SIGNIFICANT DIGIT, SIGN.
15370 ; INPUT:  EPAK=0 FOR ZONED STRING;177777 FOR PACKED
15371 ;         RO=STRING ADR
15372 ;         R1=STRING LEN
15373 ;
15374 ;
15375 ; NOTE: ROUTINE PRINTS '0 +' FOR ZONED STRINGS OF
15376 ; ZERO LENGTH (EXCEPT SEPARATE TYPE).
15377 070006 012737 177777 002310  DECPRT: MOV #177777,PRTSGN          ;SET PRINTING IN PROGRESS FLAG
15378 070014 010003          MOV R0,R3          ;SAVE R0 IN R3
15379 070016 005037 025220    CLR EODD
15380 070022 032701 000001    BIT #1,R1          ;IS STRING ODD IN LENGTH
15381 070026 001403          BEQ 1$
15382 070030 012737 177777 025220    MOV #177777,EODD          ;SET ODD INDICATOR
15383 070036 010137 025236    1$:  MOV R1,ELSD
15384 070042 110137 002104    MOV# R1,NBLKS          ;DETERMINE # OF BLANK DIGITS TO PRINT
15385 070046 012702 000037    MOV #37,R2
15386 070052 163702 002104    SUB NBLKS,R2
15387 070056 001002          BNE 11$
15388 070060 012702 000001    MOV #1,R2
15389 070064          11$: PRINTB #FORM27          ;PRINT THE BLANKS
   (6) 070064 012746 014302    MOV #FORM27,-(SP)
   (3) 070070 010600          MOV SP,R0
   (4) 070072 004737 066232    JSR PC,FPRINT
15390 070076 005302          DEC R2
15391 070100 001371          BNE 11$
15392 070102 105701          3$:  TSTB R1          ;STRING LENGTH = 0?
15393 070104 001017          BNE 4$          ;BRANCH IF NO
15394 070106 005737 026430    TST EPAK          ;STRING PACKED?
15395 070112 001407          BEQ 5$          ;BRANCH IF NO
15396 070114 005201          INC R1          ;YES - SET LEN - 1
15397 070116 005237 025236    INC ELSD
15398 070122 012737 177777 025220    MOV #177777,EODD
15399 070130 000405          BR 4$
15400 070132 005002          5$:  CLR R2          ;ZONED - ZERO LENGTH
15401 070134 004537 070330    JSR R5,CONVN          ;PRINT 0
15402 070140 070364          DIGTBL
15403 070142 000413          BR 12$          ;EXIT
15404 070144 010300          4$:  MOV R3,R0          ;RESTORE R0
15405 070146 105001          CLRB R1
15406 070150 004737 021456    7$:  JSR PC,ESNK          ;GET NEXT DIGIT
15407 070154 004537 070330    JSR R5,CONVN          ;CONVERT NIBBLE & PRINT HEX DIGIT
15408 070160 070364          DIGTBL

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15409 070162 105201          INCB R1
15410 070164 120137 025236    CMPB R1,ELSD
15411 070170 001367          BNE 7$
15412 070172 004737 021456    12$: JSR PC,ESNK          ;CALL ROUTINE TO FIND SIGN
15413                                     ;SIGN RETURNED IN ERSNEG (0=+,/=0=-)
15414                                     ;SIGN BYTE RETURNED IN 'SGNBY'
15415 070176 005737 025170    TST ERSNEG          ;IS SIGN NEGATIVE
15416 070202 001006          BNE 2$             ;BRANCH IF YES
15417 070204          PRINTB #FORM34          ;PRINT +
    (6) 070204 012746 014366    MOV #FORM34,-(SP)
    (3) 070210 010600          MOV SP,R0
    (4) 070212 004737 066232    JSR PC,FPRINT
15418 070216 000405          BR 33$
15419 070220          PRINTB #FORM35          ;PRINT -
    (6) 070220 012746 014373    MOV #FORM35,-(SP)
    (3) 070224 010600          MOV SP,R0
    (4) 070226 004737 066232    JSR PC,FPRINT
15420 070232          PRINTB #FORM32          ;PRINT ' ('
    (6) 070232 012746 014342    MOV #FORM32,-(SP)
    (3) 070236 010600          MOV SP,R0
    (4) 070240 004737 066232    JSR PC,FPRINT
15421 070244 013702 025274    MOV SGNBYT,R2      ;GET HIGH NIBBLE OF SIGN BYTE
15422 070250 006202          ASR R2
15423 070252 006202          ASR R2
15424 070254 006202          ASR R2
15425 070256 006202          ASR R2
15426 070260 042702 177760    BIC #177760,R2
15427 070264 004537 070330    JSR R5,CONVN      ;CONVERT NIBBLE & PRINT HEX DIGIT
15428 070270 070364          DIGTBL
15429 070272 113702 025274    MOVB SGNBYT,R2    ;GET LOW NIBBLE OF SIGN BYTE
15430 070276 042702 177760    BIC #177760,R2
15431 070302 004537 070330    JSR R5,CONVN      ;CONVERT NIBBLE & PRINT HEX DIGIT
15432 070306 070364          DIGTBL
15433 070310          PRINTB #FORM33          ;PRINT ')'
    (6) 070310 012746 014362    MOV #FORM33,-(SP)
    (3) 070314 010600          MOV SP,R0
    (4) 070316 004737 066232    JSR PC,FPRINT
15434 070322 005037 002510    6$: CLR PRISGN      ;YES - CLEAR PRINTING FLAG
15435 070326 000207          RTS PC
15436
15437
15438
15439          ;SUBROUTINE TO CONVERT NIBBLE (IN R2) TO A PRINTABLE CHARACTER
15440          ;AND PRINT CHARACTER.
15441          ;INPUT PARAMETER FOLLOWS CALL - CONVERSION TABLE ADDRESS
15442          ;
15443          CONVN:
15444 070330          MOV R0,-(SP)          ;SAVE R0
15445 070330 010046          MOV (R5)+,R0      ;GET ADDRESS OF CONVERSION TABLE
15446 070332 012500          ADD R2,R0         ;INDEX INTO TABLE
15447 070334 060200          MOVB (R0),ANIB+2 ;TRANSFER PRINT CHAR FROM TABLE TO ASCIZ PRINT STREAM.
15448 070336 111037 070362    PRINTB #ANIB      ;PRINT CONVERTED NIBBLE
    (6) 070342 012746 070360    MOV #ANIB,-(SP)
    (3) 070346 010600          MOV SP,R0
    
```

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(4) 070350 004737 C66232 JSR PC,FPRINT
15449 070354 012600 MOV (SP)+,R0 ;RESTORE R0
15450 070356 000205 RTS R5 ;EXIT
15451
15452 070360 045 ANIB: .BYTE 045 ;%
15453 070361 101 .BYTE 101 ;A
15454 070362 000 .BYTE 000 ;PRINT CHAR
15455 070363 000 .BYTE 000 ;ZERO BYTE
15456
15457
15458 070364 060 DIGTBL: .BYTE 060 ;0
15459 070365 061 .BYTE 061 ;1
15460 070366 062 .BYTE 062 ;2
15461 070367 063 .BYTE 063 ;3
15462 070370 064 .BYTE 064 ;4
15463 070371 065 .BYTE 065 ;5
15464 070372 066 .BYTE 066 ;6
15465 070373 067 .BYTE 067 ;7
15466 070374 070 .BYTE 070 ;8
15467 070375 071 .BYTE 071 ;9
15468 070376 101 .BYTE 101 ;A
15469 070377 102 .BYTE 102 ;B
15470 070400 103 .BYTE 103 ;C
15471 070401 104 .BYTE 104 ;D
15472 070402 105 .BYTE 105 ;E
15473 070403 106 .BYTE 106 ;F
15474
15475 ;SUBROUTINE TO SEARCH FOR A MATCH BETWEEN ENTERED INST
15476 ;AND TABLED ASCII LIST OF CIS INSTRUCTIONS.
15477
15478 070404 012701 004454 SFCI: MOV #ASZINS,R1
15479 070410 005711 1$: TST (R1) ;REACHED END OF TABLED ASCII LIST?
15480 070412 001434 BEQ NOMTCH ;BRANCH IF YES
15481 070414 021137 002466 CMP (R1),ACINST ;DO 1ST TWO CHARS MATCH TABLED INST?
15482 070420 001403 BEQ 2$ ;BRANCH IF YES
15483 070422 062701 000010 11$: ADD #10,R1 ;UPDATE TO NEXT TABLED INST
15484 070426 000770 BR 1$ ;RETURN TO CONTINUE SEARCH
15485 070430 026137 000002 002470 2$: CMP 2(R1),ACINST+2 ;DO 2ND GROUP OF 2 CHARS MATCH
15486 070436 001401 BEQ 3$ ;BRANCH IF YES
15487 070440 000770 BR 11$
15488 070442 026137 000004 002472 3$: CMP 4(R1),ACINST+4 ;DO 3RD GROUP OF 2 CHARS MATCH
15489 070450 001364 BNE 11$ ;BRANCH IF NO
15490 070452 005737 001764 TST RANDOM ;RANDOM EXERCISE MODE?
15491 070456 001405 BEQ 4$ ;BRANCH IF NO
15492 070460 016100 000006 MOV 6(R1),R0
15493 070464 011037 072776 MOV (R0),IDUM ;LOAD OCTAL CODING FOR CIS INST INTO DUMMY INPUT TABLE
15494 070470 000403 BR MTCH
15495 070472 016137 000006 073052 4$: MOV 6(R1),INPTBL ;MATCH FOUND - RETURN TO CALL + 4
15496 ;SAVE DESIRED INST INPUT TABLE ADDRESS
15497 ;IN INPTBL.
15498 070500 062716 000002 MTCH: ADD #2,(SP)
15499 070504 000207 NOMTCH: RTS PC ;NO MATCH - RETURN TO CALL + 2
15500

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MESSAGE PRINT ROUTINES

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15502
15503      ;SUBROUTINE TO ACCEPT ASCII CHARS (6MAX,LESS+CR) FROM TTY.
15504      ; STORES ASCII CHARS 2 PER WORD IN ACINST,ACINST+2, AND ACINST+4.
15505
15506      ACASZ: CLR ACINST
15507      070512 005037 002466      CLR ACINST+2
15508      070516 005037 002470      CLR ACINST+4      ;CLEAR OUT STORAGE AREA
15509      070522 012701 002466      MOV #ACINST,R1      ;SETUP REG POINTER TO STORAGE AREA
15510      070526 105777 111134      1$: TSTB @TKS      ;WAIT FOR A CHAR
15511      070532 100375      BPL 1$
15512      070534 117737 111152 065600      MOVB @TKB,RCHAR      ;READ AND SAVE CHAR
15513      070542 032737 000100 065600      BIT #100,RCHAR      ;CONVERT LOWER CASE TO UPPER
15514      070550 001403      BEQ 3$      ; CASE LETTERS
15515      070552 042737 000040 065600      BIC #40,RCHAR
15516      070560 042737 177600 065600      3$: BIC #^C177,RCHAR      ;GET RID OF JUNK IF ANY
15517      070566 022737 000021 065600      CMP #021,RCHAR      ;SEE IF A RANDOM ^Q WAS INPUTED      ;;REV-C
15518      070574 001754      BEQ 1$      ;BRANCH BACK IF SO - INPUT NOT WANTED      ;;REV-C
15519      070576 123727 065600 000015      CMPB RCHAR,#15      ;IS CHAR A CR?
15520      070604 001412      BEQ 2$      ;BRANCH IF YES
15521      070606 113721 065600      MOVB RCHAR,(R1)+      ;SAVE CHAR
15522      070612 004737 065562      JSR PC,ECHAR      ;ECHO 6TH CHAR
15523      070616 022701 002474      CMP #ACINST+6,R1      ;6 CHARS ENTERED?
15524      070622 001341      BNE 1$      ;BRANCH IF NO TO LISTEN FOR NEXT CHAR
15525      070624 112737 000015 065600      MOVB #15,RCHAR      ;ECHO A CR
15526      070632 004737 065562      2$: JSR PC,ECHAR      ;ECHO CR
15527      070636 000207      RTS PC
15528
15529      ;SUBROUTINE TO RECORD WHICH CONDITION CODE STATES ARE EXERCISED

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 CZKEEC.P11 MESSAGE PRINT ROUTINES

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15531 ;FOR EACH INSTRUCTION.
15532 ;
15533 070640 RECCC:
15534 07064C 013701 002302 MOV OCTIC,R1 ;FORM POINTER INTO TABLE OF COND. CODE USAGE
15535 070644 006301 ASL R1
15536 070646 062701 004022 ADD #CCREC,R1
15537 070652 113737 003730 002041 MOV#B ECCR,ZCCR+1
15538 070660 153711 003730 BISB ECCR,(R1) ;LOG CC '1' STATES EXERCISED
15539 070664 005137 002040 COM ZCCR
15540 070670 042737 170377 002040 BIC #170377,ZCCR
15541 070676 053711 002040 BIS ZCCR,(R1) ;LOG CC '0' STATES EXERCISED
15542 070702 000207 RTS PC
15543 ;POINTERS TO CIS INSTRUCTION ERROR MESSAGEAEGE HEADER ROUTINE
15544 ;
15545 INEM:
15546 070704 000000 .WORD 0
15547 070706 070774 .WORD YMOV#C
15548 070710 071030 .WORD YMOV#R#C
15549 070712 071064 .WORD YMOV#T#C
15550 070714 071120 .WORD YLOCC
15551 070716 071154 .WORD YSKPC
15552 070720 071210 .WORD YSCANC
15553 070722 071244 .WORD YSPANC
15554 070724 071300 .WORD YCM#P#C
15555 070726 071334 .WORD YMATCH#C
15556 070730 071370 .WORD YADD#N
15557 070732 071432 .WORD YSUB#N
15558 070734 071474 .WORD YCM#P#N
15559 070736 071536 .WORD YCV#T#N#L
15560 070740 071600 .WORD YCV#T#P#N
15561 070742 071642 .WORD YCV#T#N#P
15562 070744 071704 .WORD YASH#N
15563 070746 071746 .WORD YCV#T#L#N
15564 070750 072010 .WORD YADD#P
15565 070752 072052 .WORD YSUB#P
15566 070754 072114 .WORD YCM#P#P
15567 070756 072156 .WORD YCV#T#P#L
15568 070760 072220 .WORD YMUL#P
15569 070762 072262 .WORD YDIV#P
15570 070764 072324 .WORD YASH#P
15571 070766 072366 .WORD YCV#T#L#P
15572 070770 072430 .WORD YL2#D
15573 070772 072470 .WORD YL3#D
15574 ;
15575 ;SBTTL ERROR MESSAGE HEADERS
15576 ;ERROR MESSAGE HEADERS
15577 ;
15578 YMOV#C:
15579 070774 PRINT#B #AMOV#C
(6) 070774 012746 007444 MOV #AMOV#C,-(SP)
(3) 071000 010600 MOV SP,R0
(4) 071002 004737 066232 JSR PC,FPRINT
15580 071006 004737 072530 JSR PC,PRNTIQ ;PRINT TEST #
15581 071012 000405 BR 1$ ;CN#L-T RETURN

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15582	071014			PRINTB #FORM1	;NORMAL RETURN
(6)	071014	012746	010012	MOV #FORM1,-(SP)	
(3)	071020	010600		MOV SP,R0	
(4)	071022	004737	066232	JSR PC,FPRINT	
15583	071026	000207		RTS PC	
15584	071030			1\$:	
15585	071030			YMOVRC:	
(6)	071030	012746	007454	PRINTB #AMOVRC	
(3)	071034	010600		MOV #AMOVRC,-(SP)	
(4)	071036	004737	066232	MOV SP,R0	
15586	071042	004737	072530	JSR PC,FPRINT	
15587	071046	000405		JSR PC,PRNTIQ	;PRINT TEST #
15588	071050			BR 1\$	
(6)	071050	012746	010012	PRINTB #FORM1	
(3)	071054	010600		MOV #FORM1,-(SP)	
(4)	071056	004737	066232	MOV SP,R0	
15589	071062	000207		JSR PC,FPRINT	
15590	071064			RTS PC	
15591	071064			1\$:	
(6)	071064	012746	007465	YMOVTC:	
(3)	071070	010600		PRINTB #AMOVTC	
(4)	071072	004737	066232	MOV #AMOVTC,-(SP)	
15592	071076	004737	072530	MOV SP,R0	
15593	071102	000405		JSR PC,FPRINT	
15594	071104			JSR PC,PRNTIQ	;PRINT TEST #
(6)	071104	012746	010072	BR 1\$	
(3)	071110	010600		PRINTB #FORM2	
(4)	071112	004737	066232	MOV #FORM2,-(SP)	
15595	071116	000207		MOV SP,R0	
15596	071120			JSR PC,FPRINT	
15597	071120			RTS PC	
(6)	071120	012746	007476	1\$:	
(3)	071124	010600		YLOCC:	
(4)	071126	004737	066232	PRINTB #ALOCC	
15598	071132	004737	072530	MOV #ALOCC,-(SP)	
15599	071136	000405		MOV SP,R0	
15600	071140			JSR PC,FPRINT	
(6)	071140	012746	010160	JSR PC,PRNTIQ	;PRINT TEST #
(3)	071144	010600		BR 1\$	
(4)	071146	004737	066232	PRINTB #FORM3	
15601	071152	000207		MOV #FORM3,-(SP)	
15602	071154			MOV SP,R0	
15603	071154			JSR PC,FPRINT	
(6)	071154	012746	007506	RTS PC	
(3)	071160	010600		1\$:	
(4)	071162	004737	066232	YASKPC:	
15604	071166	004737	072530	PRINTB #ASKPC	
15605	071172	000405		MOV #ASKPC,-(SP)	
15606	071174			MOV SP,R0	
(6)	071174	012746	010160	JSR PC,FPRINT	
(3)	071200	010600		JSR PC,PRNTIQ	;PRINT TEST #
(4)	071202	004737	066232	BR 1\$	
15607	071206	000207		PRINTB #FORM3	
15608	071210			MOV #FORM3,-(SP)	
				MOV SP,R0	
				JSR PC,FPRINT	
				RTS PC	
				1\$:	
				YSCANC:	

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15609	071210			PRINTB #ASCANC	
(6)	071210	012746	007516	MOV #ASCANC,-(SP)	
(3)	071214	010600		MOV SP,R0	
(4)	071216	004737	066232	JSR PC,FPRINT	
15610	071222	004737	072530	JSR PC,PRNTIQ	;PRINT TEST #
15611	071226	000405		BR 1\$	
15612	071230			PRINTB #FORM4	
(6)	071230	012746	010226	MOV #FORM4,-(SP)	
(3)	071234	010600		MOV SP,R0	
(4)	071236	004737	066232	JSR PC,FPRINT	
15613	071242	000207		RTS PC	
15614	071244			1\$: YSPANC:	
15615	071244			PRINTB #ASPANC	
(6)	071244	012746	007527	MOV #ASPANC,-(SP)	
(3)	071250	010600		MOV SP,R0	
(4)	071252	004737	066232	JSR PC,FPRINT	
15616	071256	004737	072530	JSR PC,PRNTIQ	;PRINT TEST #
15617	071262	000405		BR 1\$	
15618	071264			PRINTB #FORM4	
(6)	071264	012746	010226	MOV #FORM4,-(SP)	
(3)	071270	010600		MOV SP,R0	
(4)	071272	004737	066232	JSR PC,FPRINT	
15619	071276	000207		RTS PC	
15620	071300			1\$: YCMPC:	
15621	071300			PRINTB #ACMPC	
(6)	071300	012746	007540	MOV #ACMPC,-(SP)	
(3)	071304	010600		MOV SP,R0	
(4)	071306	004737	066232	JSR PC,FPRINT	
15622	071312	004737	072530	JSR PC,PRNTIQ	;PRINT TEST #
15623	071316	000405		BR 1\$	
15624	071320			PRINTB #FORM5	
(6)	071320	012746	010302	MOV #FORM5,-(SP)	
(3)	071324	010600		MOV SP,R0	
(4)	071326	004737	066232	JSR PC,FPRINT	
15625	071332	000207		RTS PC	
15626	071334			1\$: YMATCHC:	
15627	071334			PRINTB #AMATCHC	
(6)	071334	012746	007550	MOV #AMATCHC,-(SP)	
(3)	071340	010600		MOV SP,R0	
(4)	071342	004737	066232	JSR PC,FPRINT	
15628	071346	004737	072530	JSR PC,PRNTIQ	;PRINT TEST #
15629	071352	000405		BR 1\$	
15630	071354			PRINTB #FORM6	
(6)	071354	012746	010366	MOV #FORM6,-(SP)	
(3)	071360	010600		MOV SP,R0	
(4)	071362	004737	066232	JSR PC,FPRINT	
15631	071366	000207		RTS PC	
15632	071370			1\$: YADDN:	
15633	071370			PRINTB #AADDN	
(6)	071370	012746	007560	MOV #AADDN,-(SP)	
(3)	071374	010600		MOV SP,R0	
(4)	071376	004737	066232	JSR PC,FPRINT	
15634	071402	004737	072530	JSR PC,PRNTIQ	;PRINT TEST #
15635	071406	000410		BR 1\$	

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15636	071410				PRINTB #FORM7	
(6)	071410	012746	010440		MOV #FORM7,-(SP)	
(3)	071414	010600			MOV SP,R0	
(4)	071416	004737	066232		JSR PC,FPRINT	
15637	071422	012737	000016	002476	MOV #000016,PZCODE	;SET PRINTCODE TO DISPLAY ZONED SRC1,SRC2,DST
15638	071430	000207			RTS PC	
15639	071432				1\$: YSUBN:	
15640	071432				PRINTB #ASUBN	
(6)	071432	012746	007570		MOV #ASUBN,-(SP)	
(3)	071436	010600			MOV SP,R0	
(4)	071440	004737	066232		JSR PC,FPRINT	
15641	071444	004737	072530		JSR PC,PRNTIQ	;PRINT TEST #
15642	071450	000410			BR 1\$	
15643	071452				PRINTB #FORM7	
(6)	071452	012746	010440		MOV #FORM7,-(SP)	
(3)	071456	010600			MOV SP,R0	
(4)	071460	004737	066232		JSR PC,FPRINT	
15644	071464	012737	000016	002476	MOV #000016,PZCODE	;SET PRINTCODE TO DISPLAY ZONED SRC1,SRC2,DST.
15645	071472	000207			RTS PC	
15646	071474				1\$: YCMPN:	
15647	071474				PRINTB #ACMPN	
(6)	071474	012746	007600		MOV #ACMPN,-(SP)	
(3)	071500	010600			MOV SP,R0	
(4)	071502	004737	066232		JSR PC,FPRINT	
15648	071506	004737	072530		JSR PC,PRNTIQ	;PRINT TEST #
15649	071512	000410			BR 1\$	
15650	071514				PRINTB #FORM8	
(6)	071514	012746	010534		MOV #FORM8,-(SP)	
(3)	071520	010600			MOV SP,R0	
(4)	071522	004737	066232		JSR PC,FPRINT	
15651	071526	012737	000006	002476	MOV #000006,PZCODE	;SET PRINTCODE TO DISPLAY ZONED SRC1,SRC2.
15652	071534	000207			RTS PC	
15653	071536				1\$: YCVTNL:	
15654	071536				PRINTB #ACVTNL	
(6)	071536	012746	007610		MOV #ACVTNL,-(SP)	
(3)	071542	010600			MOV SP,R0	
(4)	071544	004737	066232		JSR PC,FPRINT	
15655	071550	004737	072530		JSR PC,PRNTIQ	;PRINT TEST #
15656	071554	000410			BR 1\$	
15657	071556				PRINTB #FORM9	
(6)	071556	012746	010612		MOV #FORM9,-(SP)	
(3)	071562	010600			MOV SP,R0	
(4)	071564	004737	066232		JSR PC,FPRINT	
15658	071570	012737	000001	002476	MOV #000001,PZCODE	;SET PRINTCODE TO DISPLAY ZONED SRC.
15659	071576	000207			RTS PC	
15660	071600				1\$: YCVTPN:	
15661	071600				PRINTB #ACVTPN	
(6)	071600	012746	007621		MOV #ACVTPN,-(SP)	
(3)	071604	010600			MOV SP,R0	
(4)	071606	004737	066232		JSR PC,FPRINT	
15662	071612	004737	072530		JSR PC,PRNTIQ	;PRINT TEST #
15663	071616	000410			BR 1\$	
15664	071620				PRINTB #FORM10	
(6)	071620	012746	010666		MOV #FORM10,-(SP)	

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 CZKEEC.P11 ERROR MESSAGE HEADERS

(3)	071624	010600			MOV SP,R0	
(4)	071626	004737	066232		JSR PC,FPRINT	
15665	071632	012737	000420	002476	MOV #000420,PZCODE	;SET PRINTCODE TO DISPLAY PACKED SRC AND ZONED DST.
15666	071640	000207			RTS PC	
15667	071642				1\$:	
15668	071642				YCVTNP:	
(6)	071642	012746	007632		PRINTB #ACVTNP	
(3)	071646	010600			MOV #ACVTNP,-(SP)	
(4)	071650	004737	066232		MOV SP,R0	
15669	071654	004737	072530		JSR PC,FPRINT	
15670	071660	000410			JSR PC,PRNTIQ	;PRINT TEST #
15671	071662				BR 1\$	
(6)	071662	012746	010666		PRINTB #FORM10	
(3)	071666	010600			MOV #FORM10,-(SP)	
(4)	071670	004737	066232		MOV SP,R0	
15672	071674	012737	010001	002476	JSR PC,FPRINT	
15673	071702	000207			MOV #010001,PZCODE	;SET PRINTCODE TO DSIPLAY ZONED SRC AND PACKED DST.
15674	071704				RTS PC	
15675	071704				1\$:	
(6)	071704	012746	007643		YASHN:	
(3)	071710	010600			PRINTB #AASHN	
(4)	071712	004737	066232		MOV #AASHN,-(SP)	
15676	071716	004737	072530		MOV SP,R0	
15677	071722	000410			JSR PC,FPRINT	
15678	071724				JSR PC,PRNTIQ	;PRINT TEST #
(6)	071724	012746	010740		BR 1\$	
(3)	071730	010600			PRINTB #FORM11	
(4)	071732	004737	066232		MOV #FORM11,-(SP)	
15679	071736	012737	000021	002476	MOV SP,R0	
15680	071744	000207			JSR PC,FPRINT	
15681	071746				MOV #000021,PZCODE	;SET PRINTCODE TO DISPLAY ZONED SRC,DST.
15682	071746				RTS PC	
(6)	071746	012746	007653		1\$:	
(3)	071752	010600			YCVTLN:	
(4)	071754	004737	066232		PRINTB #ACVTLN	
15683	071760	004737	072530		MOV #ACVTLN,-(SP)	
15684	071764	000410			MOV SP,R0	
15685	071766				JSR PC,FPRINT	
(6)	071766	012746	011022		JSR PC,PRNTIQ	;PRINT TEST #
(3)	071772	010600			BR 1\$	
(4)	071774	004737	066232		PRINTB #FORM12	
15686	072000	012737	000040	002476	MOV #FORM12,-(SP)	
15687	072006	000207			MOV SP,R0	
15688	072010				JSR PC,FPRINT	
15689	072010				MOV #000040,PZCODE	;SET PRINTCODE TO DISPLAY ZONED DST.
(6)	072010	012746	007664		RTS PC	
(3)	072014	010600			1\$:	
(4)	072016	004737	066232		YADDP:	
15690	072022	004737	072530		PRINTB #AADDP	
15691	072026	000410			MOV #AADDP,-(SP)	
15692	072030				MOV SP,R0	
(6)	072030	012746	010440		JSR PC,FPRINT	
(3)	072034	010600			JSR PC,PRNTIQ	;PRINT TEST #
(4)	072036	004737	066232		BR 1\$	
					PRINTB #FORM7	
					MOV #FORM7,-(SP)	
					MOV SP,R0	
					JSR PC,FPRINT	

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15693	072042	012737	007000	002476		MOV #007000,PZCODE ;SET PRINTCODE TO DISPLAY PACKED SRC1, SRC2, AND DST.
15694	072050	000207			1\$:	RTS PC
15695	072052				YSUBP:	
15696	072052					PRINTB #ASUBP
(6)	072052	012746	007674			MOV #ASUBP,-(SP)
(3)	072056	010600				MOV SP,R0
(4)	072060	004737	066232			JSR PC,FPRINT
15697	072064	004737	072530			JSR PC,PRNTIQ ;PRINT TEST #
15698	072070	000410				BR 1\$
15699	072072					PRINTB #FORM7
(6)	072072	012746	010440			MOV #FORM7,-(SP)
(3)	072076	010600				MOV SP,R0
(4)	072100	004737	066232			JSR PC,FPRINT
15700	072104	012737	007000	002476		MOV #007000,PZCODE ;SET PRINTCODE TO DISPLAY PACKED SRC1, SRC2, AND DST.
15701	072112	000207			1\$:	RTS PC
15702	072114				YCMPP:	
15703	072114					PRINTB #ACMPP
(6)	072114	012746	007704			MOV #ACMPP,-(SP)
(3)	072120	010600				MOV SP,R0
(4)	072122	004737	066232			JSR PC,FPRINT
15704	072126	004737	072530			JSR PC,PRNTIQ ;PRINT TEST #
15705	072132	000410				BR 1\$
15706	072134					PRINTB #FORM8
(6)	072134	012746	010534			MOV #FORM8,-(SP)
(3)	072140	010600				MOV SP,R0
(4)	072142	004737	066232			JSR PC,FPRINT
15707	072146	012737	003000	002476		MOV #003000,PZCODE ;SET PRINTCODE TO DISPLAY PACKED SRC1, AND SRC2.
15708	072154	000207			1\$:	RTS PC
15709	072156				YCVTPL:	
15710	072156					PRINTB #ACVTPL
(6)	072156	012746	007714			MOV #ACVTPL,-(SP)
(3)	072162	010600				MOV SP,R0
(4)	072164	004737	066232			JSR PC,FPRINT
15711	072170	004737	072530			JSR PC,PRNTIQ ;PRINT TEST #
15712	072174	000410				BR 1\$
15713	072176					PRINTB #FORM9
(6)	072176	012746	010612			MOV #FORM9,-(SP)
(3)	072202	010600				MOV SP,R0
(4)	072204	004737	066232			JSR PC,FPRINT
15714	072210	012737	000400	002476		MOV #000400,PZCODE ;SET PRINTCODE TO DISPLAY PACKED SRC.
15715	072216	000207			1\$:	RTS PC
15716	072220				YMULP:	
15717	072220					PRINTB #AMULP
(6)	072220	012746	007725			MOV #AMULP,-(SP)
(3)	072224	010600				MOV SP,R0
(4)	072226	004737	066232			JSR PC,FPRINT
15718	072232	004737	072530			JSR PC,PRNTIQ ;PRINT TEST #
15719	072236	000410				BR 1\$
15720	072240					PRINTB #FORM7
(6)	072240	012746	010440			MOV #FORM7,-(SP)
(3)	072244	010600				MOV SP,R0
(4)	072246	004737	066232			JSR PC,FPRINT
15721	072252	012737	007000	002476		MOV #007000,PZCODE ;SET PRINTCODE TO DISPLAY PACKED SRC1, SRC2, AND DST.
15722	072260	000207			1\$:	RTS PC

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15723	072262								
15724	072262								
	(6) 072262	012746	007735						
	(3) 072266	010600							
	(4) 072270	004737	066232						
15725	072274	004737	072530						
15726	072300	000410							
15727	072302								
	(6) 072302	012746	010440						
	(3) 072306	010600							
	(4) 072310	004737	066232						
15728	072314	012737	007000	002476					
15729	072322	000207							
15730	072324								
15731	072324	012746	007745						
	(6) 072324	012746	007745						
	(3) 072330	010600							
	(4) 072332	004737	066232						
15732	072336	004737	072530						
15733	072342	000410							
15734	072344								
	(6) 072344	012746	010740						
	(3) 072350	010600							
	(4) 072352	004737	066232						
15735	072356	012737	010400	002476					
15736	072364	000207							
15737	072366								
15738	072366								
	(6) 072366	012746	007755						
	(3) 072372	010600							
	(4) 072374	004737	066232						
15739	072400	004737	072530						
15740	072404	000410							
15741	072406								
	(6) 072406	012746	011022						
	(3) 072412	010600							
	(4) 072414	004737	066232						
15742	072420	012737	020000	002476					
15743	072426	000207							
15744	072430								
15745	072430								
	(7) 072430	013746	050164						
	(6) 072434	012746	007766						
	(3) 072440	010600							
	(4) 072442	004737	066232						
15746	072446	004737	072530						
15747	072452	000405							
15748	072454								
	(6) 072454	012746	014733						
	(3) 072460	010600							
	(4) 072462	004737	066232						
15749	072466	000207							
15750	072470								
15751	072470								

YDIVP:

```

PRINTB #ADIVP
MOV #ADIVP,-(SP)
MOV SP,RO
JSR PC,FPRINT
JSR PC,PRNTIQ ;PRINT TEST #
BR 1$

```

1\$:

```

PRINTB #FORM7
MOV #FORM7,-(SP)
MOV SP,RO
JSR PC,FPRINT
MOV #007000,PZCODE ;SET PRINTCODE TO DISPLAY PACKED SRC1,SRC2, AND DST.
RTS PC

```

YASHP:

```

PRINTB #AASHP
MOV #AASHP,-(SP)
MOV SP,RO
JSR PC,FPRINT
JSR PC,PRNTIQ ;PRINT TEST #
BR 1$

```

1\$:

```

PRINTB #FORM11
MOV #FORM11,-(SP)
MOV SP,RO
JSR PC,FPRINT
MOV #010400,PZCODE ;SET PRINTCODE TO DISPLAY PACKED SRC,DST.
RTS PC

```

YCVTLP:

```

PRINTB #ACVTLP
MOV #ACVTLP,-(SP)
MOV SP,RO
JSR PC,FPRINT
JSR PC,PRNTIQ ;PRINT TEST #
BR 1$

```

1\$:

```

PRINTB #FORM12
MOV #FORM12,-(SP)
MOV SP,RO
JSR PC,FPRINT
MOV #020000,PZCODE ;SET PRINTCODE TO DISPLAY PACKED DST.
RTS PC

```

YL2D:

```

PRINTB #AL2D,TINST
MOV TINST,-(SP)
MOV #AL2D,-(SP)
MOV SP,RO
JSR PC,FPRINT
JSR PC,PRNTIQ
BR 1$

```

1\$:

```

PRINTB #FORM41
MOV #FORM41,-(SP)
MOV SP,RO
JSR PC,FPRINT
RTS PC

```

YL3D:

```

PRINTB #AL3D,TINST

```

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```

(7) 072470 013746 050164      MOV     TINST,-(SP)
(6) 072474 012746 010000      MOV     #AL3D,-(SP)
(3) 072500 010600              MOV     SP,R0
(4) 072502 004737 066232      JSR PC,FPRINT
15752 072506 004737 072530      JSR PC,PRNTIQ
15753 072512 000405              BR 1$
15754 072514              PRINTB #FORM41
(6) 072514 012746 014733      MOV     #FORM41,-(SP)
(3) 072520 010600              MOV     SP,R0
(4) 072522 004737 066232      JSR PC,FPRINT
15755 072526 000207              RTS PC
15756
15757
15758
15759
15760 072530 032737 000100 050164  PRNTIQ: BIT #100,TINST      ;SUBROUTINE TO PRINT I ON END OF IN-LINE OPCODE
15761
15762
15763 072536 001405              BEQ 1$
15764 072540              PRINTB #FORM31
(6) 072540 012746 014336      MOV     #FORM31,-(SP)
(3) 072544 010600              MOV     SP,R0
(4) 072546 004737 066232      JSR PC,FPRINT
15765 072552              PRINTB #FORM30,TOTTC,TOTTC      ;PRINT TEST #
(8) 072552 013746 001420      MOV     TOTTC,-(SP)
(7) 072556 013746 001416      MOV     TOTTC,-(SP)
(6) 072562 012746 014306      MOV     #FORM30,-(SP)
(3) 072566 010600              MOV     SP,R0
(4) 072570 004737 066232      JSR PC,FPRINT
15766 072574 005737 001766      TST CTACT      ;CNTRL-T REQUEST ACTIVE?
15767 072600 001066              BNE 3$         ;BRANCH IF YES
15768 072602              PRINTB #FORM40,INTCT,REGSET      ;PRINT INTERRUPT COUNT AND REG SET
(8) 072602 013746 002056      MOV     REGSET,-(SP)
(7) 072606 013746 002552      MOV     INTCT,-(SP)
(6) 072612 012746 014653      MOV     #FORM40,-(SP)
(3) 072616 010600              MOV     SP,R0
(4) 072620 004737 066232      JSR PC,FPRINT
15769 072624 062716 000002      ADD #2,(SP)
15770 072630 005737 002164      TST MODE
15771 072634 001004              BNE 4$         ;FORM ASCII MODE CHARACTER
15772 072636 112737 000113 066744      MOVB #113,TDIG      ;KERNEL MODE (K)
15773 072644 000413              BR 10$
15774 072646 022737 000001 002164  4$:  CMP #1,MODE
15775 072654 001004              BNE 5$
15776 072656 112737 000123 066744      MOVB #123,TDIG      ;SUPERVISOR MODE (S)
15777 072664 000403              BR 10$
15778 072666 112737 000125 066744  5$:  MOVB #125,TDIG      ;USER MODE (U)
15779 072674 104401              10$:  TYPE
15780 072676 066744              TDIG
15781 072700              PRINTB #FRM40A      ;PRINT D EN
(6) 072700 012746 014721      MOV     #FRM40A,-(SP)
(3) 072704 010600              MOV     SP,R0
(4) 072706 004737 066232      JSR PC,FPRINT
15782 072712 005737 002166      TST DEN      ;PRINT Y OR N

```


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CZKEEC.P11 ERROR MESSAGE HEADERS

```

15800
15801      .SBTTL DUMMY INPUT TABLE (FOR RANDOM MODE)
15802      :DUMMY INPUT TABLE - USED ONLY IN RANDOM EXERCISE MODE
15803      :
15804      IDUM: .WORD 0          :INST
15805             .WORD 0          :TYPE = 0
15806             .WORD 0          :IP1
15807             .WORD 0          :IP2
15808             .WORD 0          :IP3
15809             .WORD 0          :IP4
15810             .WORD 0          :IP5
15811             .WORD 0          :IP6
15812             .WORD 0          :IP7
15813             .WORD 0          :IP10
15814             .WORD 0          :IP11
15815             .WORD 0          :IP12
15816             .WORD 0          :IP13
15817             .WORD 0          :IP14
15818             .WORD 0          :IP15
15819             .WORD 0          :IP16
15820             .WORD 0          :IP17
15821             .WORD 0          :IP20
15822             .WORD 0          :IP21
15823             .WORD 0          :IP22
15824             .WORD 0          :IP23
15825      IDUME: .WORD 0          :IP24
15826

```

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CZKEEC.P11 DUMMY INPUT TABLE (FOR RANDOM MODE)

15828
15829
15830
15831
15832 073052 000000
15833

.SBTTL CIS INST INPUT TABLES
:INPUT TABLES
:
:INPTBL: .WORD 0
:

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CZKEEC.P11 L2D TABLES

15835
15836
15837
15838
15839 073054 000032
15840 073056 000003
15841 073060 110450
15842 073062 110460
15843 073064 110470
15844 073066 110500
15845 073070 110510
15846 073072 110520
15847 073074 110530
15848 073076 000000
15849 073100 000000
15850 073102 000000
15851 073104 000000
15852 073106 000000
15853 073110 000000
15854 073112 000000
15855 073114 000000
15856 073116 000000
15857 073120 000000
15858 073122 000000
15859 073124 000000
15860 073126 000000
15861
15862

.SBTTL L2D TABLES

:ENTRY 0.1 - INSTRUCTION UNDER TEST = L2DR

:L2D: .WORD 32 ;INST=L2DR; NOTE:R IS CALCULATED USING IP7.
 .WORD 3 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
 .WORD T53 ;IP1 - R0 PATTERN
 .WORD T54 ;IP2 - R1 PATTERN
 .WORD T55 ;IP3 - R2 PATTERN
 .WORD T56 ;IP4 - R3 PATTERN
 .WORD T57 ;IP5 - R4 PATTERN
 .WORD T60 ;IP6 - R5 PATTERN
 .WORD T61 ;IP7 - DESC ADDRESS
 .WORD 0 ;IP10
 .WORD 0 ;IP11
 .WORD 0 ;IP12
 .WORD 0 ;IP13
 .WORD 0 ;IP14
 .WORD 0 ;IP15
 .WORD 0 ;IP16
 .WORD 0 ;IP17
 .WORD 0 ;IP20
 .WORD 0 ;IP21
 .WORD 0 ;IP22
 .WORD 0 ;IP23
 .WORD 0 ;IP24

:TOTAL # OF TESTS = 8

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L3D TABLES

```

15864
15865
15866
15867
15868 073130 000033
15869 073132 000003
15870 073134 110450
15871 073136 110460
15872 073140 110470
15873 073142 110500
15874 073144 110510
15875 073146 110520
15876 073150 110530
15877 073152 000000
15878 073154 000000
15879 073156 000000
15880 073160 000000
15881 073162 000000
15882 073164 000000
15883 073166 000000
15884 073170 000000
15885 073172 000000
15886 073174 000000
15887 073176 000000
15888 073200 000000
15889 073202 000000
15890
15891

```

```

.SBTTL          L3D TABLES
:ENTRY 0.2 - INSTRUCTION UNDER TEST = L3DR
:
:IL3D:          .WORD 33          ;INST=L3DR; NOTE:R IS CALCULATED USING IP7.
                .WORD 3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
                .WORD T53        ;IP1 - R0 PATTERN
                .WORD T54        ;IP2 - R1 PATTERN
                .WORD T55        ;IP3 - R2 PATTERN
                .WORD T56        ;IP4 - R3 PATTERN
                .WORD T57        ;IP5 - R4 PATTERN
                .WORD T60        ;IP6 - R5 PATTERN
                .WORD T61        ;IP7 - DESC ADDRESS
                .WORD 0          ;IP10
                .WORD 0          ;IP11
                .WORD 0          ;IP12
                .WORD 0          ;IP13
                .WORD 0          ;IP14
                .WORD 0          ;IP15
                .WORD 0          ;IP16
                .WORD 0          ;IP17
                .WORD 0          ;IP20
                .WORD 0          ;IP21
                .WORD 0          ;IP22
                .WORD 0          ;IP23
                .WORD 0          ;IP24

:TOTAL # OF TESTS = 8

```

PDP-11 (IS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 103-1
 CZKEEC.P11 MOV C TABLES

```

15894 .SBTTL MOV C TABLES
15895 :ENTRY 1 - INST UNDER TEST = MOV C
15896 :
15897 073204 000001 :IMOV C: .WORD 1 ;INST=MOV C
15898 073206 000003 .WORD 3 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
15899 073210 103726 .WORD TL1C ;IP1 - SRC.LEN
15900 073212 103766 .WORD T2 ;IP2 - SRC.ADR
15901 073214 103746 .WORD TL2C ;IP3 - DST.LEN
15902 073216 104022 .WORD T4 ;IP4 - DST.ADR
15903 073220 104660 .WORD T5 ;IP5 - FILL
15904 073222 104710 .WORD T6 ;IP6 - SRC DATA
15905 073224 104742 .WORD T7 ;IP7 - SRC SURR DATA
15906 073226 104760 .WORD T10 ;IP10 - SRC.SURR.LEN
15907 073230 104774 .WORD T11 ;IP11 - DS1 DATA
15908 073232 105012 .WORD T12 ;IP12 - DST SURR DATA
15909 073234 105030 .WORD T13 ;IP13 - DST.SURR.LEN
15910 073236 105044 .WORD T14 ;IP14 - SEPARATION CONSTANT
15911 073240 000000 .WORD 0 ;IP15 - (TRANSLATION TABLE FOR MOVTC)
15912 073242 103412 .WORD T0 ;IP16 - SPECIAL HANDLING
15913 073244 000000 .WORD 0 ;IP17
15914 073246 000000 .WORD 0 ;IP20
15915 073250 000000 .WORD 0 ;IP21
15916 073252 000000 .WORD 0 ;IP22
15917 073254 000000 .WORD 0 ;IP23
15918 073256 000000 .WORD 0 ;IP24

```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: SOURCE LENGTH - 0,1,300
: DESTINATION LENGTH - 0,1,5
: SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD < DEST. AD
: - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD > DEST. AD
: - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
: - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
: - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
: - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
: - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # = 1.

```

```

: TOTAL # OF TEST CONDITIONS = 48
: TOTAL # OF TESTS = (1 REG. + 1 INLINE)48 = 96
:

```

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 103-2
 CZKEEC.P11 MOV C TABLES

```

15938 ;ENTRY 2 - INST UNDER TEST = MOV C
15939 ;
15940 073260 000001 ;MOV C1: .WORD 1 ;INST=MOV C
15941 073262 000003 ;.WORD 3 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1)
15942 073264 103436 ;.WORD T1A ;IP1 - SRC.LEN
15943 073266 104004 ;.WORD T2AA ;IP2 - SRC.ADR
15944 073270 103436 ;.WORD T1A ;IP3 - DST.LEN
15945 073272 104264 ;.WORD T4A ;IP4 - DST.ADR
15946 073274 104660 ;.WORD T5 ;IP5 - FILL
15947 073276 104732 ;.WORD T6A ;IP6 - SRC DATA
15948 073300 103412 ;.WORD T0 ;IP7 - SRC SURR DATA
15949 073302 103412 ;.WORD T0 ;IP10 - SRC.SURR.LEN
15950 073304 103412 ;.WORD T0 ;IP11 - DST DATA
15951 073306 103412 ;.WORD T0 ;IP12 - DST SURR DATA
15952 073310 103412 ;.WORD T0 ;IP13 - DST.SURR.LEN
15953 073312 105044 ;.WORD T14 ;IP14 - SEPARATION CONSTANT
15954 073314 000000 ;.WORD 0 ;IP15 - (TRANSLATION TABLE FOR MOV C)
15955 073316 103662 ;.WORD TSPA ;IP16 - SPECIAL HANDLING
15956 073320 000000 ;.WORD 0 ;IP17
15957 073322 000000 ;.WORD 0 ;IP20
15958 073324 000000 ;.WORD 0 ;IP21
15959 073326 000000 ;.WORD 0 ;IP22
15960 073330 000000 ;.WORD 0 ;IP23
15961 073332 000000 ;.WORD 0 ;IP24
15962 ;
15963 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
15964 ;
15965 ; SOURCE LENGTH - 0,1,2,3,4,5,11,20
15966 ; DESTINATION LENGTH - 0,1,2,3,4,5,11,20
15967 ; SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
15968 ; DESTINATION ADDRESS - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
15969 ; - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
15970 ; SOURCE DATA - INCREMENTING SEQUENCE; INC-1,START#=0
15971 ;
15972 ;TOTAL # OF TEST CONDITIONS = 256
15973 ;TOTAL # OF TESTS = (1 REG.)256 = 256
15974 ;

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 103-3
MOVC TABLES

```

15976          :ENTRY 3 - INST UNDER TEST = MOVC
15977          :
15978 073334 000001      :IMOV2: .WORD 1          :INST=MOVC
15979 073336 000000      :        .WORD 0          :TYPE = 0
15980 073340 100010      :        .WORD 100010     :IP1 - SRC.LEN
15981 073342 000201      :        .WORD 201        :IP2 - SRC.ADR
15982 073344 000011      :        .WORD 000011     :IP3 - DST.LEN
15983 073346 000224      :        .WORD 224        :IP4 - DST.ADR
15984 073350 000377      :        .WORD 377        :IP5 - FILL
15985 073352 104712      :        .WORD 16+2       :IP6 - SRC DATA
15986 073354 000240      :        .WORD 240        :IP7 - SRC SURR DATA
15987 073356 000000      :        .WORD 0          :IP10 - SRC.SURR.LEN
15988 073360 000252      :        .WORD 252        :IP11 - DST DATA
15989 073362 000360      :        .WORD 360        :IP12 - DST SURR DATA
15990 073364 000000      :        .WORD 0          :IP13 - DST.SURR.LEN
15991 073366 000000      :        .WORD 0          :IP14 - SEPARATION CONSTANT
15992 073370 000000      :        .WORD 0          :IP15
15993 073372 000003      :        .WORD 3          :IP16 - SPECIAL HANDLING
15994 073374 000000      :        .WORD 0          :IP17
15995 073376 000000      :        .WORD 0          :IP20
15996 073400 000000      :        .WORD 0          :IP21
15997 073402 000000      :        .WORD 0          :IP22
15998 073404 000000      :        .WORD 0          :IP23
15999 073406 000000      :        .WORD 0          :IP24
16000
16001          :THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
16002          :
16003          :      SOURCE LENGTH - 100010
16004          :      DESTINATION LENGTH - 11
16005          :      SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
16006          :      DESTINATION ADDRESS - 224 (RELATIVE TO START OF TEST BUFFER)
16007          :      SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # 1.
16008          :
16009          :THIS TEST WAS ADDED TO EXERCISE & TEST THE MOVC V-BIT OPERATION
16010          :TOTAL # OF TESTS = (1 REG. + 1 INLINE)- 2
16011          :

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 104
 CZKEEC.P11 LOCC TABLES

```

16013 .SBTTL          LOCC TABLES
16014 :
16015 :ENTRY 4 - INSTRUCTION UNDER TEST = LOCC
16016 :
16017 :LOCC: .WORD    4          ;INST=LOCC
16018 .WORD    3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
16019 .WORD    TL1C       ;IP1 - SRC.LEN
16020 .WORD    T2        ;IP2 - SRC.ADR
16021 .WORD    T15       ;IP3 - CHAR
16022 .WORD    T6        ;IP4 - SRC DATA
16023 .WORD    T7        ;IP5 - SRC SURR DATA
16024 .WORD    T10       ;IP6 - SRC.SURR.LEN
16025 .WORD    T0        ;IP7 - SPECIAL HANDLING
16026 .WORD    0         ;IP10
16027 .WORD    0         ;IP11
16028 .WORD    0         ;IP12
16029 .WORD    0         ;IP13
16030 .WORD    0         ;IP14
16031 .WORD    0         ;IP15
16032 .WORD    0         ;IP16
16033 .WORD    0         ;IP17
16034 .WORD    0         ;IP20
16035 .WORD    0         ;IP21
16036 .WORD    0         ;IP22
16037 .WORD    0         ;IP23
16038 .WORD    0         ;IP24
16039 :
16040 :THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
16041 :
16042 :      SOURCE LENGTH - 0,1,300
16043 :      SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
16044 :      CHAR - 004,375,240
16045 :      SOURCE DATA - INCREMENTING SEQUENCE;INC=1,START#=1
16046 :
16047 :TOTAL # OF TEST CONDITIONS = 9
16048 :TOTAL # OF TESTS = (1 REG. + 1 INLINE)9 = 18
16049 :

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 104-1
LOCC TABLES

```

16051
16052
16053
16054 073464 000004
16055 073466 000003
16056 073470 103436
16057 073472 104004
16058 073474 105110
16059 073476 104732
16060 073500 103412
16061 073502 103412
16062 073504 103662
16063 073506 000000
16064 073510 000000
16065 073512 000000
16066 073514 000000
16067 073516 000000
16068 073520 000000
16069 073522 000000
16070 073524 000000
16071 073526 000000
16072 073530 000000
16073 073532 000000
16074 073534 000000
16075 073536 000000
16076
16077
16078
16079
16080
16081
16082
16083
16084
16085
16086

```

:ENTRY 5 - INSTRUCTION UNDER TEST = LOCC

```

:LOCC1: .WORD 4          :INST=LOCC
        .WORD 3          :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
        .WORD T1A       :IP1 - SRC.LEN
        .WORD T2AA      :IP2 - SRC.ADR
        .WORD T15A      :IP3 - CHAR
        .WORD T6A       :IP4 - SRC DATA
        .WORD T0        :IP5 - SRC SURR DATA
        .WORD T0        :IP6 - SRC.SURR.LEN
        .WORD TSPA      :IP7 - SPECIAL HANDLING
        .WORD 0         :IP10
        .WORD 0         :IP11
        .WORD 0         :IP12
        .WORD 0         :IP13
        .WORD 0         :IP14
        .WORD 0         :IP15
        .WORD 0         :IP16
        .WORD 0         :IP17
        .WORD 0         :IP20
        .WORD 0         :IP21
        .WORD 0         :IP22
        .WORD 0         :IP23
        .WORD 0         :IP24

```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:   SOURCE LENGTH - 0,1,2,3,4,5,11,20
:   SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
:   CHAR - 004
:   SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # 0
:
:TOTAL # OF TEST CONDITIONS = 16
:TOTAL # OF TESTS = (1 REG.)16 = 16
:

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 104-2
 CZKEEC.P11 LOCC TABLES

```

16088
16089      : ENTRY 6 - INSTRUCTION UNDER TEST = LOCC
16090
16091      : LOCC2: .WORD 4          ; INST=LOCC
16092      :          0          ; TYPE = 0
16093      :          100011     ; IP1 - SRC.LEN
16094      :          201      ; IP2 - SRC.ADR
16095      :          2        ; IP3 - CHAR
16096      :          16*2     ; IP4 - SRC DATA DESCRIPTOR ADR
16097      :          0        ; IP5 - SRC SURR DATA DESCRIPTOR ADR
16098      :          0        ; IP6 - SRC.SURR.LEN
16099      :          3        ; IP7 - SPECIAL HANDLING
16100      :          0        ; IP10
16101      :          0        ; IP11
16102      :          0        ; IP12
16103      :          0        ; IP13
16104      :          0        ; IP14
16105      :          0        ; IP15
16106      :          0        ; IP16
16107      :          0        ; IP17
16108      :          0        ; IP20
16109      :          0        ; IP21
16110      :          0        ; IP22
16111      :          0        ; IP23
16112      :          0        ; IP24
16113
16114      : THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
16115      :
16116      :          SOURCE LENGTH - 100011
16117      :          SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
16118      :          CHAR - 002
16119      :          SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START#-1
16120      :
16121      : THIS TEST WAS ADDED TO EXERCISE & TEST THE LOCC V-BIT OPERATION
16122      : TOTAL # OF TESTS = (1 REG. + 1 INLINE) = 2
16123      :

```

16125
 16126
 16127
 16128
 16129 073614 000010
 16130 073616 000003
 16131 073620 103726
 16132 073622 103766
 16133 073624 103746
 16134 073626 104632
 16135 073630 104672
 16136 073632 106024
 16137 073634 103412
 16138 073636 104760
 16139 073640 106024
 16140 073642 105012
 16141 073644 105030
 16142 073646 105044
 16143 073650 103412
 16144 073652 000000
 16145 073654 000000
 16146 073656 000000
 16147 073660 000000
 16148 073662 000000
 16149 073664 000000
 16150 073666 000000
 16151
 16152
 16153
 16154
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 16156
 16157
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 16161
 16162
 16163
 16164
 16165

```

.SBTTL          CMPC TABLES
:ENTRY 7 - INSTRUCTION UNDER TEST = CMPC
:CMPC: .WORD 10          ;INST = CMPC
        .WORD 3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
        .WORD TL1C       ;IP1 - SRC1.LEN
        .WORD T2         ;IP2 - SRC1.ADR
        .WORD TL2C       ;IP3 - SRC2.LEN
        .WORD T411       ;IP4 - SRC2.ADR
        .WORD T511       ;IP5 - FILL
        .WORD T20        ;IP6 - SRC1.DATA
        .WORD T0         ;IP7 - SRC1.SURR.DATA
        .WORD T10        ;IP10 - SRC1.SURR.LEN
        .WORD T20        ;IP11 - SRC2.DATA
        .WORD T12        ;IP12 - SRC2.SURR.DATA
        .WORD T13        ;IP13 - SRC2.SURR.LEN
        .WORD T14        ;IP14 - SEPARATION CONSTANT
        .WORD T0         ;IP15 - SPECIAL HANDLING
        .WORD 0          ;IP16
        .WORD 0          ;IP17
        .WORD 0          ;IP20
        .WORD 0          ;IP21
        .WORD 0          ;IP22
        .WORD 0          ;IP23
        .WORD 0          ;IP24
    
```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:   SOURCE 1 LENGTH - 0,1,300
:   SOURCE 2 LENGTH - 0,1,5
:   SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:   SOURCE 2 ADDRESS - NO OVERLAP OF SOURCE STRINGS
:   FILL CHAR - 201,377,127
:   SOURCE 1 DATA - ALL STRING CHARS IDENTICAL = 127
:   SOURCE 2 DATA - ALL STRING CHARS IDENTICAL = 127
:
:TOTAL # OF TEST CONDITIONS = 27
:TOTAL # OF TESTS - (1 REG. + 1 INLINE)27 = 54
:
    
```


PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 106
CMPC TABLES

16167
16168
16169
16170 073670 000010
16171 073672 000001
16172 073674 106114
16173 073676 103766
16174 073700 106132
16175 073702 104022
16176 073704 104660
16177 073706 104710
16178 073710 104742
16179 073712 104760
16180 073714 104710
16181 073716 105012
16182 073720 105030
16183 073722 105044
16184 073724 103412
16185 073726 000000
16186 073730 000000
16187 073732 000000
16188 073734 000000
16189 073736 000000
16190 073740 000000
16191 073742 000000
16192
16193
16194
16195
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16198
16199
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16206
16207
16208
16209
16210
16211

:ENTRY 8 - INSTRUCTION UNDER TEST = CMPC

```

:CMPC1: .WORD 10          ;INST = CMPC
        .WORD 1          ;TYPE = 1
        .WORD TL21C     ;IP1 - SRC1.LEN
        .WORD T2        ;IP2 - SRC1.ADR
        .WORD TL22C     ;IP3 - SRC2.LEN
        .WORD T4        ;IP4 - SRC2.ADR
        .WORD T5        ;IP5 - FILL
        .WORD T6        ;IP6 - SRC1.DATA
        .WORD T7        ;IP7 - SRC1.SURR.DATA
        .WORD T10       ;IP10 - SRC1.SURR.LEN
        .WORD T6        ;IP11 - SRC2.DATA
        .WORD T12       ;IP12 - SRC2.SURR.DATA
        .WORD T13       ;IP13 - SRC2.SURR.LEN
        .WORD T14       ;IP14 - SEPARATION CONSTANT
        .WORD T0        ;IP15 - SPECIAL HANDLING
        .WORD 0         ;IP16
        .WORD 0         ;IP17
        .WORD 0         ;IP20
        .WORD 0         ;IP21
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 1,5
: SOURCE 2 LENGTH - 1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD < DEST. ADD
:                   - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD > DEST. AD
:                   - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
:                   - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
:                   - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
:                   - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
:                   - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD

```

FILL CHAR - 377

SOURCE 1 DATA - INCREMENTING SEQUENCE; INC=1, START # =1

SOURCE 2 DATA - INCREMENTING SEQUENCE; INC=1, START # =1

:TOTAL # OF TEST CONDITIONS = 26

:TOTAL # OF TESTS = (1 REG + 1 IN-LINE)26 = 52

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 106-1
 CZKEEC.P11 CMPC TABLES

16213
 16214
 16215
 16216 073744 000010
 16217 073746 000003
 16218 073750 103436
 16219 073752 104004
 16220 073754 103436
 16221 073756 104264
 16222 073760 104660
 16223 073762 104732
 16224 073764 103412
 16225 073766 103412
 16226 073770 104732
 16227 073772 103412
 16228 073774 103412
 16229 073776 105044
 16230 074000 103662
 16231 074002 000000
 16232 074004 000000
 16233 074006 000000
 16234 074010 000000
 16235 074012 000000
 16236 074014 000000
 16237 074016 000000
 16238
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 16240
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 16251
 16252

:ENTRY 9 - INSTRUCTION UNDER TEST = CMPC

```

:CMPC2: .WORD 10          ;INST = CMPC
        .WORD 3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1 1)
        .WORD T1A       ;IP1 - SRC1.LEN
        .WORD T2AA      ;IP2 - SRC1.ADR
        .WORD T1A       ;IP3 - SRC2.LEN
        .WORD T4A       ;IP4 - SRC2.ADR
        .WORD T5        ;IP5 - FILL
        .WORD T6A       ;IP6 - SRC1.DATA
        .WORD T0        ;IP7 - SRC1.SURR.DATA
        .WORD T0        ;IP10 - SRC1.SURR.LEN
        .WORD T6A       ;IP11 - SRC2.DATA
        .WORD T0        ;IP12 - SRC2.SURR.DATA
        .WORD T0        ;IP13 - SRC2.SURR.LEN
        .WORD T14      ;IP14 - SEPARATION CONSTANT
        .WORD TSPA     ;IP15 - SPECIAL HANDLING
        .WORD 0         ;IP16
        .WORD 0         ;IP17
        .WORD 0         ;IP20
        .WORD 0         ;IP21
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24
  
```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 1 ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DEST
:                   - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
:
: FILL CHAR - 006
: SOURCE 1 DATA - INCREMENTING SEQUENCE; INC=1,START # =0
: SOURCE 2 DATA - INCREMENTING SEQUENCE; INC=1,START # =0
:
: TOTAL # OF TEST CONDITIONS = 256
: TOTAL # OF TESTS = (1 REG.)256 = 256
:
  
```

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CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 107
MOVRC TABLES

```

16254 .SBTTL          MOVRC TABLES
16255
16256 .:ENTRY 10 - INSTRUCTION UNDER TEST = MOVRC
16257
16258 MOVRC: .WORD    2          ;INST=MOVRC
16259        .WORD    3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
16260        .WORD   TL1C        ;IP1 - SRC.LEN
16261        .WORD    T2          ;IP2 - SRC.ADR
16262        .WORD   TL2C        ;IP3 - DST.LEN
16263        .WORD    T4          ;IP4 - DST.ADR
16264        .WORD    T5          ;IP5 - FILL
16265        .WORD    T6          ;IP6 - SRC DATA
16266        .WORD    T7          ;IP7 - SRC SURR DATA
16267        .WORD   T10         ;IP10 - SRC.SURR.LEN
16268        .WORD   T11         ;IP11 - DST DATA
16269        .WORD   T12         ;IP12 - DST SURR DATA
16270        .WORD   T13         ;IP13 - DST.SURR.LEN
16271        .WORD   T14         ;IP14 - SEPARATION CONSTANT
16272        .WORD    0          ;IP15
16273        .WORD    T0          ;IP16 - SPECIAL HANDLING
16274        .WORD    0          ;IP17
16275        .WORD    0          ;IP20
16276        .WORD    0          ;IP21
16277        .WORD    0          ;IP22
16278        .WORD    0          ;IP23
16279        .WORD    0          ;IP24

```

```

16280
16281 .:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
16282
16283 .:
16284 .:   SOURCE LENGTH - 0,1,300
16285 .:   DESTINATION LENGTH - 0,1,5
16286 .:   SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
16287 .:   DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD < DEST. AD
16288 .:   - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD > DEST. AD
16289 .:   - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
16290 .:   - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
16291 .:   - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
16292 .:   - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
16293 .:   - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD
16294 .:   SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # = 1.
16295
16296 .:TOTAL # OF TEST CONDITIONS = 48
16297 .:TOTAL # OF TESTS = (1 REG. + 1 INLINE) 48 = 96

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 107-1
MOVRC TABLES

16299
16300
16301
16302 074074 000002
16303 074076 000001
16304 074100 103436
16305 074102 104004
16306 074104 103436
16307 074106 104264
16308 074110 104660
16309 074112 104732
16310 074114 103412
16311 074116 103412
16312 074120 103412
16313 074122 103412
16314 074124 103412
16315 074126 105044
16316 074130 000000
16317 074132 103662
16318 074134 000000
16319 074136 000000
16320 074140 000000
16321 074142 000000
16322 074144 000000
16323 074146 000000
16324
16325
16326
16327
16328
16329
16330
16331
16332
16333
16334
16335
16336

: ENTRY 11 - INSTRUCTION UNDER TEST = MOVRC

```

:IMOVRC: .WORD 2          ;INST=MOVRC
          .WORD 1          ;TYPE = 1
          .WORD T1A        ;IP1 - SRC.LEN
          .WORD T2AA       ;IP2 - SRC.ADR
          .WORD T1A        ;IP3 - DST.LEN
          .WORD T4A        ;IP4 - DST.ADR
          .WORD T5         ;IP5 - FILL
          .WORD T6A        ;IP6 - SRC DATA
          .WORD T0         ;IP7 - SRC SURR DATA
          .WORD T0         ;IP10 - SRC.SURR.LEN
          .WORD T0         ;IP11 - DST DATA
          .WORD T0         ;IP12 - DST SURR DATA
          .WORD T0         ;IP13 - DST.SURR.LEN
          .WORD T14        ;IP14 - SEPARATION CONSTANT
          .WORD 0          ;IP15
          .WORD TSPA       ;IP16 - SPECIAL HANDLING
          .WORD 0          ;IP17
          .WORD 0          ;IP20
          .WORD 0          ;IP21
          .WORD 0          ;IP22
          .WORD 0          ;IP23
          .WORD 0          ;IP24
    
```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: SOURCE LENGTH - 0,1,2,3,4,5,11,20
: DESTINATION LENGTH - 0,1,2,3,4,5,11,20
: SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
: DESTINATION ADDRESS - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD<DEST
:                       - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD>DEST
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START#=0
    
```

```

: TOTAL # OF TEST CONDITIONS = 256
: TOTAL # OF TESTS = (1 REG.)256 = 256
    
```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 107-2
 CZKEEC.P11 MOVRC TABLES

```

16338
16339
16340
16341 074150 000002
16342 074152 000000
16343 074154 100100
16344 074156 100000
16345 074160 000111
16346 074162 000100
16347 074164 000376
16348 074166 104712
16349 074170 000240
16350 074172 000000
16351 074174 000255
16352 074176 000366
16353 074200 000000
16354 074202 000000
16355 074204 000000
16356 074206 000037
16357 074210 000000
16358 074212 000000
16359 074214 000000
16360 074216 000000
16361 074220 000000
16362 074222 000000
16363
16364
16365
16366
16367
16368
16369
16370
16371
16372
16373
16374

```

```

:ENTRY 12 - INSTRUCTION UNDER TEST = MOVRC
:MOVRC: .WORD 2 ;INST=MOVRC
: .WORD 0 ;TYPE = 0
: .WORD 100100 ;IP1 - SRC.LEN
: .WORD 100000 ;IP2 - SRC.ADR
: .WORD 000111 ;IP3 - DST.LEN
: .WORD 100 ;IP4 - DST.ADR
: .WORD 376 ;IP5 - FILL
: .WORD 16+2 ;IP6 - SRC DATA
: .WORD 240 ;IP7 - SRC SURR DATA
: .WORD 0 ;IP10 - SRC.SURR.LEN
: .WORD 255 ;IP11 - DST DATA
: .WORD 366 ;IP12 - DST SURR DATA
: .WORD 0 ;IP13 - DST.SURR.LEN
: .WORD 0 ;IP14 - SEPARATION CONSTANT
: .WORD 0 ;IP15
: .WORD 37 ;IP16 - SPECIAL HANDLING
: .WORD 0 ;IP17
: .WORD 0 ;IP20
: .WORD 0 ;IP21
: .WORD 0 ;IP22
: .WORD 0 ;IP23
: .WORD 0 ;IP24

```

```

:THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
:
: SOURCE LENGTH - 100100
: DESTINATION LENGTH - 111
: SOURCE ADDRESS - 100000 (RELATIVE TO START OF TEST BUFFER)
: DESTINATION ADDRESS - 100 (RELATIVE TO START OF TEST BUFFER)
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START # 1.
:THIS TEST WAS ADDED TO EXERCISE & TEST THE MOVRC V-BIT OPERATION
:TOTAL # OF TESTS = (1 REG. + 1 INLINE)= 2
:

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 108
 CZKEEC.P11 MOVTC TABLES

```

16376
16377
16378
16379 074224 000003
16380 074226 000001
16381 074230 103726
16382 074232 103766
16383 074234 103746
16384 074236 104022
16385 074240 104660
16386 074242 104710
16387 074244 104742
16388 074246 104760
16389 074250 104774
16390 074252 105012
16391 074254 105030
16392 074256 105044
16393 074260 106210
16394 074262 103412
16395 074264 000000
16396 074266 000000
16397 074270 000000
16398 074272 000000
16399 074274 000000
16400 074276 000000

```

```

:SBTTL          MOVTC TABLES
:ENTRY 13 - INSTRUCTION UNDER TEST = MOVTC

```

```

:IMOVT: .WORD 3          :INST=MOVTC
        .WORD 1          :TYPE = 1
        .WORD TL1C       :IP1 - SRC.LEN
        .WORD T2         :IP2 - SRC.ADR
        .WORD TL2C       :IP3 - DST.LEN
        .WORD T4         :IP4 - DST.ADR
        .WORD T5         :IP5 - FILL
        .WORD T6         :IP6 - SRC DATA
        .WORD T7         :IP7 - SRC SURR DATA
        .WORD T10        :IP10 - SRC.SURR.LEN
        .WORD T11        :IP11 - DST DATA
        .WORD T12        :IP12 - DST SURR DATA
        .WORD T13        :IP13 - DST.SURR.LEN
        .WORD T14        :IP14 - SEPARATION CONSTANT
        .WORD T24        :IP15 - TRANSLATION TABLE
        .WORD T0         :IP16 - SPECIAL HANDLING
        .WORD 0          :IP17
        .WORD 0          :IP20
        .WORD 0          :IP21
        .WORD 0          :IP22
        .WORD 0          :IP23
        .WORD 0          :IP24

```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

```

:
: SOURCE LENGTH - 0,1,300
: DESTINATION LENGTH - 0,1,5
: SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD < DEST. AD
:                       - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD > DEST. AD
:                       - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
:                       - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
:                       - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
:                       - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
:                       - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD
:
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # = 1.
: TRANSLATION TABLE DATA = 1 IN LOC 0, 2 IN LOC 1, ETC

```

```

: TOTAL # OF TEST CONDITIONS = 48
: TOTAL # OF TESTS = (1 REG. + 1 INLINE) 48 = 96

```

```

16401
16402
16403
16404
16405
16406
16407
16408
16409
16410
16411
16412
16413
16414
16415
16416
16417
16418
16419

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 108-1
 CZKEEC.P11 MOVTC TABLES

```

16421 ;ENTRY 14 - INSTRUCTION UNDER TEST = MOVTC
16422 ;
16423 074300 000003 ;IMOV1: .WORD 3 ;INST=MOVTC
16424 074302 000003 ;.WORD 3 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
16425 074304 103436 ;.WORD T1A ;IP1 - SRC.LEN
16426 074306 104004 ;.WORD T2AA ;IP2 - SRC.ADR
16427 074310 103436 ;.WORD T1A ;IP3 - DST.LEN
16428 074312 104264 ;.WORD T4A ;IP4 - DST.ADR
16429 074314 104660 ;.WORD T5 ;IP5 - FILL
16430 074316 104732 ;.WORD T6A ;IP6 - SRC DATA
16431 074320 103412 ;.WORD T0 ;IP7 - SRC SURR DATA
16432 074322 103412 ;.WORD T0 ;IP10 - SRC.SURR.LEN
16433 074324 103412 ;.WORD T0 ;IP11 - DST DATA
16434 074326 103412 ;.WORD T0 ;IP12 - DST SURR DATA
16435 074330 103412 ;.WORD T0 ;IP13 - DST.SURR.LEN
16436 074332 105044 ;.WORD T14 ;IP14 - SEPARATION CONSTANT
16437 074334 106210 ;.WORD T24 ;IP15 - TRANSLATION TABLE
16438 074336 103662 ;.WORD TSPA ;IP16 - SPECIAL HANDLING
16439 074340 000000 ;.WORD 0 ;IP17
16440 074342 000000 ;.WORD 0 ;IP20
16441 074344 000000 ;.WORD 0 ;IP21
16442 074346 000000 ;.WORD 0 ;IP22
16443 074350 000000 ;.WORD 0 ;IP23
16444 074352 000000 ;.WORD 0 ;IP24
16445
16446 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
16447 ;
16448 ; SOURCE LENGTH - 0,1,2,3,4,5,11,20
16449 ; DESTINATION LENGTH - 0,1,2,3,4,5,11,20
16450 ; SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
16451 ; DESTINATION ADDRESS - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD<DEST
16452 ; - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD>DEST
16453 ; SOURCE DATA - INCREMENTING SEQUENCE; INC=1,START#=0
16454 ; TRANSLATION TABLE DATA = 1 IN LOC 0, 2 IN LOC 1, ETC
16455 ;
16456 ;TOTAL # OF TEST CONDITIONS = 256
16457 ;TOTAL # OF TESTS = (1 REG.)256 = 256
16458 ;
16459 ;

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 108-2
 CZKEEC.P11 MOVTC TABLES

```

16461                                     :ENTRY 15 - INSTRUCTION UNDER TEST = MOVTC
16462                                     :
16463 074354 000003                       :MOVTC: .WORD 3                               ;INST=MOVTC
16464 074356 000000                       .WORD 0                               ;TYPE = 0
16465 074360 100010                       .WORD 100010                          ;IP1 - SRC.LEN
16466 074362 000201                       .WORD 201                              ;IP2 - SRC.ADR
16467 074364 000011                       .WORD 000011                          ;IP3 - DST.LEN
16468 074366 000225                       .WORD 225                              ;IP4 - DST.ADR
16469 074370 000375                       .WORD 375                              ;IP5 - FILL
16470 074372 104712                       .WORD 16+2                             ;IP6 - SRC DATA
16471 074374 000240                       .WORD 240                              ;IP7 - SRC SURR DATA
16472 074376 000000                       .WORD 0                                ;IP10 - SRC.SURR.LEN
16473 074400 000254                       .WORD 254                              ;IP11 - DST DATA
16474 074402 000355                       .WORD 355                              ;IP12 - DST SURR DATA
16475 074404 000000                       .WORD 0                                ;IP13 - DST.SURR.LEN
16476 074406 000000                       .WORD 0                                ;IP14 - SEPARATION CONSTANT
16477 074410 001734                       .WORD IXLTB1                           ;IP15 - TRANSLATION TABLE
16478 074412 000003                       .WORD 3                                ;IP16 - SPECIAL HANDLING
16479 074414 000000                       .WORD 0                                ;IP17
16480 074416 000000                       .WORD 0                                ;IP20
16481 074420 000000                       .WORD 0                                ;IP21
16482 074422 000000                       .WORD 0                                ;IP22
16483 074424 000000                       .WORD 0                                ;IP23
16484 074426 000000                       .WORD 0                                ;IP24
16485
16486                                     :THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
16487                                     :
16488                                     :   SOURCE LENGTH - 100010
16489                                     :   DESTINATION LENGTH - 11
16490                                     :   SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
16491                                     :   DESTINATION ADDRESS - 225 (RELATIVE TO START OF TEST BUFFER)
16492                                     :   SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # - 1.
16493                                     :   TRANSLATION TABLE DATA = 1 IN LOC 0, 2 IN LOC 1, ETC
16494
16495                                     :THIS TEST WAS ADDED TO EXERCISE 8 TEST THE MOVTC V-BIT OPERATION
16496                                     :TOTAL # OF TESTS = (1 REG. + 1 INLINE)= 2
16497                                     :

```


16499
 16500
 16501
 16502 074430 000005
 16503 074432 000001
 16504 074434 103726
 16505 074436 103766
 16506 074440 106224
 16507 074442 106250
 16508 074444 104742
 16509 074446 104760
 16510 074450 103412
 16511 074452 000000
 16512 074454 000000
 16513 074456 000000
 16514 074460 000000
 16515 074462 000000
 16516 074464 000000
 16517 074466 000000
 16518 074470 000000
 16519 074472 000000
 16520 074474 000000
 16521 074476 000000
 16522 074500 000000
 16523 074502 000000
 16524
 16525
 16526
 16527
 16528
 16529
 16530
 16531
 16532
 16533
 16534

```

.SBTTL          SKPC TABLES
:ENTRY 16 - INSTRUCTION UNDER TEST = SKPC
:SKPC: .WORD    5          :INST=SKPC
        .WORD    1          :TYPE = 1
        .WORD   TL1C       :IP1 - SRC.LEN
        .WORD    T2        :IP2 - SRC.ADR
        .WORD    T25       :IP3 - CHAR
        .WORD    T26       :IP4 - SRC DATA
        .WORD    T7        :IP5 - SRC SURR DATA
        .WORD    T10       :IP6 - SRC.SURR.LEN
        .WORD    T0        :IP7 - SPECIAL HANDLING
        .WORD    0          :IP10
        .WORD    0          :IP11
        .WORD    0          :IP12
        .WORD    0          :IP13
        .WORD    0          :IP14
        .WORD    0          :IP15
        .WORD    0          :IP16
        .WORD    0          :IP17
        .WORD    0          :IP20
        .WORD    0          :IP21
        .WORD    0          :IP22
        .WORD    0          :IP23
        .WORD    0          :IP24

```

```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
: SOURCE LENGTH - 0,1,300
: SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE DATA - CHARACTERS FROM STRING = 001,001,007
: CHAR - 001,240
: TOTAL # OF TEST CONDITIONS = 6
: TOTAL # OF TESTS (1 REG + 1 INLINE)6 = 12

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 109-1
SKPC TABLES

16536
16537
16538 074504 000005
16539 074506 000001
16540 074510 103436
16541 074512 104004
16542 074514 106242
16543 074516 104732
16544 074520 103412
16545 074522 103412
16546 074524 103662
16547 074526 000000
16548 074530 000000
16549 074532 000000
16550 074534 000000
16551 074536 000000
16552 074540 000000
16553 074542 000000
16554 074544 000000
16555 074546 000000
16556 074550 000000
16557 074552 000000
16558 074554 000000
16559 074556 000000
16560
16561
16562
16563
16564
16565
16566
16567
16568
16569

:ENTRY 17 - INSTRUCTION UNDER TEST = SKPC

```

:SKPC1: .WORD 5           :INST=SKPC
        .WORD 1           :TYPE = 1
        .WORD T1A        :IP1 - SRC.LEN
        .WORD T2AA       :IP2 - SRC.ADR
        .WORD T25A       :IP3 - CHAR
        .WORD T6A        :IP4 - SRC DATA
        .WORD T0         :IP5 - SRC SURR DATA
        .WORD T0         :IP6 - SRC.SURR.LEN
        .WORD TSPA      :IP7 - SPECIAL HANDLING
        .WORD 0          :IP10
        .WORD 0          :IP11
        .WORD 0          :IP12
        .WORD 0          :IP13
        .WORD 0          :IP14
        .WORD 0          :IP15
        .WORD 0          :IP16
        .WORD 0          :IP17
        .WORD 0          :IP20
        .WORD 0          :IP21
        .WORD 0          :IP22
        .WORD 0          :IP23
        .WORD 0          :IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE LENGTH - 0,1,2,3,4,5,11,20
: SOURCE ADDRESS - 200,201
: CHAR - 007
: SOURCE DATA - INCREMENTING SEQUENCE; INC 1, START # 0
:

```

```

: TOTAL # OF TEST CONDITIONS = 16
: TOTAL # OF TESTS = (1 REG.)16 = 16
:

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 109-2
 CZKFECC.P11 SKPC TABLES

```

16571
16572
16573
16574 074560 000005
16575 074562 000000
16576 074564 100111
16577 074566 000203
16578 074570 000003
16579 074572 104712
16580 074574 000000
16581 074576 000000
16582 074600 000003
16583 074602 000000
16584 074604 000000
16585 074606 000000
16586 074610 000000
16587 074612 000000
16588 074614 000000
16589 074616 000000
16590 074620 000000
16591 074622 000000
16592 074624 000000
16593 074626 000000
16594 074630 000000
16595 074632 000000
16596
16597
16598
16599
16600
16601
16602
16603
16604
16605
16606

```

```

:
: ENTRY 18 - INSTRUCTION UNDER TEST = SKPC
:
: SKPC2: .WORD 5 ; INST=SKPC
: .WORD 0 ; TYPE = 0
: .WORD 100111 ; IP1 - SRC.LEN
: .WORD 203 ; IP2 - SRC.ADR
: .WORD 3 ; IP3 - CHAR
: .WORD T6+2 ; IP4 - SRC DATA
: .WORD 0 ; IP5 - SRC SURR DATA
: .WORD 0 ; IP6 - SRC.SURR.LEN
: .WORD 3 ; IP7 - SPECIAL HANDLING
: .WORD 0 ; IP10
: .WORD 0 ; IP11
: .WORD 0 ; IP12
: .WORD 0 ; IP13
: .WORD 0 ; IP14
: .WORD 0 ; IP15
: .WORD 0 ; IP16
: .WORD 0 ; IP17
: .WORD 0 ; IP20
: .WORD 0 ; IP21
: .WORD 0 ; IP22
: .WORD 0 ; IP23
: .WORD 0 ; IP24
:
: THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:
:
: SOURCE LENGTH - 100111
: SOURCE ADDRESS - 203
: CHAR - 003
: SOURCE DATA - INCREMENTING SEQUENCE; INC-1, START # 1.
:
: THIS TEST WAS ADDED TO EXERCISE & TEST THE SKPC V-BIT OPERATION.
: TOTAL # OF TESTS = (1 REG. + 1 INLINE) - 2
:

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 110
CZKEEC.P11 MATCHC TABLES

16608
16609
16610
16611
16612 074634 000011
16613 074636 000003
16614 074640 103726
16615 074642 103766
16616 074644 103746
16617 074646 104342
16618 074650 104660
16619 074652 106024
16620 074654 103412
16621 074656 104760
16622 074660 106024
16623 074662 105012
16624 074664 105030
16625 074666 105044
16626 074670 103412
16627 074672 000000
16628 074674 000000
16629 074676 000000
16630 074700 000000
16631 074702 000000
16632 074704 000000
16633 074706 000000
16634
16635
16636
16637
16638
16639
16640
16641
16642
16643
16644
16645
16646
16647
16648
16649
16650
16651
16652

```
.SBTTL          MATCHC TABLES
:ENTRY 19 - INSTRUCTION UNDER TEST = MATCHC
:IMATC: .WORD 11          ;INST = MATCHC
        .WORD 3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
        .WORD TL1C       ;IP1 - OBJ.LEN
        .WORD T2         ;IP2 - OBJ.ADR
        .WORD TL2C       ;IP3 - SRC.LEN
        .WORD T4I        ;IP4 - SRC.ADR
        .WORD T5         ;IP5 - UNUSED PORTION OF REGISTER 4
        .WORD T20        ;IP6 - OBJ.DATA
        .WORD T0         ;IP7 - OBJ.SURR.DATA
        .WORD T10        ;IP10 - OBJ.SURR.LEN
        .WORD T20        ;IP11 - SRC.DATA
        .WORD T12        ;IP12 - SRC.SURR.DATA
        .WORD T13        ;IP13 - SRC.SURR.LEN
        .WORD T14        ;IP14 - SEPARATION CONSTANT
        .WORD T0         ;IP15 - SPECIAL HANDLING
        .WORD 0          ;IP16
        .WORD 0          ;IP17
        .WORD 0          ;IP20
        .WORD 0          ;IP21
        .WORD 0          ;IP22
        .WORD 0          ;IP23
        .WORD 0          ;IP24
```

```
:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:OBJECT LENGTH - 0,1,300
:SOURCE LENGTH - 0,1,5
:OBJECT ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:SOURCE ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD < DEST. ADD
:                  - NO OVERLAP OF SOURCE & DEST. STRINGS;SOURCE ADD > DEST. AD
:                  - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
:                  - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
:                  - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
:                  - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
:                  - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD
:
:OBJECT DATA - ALL STRING CHARACTERS IDENTICAL = 127
:SOURCE DATA - ALL STRING CHARACTERS IDENTICAL = 127
:
:TOTAL # OF TEST CONDITIONS =
:TOTAL # OF TESTS =
```

16654
 16655
 16656
 16657
 16658 074710 000011
 16659 074712 000003
 16660 074714 103436
 16661 074716 104004
 16662 074720 103436
 16663 074722 104342
 16664 074724 103412
 16665 074726 104732
 16666 074730 103412
 16667 074732 103412
 16668 074734 104710
 16669 074736 103412
 16670 074740 103412
 16671 074742 105044
 16672 074744 103662
 16673 074746 000000
 16674 074750 000000
 16675 074752 000000
 16676 074754 000000
 16677 074756 000000
 16678 074760 000000
 16679 074762 000000
 16680
 16681
 16682
 16683
 16684
 16685
 16686
 16687
 16688
 16689
 16690
 16691
 16692
 16693
 16694
 16695
 16696
 16697
 16698

: ENTRY 21 - INSTRUCTION UNDER TEST = MATCHC

```

:IMATC1: .WORD 11          ;INST = MATCHC
          .WORD 3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
          .WORD T1A       ;IP1 - OBJ.LEN
          .WORD T2AA      ;IP2 - OBJ.ADR
          .WORD T1A       ;IP3 - SRC.LEN
          .WORD T4I       ;IP4 - SRC.ADR
          .WORD T0        ;IP5 - 0
          .WORD T6A       ;IP6 - OBJ.DATA
          .WORD T0        ;IP7 - OBJ.SURR.DATA
          .WORD T0        ;IP10 - OBJ.SURR.LEN
          .WORD T6        ;IP11 - SRC.DATA
          .WORD T0        ;IP12 - SRC.SURR.DATA
          .WORD T0        ;IP13 - SRC.SURR.LEN
          .WORD T14       ;IP14 - SEPARATION CONSTANT
          .WORD TSPA      ;IP15 - SPECIAL HANDLING
          .WORD 0         ;IP16
          .WORD 0         ;IP17
          .WORD 0         ;IP20
          .WORD 0         ;IP21
          .WORD 0         ;IP22
          .WORD 0         ;IP23
          .WORD 0         ;IP24

```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: OBJECT LENGTH - 0,1,2,3,4,5,11,20
: SOURCE LENGTH - 0,1,2,3,4,5,11,20
: OBJECT ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
: SOURCE ADDRESS - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD < DEST. ADD
:                   - NO OVERLAP OF SOURCE & DEST. STRINGS; SOURCE ADD > DEST. AD
:                   - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD < DEST ADD
:                   - SOURCE & DEST. STRINGS ADJACENT; SOURCE ADD > DEST ADD
:                   - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD < DE
:                   - SOURCE STRING PARTIALLY OVERLAPS DEST STRING; SRC ADD > DE
:                   - COMPLETE OVERLAP OF SOURCE AND DEST STRINGS; SOURCE ADD
: OBJECT DATA - INCREMENTING SEQUENCE; INC=1, START # = 0
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1; START # = 1

```

```

: TOTAL # OF TEST CONDITIONS = 896
: TOTAL # OF TESTS = (1 REG.)896 = 896

```

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 CZKEEC.P11 MATCHC TABLES

16700
 16701
 16702
 16703 074764 000011
 16704 074766 000000
 16705 074770 000020
 16706 074772 000100
 16707 074774 100020
 16708 074776 000201
 16709 075000 000000
 16710 075002 104712
 16711 075004 000000
 16712 075006 000000
 16713 075010 104712
 16714 075012 000000
 16715 075014 000000
 16716 075016 000000
 16717 075020 000003
 16718 075022 000000
 16719 075024 000000
 16720 075026 000000
 16721 075030 000000
 16722 075032 000000
 16723 075034 000000
 16724 075036 000000
 16725
 16726
 16727
 16728
 16729
 16730
 16731
 16732
 16733
 16734
 16735
 16736
 16737

ENTRY 22 - INSTRUCTION UNDER TEST = MATCHC

```

:IMATC2: .WORD 11          :INST = MATCHC
          .WORD 0          :TYPE = 0
          .WORD 20         :IP1 - OBJ.LEN
          .WORD 100        :IP2 - OBJ.ADR
          .WORD 100020     :IP3 - SRC.LEN
          .WORD 201        :IP4 - SRC.ADR
          .WORD 0          :IP5 - 0
          .WORD T6+2       :IP6 - OBJ.DATA
          .WORD 0          :IP7 - OBJ.SURR.DATA
          .WORD 0          :IP10 - OBJ.SURR.LEN
          .WORD T6+2       :IP11 - SRC.DATA
          .WORD 0          :IP12 - SRC.SURR.DATA
          .WORD 0          :IP13 - SRC.SURR.LEN
          .WORD 0          :IP14 - SEPARATION CONSTANT
          .WORD 3          :IP15 - SPECIAL HANDLING
          .WORD 0          :IP16
          .WORD 0          :IP17
          .WORD 0          :IP20
          .WORD 0          :IP21
          .WORD 0          :IP22
          .WORD 0          :IP23
          .WORD 0          :IP24
    
```

: THIS TABLE EXERCISE THE FOLLOWING TEST CONDITION:

```

: OBJECT LENGTH - 20
: SOURCE LENGTH - 100020
: OBJECT ADDRESS - 100 (RELATIVE TO START OF TEST BUFFER)
: SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
: OBJECT DATA - INCREMENTING SEQUENCE; INC=1, START # - 1
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # = 1
    
```

: THIS TEST WAS ADDED TO EXERCISE & TEST THE MATCHC N-BIT OPERATION.
 : TOTAL # OF TESTS = (1 REG. + 1 INLINE) = 2

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CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 112
SCANC TABLES

16739
16740
16741
16742
16743
16744 075040 000006
16745 075042 000003
16746 075044 103726
16747 075046 103766
16748 075050 106266
16749 075052 106302
16750 075054 106356
16751 075056 104710
16752 075060 105012
16753 075062 105030
16754 075064 106416
16755 075066 104742
16756 075070 104760
16757 075072 105044
16758 075074 103412
16759 075076 000000
16760 075100 000000
16761 075102 000000
16762 075104 000000
16763 075106 000000
16764 075110 000000
16765 075112 000000
16766
16767
16768
16769
16770
16771
16772
16773
16774
16775
16776
16777
16778
16779
16780
16781
16782

.SBTTL SCANC TABLES

: ENTRY 23 - INSTRUCTION UNDER TEST = SCANC

```

:ISCAN: .WORD 6          ;INST - SCANC
        .WORD 3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
        .WORD TL1C      ;IP1 - SRC.LEN
        .WORD T2        ;IP2 - SRC.ADR
        .WORD T27       ;IP3 - TABLE LEN (256 BYTES)
        .WORD T30       ;IP4 - MASK
        .WORD T31       ;IP5 - TABLE ADR
        .WORD T6        ;IP6 - SRC.DATA
        .WORD T12       ;IP7 - SRC.SURR DATA
        .WORD T13       ;IP10 - SRC.SURR.LEN
        .WORD T32       ;IP11 - TABLE DATA
        .WORD T7        ;IP12 - TABLE SURR DATA
        .WORD T10       ;IP13 - TABLE SURR LEN
        .WORD T14       ;IP14 - SEPARATION CONSTANT
        .WORD T0        ;IP15 - SPECIAL HANDLING
        .WORD 0         ;IP16
        .WORD 0         ;IP17
        .WORD 0         ;IP20
        .WORD 0         ;IP21
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24

```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: SOURCE LENGTH - 0,1,300
: SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: MASK - 0,1,377
: TABLE ADDRESS - NO OVERLAP WITH SOURCE STRING
:                   - OVERLAP - TABLE ADDRESS=SOURCE ADDRESS
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # =1
: TABLE DATA - ALL BYTES IDENTICAL = 0
:                   - ALL BYTES IDENTICAL = 377
:                   - INCREMENTING SEQUENCE; INC=1, START # =1

```

```

: TOTAL # OF TEST CONDITIONS = 54
: TOTAL # OF TESTS = (1 REG. + 1 INLINE)54=108

```

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 CZKEEC.P11 SCANC TABLES

```

16784
16785      ;ENTRY 24 - INSTRUCTION UNDER TEST = SCANC
16786
16787 075114 000006      ;SCANC1: .WORD 6          ;INST = SCANC
16788 075116 000003      ;          .WORD 3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
16789 075120 103436      ;          .WORD T1A        ;IP1 - SRC.LEN
16790 075122 104004      ;          .WORD T2AA        ;IP2 - SRC.ADR
16791 075124 106266      ;          .WORD T27         ;IP3 - TABLE LEN (256 BYTES)
16792 075126 106322      ;          .WORD T30A        ;IP4 - MASK
16793 075130 106330      ;          .WORD T31A        ;IP5 - TABLE ADR
16794 075132 104732      ;          .WORD T6A         ;IP6 - SRC.DATA
16795 075134 103412      ;          .WORD T0          ;IP7 - SRC.SURR DATA
16796 075136 103412      ;          .WORD T0          ;IP10 - SRC.SURR.LEN
16797 075140 104732      ;          .WORD T6A         ;IP11 - TABLE DATA
16798 075142 103412      ;          .WORD T0          ;IP12 - TABLE SURR DATA
16799 075144 103412      ;          .WORD T0          ;IP13 - TABLE SURR LEN
16800 075146 105044      ;          .WORD T14         ;IP14 - SEPARATION CONSTANT
16801 075150 103662      ;          .WORD TSPA        ;IP15 - SPECIAL HANDLING
16802 075152 000000      ;          .WORD 0           ;IP16
16803 075154 000000      ;          .WORD 0           ;IP17
16804 075156 000000      ;          .WORD 0           ;IP20
16805 075160 000000      ;          .WORD 0           ;IP21
16806 075162 000000      ;          .WORD 0           ;IP22
16807 075164 000000      ;          .WORD 0           ;IP23
16808 075166 000000      ;          .WORD 0           ;IP24
16809
16810      ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
16811      ; SOURCE LENGTH - 0,1,2,3,4,5,11,20
16812      ; SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
16813      ; MASK - 252
16814      ; TABLE ADDRESS - NO OVERLAP WITH SOURCE STRING
16815      ; SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START #-0
16816      ; TABLE DATA - INCREMENTING SEQUENCE; INC=1, START # 0
16817
16818      ;TOTAL # OF TEST CONDITIONS = 16
16819      ;TOTAL # OF TESTS = (1 REG.) = 16
16820

```


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 CZKEEC.P11 SCANC TABLES

16822
 16823
 16824
 16825 075170 000006
 16826 075172 000000
 16827 075174 100040
 16828 075176 000110
 16829 075200 000256
 16830 075202 000377
 16831 075204 000200
 16832 075206 104712
 16833 075210 000000
 16834 075212 000000
 16835 075214 106424
 16836 075216 000000
 16837 075220 000000
 16838 075222 000000
 16839 075224 000003
 16840 075226 000000
 16841 075230 000000
 16842 075232 000000
 16843 075234 000000
 16844 075236 000000
 16845 075240 000000
 16846 075242 000000
 16847
 16848
 16849
 16850
 16851
 16852
 16853
 16854
 16855
 16856
 16857
 16858
 16859

: ENTRY 25 - INSTRUCTION UNDER TEST = SCANC

```

:SCAN2: .WORD 6           ;INST = SCANC
        .WORD 0           ;TYPE = 0
        .WORD 100040      ;IP1 - SRC.LEN
        .WORD 110         ;IP2 - SRC.ADR
        .WORD 256         ;IP3 - TABLE LEN (256 BYTES)
        .WORD 377         ;IP4 - MASK
        .WORD 200         ;IP5 - TABLE ADR
        .WORD T6+2        ;IP6 - SRC.DATA
        .WORD 0           ;IP7 - SRC.SURR DATA
        .WORD 0           ;IP10 - SRC.SURR.LEN
        .WORD T32+6       ;IP11 - TABLE DATA
        .WORD 0           ;IP12 - TABLE SURR DATA
        .WORD 0           ;IP13 - TABLE SURR LEN
        .WORD 0           ;IP14 - SEPARATION CONSTANT
        .WORD 3           ;IP15 - SPECIAL HANDLING
        .WORD 0           ;IP16
        .WORD 0           ;IP17
        .WORD 0           ;IP20
        .WORD 0           ;IP21
        .WORD 0           ;IP22
        .WORD 0           ;IP23
        .WORD 0           ;IP24
    
```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: SOURCE LENGTH - 100040
: SOURCE ADDRESS - 10
: MARK - 377
: TABLE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1,STAR?#=1
: TABLE DATA - ALL BYTES IDENTICAL = 377
    
```

: THIS TEST WAS ADDED TO EXERCISE & TEST THE SCANC N-BIT OPERATION.
 : TOTAL # OF TESTS = (1 REG. + 1 INLINE)=2

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CZKEEC.P11 SPANC TABLES

16861
16862
16863
16864
16865
16866 075244 000007
16867 075246 000001
16868 075250 103726
16869 075252 103766
16870 075254 106266
16871 075256 106302
16872 075260 106356
16873 075262 104710
16874 075264 105012
16875 075266 105030
16876 075270 106416
16877 075272 104742
16878 075274 104760
16879 075276 105044
16880 075300 103412
16881 075302 000000
16882 075304 000000
16883 075306 000000
16884 075310 000000
16885 075312 000000
16886 075314 000000
16887 075316 000000
16888
16889
16890
16891
16892
16893
16894
16895
16896
16897
16898
16899
16900
16901
16902
16903
16904

.SBTTL SPANC TABLES

:
: ENTRY 26 - INSTRUCTION UNDER TEST = SPANC
:

: SPAN: .WORD 7 ; INST = SPANC
: .WORD 1 ; TYPE = 1
: .WORD TL1C ; IP1 - SRC.LEN
: .WORD T2 ; IP2 - SRC.ADR
: .WORD T27 ; IP3 - TABLE LEN (256 BYTES)
: .WORD T30 ; IP4 - MASK
: .WORD T31 ; IP5 - TABLE ADR
: .WORD T6 ; IP6 - SRC.DATA
: .WORD T12 ; IP7 - SRC.SURR DATA
: .WORD T13 ; IP10 - SRC.SURR.LEN
: .WORD T32 ; IP11 - TABLE DATA
: .WORD T7 ; IP12 - TABLE SURR DATA
: .WORD T10 ; IP13 - TABLE SURR LEN
: .WORD T14 ; IP14 - SEPARATION CONSTANT
: .WORD T0 ; IP15 - SPECIAL HANDLING
: .WORD 0 ; IP16
: .WORD 0 ; IP17
: .WORD 0 ; IP20
: .WORD 0 ; IP21
: .WORD 0 ; IP22
: .WORD 0 ; IP23
: .WORD 0 ; IP24

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

:
: SOURCE LENGTH - 0,1,300
: SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: MASK - 0,1,377
: TABLE ADDRESS - NO OVERLAP WITH SOURCE STRING
: - OVERLAP - TABLE ADDRESS=SOURCE ADDRESS
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # 1
: TABLE DATA - ALL BYTES IDENTICAL = 0
: - ALL BYTES IDENTICAL = 377
: - INCREMENTING SEQUENCE; INC=1, START # -1
:

: TOTAL # OF TEST CONDITIONS = 54
: TOTAL # OF TESTS = (1 REG. + 1 INLINE)54-108
:

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 CZKEEC.P11 SPANC TABLES

16906
 16907
 16908
 16909 075320 000007
 16910 075322 000001
 16911 075324 103436
 16912 075326 104004
 16913 075330 106266
 16914 075332 106322
 16915 075334 106330
 16916 075336 104732
 16917 075340 103412
 16918 075342 103412
 16919 075344 104732
 16920 075346 103412
 16921 075350 103412
 16922 075352 105044
 16923 075354 103662
 16924 075356 000000
 16925 075360 000000
 16926 075362 000000
 16927 075364 000000
 16928 075366 000000
 16929 075370 000000
 16930 075372 000000
 16931
 16932
 16933
 16934
 16935
 16936
 16937
 16938
 16939
 16940
 16941
 16942

:
 : ENTRY 27 - INSTRUCTION UNDER TEST = SPANC
 :

```

: SPAN1: .WORD 7           ; INST = SPANC
          .WORD 1           ; TYPE = 1
          .WORD T1A        ; IP1 - SRC.LEN
          .WORD T2AA       ; IP2 - SRC.ADR
          .WORD T27        ; IP3 - TABLE LEN (256 BYTES)
          .WORD T30A       ; IP4 - MASK
          .WORD T31A       ; IP5 - TABLE ADR
          .WORD T6A        ; IP6 - SRC.DATA
          .WORD T0         ; IP7 - SRC.SURR DATA
          .WORD T0         ; IP10 - SRC.SURR.LEN
          .WORD T6A       ; IP11 - TABLE DATA
          .WORD T0         ; IP12 - TABLE SURR DATA
          .WORD T0         ; IP13 - TABLE SURR LEN
          .WORD T14       ; IP14 - SEPARATION CONSTANT
          .WORD TSPA      ; IP15 - SPECIAL HANDLING
          .WORD 0         ; IP16
          .WORD 0         ; IP17
          .WORD 0         ; IP20
          .WORD 0         ; IP21
          .WORD 0         ; IP22
          .WORD 0         ; IP23
          .WORD 0         ; IP24
  
```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: SOURCE LENGTH - 0,1,2,3,4,5,11,20
: SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
: MASK - 252
: TABLE ADDRESS - NO OVERLAP WITH SOURCE STRING
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START # 0
: TABLE DATA - INCREMENTING SEQUENCE; INC=1, START # 0

```

```

: TOTAL # OF TEST CONDITIONS = 16
: TOTAL # OF TESTS = (1 REG.) = 16
:

```

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 CZKEEC.P11 SPANC TABLES

16944
 16945
 16946
 16947 075374 000007
 16948 075376 000000
 16949 075400 100040
 16950 075402 000110
 16951 075404 000256
 16952 075406 000000
 16953 075410 000200
 16954 075412 104712
 16955 075414 000000
 16956 075416 000000
 16957 075420 106424
 16958 075422 000000
 16959 075424 000000
 16960 075426 000000
 16961 075430 000003
 16962 075432 000000
 16963 075434 000000
 16964 075436 000000
 16965 075440 000000
 16966 075442 000000
 16967 075444 000000
 16968 075446 000000
 16969
 16970
 16971
 16972
 16973
 16974
 16975
 16976
 16977
 16978
 16979
 16980
 16981

: ENTRY 28 - INSTRUCTION UNDER TEST = SPANC

```

: SPAN2: .WORD 7           ; INST = SPANC
          .WORD 0           ; TYPE = 0
          .WORD 100040      ; IP1 - SRC.LEN
          .WORD 110         ; IP2 - SRC.ADR
          .WORD 256         ; IP3 - TABLE LEN (256 BYTES)
          .WORD 0           ; IP4 - MASK
          .WORD 200         ; IP5 - TABLE ADR
          .WORD T6+2        ; IP6 - SRC.DATA
          .WORD 0           ; IP7 - SRC.SURR DATA
          .WORD 0           ; IP10 - SRC.SURR.LEN
          .WORD T32+6       ; IP11 - TABLE DATA
          .WORD 0           ; IP12 - TABLE SURR DATA
          .WORD 0           ; IP13 - TABLE SURR LEN
          .WORD 0           ; IP14 - SEPARATION CONSTANT
          .WORD 3           ; IP15 - SPECIAL HANDLING
          .WORD 0           ; IP16
          .WORD 0           ; IP17
          .WORD 0           ; IP20
          .WORD 0           ; IP21
          .WORD 0           ; IP22
          .WORD 0           ; IP23
          .WORD 0           ; IP24
  
```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: SOURCE LENGTH - 100040
: SOURCE ADDRESS - 10
: MARK - 377
: TABLE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE DATA - INCREMENTING SEQUENCE; INC=1, START#-1
: TABLE DATA - ALL BYTES IDENTICAL = 377
  
```

: THIS TEST WAS ADDED TO EXERCISE 8 TEST THE SCANC N-BIT OPERATION.
 : TOTAL # OF TESTS = (1 REG. + 1 INLINE)=2

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CZKEEC.P11 CVTPN TABLES

16983
16984
16985
16986
16987
16988 075450 000016
16989 075452 000001
16990 075454 106502
16991 075456 103766
16992 075460 106522
16993 075462 106610
16994 075464 106666
16995 075466 104742
16996 075470 104760
16997 075472 104774
16998 075474 105012
16999 075476 105030
17000 075500 105044
17001 075502 103412
17002 075504 000000
17003 075506 000000
17004 075510 000000
17005 075512 000000
17006 075514 000000
17007 075516 000000
17008 075520 000000
17009 075522 000000
17010
17011
17012
17013
17014
17015
17016
17017
17018
17019
17020
17021
17022
17023
17024

.SBTTL CVTPN TABLES

: ENTRY 29 - INSTRUCTION UNDER TEST = CVTPN

: ICYZ: .WORD 16 ; INST=CVTPN
: .WORD 1 ; TYPE = 1
: .WORD T331 ; IP1 - SRC.LEN
: .WORD T2 ; IP2 - SRC.ADR
: .WORD T332 ; IP3 - DST.LEN
: .WORD T34 ; IP4 - DST.ADR
: .WORD T35 ; IP5 - SRC DATA
: .WORD T7 ; IP6 - SRC SURR DATA
: .WORD T10 ; IP7 - SRC SURR LEN
: .WORD T11 ; IP10 - DST DATA
: .WORD T12 ; IP11 - DST SURR DATA
: .WORD T13 ; IP12 - DST SURR LEN
: .WORD T14 ; IP13 - SEPARATION CONSTANT
: .WORD T0 ; IP14 - SPECIAL HANDLING
: .WORD 0 ; IP15
: .WORD 0 ; IP16
: .WORD C ; IP17
: .WORD 0 ; IP20
: .WORD 0 ; IP21
: .WORD 0 ; IP22
: .WORD 0 ; IP23
: .WORD 0 ; IP24

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS.

: SOURCE LENGTH - 0,1,37
: DESTINATION LENGTH - 0,1,37
: SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
: DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
: - SOURCE & DESTINATION STRINGS ADJACENT
: SOURCE DATA - ALL DIGITS IDENTICAL = 3; SIGN +
: - ALL DIGITS IDENTICAL = 8; SIGN -
: - ALL DIGITS IDENTICAL = 0; SIGN -

: TOTAL # OF TEST CONDITIONS = 54
: TOTAL # OF TESTS - (2 DATA TYPES + 1 IN LINE)54=162

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 CZKEEC.P11 CVTPN TABLES

```

17026          ;ENTRY 30 - INSTRUCTION UNDER TEST = CVTPN
17027          ;
17028 075524 000016      ;ICPZ1: .WORD 16          ;INST=CVTPN
17029 075526 000001      ;.WORD 1          ;TYPE = 1
17030 075530 103436      ;.WORD T1A        ;IP1 - SRC.LEN
17031 075532 103776      ;.WORD T2A        ;IP2 - SRC.ADR
17032 075534 103436      ;.WORD T1A        ;IP3 - DST.LEN
17033 075536 106556      ;.WORD T34A       ;IP4 - DST.ADR
17034 075540 106754      ;.WORD TP19       ;IP5 - SRC DATA
17035 075542 103412      ;.WORD T0         ;IP6 - SRC SURR DATA
17036 075544 103412      ;.WORD T0         ;IP7 - SRC SURR LEN
17037 075546 103412      ;.WORD T0         ;IP10 - DST DATA
17038 075550 103412      ;.WORD T0         ;IP11 - DST SURR DATA
17039 075552 103412      ;.WORD T0         ;IP12 - DST SURR LEN
17040 075554 105044      ;.WORD T14        ;IP13 - SEPARATION CONSTANT
17041 075556 103662      ;.WORD TSPA       ;IP14 - SPECIAL HANDLING
17042 075560 000000      ;.WORD 0          ;IP15
17043 075562 000000      ;.WORD 0          ;IP16
17044 075564 000000      ;.WORD 0          ;IP17
17045 075566 000000      ;.WORD 0          ;IP20
17046 075570 000000      ;.WORD 0          ;IP21
17047 075572 000000      ;.WORD 0          ;IP22
17048 075574 000000      ;.WORD 0          ;IP23
17049 075576 000000      ;.WORD 0          ;IP24
17050
17051
17052          ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
17053          ;
17054          ; SOURCE LENGTH - 0,1,2,3,4,5,11,20
17055          ; DESTINATION LENGTH - 0,1,2,3,4,5,11,20
17056          ; SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
17057          ; DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
17058          ; SOURCE DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
17059          ;
17060          ; TOTAL # OF TEST CONDITIONS = 64
17061          ; TOTAL # OF TESTS = (1 REG.)64 - 64
17062          ;

```

```

17064
17065
17066
17067 075600 000017
17068 075602 000003
17069 075604 106502
17070 075606 103766
17071 075610 106522
17072 075612 107144
17073 075614 107226
17074 075616 104742
17075 075620 104760
17076 075622 104774
17077 075624 105012
17078 075626 105030
17079 075630 105044
17080 075632 103412
17081 075634 000000
17082 075636 000000
17083 075640 000000
17084 075642 000000
17085 075644 000000
17086 075646 000000
17087 075650 000000
17088 075652 000000
17089
17090
17091
17092
17093
17094
17095
17096
17097
17098
17099
17100
17101
17102
17103

```

```

.SBTTL          CVTNP TABLES
:ENTRY 31 - INSTRUCTION UNDER TEST = CVTNP
:ICZF:
.WORD 17          :INST=CVTNP
.WORD 3           :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1:1)
.WORD T331       :IP1 - SRC.LEN
.WORD T2         :IP2 - SRC.ADR
.WORD T332       :IP3 - DST.LEN
.WORD T36        :IP4 - DST.ADR
.WORD T37        :IP5 - SRC DATA
.WORD T7         :IP6 - SRC SURR DATA
.WORD T10        :IP7 - SRC SURR LEN
.WORD T11        :IP10 - DST DATA
.WORD T12        :IP11 - DST SURR DATA
.WORD T13        :IP12 - DST SURR LEN
.WORD T14        :IP13 - SEPARATION CONSTANT
.WORD T0         :IP14 - SPECIAL HANDLING
.WORD 0          :IP15
.WORD 0          :IP16
.WORD 0          :IP17
.WORD 0          :IP20
.WORD 0          :IP21
.WORD 0          :IP22
.WORD 0          :IP23
.WORD 0          :IP24

```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:   SOURCE LENGTH - 0,1,37
:   DESTINATION LENGTH - 0,1,37
:   SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:   DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
:                       - SOURCE & DESTINATION STRINGS ADJACENT
:   SOURCE DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE 7
:                - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE 8
:                - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE -
:
:TOTAL # OF TEST CONDITIONS = 54
:TOTAL # OF TESTS = (6 DATA TYPES * 1 IN LINE)54 * 378
:

```

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 CZKEEC.P11 CVTNP TABLES

```

17105      ;ENTRY 32 - INSTRUCTION UNDER TEST = CVTNP
17106      :
17107      075654 000017      ;ICZP1: .WORD 17          .INST=CVTNP
17108      075656 000001      :.WORD 1          :TYPE = 1
17109      075660 103436      :.WORD T1A        :IP1 - SRC.LEN
17110      075662 103776      :.WORD T2A        :IP2 - SRC.ADR
17111      075664 103436      :.WORD T1A        :IP3 - DST.LEN
17112      075666 107116      :.WORD T36A       :IP4 - DST.ADR
17113      075670 107314      :.WORD T219       :IP5 - SRC DATA
17114      075672 103412      :.WORD T0         :IP6 - SRC SURR DATA
17115      075674 103412      :.WORD T0         :IP7 - SRC SURR LEN
17116      075676 103412      :.WORD T0         :IP10 - DST DATA
17117      075700 103412      :.WORD T0         :IP11 - DST SURR DATA
17118      075702 103412      :.WORD T0         :IP12 - DST SURR LEN
17119      075704 105044      :.WORD T14        :IP13 - SEPARATION CONSTANT
17120      075706 103662      :.WORD TSPA       :IP14 - SPECIAL HANDLING
17121      075710 000000      :.WORD 0          :IP15
17122      075712 000000      :.WORD 0          :IP16
17123      075714 000000      :.WORD 0          :IP17
17124      075716 000000      :.WORD 0          :IP20
17125      075720 000000      :.WORD 0          :IP21
17126      075722 000000      :.WORD 0          :IP22
17127      075724 000000      :.WORD 0          :IP23
17128      075726 000000      :.WORD 0          :IP24
17129      :
17130      ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
17131      :
17132      :          SOURCE LENGTH - 0,1,2,3,4,5,11,20
17133      :          DESTINATION LENGTH - 0,1,2,3,4,5,11,20
17134      :          SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
17135      :          DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
17136      :          SOURCE DATA - DIGITS FROM STRING= 1234567891234567891234000891233; SIGN +
17137      :
17138      :TOTAL # OF TEST CONDITIONS = 64
17139      :TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)64 = 64
17140      :

```


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 CZKFEQ.P11 CVTNP TABLES

17142
 17143
 17144 075730 000017
 17145 075732 000001
 17146 075734 103462
 17147 075736 104004
 17148 075740 103462
 17149 075742 107116
 17150 075744 107314
 17151 075746 103412
 17152 075750 103412
 17153 075752 103412
 17154 075754 103412
 17155 075756 103412
 17156 075760 105044
 17157 075762 103412
 17158 075764 000000
 17159 075766 000000
 17160 075770 000000
 17161 075772 000000
 17162 075774 000000
 17163 075776 000000
 17164 076000 000000
 17165 076002 000000
 17166
 17167
 17168
 17169
 17170
 17171
 17172
 17173
 17174
 17175
 17176

:ENTRY 32A - INSTRUCTION UNDER TEST = CVTNP

```

:ICZP2: .WORD 17          ;INST=CVTNP
        .WORD 1          ;TYPE = 1
        .WORD T1B       ;IP1 - SRC.LEN
        .WORD T2AA      ;IP2 - SRC.ADR
        .WORD T1B       ;IP3 - DST.LEN
        .WORD T36A      ;IP4 - DST.ADR
        .WORD T219      ;IP5 - SRC DATA
        .WORD T0        ;IP6 - SRC SURR DATA
        .WORD T0        ;IP7 - SRC SURR LEN
        .WORD T0        ;IP10 - DST DATA
        .WORD T0        ;IP11 - DST SURR DATA
        .WORD T0        ;IP12 - DST SURR LEN
        .WORD T14       ;IP13 - SEPARATION CONSTANT
        .WORD T0        ;IP14 - SPECIAL HANDLING
        .WORD 0         ;IP15
        .WORD 0         ;IP16
        .WORD 0         ;IP17
        .WORD 0         ;IP20
        .WORD 0         ;IP21
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24
    
```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
:   SOURCE LENGTH - 1,2,3
:   DESTINATION LENGTH - 1,2,3
:   SOURCE ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
:   DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
:   SOURCE DATA - DIGITS FROM STRING= 12345678912345678912340C0891233; SIGN +
:
:TOTAL # OF TEST CONDITIONS = 18
:TOTAL # OF TESTS = (6 DATA TYPES + 1 IN LINE)18 = 126
    
```

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 CZKEEC.P11 CVTLP TABLES

```

17178
17179
17180
17181 076004 000031
17182 076006 000003
17183 076010 107372
17184 076012 107452
17185 076014 106446
17186 076016 103766
17187 076020 104774
17188 076022 105012
17189 076024 105030
17190 076026 103412
17191 076030 000000
17192 076032 000000
17193 076034 000000
17194 076036 000000
17195 076040 000000
17196 076042 000000
17197 076044 000000
17198 076046 000000
17199 076050 000000
17200 076052 000000
17201 076054 000000
17202 076056 000000
17203
17204
17205
17206
17207
17208
17209
17210
17211
17212
17213
17214

.SBTTL          CVTLP TABLES
:ENTRY 33 - INSTRUCTION UNDER TEST = CVTLP
:
:ICLP:          .WORD 31          :INST=CVTLP
                .WORD 3          :TYPE = 1(BIT 0);11/44 OV TABLE(BIT 1-1)
                .WORD T40        :IP1 - SRC.HIGH (R2)
                .WORD T41        :IP2 - SRC.LOW (R3)
                .WORD T33        :IP3 - DST.LEN (R4)
                .WORD T2         :IP4 - DST.ADR (R5)
                .WORD T11        :IP5 - DST DATA
                .WORD T12        :IP6 - DST SURR DATA
                .WORD T13        :IP7 - DST SURR LEN
                .WORD T0         :IP10 - SPECIAL HANDLING
                .WORD 0          :IP11
                .WORD 0          :IP12
                .WORD 0          :IP13
                .WORD 0          :IP14
                .WORD 0          :IP15
                .WORD 0          :IP16
                .WORD 0          :IP17
                .WORD 0          :IP20
                .WORD 0          :IP21
                .WORD 0          :IP22
                .WORD 0          :IP23
                .WORD 0          :IP24

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS.
:
:   DESTINATION LENGTH - 0,1,20
:   DESTINATION ADDRESS - 200 (REATIVE TO START OF BUFFER)
:   SOURCE DATA HIGH - 0+,0-,77777+,77777-,5+
:   SOURCE DATA LOW - 0+,4+,77777-
:
:TOTAL # OF TEST CONDITIONS = 45
:TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)45 = 135
:

```

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CZKEEC.P11 CVTLP TABLES

17216
17217
17218 076060 000031
17219 076062 000003
17220 076064 107420
17221 076066 107436
17222 076070 103436
17223 076072 103776
17224 076074 103412
17225 076076 103412
17226 076100 103412
17227 076102 103662
17228 076104 000000
17229 076106 000000
17230 076110 000000
17231 076112 000000
17232 076114 000000
17233 076116 000000
17234 076120 000000
17235 076122 000000
17236 076124 000000
17237 076126 000000
17238 076130 000000
17239 076132 000000
17240
17241
17242
17243
17244
17245
17246
17247
17248
17249
17250

:ENTRY 34 - INSTRUCTION UNDER TEST = CVTLP
:ICLP1: .WORD 31 :INST=CVTLP
: .WORD 3 :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
: .WORD T40A :IP1 - SRC.HIGH (R2)
: .WORD T41A :IP2 - SRC.LOW (R3)
: .WORD T1A :IP3 - DST.LEN (R4)
: .WORD T2A :IP4 - DST.ADR (R5)
: .WORD T0 :IP5 - DST DATA
: .WORD T0 :IP6 - DST SURR DATA
: .WORD T0 :IP7 - DST SURR LEN
: .WORD TSPA :IP10 - SPECIAL HANDLING
: .WORD 0 :IP11
: .WORD 0 :IP12
: .WORD 0 :IP13
: .WORD 0 :IP14
: .WORD 0 :IP15
: .WORD 0 :IP16
: .WORD 0 :IP17
: .WORD 0 :IP20
: .WORD 0 :IP21
: .WORD 0 :IP22
: .WORD 0 :IP23
: .WORD 0 :IP24

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
: :
: : DESTINATION LENGTH - 0,1,2,3,4,5,11,20
: : DESTINATION ADDRESS - 201
: : SOURCE DATA HIGH - 0+
: : SOURCE DATA LOW - 77777-
: :
: : TOTAL # OF TEST CONDITIONS = 8
: : TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)8 - 8
: :

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CZKEEC.P11MACY11 27(655) 25-MAR-81 12:25 PAGE 119
CVTLP TABLES

17252
17253
17254 076134 000031
17255 076136 000003
17256 076140 107424
17257 076142 107472
17258 076144 105044
17259 076146 103766
17260 076150 103412
17261 076152 103412
17262 076154 103412
17263 076156 103412
17264 076160 000000
17265 076162 000000
17266 076164 000000
17267 076166 000000
17268 076170 000000
17269 076172 000000
17270 076174 000000
17271 076176 000000
17272 076200 000000
17273 076202 000000
17274 076204 000000
17275 076206 000000
17276
17277
17278
17279
17280
17281
17282
17283
17284
17285
17286

:ENTRY 34A - INSTRUCTION UNDER TEST = CVTLP

```

:ICLP2: .WORD 31          ;INST=CVTLP
        .WORD 3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT : 1)
        .WORD T40B      ;IP1 - SRC.HIGH (R2)
        .WORD T41B      ;IP2 - SRC.LOW (R3)
        .WORD T14       ;IP3 - DST.LEN (R4)
        .WORD T2        ;IP4 - DST.ADR (R5)
        .WORD T0        ;IP5 - DST DATA
        .WORD T0        ;IP6 - DST SURR DATA
        .WORD T0        ;IP7 - DST SURR LEN
        .WORD T0        ;IP10 - SPECIAL HANDLING
        .WORD 0         ;IP11
        .WORD 0         ;IP12
        .WORD 0         ;IP13
        .WORD 0         ;IP14
        .WORD 0         ;IP15
        .WORD 0         ;IP16
        .WORD 0         ;IP17
        .WORD 0         ;IP20
        .WORD 0         ;IP21
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24

```

:THIS TABLE EXERCISES THE FOLLOWING TEST CONDITION

```

:
:   DESTINATION LENGTH - 10
:   DESTINATION ADDRESS - 200
:   SOURCE DATA HIGH - 0,231,252
:   SOURCE DATA LOW - 120360,0,125
:

```

:TOTAL # OF TEST CONDITIONS = 9

:TOTAL # OF TESTS = (2 DATA TYPES + 1 IN-LINE)9 = 27

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 CZKEEC.P11 CVTLN TABLES

```

17288
17289
17290
17291 076210 000021
17292 076212 000001
17293 076214 107372
17294 076216 107452
17295 076220 106446
17296 076222 103766
17297 076224 104774
17298 076226 105012
17299 076230 105030
17300 076232 103412
17301 076234 000000
17302 076236 000000
17303 076240 000000
17304 076242 000000
17305 076244 000000
17306 076246 000000
17307 076250 000000
17308 076252 000000
17309 076254 000000
17310 076256 000000
17311 076260 000000
17312 076262 000000
17313
17314
17315
17316
17317
17318
17319
17320
17321
17322
17323

.SBTTL          CVTLN TABLES
:ENTRY 35 - INSTRUCTION UNDER TEST = CVTLN
:ICLZ:
:   .WORD 21          :INST=CVTLN
:   .WORD 1           :TYPE = 1
:   .WORD T40         :IP1 - SRC.HIGH (R2)
:   .WORD T41         :IP2 - SRC.LOW (R3)
:   .WORD T33         :IP3 - DST.LEN (R4)
:   .WORD T2          :IP4 - DST.ADR (R5)
:   .WORD T11         :IP5 - DST DATA
:   .WORD T12         :IP6 - DST SURR DATA
:   .WORD T13         :IP7 - DST SURR LEN
:   .WORD T0          :IP10 - SPECIAL HANDLING
:   .WORD 0           :IP11
:   .WORD 0           :IP12
:   .WORD 0           :IP13
:   .WORD 0           :IP14
:   .WORD 0           :IP15
:   .WORD 0           :IP16
:   .WORD 0           :IP17
:   .WORD 0           :IP20
:   .WORD 0           :IP21
:   .WORD 0           :IP22
:   .WORD 0           :IP23
:   .WORD 0           :IP24

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:   DESTINATION LENGTH - 0,1,20
:   DESTINATION ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:   SOURCE DATA HIGH - 0+,0-,77777+,77777-,5+
:   SOURCE DATA LOW - 0+,4+,77777-
:
:TOTAL # OF TEST CONDITIONS = 45
:TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)45 = 315
:

```

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 CZKEEC.P11 CVTLN TABLES

17325
 17326
 17327 076264 000021
 17328 076266 000001
 17329 076270 107442
 17330 076272 107446
 17331 076274 103436
 17332 076276 103776
 17333 076300 103412
 17334 076302 103412
 17335 076304 103412
 17336 076306 103662
 17337 076310 000000
 17338 076312 000000
 17339 076314 000000
 17340 076316 000000
 17341 076320 000000
 17342 076322 000000
 17343 076324 000000
 17344 076326 000000
 17345 076330 000000
 17346 076332 000000
 17347 076334 000000
 17348 076336 000000
 17349
 17350
 17351
 17352
 17353
 17354
 17355
 17356
 17357
 17358
 17359

```

:ENTRY 36 - INSTRUCTION UNDER TEST = CVTLN
:ICLZ1: .WORD 21          :INST=CVTLN
        .WORD 1          :TYPE = 1
        .WORD T40AA      :IP1 - SRC.HIGH (R2)
        .WORD T41AA      :IP2 - SRC.LOW (R3)
        .WORD T1A        :IP3 - DST.LEN (R4)
        .WORD T2A        :IP4 - DST.ADR (R5)
        .WORD T0         :IP5 - DST DATA
        .WORD T0         :IP6 - DST SURR DATA
        .WORD TSPA       :IP7 - DST SURR LEN
        .WORD 0          :IP10 - SPECIAL HANDLING
        .WORD 0          :IP11
        .WORD 0          :IP12
        .WORD 0          :IP13
        .WORD 0          :IP14
        .WORD 0          :IP15
        .WORD 0          :IP16
        .WORD 0          :IP17
        .WORD 0          :IP20
        .WORD 0          :IP21
        .WORD 0          :IP22
        .WORD 0          :IP23
        .WORD 0          :IP24
    
```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:   DESTINATION LENGTH - 0,1,2,3,4,5,11,20
:   DESTINATION ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
:   SOURCE DATA HIGH - 5+
:   SOURCE DATA LOW - 4+
:
:TOTAL # OF TEST CONDITIONS = 8
:TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)8 - 8
:
    
```

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CZKEFC.P11 CVTPL TABLES

17361
17362
17363
17364 076340 000025
17365 076342 000003
17366 076344 106446
17367 076346 103766
17368 076350 106666
17369 076352 104742
17370 076354 104760
17371 076356 104660
17372 076360 103412
17373 076362 000000
17374 076364 000000
17375 076366 000000
17376 076370 000000
17377 076372 000000
17378 076374 000000
17379 076376 000000
17380 076400 000000
17381 076402 000000
17382 076404 000000
17383 076406 000000
17384 076410 000000
17385 076412 000000
17386
17387
17388
17389
17390
17391
17392
17393
17394
17395
17396
17397

```
.SBTTL          CVTPL TABLES
:ENTRY 37 - INSTRUCTION UNDER TEST = CVTPL
:
:ICPL:  .WORD 25          :INST = CVTPL
        .WORD 3           :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
        .WORD T33        :IP1 - SRC.LEN (R0)
        .WORD T2         :IP2 - SRC.ADR (R1)
        .WORD T35        :IP3 - SRC DATA
        .WORD T7         :IP4 - SRC SURR DATA
        .WORD T10        :IP5 - SRC SURR LEN
        .WORD T5         :IP6- UNUSED PORTION OF REGISTER 4
        .WORD T0         :IP7 - SPECIAL HANDLING
        .WORD 0          :IP10
        .WORD 0          :IP11
        .WORD 0          :IP12
        .WORD 0          :IP13
        .WORD 0          :IP14
        .WORD 0          :IP15
        .WORD 0          :IP16
        .WORD 0          :IP17
        .WORD 0          :IP20
        .WORD 0          :IP21
        .WORD 0          :IP22
        .WORD 0          :IP23
        .WORD 0          :IP24

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS.
:
:      SOURCE LENGTH - 0,1,20
:      SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:      SOURCE DATA - ALL DIGITS IDENTICAL = 3; SIGN +
:                   - ALL DIGITS IDENTICAL = 8; SIGN -
:                   - ALL DIGITS IDENTICAL = 0; SIGN -
:
:TOTAL # OF TEST CONDITIONS = 9
:TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)9 27
:
```

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 CZKEEC.P11 CVTPL TABLES

```

17399
17400
17401
17402
17403 076414 000025
17404 076416 000003
17405 076420 106466
17406 076422 103766
17407 076424 110354
17408 076426 104742
17409 076430 104760
17410 076432 104660
17411 076434 103412
17412 076436 000000
17413 076440 000000
17414 076442 000000
17415 076444 000000
17416 076446 000000
17417 076450 000000
17418 076452 000000
17419 076454 000000
17420 076456 000000
17421 076460 000000
17422 076462 000000
17423 076464 000000
17424 076466 000000
17425
17426
17427
17428
17429
17430
17431
17432
17433
17434
17435
17436
17437
17438
17439

```

```

: ENTRY 40 - INSTRUCTION UNDER TEST = CVTPL
:
:ICPL1: .WORD 25          :INST = CVTPL
        .WORD 3          :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1 1)
        .WORD T33A      :IP1 - SRC.LEN (R0)
        .WORD T2        :IP2 - SRC.ADR (R1)
        .WORD T51       :IP3 - SRC DATA
        .WORD T7        :IP4 - SRC SURR DATA
        .WORD T10       :IP5 - SRC SURR LEN
        .WORD T5        :IP6- UNUSED PORTION OF REGISTER 4
        .WORD T0        :IP7 - SPECIAL HANDLING
        .WORD 0         :IP10
        .WORD 0         :IP11
        .WORD 0         :IP12
        .WORD 0         :IP13
        .WORD 0         :IP14
        .WORD 0         :IP15
        .WORD 0         :IP16
        .WORD 0         :IP17
        .WORD 0         :IP20
        .WORD 0         :IP21
        .WORD 0         :IP22
        .WORD 0         :IP23
        .WORD 0         :IP24

```

```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS.
:
: SOURCE LENGTH - 12
: SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE DATA - DIGITS FROM STRING = 2,147,483,648+
:               - DIGITS FROM STRING = 2,147,483,647+
:               - DIGITS FROM STRING = 2,147,483,648-
:               - DIGITS FROM STRING = 2,147,483,649-
:               - DIGITS FROM STRING = 4,294,967,294+
:               - DIGITS FROM STRING = 42,949,672,940+
:
: TOTAL # OF TEST CONDITIONS = 6
: TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)6 = 18
:

```


PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 121-2
CVTPL TABLES

17441
17442
17443 076470 000025
17444 076472 000003
17445 076474 103436
17446 076476 103776
17447 076500 106754
17448 076502 103412
17449 076504 103412
17450 076506 104660
17451 076510 103662
17452 076512 000000
17453 076514 000000
17454 076516 000000
17455 076520 000000
17456 076522 000000
17457 076524 000000
17458 076526 000000
17459 076530 000000
17460 076532 000000
17461 076534 000000
17462 076536 000000
17463 076540 000000
17464 076542 000000
17465
17466
17467
17468
17469
17470
17471
17472
17473
17474

:ENTRY 41 - INSTRUCTION UNDER TEST = CVTPL

:CPL2: .WORD 25 :INST = CVTPL
:WORD 3 :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
:WORD T1A :IP1 - SRC.LEN (R0)
:WORD T2A :IP2 - SRC.ADR (R1)
:WORD TP19 :IP3 - SRC DATA
:WORD T0 :IP4 - SRC SURR DATA
:WORD T0 :IP5 - SRC SURR LEN
:WORD T5 :IP6- UNUSED PORTION OF REGISTER 4
:WORD TSPA :IP7 - SPECIAL HANDLING
:WORD 0 :IP10
:WORD 0 :IP11
:WORD 0 :IP12
:WORD 0 :IP13
:WORD 0 :IP14
:WORD 0 :IP15
:WORD 0 :IP16
:WORD 0 :IP17
:WORD 0 :IP20
:WORD 0 :IP21
:WORD 0 :IP22
:WORD 0 :IP23
:WORD 0 :IP24

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

: SOURCE LENGTH - 0,1,2,3,4,5,11,20
: SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
: SOURCE DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
: TOTAL # OF TEST CONDITIONS = 8
: TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)8 - 8
:

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 CZKEEC.P11 CVTPL TABLES

```

17476 ;ENTRY 41A - INSTRUCTION UNDER TEST = CVTPL
17477 ;
17478 076544 000025 ;ICPL3: .WORD 25 ;INST = CVTPL
17479 076546 000003 ;.WORD 3 ;TYPE = 1(BIT 0);11/44 OV TABLE(BIT 1:1)
17480 076550 106466 ;.WORD T33A ;IP1 - SRC.LEN (R0)
17481 076552 103766 ;.WORD T2 ;IP2 - SRC.ADR (R1)
17482 076554 106764 ;.WORD TP19A ;IP3 - SRC DATA
17483 076556 103412 ;.WORD T0 ;IP4 - SRC SURR DATA
17484 076560 103412 ;.WORD T0 ;IP5 - SRC SURR LEN
17485 076562 104660 ;.WORD T5 ;IP6- UNUSED PORTION OF REGISTER 4
17486 076564 103412 ;.WORD T0 ;IP7 - SPECIAL HANDLING
17487 076566 000000 ;.WORD 0 ;IP10
17488 076570 000000 ;.WORD 0 ;IP11
17489 076572 000000 ;.WORD 0 ;IP12
17490 076574 000000 ;.WORD 0 ;IP13
17491 076576 000000 ;.WORD 0 ;IP14
17492 076600 000000 ;.WORD 0 ;IP15
17493 076602 000000 ;.WORD 0 ;IP16
17494 076604 000000 ;.WORD 0 ;IP17
17495 076606 000000 ;.WORD 0 ;IP20
17496 076610 000000 ;.WORD 0 ;IP21
17497 076612 000000 ;.WORD 0 ;IP22
17498 076614 000000 ;.WORD 0 ;IP23
17499 076616 000000 ;.WORD 0 ;IP24
17500 ;
17501 ;THIS TABLE EXERCISES THE FOLLOWING TEST CONDITION
17502 ;
17503 ; SOURCE LENGTH - 12
17504 ; SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
17505 ; SOURCE DATA - 3 X 2 ** 31 = 6442450944 +
17506 ; - 3 X 2 ** 31 (-) = 6442450944 -
17507 ;
17508 ;TOTAL # OF TEST CONDITIONS = 2
17509 ;TOTAL # OF TESTS = (2 DATA TYPES + 1 IN-LINE) 2 = 6
17510 ;

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 123
CVTNL TABLES

17512
17513
17514
17515 076620 000015
17516 076622 000001
17517 076624 106446
17518 076626 103766
17519 076630 107226
17520 076632 104742
17521 076634 104760
17522 076636 104660
17523 076640 103412
17524 076642 000000
17525 076644 000000
17526 076646 000000
17527 076650 000000
17528 076652 000000
17529 076654 000000
17530 076656 000000
17531 076660 000000
17532 076662 000000
17533 076664 000000
17534 076666 000000
17535 076670 000000
17536 076672 000000
17537
17538
17539
17540
17541
17542
17543
17544
17545
17546
17547
17548

```

.SBTTL          CVTNL TABLES
:ENTRY 42 - INSTRUCTION UNDER TEST = CVTNL
:
:ICZL:          .WORD 15          ;INST = CVTNL
                .WORD 1          ;TYPE = 1
                .WORD T33        ;IP1 - SRC.LEN (R0)
                .WORD T2        ;IP2 - SRC.ADR (R1)
                .WORD T37        ;IP3 - SRC DATA
                .WORD T7         ;IP4 - SRC SURR DATA
                .WORD T10        ;IP5 - SRC SURR LEN
                .WORD T5         ;IP6 - UNUSED PORTION OF REGISTER 4
                .WORD T0         ;IP7 - SPECIAL HANDLING
                .WORD 0          ;IP10
                .WORD 0          ;IP11
                .WORD 0          ;IP12
                .WORD 0          ;IP13
                .WORD 0          ;IP14
                .WORD 0          ;IP15
                .WORD 0          ;IP16
                .WORD 0          ;IP17
                .WORD 0          ;IP20
                .WORD 0          ;IP21
                .WORD 0          ;IP22
                .WORD 0          ;IP23
                .WORD 0          ;IP24

```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:          SOURCE LENGTH - 0,1,20
:          SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:          SOURCE DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE 7
:                       - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE 8
:                       - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE 1

```

```

: TOTAL # OF TEST CONDITIONS = 9
: TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)9 = 63
:

```

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 CZKEEC.P11 CVTNL TABLES

17550
 17551
 17552
 17553
 17554 076674 000015
 17555 076676 000001
 17556 076700 106466
 17557 076702 103766
 17558 076704 110416
 17559 076706 104742
 17560 076710 104760
 17561 076712 104660
 17562 076714 103412
 17563 076716 000000
 17564 076720 000000
 17565 076722 000000
 17566 076724 000000
 17567 076726 000000
 17568 076730 000000
 17569 076732 000000
 17570 076734 000000
 17571 076736 000000
 17572 076740 000000
 17573 076742 000000
 17574 076744 000000
 17575 076746 000000
 17576
 17577
 17578
 17579
 17580
 17581
 17582
 17583
 17584
 17585
 17586
 17587
 17588

:
 : ENTRY 43 - INSTRUCTION UNDER TEST = CVTNL
 :

:ICZL: .WORD 15 ;INST = CVTNL
 : .WORD 1 ;TYPE = 1
 : .WORD T33A ;IP1 - SRC.LEN (R0)
 : .WORD T2 ;IP2 - SRC.ADR (R1)
 : .WORD T52 ;IP3 - SRC DATA
 : .WORD T7 ;IP4 - SRC SURR DATA
 : .WORD T10 ;IP5 - SRC SURR LEN
 : .WORD T5 ;IP6 - UNUSED PORTION OF REGISTER 4
 : .WORD T0 ;IP7 - SPECIAL HANDLING
 : .WORD 0 ;IP10
 : .WORD 0 ;IP11
 : .WORD 0 ;IP12
 : .WORD 0 ;IP13
 : .WORD 0 ;IP14
 : .WORD 0 ;IP15
 : .WORD 0 ;IP16
 : .WORD 0 ;IP17
 : .WORD 0 ;IP20
 : .WORD 0 ;IP21
 : .WORD 0 ;IP22
 : .WORD 0 ;IP23
 : .WORD 0 ;IP24

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

:
 : SOURCE LENGTH - 12
 : SOURCE ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
 : SOURCE DATA - DIGITS FROM STRING = 2,147,483,648+
 : - DIGITS FROM STRING = 2,147,483,647+
 : - DIGITS FROM STRING = 2,147,483,648-
 : - DIGITS FROM STRING = 2,147,483,649-
 :

: TOTAL # OF TEST CONDITIONS = 4
 : TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)4 = 28
 :

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 CZKFECL.P11 CVTNL TABLES

```

17590                               :ENTRY 44 - INSTRUCTION UNDER TEST = CVTNL
17591                               :
17592   076750   000015            :ICZL2:   .WORD 15                        :INST = CVTNL
17593   076752   000001            :          .WORD 1                        :TYPE = 1
17594   076754   103436            :          .WORD T1A                     :IP1 - SRC.LEN (R0)
17595   076756   103776            :          .WORD T2A                     :IP2 - SRC.ADR (R1)
17596   076760   107314            :          .WORD T219                    :IP3 - SRC DATA
17597   076762   103412            :          .WORD T0                      :IP4 - SRC SURR DATA
17598   076764   103412            :          .WORD T0                      :IP5 - SRC SURR LEN
17599   076766   104660            :          .WORD T5                      :IP6 - UNUSED PORTION OF REGISTER 4
17600   076770   103662            :          .WORD TSPA                    :IP7 - SPECIAL HANDLING
17601   076772   000000            :          .WORD 0                        :IP10
17602   076774   000000            :          .WORD 0                        :IP11
17603   076776   000000            :          .WORD 0                        :IP12
17604   077000   000000            :          .WORD 0                        :IP13
17605   077002   000000            :          .WORD 0                        :IP14
17606   077004   000000            :          .WORD 0                        :IP15
17607   077006   000000            :          .WORD 0                        :IP16
17608   077010   000000            :          .WORD 0                        :IP17
17609   077012   000000            :          .WORD 0                        :IP20
17610   077014   000000            :          .WORD 0                        :IP21
17611   077016   000000            :          .WORD 0                        :IP22
17612   077020   000000            :          .WORD 0                        :IP23
17613   077022   000000            :          .WORD 0                        :IP24
17614                               :
17615                               :THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
17616                               :
17617                               :      SOURCE LENGTH - 0,1,2,3,4,5,11,20
17618                               :      SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
17619                               :      SOURCE DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
17620                               :
17621                               :TOTAL # OF TEST CONDITIONS = 8
17622                               :TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)8 = 8
17623                               :

```

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 CZKEEC.P11 ADDP TABLES

17625
 17626
 17627
 17628 077024 000022
 17629 077026 000003
 17630 077030 103412
 17631 077032 103766
 17632 077034 103412
 17633 077036 105234
 17634 077040 103416
 17635 077042 103412
 17636 077044 106152
 17637 077046 104742
 17638 077050 104760
 17639 077052 106152
 17640 077054 106024
 17641 077056 103412
 17642
 17643 077060 104774
 17644 077062 105012
 17645 077064 105030
 17646 077066 105044
 17647 077070 103412
 17648 077072 000000
 17649 077074 000000
 17650 077076 000000
 17651
 17652
 17653
 17654
 17655
 17656
 17657
 17658
 17659
 17660
 17661
 17662
 17663
 17664
 17665

```

.SBTTL          ADDP TABLES
:ENTRY 45 - INSTRUCTION UNDER TEST = ADDP
:
:ADDP: .WORD    22          :INST=ADDP
        .WORD    3          :TYPE = 1(BIT 0);11/44 OV TABLE(BIT 1-1)
        .WORD    T0         :IP1 - SRC1.LEN
        .WORD    T2         :IP2 - SRC1.ADR
        .WORD    T0         :IP3 - SRC2.LEN
        .WORD    T16        :IP4 - SRC2.ADR
        .WORD    XT1        :IP5 - DST.LEN
        .WORD    T0         :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD    T22        :IP7 - SRC1 DATA
        .WORD    T7         :IP10 - SRC1 SURR DATA
        .WORD    T10        :IP11 - SRC1 SURR LEN
        .WORD    T22        :IP12 - SRC2 DATA
        .WORD    T20        :IP13 - SRC2 SURR DATA
        .WORD    T0         :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        : AS NOT TO DESTROY ANY OF SRC1)
        .WORD    T11        :IP15 - DST DATA
        .WORD    T12        :IP16 - DST SURR DATA
        .WORD    T13        :IP17 - DST SURR LEN
        .WORD    T14        :IP20 - SEPARATION CONSTRAINT
        .WORD    T0         ;IP21 - SPECIAL HANDLING
        .WORD    0          :IP22
        .WORD    0          :IP23
        .WORD    0          :IP24
    
```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:SOURCE 1 LENGTH - 0
:SOURCE 2 LENGTH - 0
:DESTINATION LENGTH - 0,1,5
:SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:                               - SOURCE 2 STRINGS ALIGNED WITH DESTINATION STRING
:
:SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
:SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
:
:TOTAL # OF TEST CONDITIONS = 6
:TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)6 = 18
:
    
```

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CZKFECLP11

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ADDP TABLES

17667
17668
17669 077100 000022
17670 077102 000001
17671 077104 103412
17672 077106 103766
17673 077110 106042
17674 077112 105234
17675 077114 103416
17676 077116 103412
17677 077120 106152
17678 077122 104742
17679 077124 104760
17680 077126 105750
17681 077130 106024
17682 077132 103412
17683
17684 077134 104774
17685 077136 105012
17686 077140 105030
17687 077142 105044
17688 077144 103412
17689 077146 000000
17690 077150 000000
17691 077152 000000
17692
17693
17694
17695
17696
17697
17698
17699
17700
17701
17702
17703
17704
17705
17706
17707
17708
17709

:ENTRY 46 - INSTRUCTION UNDER TEST = ADDP

```

:ADDP1: .WORD 22          :INST=ADDP
        .WORD 1          :TYPE = 1
        .WORD T0         :IP1 - SRC1.LEN
        .WORD T2         :IP2 - SRC1.ADR
        .WORD T21        :IP3 - SRC2.LEN
        .WORD T16        :IP4 - SRC2.ADR
        .WORD XT         :IP5 - DST.LEN
        .WORD T0         :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD T22        :IP7 - SRC1 DATA
        .WORD T7         :IP10 - SRC1 SURR DATA
        .WORD T10        :IP11 - SRC1 SURR LEN
        .WORD T17        :IP12 - SRC2 DATA
        .WORD T20        :IP13 - SRC2 SURR DATA
        .WORD T0         :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        : AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11        :IP15 - DST DATA
        .WORD T12        :IP16 - DST SURR DATA
        .WORD T13        :IP17 - DST SURR LEN
        .WORD T14        :IP20 - SEPARATION CONSTRAINT
        .WORD T0         :IP21 - SPECIAL HANDLING
        .WORD 0          :IP22
        .WORD 0          :IP23
        .WORD 0          :IP24
    
```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS

```

:
: SOURCE 1 LENGTH - 0
: SOURCE 2 LENGTH - 1,5
: DESTINATION LENGTH - 0,1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
: - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
: SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
: SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
: - ALL DIGITS IDENTICAL = 5; SIGN +
: - ALL DIGITS IDENTICAL = 3; SIGN -
: - ALL DIGITS IDENTICAL = 0; SIGN +
    
```

```

: TOTAL # OF TEST CONDITIONS = 48
: TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
:
    
```

17711
 17712
 17713 077154 000022
 17714 077156 000001
 17715 077160 106042
 17716 077162 103766
 17717 077164 103412
 17718 077166 105234
 17719 077170 103416
 17720 077172 103412
 17721 077174 105750
 17722 077176 104742
 17723 077200 104760
 17724 077202 106152
 17725 077204 106024
 17726 077206 103412
 17727
 17728 077210 104774
 17729 077212 105012
 17730 077214 105030
 17731 077216 105044
 17732 077220 103412
 17733 077222 000000
 17734 077224 000000
 17735 077226 000000
 17736
 17737
 17738
 17739
 17740
 17741
 17742
 17743
 17744
 17745
 17746
 17747
 17748
 17749
 17750
 17751
 17752
 17753

:ENTRY 47 - INSTRUCTION UNDER TEST = ADDP

```

:ADDP2: .WORD 22          ;INST=ADDP
        .WORD 1          ;TYPE = 1
        .WORD T21       ;IP1 - SRC1.LEN
        .WORD T2        ;IP2 - SRC1.ADR
        .WORD T0        ;IP3 - SRC2.LEN
        .WORD T16       ;IP4 - SRC2.ADR
        .WORD XT        ;IP5 - DST.LEN
        .WORD T0        ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR :P4
        .WORD T17       ;IP7 - SRC1 DATA
        .WORD T7        ;IP10 - SRC1 SURR DATA
        .WORD T10       ;IP11 - SRC1 SURR LEN
        .WORD T22       ;IP12 - SRC2 DATA
        .WORD T20       ;IP13 - SRC2 SURR DATA
        .WORD T0        ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        ; AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11       ;IP15 - DST DATA
        .WORD T12       ;IP16 - DST SURR DATA
        .WORD T13       ;IP17 - DST SURR LEN
        .WORD T14       ;IP20 - SEPARATION CONSTRAINT
        .WORD T0        ;IP21 - SPECIAL HANDLING
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24
  
```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 1,5
: SOURCE 2 LENGTH - 0
: DESTINATION LENGTH - 0,1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:                               - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
: SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:                               - ALL DIGITS IDENTICAL = 5; SIGN +
:                               - ALL DIGITS IDENTICAL = 3; SIGN -
:                               - ALL DIGITS IDENTICAL = 0; SIGN +
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
  
```

```

: TOTAL # OF TEST CONDITIONS =48
: TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
:
  
```


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 CZKEEC.P11 ADDP TABLES

```

17755 ;ENTRY 48 - INSTRUCTION UNDER TEST = ADDP
17756 ;
17757 077230 000022 ;IADDP3: .WORD 22 ;INST=ADDP
17758 077232 000001 ;.WORD 1 ;TYPE = 1
17759 077234 106056 ;.WORD T211 ;IP1 - SRC1.LEN
17760 077236 103766 ;.WORD T2 ;IP2 - SRC1.ADR
17761 077240 106074 ;.WORD T212 ;IP3 - SRC2.LEN
17762 077242 105234 ;.WORD T16 ;IP4 - SRC2.ADR
17763 077244 103616 ;.WORD T17 ;IP5 - DST.LEN
17764 077246 103412 ;.WORD T0 ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
17765 077250 105750 ;.WORD T17 ;IP7 - SRC1 DATA
17766 077252 104742 ;.WORD T7 ;IP10 - SRC1 SURR DATA
17767 077254 104760 ;.WORD T10 ;IP11 - SRC1 SURR LEN
17768 077256 105750 ;.WORD T17 ;IP12 - SRC2 DATA
17769 077260 106024 ;.WORD T20 ;IP13 - SRC2 SURR DATA
17770 077262 103412 ;.WORD T0 ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
; AS NOT TO DESTROY ANY OF SRC1)
17771 ;
17772 077264 104774 ;.WORD T11 ;IP15 - DST DATA
17773 077266 105012 ;.WORD T12 ;IP16 - DST SURR DATA
17774 077270 105030 ;.WORD T13 ;IP17 - DST SURR LEN
17775 077272 105056 ;.WORD T14A ;IP20 - SEPARATION CONSTRAINT
17776 077274 103412 ;.WORD T0 ;IP21 - SPECIAL HANDLING
17777 077276 000000 ;.WORD 0 ;IP22
17778 077300 000000 ;.WORD 0 ;IP23
17779 077302 000000 ;.WORD 0 ;IP24

```

```

17780 ;
17781 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
17782 ;
17783 SOURCE 1 LENGTH - 1,37
17784 SOURCE 2 LENGTH - 1,37
17785 DESTINATION LENGTH - 0,1,37
17786 SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
17787 SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
17788 - SOURCE 2 STRING ALIGNED WITH DEST STRING
17789 SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
17790 - ALL DIGITS IDENTICAL = 5; SIGN +
17791 - ALL DIGITS IDENTICAL = 3; SIGN -
17792 - ALL DIGITS IDENTICAL = 0; SIGN +
17793 SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
17794 - ALL DIGITS IDENTICAL = 5; SIGN +
17795 - ALL DIGITS IDENTICAL = 3; SIGN -
17796 - ALL DIGITS IDENTICAL = 0; SIGN +
17797 ;
17798 ;TOTAL # OF TEST CONDITIONS = 384
17799 ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)384 = 1152
17800 ;

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 127-1
ADDP TABLES

```

17802
17803
17804 077304 000022
17805 077306 000003
17806 077310 103436
17807 077312 103776
17808 077314 103436
17809 077316 105116
17810 077320 103436
17811 077322 103412
17812 077324 106754
17813 077326 103412
17814 077330 103412
17815 077332 106754
17816 077334 103412
17817 077336 103412
17818
17819 077340 103412
17820 077342 103412
17821 077344 103412
17822 077346 105044
17823 077350 103662
17824 077352 000000
17825 077354 000000
17826 077356 000000
17827
17828
17829
17830
17831
17832
17833
17834
17835
17836
17837
17838
17839
17840

```

:ENTRY 49 - INSTRUCTION UNDER TEST = ADDP

```

:ADDP4: .WORD 22          :INST=ADDP
        .WORD 3          :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
        .WORD T1A       :IP1 - SRC1.LEN
        .WORD T2A       :IP2 - SRC1.ADR
        .WORD T1A       :IP3 - SRC2.LEN
        .WORD T16A      :IP4 - SRC2.ADR
        .WORD T1A       :IP5 - DST.LEN
        .WORD T0        :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD TP19      :IP7 - SRC1 DATA
        .WORD T0        :IP10 - SRC1 SURR DATA
        .WORD T0        :IP11 - SRC1 SURR LEN
        .WORD TP19      :IP12 - SRC2 DATA
        .WORD T0        :IP13 - SRC2 SURR DATA
        .WORD T0        :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        .WORD T0        :AS NOT TO DESTROY ANY OF SRC1)
        .WORD T0        :IP15 - DST DATA
        .WORD T0        :IP16 - DST SURR DATA
        .WORD T0        :IP17 - DST SURR LEN
        .WORD T14       :IP20 - SEPARATION CONSTRAINT
        .WORD TSPA      :IP21 - SPECIAL HANDLING
        .WORD 0         :IP22
        .WORD 0         :IP23
        .WORD 0         :IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
: DESTINATION LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
: SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
: SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:
: TOTAL # OF TEST CONDITIONS = 512
: TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
:

```

17842
 17843
 17844
 17845 077360 000012
 17846 077362 000001
 17847 077364 103412
 17848 077366 103766
 17849 077370 103412
 17850 077372 105606
 17851 077374 103416
 17852 077376 103412
 17853 077400 107504
 17854 077402 104742
 17855 077404 104760
 17856 077406 107504
 17857 077410 106024
 17858 077412 103412
 17859
 17860 077414 104774
 17861 077416 103412
 17862 077420 103412
 17863 077422 107522
 17864 077424 103412
 17865 077426 000000
 17866 077430 000000
 17867 077432 000000
 17868
 17869
 17870
 17871
 17872
 17873
 17874
 17875
 17876
 17877
 17878
 17879
 17880
 17881
 17882

```

.SBTTL          ADDN TABLES
:ENTRY 50 - INSTRUCTION UNDER TEST = ADDN
:
:ADDN: .WORD    12          :INST=ADDN
        .WORD    1          :TYPE = 1
        .WORD    T0         :IP1 - SRC1.LEN
        .WORD    T2         :IP2 - SRC1.ADR
        .WORD    T0         :IP3 - SRC2.LEN
        .WORD    T16Z       :IP4 - SRC2.ADR
        .WORD    XT1        :IP5 - DST.LEN
        .WORD    T0         :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD    T42        :IP7 - SRC1 DATA
        .WORD    T7         :IP10 - SRC1 SURR DATA
        .WORD    T10        :IP11 - SRC1 SURR LEN
        .WORD    T42        :IP12 - SRC2 DATA
        .WORD    T20        :IP13 - SRC2 SURR DATA
        .WORD    T0         :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        : AS NOT TO DESTROY ANY OF SRC1)
        .WORD    T11        :IP15 - DST DATA
        .WORD    T0         :IP16 - DST SURR DATA
        .WORD    T0         :IP17 - DST SURR LEN
        .WORD    T43        :IP20 - SEPARATION CONSTRAINT
        .WORD    T0         :IP21 - SPECIAL HANDLING
        .WORD    0          :IP22
        .WORD    0          :IP23
        .WORD    0          :IP24
    
```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASS'GNMENTS:
:
:SOURCE 1 LENGTH - 0
:SOURCE 2 LENGTH - 0
:DESTINATION LENGTH - 0,1,5
:SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:                               - SOURCE 2 STRINGS ALIGNED WITH DESTINATION STRING
:SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
:SOURCE 2 DATA - ALL DIGITS IDENTICAL 9; SIGN +; HIGH NIBBLE -17
:
:TOTAL # OF TEST CONDITIONS - 6
:TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)6 42
:
    
```

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 CZKEEC.P11 ADDN TABLES

```

17884                                     ;ENTRY 51 - INSTRUCTION UNDER TEST = ADDN
17885                                     ;
17886 077434 000012                       ;ADDN1: .WORD 12                       ;INST=ADDN
17887 077436 000001                       .WORD 1                               ;TYPE = 1
17888 077440 103412                       .WORD T0                              ;IP1 - SRC1.LEN
17889 077442 103766                       .WORD T2                              ;IP2 - SRC1.ADR
17890 077444 106042                       .WORD T21                             ;IP3 - SRC2.LEN
17891 077446 105606                       .WORD T16Z                            ;IP4 - SRC2.ADR
17892 077450 103416                       .WORD XT1                             ;IP5 - DST.LEN
17893 077452 103412                       .WORD T0                              ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
17894 077454 107504                       .WORD T42                             ;IP7 - SRC1 DATA
17895 077456 104742                       .WORD T7                              ;IP10 - SRC1 SURR DATA
17896 077460 104760                       .WORD T10                             ;IP11 - SRC1 SURR LEN
17897 077462 107226                       .WORD T37                             ;IP12 - SRC2 DATA
17898 077464 106024                       .WORD T20                             ;IP13 - SRC2 SURR DATA
17899 077466 103412                       .WORD T0                              ;IP14 - SRC2 SURR LEN (LENC,H SET TO 0 SO
; AS NOT TO DESTROY ANY OF SRC1)
17900                                     ;
17901 077470 104774                       .WORD T11                             ;IP15 - DST DATA
17902 077472 105012                       .WORD T12                             ;IP16 - DST SURR DATA
17903 077474 105030                       .WORD T13                             ;IP17 - DST SURR LEN
17904 077476 105044                       .WORD T14                             ;IP20 - SEPARATION CONSTRAINT
17905 077500 103412                       .WORD T0                              ;IP21 - SPECIAL HANDLING
17906 077502 000000                       .WORD 0                               ;IP22
17907 077504 000000                       .WORD 0                               ;IP23
17908 077506 000000                       .WORD 0                               ;IP24
17909
17910
17911
17912
17913
17914
17915
17916
17917
17918
17919
17920
17921
17922
17923
17924
17925

```

;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 0
: SOURCE 2 LENGTH - 1,5
: DESTINATION LENGTH - 0,1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
: - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
: SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE - 17
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
: - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
: - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
:

```

```

: TOTAL # OF TEST CONDITIONS = 36
: TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)36 252
:

```

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 CZKEEC.P11 ADDN TABLES

```

17927
17928
17929 077510 000012
17930 077512 000001
17931 077514 106042
17932 077516 103766
17933 077520 103412
17934 077522 105606
17935 077524 103416
17936 077526 103412
17937 077530 107226
17938 077532 104742
17939 077534 104760
17940 077536 107504
17941 077540 106024
17942 077542 103412
17943
17944 077544 104774
17945 077546 105012
17946 077550 105030
17947 077552 105044
17948 077554 103412
17949 077556 000000
17950 077560 000000
17951 077562 000000
17952
17953
17954
17955
17956
17957
17958
17959
17960
17961
17962
17963
17964
17965
17966
17967
17968

```

```

:ENTRY 52 - INSTRUCTION UNDER TEST = ADDN
IADDN2: .WORD 12          ;INST=ADDN
        .WORD 1          ;TYPE = 1
        .WORD T21       ;IP1 - SRC1.LEN
        .WORD T2        ;IP2 - SRC1.ADR
        .WORD T0        ;IP3 - SRC2.LEN
        .WORD T16Z      ;IP4 - SRC2.ADR
        .WORD XT1       ;IP5 - DST.LEN
        .WORD T0        ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD T37       ;IP7 - SRC1 DATA
        .WORD T7        ;IP10 - SRC1 SURR DATA
        .WORD T10       ;IP11 - SRC1 SURR LEN
        .WORD T42       ;IP12 - SRC2 DATA
        .WORD T20       ;IP13 - SRC2 SURR DATA
        .WORD T0        ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        ; AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11       ;IP15 - DST DATA
        .WORD T12       ;IP16 - DST SURR DATA
        .WORD T13       ;IP17 - DST SURR LEN
        .WORD T14       ;IP20 - SEPARATION CONSTRAINT
        .WORD T0        ;IP21 - SPECIAL HANDLING
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 1,5
: SOURCE 2 LENGTH - 0
: DESTINATION LENGTH - 0,1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
: - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
: SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE - 7
: - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE - 8
: - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE - 1
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
:

```

```

:TOTAL # OF TEST CONDITIONS = 36
:TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)36 - 252
:

```

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CZKEEC.P11

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ADDN TABLES .

17970
17971
17972 077564 000012
17973 077566 000001
17974 077570 106056
17975 077572 103766
17976 077574 106074
17977 077576 105606
17978 077600 103616
17979 077602 103412
17980 077604 107256
17981 077606 104742
17982 077610 104760
17983 077612 107256
17984 077614 106024
17985 077616 103412
17986
17987 077620 104774
17988 077622 103412
17989 077624 103412
17990 077626 107536
17991 077630 103412
17992 077632 000000
17993 077634 000000
17994 077636 000000
17995
17996
17997
17998
17999
18000
18001
18002
18003
18004
18005
18006
18007
18008
18009
18010
18011
18012
18013
18014
18015

:ENTRY 53 - INSTRUCTION UNDER TEST = ADDN

```

:ADDN3: .WORD 12          ;INST=ADDN
        .WORD 1          ;TYPE = 1
        .WORD T211      ;IP1 - SRC1.LEN
        .WORD T2        ;IP2 - SRC1.ADR
        .WORD T212      ;IP3 - SRC2.LEN
        .WORD T16Z      ;IP4 - SRC2.ADR
        .WORD T12       ;IP5 - DST.LEN
        .WORD T0        ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD T37A      ;IP7 - SRC1 DATA
        .WORD T7        ;IP10 - SRC1 SURR DATA
        .WORD T10       ;IP11 - SRC1 SURR L'N
        .WORD T37A      ;IP12 - SRC2 DATA
        .WORD T20       ;IP13 - SRC2 SURR DATA
        .WORD T0        ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        ; AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11      ;IP15 - DST DATA
        .WORD T0        ;IP16 - DST SURR DATA
        .WORD T0        ;IP17 - DST SURR LEN
        .WORD T43A      ;IP20 - SEPARATION CONSTRAINT
        .WORD T0        ;IP21 - SPECIAL HANDLING
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:SOURCE 1 LENGTH - 1,37
:SOURCE 2 LENGTH - 1,37
:DESTINATION LENGTH - 0,1,37
:SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:                               - SOURCE 2 STRING ALIGNED WITH DEST STRING
:SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
:                - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
:                - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
:                - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
:                - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 8
:                - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 1
:                - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +

```

:TOTAL # OF TEST CONDITIONS = 384
:TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)384 - 2688

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 C7KEEC.P11 ADDN TABLES

```

18017 ;ENTRY 54 - INSTRUCTION UNDER TEST = ADDN
18018 ;
18019 ;ADDN4: .WORD 12 ;INST=ADDN
18020 ;.WORD 3 ;TYPE = 1(BIT 0);11/44 OV TABLE(BIT 1 1)
18021 ;.WORD T1A ;IP1 - SRC1.LEN
18022 ;.WORD T2A ;IP2 - SRC1.ADR
18023 ;.WORD T1A ;IP3 - SRC2.LEN
18024 ;.WORD T16ZA ;IP4 - SRC2.ADR
18025 ;.WORD T1A ;IP5 - DST.LEN
18026 ;.WORD T0 ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
18027 ;.WORD T219 ;IP7 - SRC1 DATA
18028 ;.WORD T0 ;IP10 - SRC1 SURR DATA
18029 ;.WORD T0 ;IP11 - SRC1 SURR LEN
18030 ;.WORD T219 ;IP12 - SRC2 DATA
18031 ;.WORD T0 ;IP13 - SRC2 SURR DATA
18032 ;.WORD T0 ;IP14 - SRC2 SURR LEN (LFNGTH SET TO 0 SO
18033 ; AS NOT TO DESTROY ANY OF SRC1)
18034 ;.WORD T0 ;IP15 - DST DATA
18035 ;.WORD T0 ;IP16 - DST SURR DATA
18036 ;.WORD T0 ;IP17 - DST SURR LEN
18037 ;.WORD T14 ;IP20 - SEPARATION CONSTRAINT
18038 ;.WORD TSPA ;IP21 - SPECIAL HANDLING
18039 ;.WORD 0 ;IP22
18040 ;.WORD 0 ;IP23
18041 ;.WORD 0 ;IP24

```

```

18042 ;
18043 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
18044 ;
18045 ; SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
18046 ; SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
18047 ; DESTINATION LENGTH - 0,1,2,3,4,5,11,20
18048 ; SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
18049 ; SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
18050 ; SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
18051 ; SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
18052 ;
18053 ;TOTAL # OF TEST CONDITIONS = 512
18054 ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 - 512
18055 ;

```

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 CZKEEC.P11 ADDN TABLES

```

18057
18058
18059 077714 000012
18060 077716 000001
18061 077720 103474
18062 077722 104004
18063 077724 103474
18064 077726 105540
18065 077730 105044
18066 077732 103412
18067 077734 107314
18068 077736 103412
18069 077740 103412
18070 077742 107314
18071 077744 103412
18072 077746 103412
18073
18074 077750 103412
18075 077752 103412
18076 077754 103412
18077 077756 105044
18078 077760 103412
18079 077762 000000
18080 077764 000000
18081 077766 000000
18082
18083
18084
18085
18086
18087
18088
18089
18090
18091
18092
18093
18094
18095

```

:ENTRY 54A - INSTRUCTION UNDER TEST = ADDN

```

:
:ADDN5: .WORD 12 ;INST=ADDN
: .WORD 1 ;TYPE = 1
: .WORD T1C ;IP1 - SRC1.LEN
: .WORD T2AA ;IP2 - SRC1.ADR
: .WORD T1C ;IP3 - SRC2.LEN
: .WORD T16ZA ;IP4 - SRC2.ADR
: .WORD T14 ;IP5 - DST.LEN
: .WORD T0 ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
: .WORD T219 ;IP7 - SRC1 DATA
: .WORD T0 ;IP10 - SRC1 SURR DATA
: .WORD T0 ;IP11 - SRC1 SURR LEN
: .WORD T219 ;IP12 - SRC2 DATA
: .WORD T0 ;IP13 - SRC2 SURR DATA
: .WORD T0 ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
: AS NOT TO DESTROY ANY OF SRC1)
: .WORD T0 ;IP15 - DST DATA
: .WORD T0 ;IP16 - DST SURR DATA
: .WORD T0 ;IP17 - DST SURR LEN
: .WORD T14 ;IP20 - SEPARATION CONSTRAINT
: .WORD T0 ;IP21 - SPECIAL HANDLING
: .WORD 0 ;IP22
: .WORD 0 ;IP23
: .WORD 0 ;IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 2,4,6
: SOURCE 2 LENGTH - 2,4,6
: DESTINATION LENGTH - 10
: SOURCE 1 ADDRESS - 200,201 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
: SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
: SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:
: TOTAL # OF TEST CONDITIONS = 18
: TOTAL # OF TESTS = (6 DATA TYPES + 1 IN-LINE)18 = 126
:

```


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 (ZKEEC.P11) SUBP TABLES

```

18097          .SBTTL          SUBP TABLES
18098          :ENTRY 55 - INSTRUCTION UNDER TEST = SUBP
18099
18100 077770 000023          :SUBP: .WORD 23          :INST=SUBP
18101 077772 000001          .WORD 1          :TYPE = 1
18102 077774 103412          .WORD T0          :IP1 - SRC1.LEN
18103 077776 103766          .WORD T2          :IP2 - SRC1.ADR
18104 100000 103412          .WORD T0          :IP3 - SRC2.LEN
18105 100002 105234          .WORD T16         :IP4 - SRC2.ADR
18106 100004 103416          .WORD XT1         :IP5 - DST.LEN
18107 100006 103412          .WORD T0          :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
18108 100010 106152          .WORD T22         :IP7 - SRC1 DATA
18109 100012 104742          .WORD T7          :IP10 - SRC1 SURR DATA
18110 100014 104760          .WORD T10         :IP11 - SRC1 SURR LEN
18111 100016 106152          .WORD T22         :IP12 - SRC2 DATA
18112 100020 106024          .WORD T20         :IP13 - SRC2 SURR DATA
18113 100022 103412          .WORD T0          :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
18114          : AS NOT TO DESTROY ANY OF SRC1)
18115 100024 104774          .WORD T11         :IP15 - DST DATA
18116 100026 105012          .WORD T12         :IP16 - DST SURR DATA
18117 100030 105030          .WORD T13         :IP17 - DST SURR LEN
18118 100032 105044          .WORD T14         :IP20 - SEPARATION CONSTRAINT
18119 100034 103412          .WORD T0          :IP21 - SPECIAL HANDLING
18120 100036 000000          .WORD 0          :IP22
18121 100040 000000          .WORD 0          :IP23
18122 100042 000000          .WORD 0          :IP24

```

```

18123          :THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
18124          :
18125          : SOURCE 1 LENGTH - 0
18126          : SOURCE 2 LENGTH - 0
18127          : DESTINATION LENGTH - 0,1,5
18128          : SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
18129          : SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
18130          : - SOURCE 2 STRINGS ALIGNED WITH DESTINATION STRING
18131          : SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
18132          : SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
18133          :
18134          : TOTAL # OF TEST CONDITIONS = 6
18135          : TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)6 - 18
18136          :
18137          :

```

18139
 18140
 18141
 18142
 18143 100044 000323
 18144 100046 000301
 18145 100050 103412
 18146 100052 103766
 18147 100054 106042
 18148 100056 105234
 18149 100060 103416
 18150 100062 103412
 18151 100064 106152
 18152 100066 104742
 18153 100070 104760
 18154 100072 105750
 18155 100074 106024
 18156 100076 103412
 18157
 18158 100100 104774
 18159 100102 105012
 18160 100104 105030
 18161 100106 105044
 18162 100110 103412
 18163 100112 000000
 18164 100114 000000
 18165 100116 000000
 18166
 18167
 18168
 18169
 18170
 18171
 18172
 18173
 18174
 18175
 18176
 18177
 18178
 18179
 18180
 18181
 18182
 18183

```

:ENTRY 56 - INSTRUCTION UNDER TEST = SUBP
:SUBP1: .WORD 23          ;INST=SUBP
        .WORD 1          ;TYPE = 1
        .WORD T0        ;IP1 - SRC1.LEN
        .WORD T2        ;IP2 - SRC1.ADR
        .WORD T2        ;IP3 - SRC2.LEN
        .WORD T16       ;IP4 - SRC2.ADR
        .WORD XT1       ;IP5 - DST.LEN
        .WORD T0        ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD T22       ;IP7 - SRC1 DATA
        .WORD T7        ;IP10 - SRC1 SURR DATA
        .WORD T10       ;IP11 - SRC1 SURR LEN
        .WORD T17       ;IP12 - SRC2 DATA
        .WORD T20       ;IP13 - SRC2 SURR DATA
        .WORD T0        ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        ; AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11       ;IP15 - DST DATA
        .WORD T12       ;IP16 - DST SURR DATA
        .WORD T13       ;IP17 - DST SURR LEN
        .WORD T14       ;IP20 - SEPARATION CONSTRAINT
        .WORD T0        ;IP21 - SPECIAL HANDLING
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24
  
```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:SOURCE 1 LENGTH - 0
:SOURCE 2 LENGTH - 1,5
:DESTINATION LENGTH - 0,1,5
:SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:                               - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
:SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
:SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:                - ALL DIGITS IDENTICAL = 5; SIGN +
:                - ALL DIGITS IDENTICAL = 3; SIGN -
:                - ALL DIGITS IDENTICAL = 0; SIGN +
:
:TOTAL # OF TEST CONDITIONS = 48
:TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
:
  
```

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 CZKEEC.P11 SUBP TABLES

```

18185 ;ENTRY 57 - INSTRUCTION UNDER TEST = SUBP
18186 ;
18187 100120 000023 ;SUBP2: .WORD 23 ;INST=SUBP
18188 100122 000001 ;.WORD 1 ;TYPE = 1
18189 100124 106042 ;.WORD T21 ;IP1 - SRC1.LEN
18190 100126 103766 ;.WORD T2 ;IP2 - SRC1.ADR
18191 100130 103412 ;.WORD T0 ;IP3 - SRC2.LEN
18192 100132 105234 ;.WORD T16 ;IP4 - SRC2.ADR
18193 100134 103416 ;.WORD XT1 ;IP5 - DST.LEN
18194 100136 103412 ;.WORD T0 ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
18195 100140 105750 ;.WORD T17 ;IP7 - SRC1 DATA
18196 100142 104742 ;.WORD T7 ;IP10 - SRC1 SURR DATA
18197 100144 104760 ;.WORD T10 ;IP11 - SRC1 SURR LEN
18198 100146 106152 ;.WORD T22 ;IP12 - SRC2 DATA
18199 100150 106024 ;.WORD T20 ;IP13 - SRC2 SURR DATA
18200 100152 103412 ;.WORD T0 ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
18201 ; AS NOT TO DESTROY ANY OF SRC1)
18202 100154 104774 ;.WORD T11 ;IP15 - DST DATA
18203 100156 105012 ;.WORD T12 ;IP16 - DST SURR DATA
18204 100160 105030 ;.WORD T13 ;IP17 - DST SURR LEN
18205 100162 105044 ;.WORD T14 ;IP20 - SEPARATION CONSTRAINT
18206 100164 103412 ;.WORD T0 ;IP21 - SPECIAL HANDLING
18207 100166 000000 ;.WORD 0 ;IP22
18208 100170 000000 ;.WORD 0 ;IP23
18209 100172 000000 ;.WORD 0 ;IP24

```

```

18210 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
18211 ;
18212 ; SOURCE 1 LENGTH - 1,5
18213 ; SOURCE 2 LENGTH - 0
18214 ; DESTINATION LENGTH - 0,1,5
18215 ; SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
18216 ; SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
18217 ; - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
18218 ; SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
18219 ; - ALL DIGITS IDENTICAL = 5; SIGN +
18220 ; - ALL DIGITS IDENTICAL = 3; SIGN -
18221 ; - ALL DIGITS IDENTICAL = 0; SIGN +
18222 ; SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
18223 ;
18224 ; TOTAL # OF TEST CONDITIONS =48
18225 ; TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 144
18226 ;
18227 ;

```

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CZKFEC.P11

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SUBP TABLES

18229
18230
18231 100174 000023
18232 100176 000001
18233 100200 106056
18234 100202 103766
18235 100204 106074
18236 100206 105234
18237 100210 103616
18238 100212 103412
18239 100214 105750
18240 100216 104742
18241 100220 104760
18242 100222 105750
18243 100224 106024
18244 100226 103412
18245
18246 100230 104774
18247 100232 105012
18248 100234 105030
18249 100236 105056
18250 100240 103412
18251 100242 000000
18252 100244 000000
18253 100246 000000
18254
18255
18256
18257
18258
18259
18260
18261
18262
18263
18264
18265
18266
18267
18268
18269
18270
18271
18272
18273
18274

:ENTRY 58 - INSTRUCTION UNDER TEST = SUBP

```

:ISUBP3: .WORD 23          :INST=SUBP
          .WORD 1          :TYPE = 1
          .WORD T211       :IP1 - SRC1.LEN
          .WORD T2         :IP2 - SRC1.ADR
          .WORD T212       :IP3 - SRC2.LEN
          .WORD T16        :IP4 - SRC2.ADR
          .WORD T17        :IP5 - DST.LEN
          .WORD T0         :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
          .WORD T17        :IP7 - SRC1 DATA
          .WORD T7         :IP10 - SRC1 SURR DATA
          .WORD T10        :IP11 - SRC1 SURR LEN
          .WORD T17        :IP12 - SRC2 DATA
          .WORD T20        :IP13 - SRC2 SURR DATA
          .WORD T0         :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
          : AS NOT TO DESTROY ANY OF SRC1)
          .WORD T11        :IP15 - DST DATA
          .WORD T12        :IP16 - DST SURR DATA
          .WORD T13        :IP17 - DST SURR LEN
          .WORD T14A       :IP20 - SEPARATION CONSTRAINT
          .WORD T0         :IP21 - SPECIAL HANDLING
          .WORD 0          :IP22
          .WORD 0          :IP23
          .WORD 0          :IP24
    
```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS

```

:SOURCE 1 LENGTH - 1,37
:SOURCE 2 LENGTH - 1,37
:DESTINATION LENGTH - 0,1,37
:SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:                               - SOURCE 2 STRING ALIGNED WITH DEST STRING
:SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:                   - ALL DIGITS IDENTICAL = 5; SIGN +
:                   - ALL DIGITS IDENTICAL = 3; SIGN -
:                   - ALL DIGITS IDENTICAL = 0; SIGN +
:SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:                   - ALL DIGITS IDENTICAL = 5; SIGN +
:                   - ALL DIGITS IDENTICAL = 3; SIGN -
:                   - ALL DIGITS IDENTICAL = 0; SIGN +
    
```

```

:TOTAL # OF TEST CONDITIONS = 384
:TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)384 1152
    
```

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 CZKEEC.P11 SUBP TABLES

```

18276 ;ENTRY 59 - INSTRUCTION UNDER TEST = SUBP
18277 ;
18278 100250 000023 ;SUBP4: .WORD 23 ;INST=SUBP
18279 100252 000001 ;.WORD 1 ;TYPE = 1
18280 100254 103436 ;.WORD T1A ;IP1 - SRC1.LEN
18281 100256 103776 ;.WORD T2A ;IP2 - SRC1.ADR
18282 100260 103436 ;.WORD T1A ;IP3 - SRC2.LEN
18283 100262 105116 ;.WORD T16A ;IP4 - SRC2.ADR
18284 100264 103436 ;.WORD T1A ;IP5 - DST.LEN
18285 100266 103412 ;.WORD T0 ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
18286 100270 106754 ;.WORD TP19 ;IP7 - SRC1 DATA
18287 100272 103412 ;.WORD T0 ;IP10 - SRC1 SURR DATA
18288 100274 103412 ;.WORD T0 ;IP11 - SRC1 SURR LEN
18289 100276 106754 ;.WORD TP19 ;IP12 - SRC2 DATA
18290 100300 103412 ;.WORD T0 ;IP13 - SRC2 SURR DATA
18291 100302 103412 ;.WORD T0 ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
; AS NOT TO DESTROY ANY OF SRC1)
18292 ;
18293 100304 103412 ;.WORD T0 ;IP15 - DST DATA
18294 100306 103412 ;.WORD T0 ;IP16 - DST SURR DATA
18295 100310 103412 ;.WORD T0 ;IP17 - DST SURR LEN
18296 100312 105044 ;.WORD T14 ;IP20 - SEPARATION CONSTRAINT
18297 100314 103662 ;.WORD TSPA ;IP21 - SPECIAL HANDLING
18298 100316 000000 ;.WORD 0 ;IP22
18299 100320 000000 ;.WORD 0 ;IP23
18300 100322 000000 ;.WORD 0 ;IP24

```

```

18301 ;
18302 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
18303 ;
18304 ; SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
18305 ; SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
18306 ; DESTINATION LENGTH - 0,1,2,3,4,5,11,20
18307 ; SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
18308 ; SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
18309 ; SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
18310 ; SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
18311 ;
18312 ;TOTAL # OF TEST CONDITIONS = 512
18313 ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
18314 ;

```

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 CZKEEC.P11 SUBN TABLES

```

18316
18317
18318
18319 100324 000013
18320 100326 000001
18321 100330 103412
18322 100332 103766
18323 100334 103412
18324 100336 105606
18325 100340 103416
18326 100342 103412
18327 100344 107504
18328 100346 104742
18329 100350 104760
18330 100352 107504
18331 100354 106024
18332 100356 103412
18333
18334 100360 104774
18335 100362 103412
18336 100364 103412
18337 100366 107522
18338 100370 103412
18339 100372 000000
18340 100374 000000
18341 100376 000000
18342
18343
18344
18345
18346
18347
18348
18349
18350
18351
18352
18353
18354
18355
18356

.SBTTL          SUBN TABLES
:ENTRY 60 - INSTRUCTION UNDER TEST = SUBN
:SUBN:
:WORD 13          :INST=SUBN
:WORD 1           :TYPE - 1
:WORD T0          :IP1 - SRC1.LEN
:WORD T2          :IP2 - SRC1.ADR
:WORD T0          :IP3 - SRC2.LEN
:WORD T16Z        :IP4 - SRC2.ADR
:WORD XT1         :IP5 - DST.LEN
:WORD T0          :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
:WORD T42         :IP7 - SRC1 DATA
:WORD T7          :IP10 - SRC1 SURR DATA
:WORD T10         :IP11 - SRC1 SURR LEN
:WORD T42         :IP12 - SRC2 DATA
:WORD T20         :IP13 - SRC2 SURR DATA
:WORD T0          :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
:                : AS NOT TO DESTROY ANY OF SRC1)
:WORD T11         :IP15 - DST DATA
:WORD T0          :IP16 - DST SURR DATA
:WORD T0          :IP17 - DST SURR LEN
:WORD T43         :IP20 - SEPARATION CONSTRAINT
:WORD T0          :IP21 - SPECIAL HANDLING
:WORD 0           :IP22
:WORD 0           :IP23
:WORD 0           :IP24

```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS.

```

:
: SOURCE 1 LENGTH - 0
: SOURCE 2 LENGTH - 0
: DESTINATION LENGTH - 0,1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:                               - SOURCE 2 STRINGS ALIGNED WITH DESTINATION STRING
: SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE 17
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE 17

```

```

: TOTAL # OF TEST CONDITIONS = 6
: TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)6 = 42
:

```

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CZKEEC.P11

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SUBN TABLES

18358
18359
18360 100400 000013
18361 100402 000001
18362 100404 103412
18363 100406 10376E
18364 100410 106042
18365 100412 105606
18366 100414 103416
18367 100416 103412
18368 100420 107504
18369 100422 104742
18370 100424 104760
18371 100426 107226
18372 100430 106024
18373 100432 103412
18374
18375 100434 104774
18376 100436 105012
18377 100440 105030
18378 100442 105044
18379 100444 103412
18380 100446 000000
18381 100450 000000
18382 100452 000000
18383
18384
18385
18386
18387
18388
18389
18390
18391
18392
18393
18394
18395
18396
18397
18398
18399

:ENTRY 61 - INSTRUCTION UNDER TEST = SUBN

```

:ISUBN1: .WORD 13          :INST=SUBN
          .WORD 1          :TYPE = 1
          .WORD T0         :IP1 - SRC1.LEN
          .WORD T2         :IP2 - SRC1.ADR
          .WORD T21        :IP3 - SRC2.LEN
          .WORD T16Z       :IP4 - SRC2.ADR
          .WORD XT1        :IP5 - DST.LEN
          .WORD T0         :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
          .WORD T42        :IP7 - SRC1 DATA
          .WORD T7         :IP10 - SRC1 SURR DATA
          .WORD T10        :IP11 - SRC1 SURR LEN
          .WORD T37        :IP12 - SRC2 DATA
          .WORD T20        :IP13 - SRC2 SURR DATA
          .WORD T0         :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
          : AS NOT TO DESTROY ANY OF SRC1)
          .WORD T11        :IP15 - DST DATA
          .WORD T12        :IP16 - DST SURR DATA
          .WORD T13        :IP17 - DST SURR LEN
          .WORD T14        :IP20 - SEPARATION CONSTRAINT
          .WORD T0         :IP21 - SPECIAL HANDLING
          .WORD 0          :IP22
          .WORD 0          :IP23
          .WORD 0          :IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 0
: SOURCE 2 LENGTH - 1,5
: DESTINATION LENGTH - 0,1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:   - SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
: SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE - 17
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE = 7
:   - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE - 8
:   - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE - 1
:

```

:TOTAL # OF TEST CONDITIONS = 36

:TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)36 = 252

18401
 18402
 18403
 18404
 18405 100454 000013
 18406 100456 000001
 18407 100460 106042
 18408 100462 103766
 18409 100464 103412
 18410 100466 105606
 18411 100470 103416
 18412 100472 103412
 18413 100474 107226
 18414 100476 104742
 18415 100500 104760
 18416 100502 107504
 18417 100504 106024
 18418 100506 103412
 18419
 18420 100510 104774
 18421 100512 105012
 18422 100514 105030
 18423 100516 105044
 18424 100520 103412
 18425 100522 000000
 18426 100524 000000
 18427 100526 000000
 18428
 18429
 18430
 18431
 18432
 18433
 18434
 18435
 18436
 18437
 18438
 18439
 18440
 18441
 18442
 18443
 18444

: ENTRY 62 - INSTRUCTION UNDER TEST = SUBN

```

:SUBN2: .WORD 13          ;INST=SUBN
        .WORD 1          ;TYPE = 1
        .WORD T21        ;IP1 - SRC1.LEN
        .WORD T2         ;IP2 - SRC1.ADR
        .WORD T0         ;IP3 - SRC2.LEN
        .WORD T16Z       ;IP4 - SRC2.ADR
        .WORD XT1        ;IP5 - DST.LEN
        .WORD T0         ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD T37        ;IP7 - SRC1 DATA
        .WORD T7         ;IP10 - SRC1 SURR DATA
        .WORD T10        ;IP11 - SRC1 SURR LEN
        .WORD T42        ;IP12 - SRC2 DATA
        .WORD T20        ;IP13 - SRC2 SURR DATA
        .WORD T0         ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        ; AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11        ;IP15 - DST DATA
        .WORD T12        ;IP16 - DST SURR DATA
        .WORD T13        ;IP17 - DST SURR LEN
        .WORD T14        ;IP20 - SEPARATION CONSTRAINT
        .WORD T0         ;IP21 - SPECIAL HANDLING
        .WORD 0          ;IP22
        .WORD 0          ;IP23
        .WORD 0          ;IP24

```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

SOURCE 1 LENGTH - 1,5
SOURCE 2 LENGTH - 0
DESTINATION LENGTH - 0,1,5
SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
- SOURCE 2 STRING ALIGNED WITH DESTINATION STRING
SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +; HIGH NIBBLE - 7
- ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE 8
- ALL DIGITS IDENTICAL 0; SIGN -; HIGH NIBBLE 1
SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE 17

```

```

: TOTAL # OF TEST CONDITIONS - 36
: TOTAL # OF TESTS - (6 DATA TYPES + 1 INLINE) 36 252

```


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CZKEEC.P11MACY11 27(655) 25-MAR-81 12:25 PAGE 140-1
SUBN TABLES

```

18493          :ENTRY 64 - INSTRUCTION UNDER TEST = SUBN
18494          :
18495 100604 000013  :ISUBN4: .WORD 13          :INST=SUBN
18496 100606 000001  :          .WORD 1          :TYPE = 1
18497 100610 103436  :          .WORD T1A        :IP1 - SRC1.LEN
18498 100612 103776  :          .WORD T2A        :IP2 - SRC1.ADR
18499 100614 103436  :          .WORD T1A        :IP3 - SRC2.LEN
18500 100616 105540  :          .WORD T16ZA      :IP4 - SRC2.ADR
18501 100620 103436  :          .WORD T1A        :IP5 - DST.LEN
18502 100622 103412  :          .WORD T0         :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
18503 100624 107314  :          .WORD TZ19       :IP7 - SRC1 DATA
18504 100626 103412  :          .WORD T0         :IP10 - SRC1 SURR DATA
18505 100630 103412  :          .WORD T0         :IP11 - SRC1 SURR LFN
18506 100632 107314  :          .WORD TZ19       :IP12 - SRC2 DATA
18507 100634 103412  :          .WORD T0         :IP13 - SRC2 SURR DATA
18508 100636 103412  :          .WORD T0         :IP14 - SRC? SURR LEN (LENGTH SET TO 0 SO
18509          :          : AS NOT TO DESTROY ANY OF SRC1)
18510 100640 103412  :          .WORD T0         :IP15 - DST DATA
18511 100642 103412  :          .WORD T0         :IP16 - DST SURR DATA
18512 100644 103412  :          .WORD T0         :IP17 - DST SURR LEN
18513 100646 105044  :          .WORD T14        :IP21 - SEPARATION CONSTRAINT
18514 100650 103662  :          .WORD TSPA       :IP21 - SPECIAL HANDLING
18515 100652 000000  :          .WORD 0          :IP22
18516 100654 000000  :          .WORD 0          :IP23
18517 100656 000000  :          .WORD 0          :IP24
18518          :
18519          :THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
18520          :
18521          :   SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
18522          :   SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
18523          :   DESTINATION LENGTH - 0,1,2,3,4,5,11,20
18524          :   SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
18525          :   SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
18526          :   SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
18527          :   SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
18528          :
18529          :TOTAL # OF TEST CONDITIONS = 512
18530          :TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
18531          :

```

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 CZKEEC.P11 (MPP TABLES)

```

18533          .SBTTL          CMPP TABLES
18534          :ENTRY 65 - INSTRUCTION UNDER TEST = CMPP
18535          :
18536          :CMPP: .WORD 24          :INST = CMPP
18537          :          .WORD 3          :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
18538          :          .WORD T0         :IP1 - SRC1.LEN
18539          :          .WORD T2         :IP2 - SRC1.ADR
18540          :          .WORD T0         :IP3 - SRC2.LEN
18541          :          .WORD T44        :IP4 - SRC2.ADR
18542          :          .WORD T5         :IP5 - UNUSED PORTION OF REG. 4
18543          :          .WORD T22        :IP6 - SRC1.DATA
18544          :          .WORD T20        :IP7 - SRC1.SURR.DATA
18545          :          .WORD T0         :IP10 - SRC1.SURR.LEN
18546          :          .WORD T22        :IP11 - SRC2.DATA
18547          :          .WORD T7         :IP12 - SRC2.SURR.DATA
18548          :          .WORD T10        :IP13 - SRC2.SURR.LEN
18549          :          .WORD T43        :IP14 - SEPARATION CONSTANT
18550          :          .WORD T0         :IP15 - SPECIAL HANDLING
18551          :          .WORD 0          :IP16
18552          :          .WORD 0          :IP17
18553          :          .WORD 0          :IP20
18554          :          .WORD 0          :IP21
18555          :          .WORD 0          :IP22
18556          :          .WORD 0          :IP23
18557          :          .WORD 0          :IP24
18558          :
18559          :THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
18560          :
18561          :          SOURCE 1 LENGTH - 0
18562          :          SOURCE 2 LENGTH - 0
18563          :          SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
18564          :          SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
18565          :          - ALIGNED SOURCE 1 - SOURCE 2 STRINGS
18566          :          SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
18567          :          SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
18568          :
18569          :TOTAL # OF TEST CONDITIONS = 2
18570          :TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)2 = 6
18571          :

```


PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 141-3
 ZKEEC.F11 CMPP TABLES

```

18657
18658      ;ENTRY 68 - INSTRUCTION UNDER TEST = CMPP
18659      ;
18660      ;CMPP3: .WORD 24      ;INST = CMPP
18661      .WORD 1      ;TYPE = 1
18662      .WORD T211    ;IP1 - SRC1.LEN
18663      .WORD T2      ;IP2 - SRC1.ADR
18664      .WORD T212    ;IP3 - SRC2.LEN
18665      .WORD T44     ;IP4 - SRC2.ADR
18666      .WORD T5      ;IP5 - UNUSED PORTION OF REG. 4
18667      .WORD T45     ;IP6 - SRC1.DATA
18668      .WORD T20     ;IP7 - SRC1.SURR.DATA
18669      .WORD T0      ;IP10 - SRC1.SURR.LEN
18670      .WORD T45     ;IP11 - SRC2.DATA
18671      .WORD T7      ;IP12 - SRC2.SURR.DATA
18672      .WORD T10     ;IP13 - SRC2.SURR.LEN
18673      .WORD T43     ;IP14 - SEPARATION CONSTANT
18674      .WORD T0      ;IP15 - SPECIAL HANDLING
18675      .WORD 0      ;IP16
18676      .WORD 0      ;IP17
18677      .WORD 0      ;IP20
18678      .WORD 0      ;IP21
18679      .WORD 0      ;IP22
18680      .WORD 0      ;IP23
18681      .WORD 0      ;IP24

```

```

18682
18683      ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
18684      ;

```

```

18685      ;SOURCE 1 LENGTH - 1,37
18686      ;SOURCE 2 LENGTH - 1,37
18687      ;SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
18688      ;SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
18689      ;SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
18690      ;                   - ALL DIGITS IDENTICAL = 3; SIGN -
18691      ;                   - ALL DIGITS IDENTICAL = 0; SIGN +
18692      ;                   - ALL DIGITS IDENTICAL = 0; SIGN -
18693      ;SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
18694      ;                   - ALL DIGITS IDENTICAL = 3; SIGN -
18695      ;                   - ALL DIGITS IDENTICAL = 0; SIGN +
18696      ;                   - ALL DIGITS IDENTICAL = 0; SIGN -

```

```

18697
18698      ;TOTAL # OF TEST CONDITIONS = 128
18699      ;TOTAL # OF TESTS = (2 DATA TYPES * 1 [INLINE] 128) 384
18700

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 141-4
CMPP TABLES

18702
18703
18704 101140 000024
18705 101142 000003
18706 101144 103436
18707 101146 103776
18708 101150 103436
18709 101152 107552
18710 101154 104660
18711 101156 106754
18712 101160 103412
18713 101162 103412
18714 101164 106754
18715 101166 103412
18716 101170 103412
18717 101172 105044
18718 101174 103662
18719 101176 000000
18720 101200 000000
18721 101202 000000
18722 101204 000000
18723 101206 000000
18724 101210 000000
18725 101212 000000
18726
18727
18728
18729
18730
18731
18732
18733
18734
18735
18736
18737
18738

:ENTRY 69 - INSTRUCTION UNDER TEST = CMPP

```

:EMPP4: .WORD 24          :INST = CMPP
        .WORD 3          :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1 1)
        .WORD T1A       :IP1 - SRC1.LEN
        .WORD T2A       :IP2 - SRC1.ADR
        .WORD T1A       :IP3 - SRC2.LEN
        .WORD T44A      :IP4 - SRC2.ADR
        .WORD T5        :IP5 - UNUSED PORTION OF REG. 4
        .WORD TP19      :IP6 - SRC1.DATA
        .WORD T0        :IP7 - SRC1.SURR.DATA
        .WORD T0        :IP10 - SRC1.SURR.LEN
        .WORD TP19      :IP11 - SRC2.DATA
        .WORD T0        :IP12 - SRC2.SURR.DATA
        .WORD T0        :IP13 - SRC2.SURR.LEN
        .WORD T14       :IP14 - SEPARATION CONSTANT
        .WORD TSPA      :IP15 - SPECIAL HANDLING
        .WORD 0         :IP16
        .WORD 0         :IP17
        .WORD 0         :IP20
        .WORD 0         :IP21
        .WORD 0         :IP22
        .WORD 0         :IP23
        .WORD 0         :IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS - NO OVERLAP OF ANY OF THE STRINGS
: SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234000891233; SIGN +
: SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:
: TOTAL # OF TEST CONDITIONS = 64
: TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)64 = 64
:

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 142
CZKEEC.P11 CMPN TABLES

18740
18741
18742
18743 101214 000014
18744 101216 000001
18745 101220 103412
18746 101222 103766
18747 101224 103412
18748 101226 110006
18749 101230 104660
18750 101232 107504
18751 101234 106024
18752 101236 103412
18753 101240 107504
18754 101242 104742
18755 101244 104760
18756 101246 105044
18757 101250 103412
18758 101252 000000
18759 101254 000000
18760 101256 000000
18761 101260 000000
18762 101262 000000
18763 101264 000000
18764 101266 000000
18765
18766
18767
18768
18769
18770
18771
18772
18773
18774
18775
18776
18777
18778
18779
18780

```
.SBTTL          CMPN TABLES
:ENTRY 70 - INSTRUCTION UNDER TEST = CMPN
:
:ICMPN: .WORD 14          ;INST = CMPN
        .WORD 1          ;TYPE = 1
        .WORD T0         ;IP1 - SRC1.LEN
        .WORD T2         ;IP2 - SRC1.ADR
        .WORD T0         ;IP3 - SRC2.LEN
        .WORD T46        ;IP4 - SRC2.ADR
        .WORD T5         ;IP5 - UNUSED PORTION OF REG. 4
        .WORD T42        ;IP6 - SRC1.DATA
        .WORD T20        ;IP7 - SRC1.SURR.DATA
        .WORD T0         ;IP10 - SRC1.SURR.LEN
        .WORD T42        ;IP11 - SRC2.DATA
        .WORD T7         ;IP12 - SRC2.SURR.DATA
        .WORD T10        ;IP13 - SRC2.SURR.LEN
        .WORD T14        ;IP14 - SEPARATION CONSTANT
        .WORD T0         ;IP15 - SPECIAL HANDLING
        .WORD 0          ;IP16
        .WORD 0          ;IP17
        .WORD 0          ;IP20
        .WORD 0          ;IP21
        .WORD 0          ;IP22
        .WORD 0          ;IP23
        .WORD 0          ;IP24
```

```
:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS
:
:   SOURCE 1 LENGTH - 0
:   SOURCE 2 LENGTH - 0
:   SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:   SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
:                       - STRINGS ADJACENT
:                       - STRINGS PARTIALLY OVERLAP
:                       - STRINGS COMPLETELY OVERLAP
:   SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE 17
:   SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE 17
:
:TOTAL # OF TEST CONDITIONS =
:TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE) =
:
```


PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 142-1
CMPN TABLES

18782
18783
18784
18785 101270 000014
18786 101272 000001
18787 101274 103412
18788 101276 103766
18789 101300 106042
18790 101302 110006
18791 101304 104660
18792 101306 107504
18793 101310 106024
18794 101312 103412
18795 101314 110230
18796 101316 104742
18797 101320 104760
18798 101322 105044
18799 101324 103412
18800 101326 000000
18801 101330 000000
18802 101332 000000
18803 101334 000000
18804 101336 000000
18805 101340 000000
18806 101342 000000
18807
18808
18809
18810
18811
18812
18813
18814
18815
18816
18817
18818
18819
18820
18821
18822
18823
18824
18825

:ENTRY 71 - INSTRUCTION UNDER TEST = CMPN

```

:|CMPN1: .WORD 14          :INST = CMPN
          .WORD 1          :TYPE = 1
          .WORD T0         :IP1 - SRC1.LEN
          .WORD T2         :IP2 - SRC1.ADR
          .WORD T21        :IP3 - SRC2.LEN
          .WORD T46        :IP4 - SRC2.ADR
          .WORD T5         :IP5 - UNUSED PORTION OF REG. 4
          .WORD T42        :IP6 - SRC1.DATA
          .WORD T20        :IP7 - SRC1.SURR.DATA
          .WORD T0         :IP10 - SRC1.SURR.LEN
          .WORD T47        :IP11 - SRC2.DATA
          .WORD T7         :IP12 - SRC2.SURR.DATA
          .WORD T10        :IP13 - SRC2.SURR.LEN
          .WORD T14        :IP14 - SEPARATION CONSTANT
          .WORD T0         :IP15 - SPECIAL HANDLING
          .WORD 0          :IP16
          .WORD 0          :IP17
          .WORD 0          :IP20
          .WORD 0          :IP21
          .WORD 0          :IP22
          .WORD 0          :IP23
          .WORD 0          :IP24
    
```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: SOURCE 1 LENGTH - 0
: SOURCE 2 LENGTH - 1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
:                   - STRINGS ADJACENT
:                   - STRINGS PARTIALLY OVERLAP
:                   - STRINGS COMPLETELY OVERLAP
: SOURCE 1 DATA - ALL DIGITS IDENTICAL = 9; SIGN +; HIGH NIBBLE = 17
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE = 1
:                   - ALL DIGITS IDENTICAL = 8; SIGN +; HIGH NIBBLE = 17
:                   - ALL DIGITS IDENTICAL = 0; SIGN +; HIGH NIBBLE = 1
:                   - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE = 8
:
: TOTAL # OF TEST CONDITIONS =
: TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE) =
:
    
```

PDP-11 CIS INST EXERCISER
CZKFECC.P11MACY11 27(655) 25-MAR-81 12:25 PAGE 142-2
CMPN TABLES

18827
18828
18829
18830 101344 000014
18831 101346 000001
18832 101350 106042
18833 101352 103766
18834 101354 103412
18835 101356 110006
18836 101360 104660
18837 101362 110230
18838 101364 106024
18839 101366 103412
18840 101370 107504
18841 101372 104742
18842 101374 104760
18843 101376 105044
18844 101400 103412
18845 101402 000000
18846 101404 000000
18847 101406 000000
18848 101410 000000
18849 101412 000000
18850 101414 000000
18851 101416 000000
18852
18853
18854
18855
18856
18857
18858
18859
18860
18861
18862
18863
18864
18865
18866
18867
18868
18869
18870

:ENTRY 72 - INSTRUCTION UNDER TEST = CMPN

```

:ICMPN2: .WORD 14          ;INST = CMPN
          .WORD 1          ;TYPE = 1
          .WORD T21        ;IP1 - SRC1.LEN
          .WORD T2         ;IP2 - SRC1.ADR
          .WORD T0         ;IP3 - SRC2.LEN
          .WORD T46        ;IP4 - SRC2.ADR
          .WORD T5         ;IP5 - UNUSED PORTION OF REG. 4
          .WORD T47        ;IP6 - SRC1.DATA
          .WORD T20        ;IP7 - SRC1.SURR.DATA
          .WORD T0         ;IP10 - SRC1.SURR.LEN
          .WORD T42        ;IP11 - SRC2.DATA
          .WORD T7         ;IP12 - SRC2.SURR.DATA
          .WORD T10        ;IP13 - SRC2.SURR.LEN
          .WORD T14        ;IP14 - SEPARATION CONSTANT
          .WORD T0         ;IP15 - SPECIAL HANDLING
          .WORD 0          ;IP16
          .WORD 0          ;IP17
          .WORD 0          ;IP20
          .WORD 0          ;IP21
          .WORD 0          ;IP22
          .WORD 0          ;IP23
          .WORD 0          ;IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
:   SOURCE 1 LENGTH - 1,5
:   SOURCE 2 LENGTH - 0
:   SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:   SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
:                       - STRINGS ADJACENT
:                       - STRINGS PARTIALLY OVERLAP
:                       - STRINGS COMPLETELY OVERLAP
:   SOURCE 1 DATA - ALL DIGITS IDENTICAL = 8; SIGN -: HIGH NIBBLE = 1
:                   - ALL DIGITS IDENTICAL = 8; SIGN +: HIGH NIBBLE = 17
:                   - ALL DIGITS IDENTICAL = 0; SIGN +: HIGH NIBBLE = 1
:                   - ALL DIGITS IDENTICAL = 0; SIGN -: HIGH NIBBLE = 8
:   SOURCE 2 DATA - ALL DIGITS IDENTICAL = 9; SIGN +: HIGH NIBBLE = 17
:

```

```

:TOTAL # OF TEST CONDITIONS =
:TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE) =
:

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 142-3
CMPN TABLES

18872
18873
18874
18875 101420 000014
18876 101422 000001
18877 101424 106056
18878 101426 103766
18879 101430 106074
18880 101432 110006
18881 101434 104660
18882 101436 110230
18883 101440 106024
18884 101442 103412
18885 101444 110230
18886 101446 104742
18887 101450 104760
18888 101452 105044
18889 101454 103412
18890 101456 000000
18891 101460 000000
18892 101462 000000
18893 101464 000000
18894 101466 000000
18895 101470 000000
18896 101472 000000
18897
18898
18899
18900
18901
18902
18903
18904
18905
18906
18907
18908
18909
18910
18911
18912
18913
18914
18915
18916
18917
18918

:ENTRY 73 - INSTRUCT.ON UNDER TEST = CMPN

```

: (CMPN3: .WORD 14          ;INST = CMPN
          .WORD 1          ;TYPE = 1
          .WORD T211       ;IP1 - SRC1.LEN
          .WORD T2         ;IP2 - SRC1.ADR
          .WORD T212       ;IP3 - SRC2.LEN
          .WORD T46        ;IP4 - SRC2.ADR
          .WORD T5         ;IP5 - UNUSED PORTION OF F.L.G. 4
          .WORD T47        ;IP6 - SRC1.DATA
          .WORD T20        ;IP7 - SRC1.SURR.DATA
          .WORD T0         ;IP10 - SRC1.SURR.LEN
          .WORD T47        ;IP11 - SRC2.DATA
          .WORD T7         ;IP12 - SRC2.SURR.DATA
          .WORD T10        ;IP13 - SRC2.SURR.LEN
          .WORD T14        ;IP14 - SEPARATION CONSTANT
          .WORD T0         ;IP15 - SPECIAL HANDLING
          .WORD 0          ;IP16
          .WORD 0          ;IP17
          .WORD 0          ;IP20
          .WORD 0          ;IP21
          .WORD 0          ;IP22
          .WORD 0          ;IP23
          .WORD 0          ;IP24

```

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: SOURCE 1 LENGTH - 1,37
: SOURCE 2 LENGTH - 1,37
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
:                   - STRINGS ADJACENT
:                   - STRINGS PARTIALLY OVERLAP
:                   - STRINGS COMPLETELY OVERLAP
: SOURCE 1 DATA - ALL DIGITS IDENTICAL = 8; SIGN -: HIGH NIBBLE 1
:                   - ALL DIGITS IDENTICAL = 8; SIGN +: HIGH NIBBLE 17
:                   - ALL DIGITS IDENTICAL = 0; SIGN +: HIGH NIBBLE - 1
:                   - ALL DIGITS IDENTICAL = 0; SIGN -: HIGH NIBBLE 8
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 8; SIGN -: HIGH NIBBLE - 1
:                   - ALL DIGITS IDENTICAL = 8; SIGN +: HIGH NIBBLE 17
:                   - ALL DIGITS IDENTICAL = 0; SIGN +: HIGH NIBBLE 1
:                   - ALL DIGITS IDENTICAL = 0; SIGN -: HIGH NIBBLE 8

```

```

: TOTAL # OF TEST CONDITIONS = 256
: TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE) 832
:

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 142-4
CMPN TABLES

```

18920
18921
18922 101474 000014
18923 101476 000003
18924 101500 103436
18925 101502 103776
18926 101504 103436
18927 101506 107760
18928 101510 104660
18929 101512 107314
18930 101514 103412
18931 101516 103412
18932 101520 107314
18933 101522 103412
18934 101524 103412
18935 101526 105044
18936 101530 103662
18937 101532 000000
18938 101534 000000
18939 101536 000000
18940 101540 000000
18941 101542 000000
18942 101544 000000
18943 101546 000000

```

:ENTRY 74 - INSTRUCTION UNDER TEST = CMPN

```

:
:(CMPN4: .WORD 14          :INST = CMPN
          .WORD 3          :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
          .WORD T1A       :IP1 - SRC1.LEN
          .WORD T2A       :IP2 - SRC1.ADR
          .WORD T1A       :IP3 - SRC2.LEN
          .WORD T46A      :IP4 - SRC2.ADR
          .WORD T5        :IP5 - UNUSED PORTION OF REG. 4
          .WORD T219      :IP6 - SRC1.DATA
          .WORD T0        :IP7 - SRC1.SURR.DATA
          .WORD T0        :IP10 - SRC1.SURR.LEN
          .WORD T219      :IP11 - SRC2.DATA
          .WORD T0        :IP12 - SRC2.SURR.DATA
          .WORD T0        :IP13 - SRC2.SURR.LEN
          .WORD T14       :IP14 - SEPARATION CONSTANT
          .WORD TSPA      :IP15 - SPECIAL HANDLING
          .WORD 0         :IP16
          .WORD 0         :IP17
          .WORD 0         :IP20
          .WORD 0         :IP21
          .WORD 0         :IP22
          .WORD 0         :IP23
          .WORD 0         :IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS - NO OVERLAP OF STRINGS
: SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
: SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:
: TOTAL # OF TEST CONDITIONS = 64
: TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)64 = 64
:

```

18956

18958
18959
18960
18961 101550 000030
18962 101552 000001
18963 101554 103666
18964 101556 103766
18965 101560 110264
18966 101562 103706
18967 101564 106610
18968 101566 107046
18969 101570 106024
18970 101572 103412
18971 101574 104774
18972 101576 105012
18973 101600 105030
18974 101602 107522
18975 101604 103412
18976 101606 000000
18977 101610 000000
18978 101612 000000
18979 101614 000000
18980 101616 000000
18981 101620 000000
18982 101622 000000
18983
18984
18985
18986
18987
18988
18989
18990
18991
18992
18993
18994
18995
18996
18997
18998
18999
19000
19001
19002
19003
19004
19005

```

.SBTTL          ASHP TABLES
:ENTRY 75 - INSTRUCTION UNDER TEST = ASHP
:
:ASHP:  .WORD 30          ;INST=ASHP
        .WORD 1          ;TYPE = 1
        .WORD T111       ;IP1 - SRC.LEN
        .WORD T2         ;IP2 - SRC.ADR
        .WORD T50        ;IP3 - RND.DGT,SHFT.CNT
        .WORD T112       ;IP4 - DST.LEN
        .WORD T34        ;IP5 - DST.ADR
        .WORD T35B       ;IP6 - SRC DATA
        .WORD T20        ;IP7 - SRC SURR DATA
        .WORD T0         ;IP10 - SRC SURR LEN
        .WORD T11        ;IP11 - DST DATA
        .WORD T12        ;IP12 - DST SURR DATA
        .WORD T13        ;IP13 - DST SURR LEN
        .WORD T43        ;IP14 - SEP CONST
        .WORD T0         ;IP15 - SPECIAL HANDLING
        .WORD 0          ;IP16
        .WORD 0          ;IP17
        .WORD 0          ;IP20
        .WORD 0          ;IP21
        .WORD 0          ;IP22
        .WORD 0          ;IP23
        .WORD 0          ;IP24

```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:   SOURCE LENGTH - 0,1,37
:   DESTINATION LENGTH - 0,1,37
:   SOURCE ADDRESS - 200
:   DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
:                           - STRINGS ADJACENT
:   SOURCE DATA - ALL DIGITS IDENTICAL = 8; SIGN -
:                 - ALL DIGITS IDENTICAL = 0; SIGN -
:                 - DIGITS FROM STRING - 1234567891234567891234000891233; SIGN +
:                 - DIGITS FROM STRING = 000888-
:                 - DIGITS FROM STRING = 40000000000000000000000000000000-
:   ROUND DIGIT, SHIFT COUNT - 0,0
:                               - 5,-2
:                               - 9,2
:                               - 3,-3
:                               - 1,-3
:                               - 0,5
:
:TOTAL # OF TEST CONDITIONS - 540
:TOTAL # OF TESTS - (2 DATA TYPES + 1 INLINE)540 1620

```

POP-11 CIS INST EXERCISER
CZKEEC.P11

MACY11 27(655) 25-MAR-81 12:25 PAGE 143-1
ASHP TABLES

19007
19008
19009 101624 000030
19010 101626 000001
19011 101630 103436
19012 101632 103776
19013 101634 110330
19014 101636 103436
19015 101640 106556
19016 101642 106754
19017 101644 103412
19018 101646 103412
19019 101650 103412
19020 101652 103412
19021 101654 103412
19022 101656 105044
19023 101660 103662
19024 101662 000000
19025 101664 000000
19026 101666 000000
19027 101670 000000
19028 101672 000000
19029 101674 000000
19030 101676 000000
19031
19032
19033
19034
19035
19036
19037
19038
19039
19040
19041
19042
19043
19044

:ENTRY 76 - INSTRUCTION UNDER TEST = ASHP

```

:ASHP1: .WORD 30          ;INST=ASHP
        .WORD 1          ;TYPE = 1
        .WORD T1A        ;IP1 - SRC.LEN
        .WORD T2A        ;IP2 - SRC.ADR
        .WORD T50C       ;IP3 - RND.DGT,SHFT.CNT
        .WORD T1A        ;IP4 - DST.LEN
        .WORD T34A       ;IP5 - DST.ADR
        .WORD TP19       ;IP6 - SRC DATA
        .WORD T0         ;IP7 - SRC SURR DATA
        .WORD T0         ;IP10 - SRC SURR LEN
        .WORD T0         ;IP11 - DST DATA
        .WORD T0         ;IP12 - DST SURR DATA
        .WORD T0         ;IP13 - DST SURR LEN
        .WORD T14        ;IP14 - SEP CONST
        .WORD TSPA       ;IP15 - SPECIAL HANDLING
        .WORD 0          ;IP16
        .WORD 0          ;IP17
        .WORD 0          ;IP20
        .WORD 0          ;IP21
        .WORD 0          ;IP22
        .WORD 0          ;IP23
        .WORD 0          ;IP24
    
```

:THIS TABLE EXERCISE ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
:   SOURCE LENGTH - 0,1,2,3,4,5,11,20
:   DESTINATION LENGTH - 0,1,2,3,4,5,11,20
:   SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
:   DESTINATION ADDRESS - NO OVERLAP
:   SOURCE DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:   ROUND DIGIT, SHIFT COUNT - 7,-1
:                               7,-2
:                               1, 0
:                               8, 3
:
    
```

:TOTAL # OF TESTS = 256

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 CZKEEC.P11 ASHP TABLES

```

19046                                     ;ENTRY 76A - INSTRUCTION UNDER TEST = ASHP
19047                                     ;
19048 101700 000030                       ;ASHP2: .WORD 30                               ;INST=ASHP
19049 101702 000003                       .WORD 3                                       ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-!)
19050 101704 103524                       .WORD T1F                                    ;IP1 - SRC.LEN
19051 101706 103776                       .WORD T2A                                    ;IP2 - SRC.ADR
19052 101710 110344                       .WORD T50D                                   ;IP3 - RND.DGT.SHFT.CNT
19053 101712 103562                       .WORD T1K                                    ;IP4 - DST.LEN
19054 101714 106556                       .WORD T34A                                   ;IP5 - DST.ADR
19055 101716 107040                       .WORD TP99                                  ;IP6 - SRC DATA
19056 101720 103412                       .WORD T0                                     ;IP7 - SRC SURR DATA
19057 101722 103412                       .WORD T0                                     ;IP10 - SRC SURR LEN
19058 101724 103412                       .WORD T0                                     ;IP11 - DST DATA
19059 101726 103412                       .WORD T0                                     ;IP12 - DST SURR DATA
19060 101730 103412                       .WORD T0                                     ;IP13 - DST SURR LEN
19061 101732 105044                       .WORD T14                                    ;IP14 - SEP CONST
19062 101734 103412                       .WORD T0                                     ;IP15 - SPECIAL HANDLING
19063 101736 000000                       .WORD 0                                       ;IP16
19064 101740 000000                       .WORD 0                                       ;IP17
19065 101742 000000                       .WORD 0                                       ;IP20
19066 101744 000000                       .WORD 0                                       ;IP21
19067 101746 000000                       .WORD 0                                       ;IP22
19068 101750 000000                       .WORD 0                                       ;IP23
19069 101752 000000                       .WORD 0                                       ;IP24
19070
19071                                     ;THIS TABLE EXERCISE ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
19072                                     ;
19073                                     ; SOURCE LENGTH - 20,16,17,3
19074                                     ; DESTINATION LENGTH - 20,16,17,1
19075                                     ; SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
19076                                     ; DESTINATION ADDRESS - NO OVERLAP
19077                                     ; SOURCE DATA - ALL DIGITS IDENTICAL = 9; SIGN -
19078                                     ; ROUND DIGIT, SHIFT COUNT - 2,-2
19079                                     ;                                     9,-3
19080
19081                                     ;TOTAL # OF TEST CONDITIONS = 32
19082                                     ;TOTAL # OF TESTS = (2 DATA TYPES + 1 IN-LINE) 32 - 96

```

19084
19085
19086
19087 101754 000020
19088 101756 000001
19089 101760 103666
19090 101762 103766
19091 101764 110264
19092 101766 103706
19093 101770 107144
19094 101772 107324
19095 101774 106024
19096 101776 103412
19097 102000 104774
19098 102002 105012
19099 102004 105030
19100 102006 107522
19101 102010 103412
19102 102012 000000
19103 102014 000000
19104 102016 000000
19105 102020 000000
19106 102022 000000
19107 102024 000000
19108 102026 000000
19109
19110
19111
19112
19113
19114
19115
19116
19117
19118
19119
19120
19121
19122
19123
19124
19125
19126
19127
19128
19129
19130
19131

```
.SBTTL          ASHN TABLES
:ENTRY 77 - INSTRUCTION UNDER TEST = ASHN
:ASHN: .WORD 20          ;INST=ASHN
        .WORD 1          ;TYPE = 1
        .WORD T111       ;IP1 - SRC.LEN
        .WORD T2         ;IP2 - SRC.ADR
        .WORD T50        ;IP3 - RND.DGT,SHFT.CNT
        .WORD T112       ;IP4 - DST.LEN
        .WORD T36        ;IP5 - DST.ADR
        .WORD T37B       ;IP6 - SRC DATA
        .WORD T20        ;IP7 - SRC SURR DATA
        .WORD T0         ;IP10 - SRC SURR LEN
        .WORD T11        ;IP11 - DST DATA
        .WORD T12        ;IP12 - DST SURR DATA
        .WORD T13        ;IP13 - DST SURR LEN
        .WORD T43        ;IP14 - SEP CONST
        .WORD T0         ;IP15 - SPECIAL HANDLING
        .WORD 0          ;IP16
        .WORD 0          ;IP17
        .WORD 0          ;IP20
        .WORD 0          ;IP21
        .WORD 0          ;IP22
        .WORD 0          ;IP23
        .WORD 0          ;IP24
```

```
:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:SOURCE LENGTH - 0,1,37
:DESTINATION LENGTH - 0,1,37
:SOURCE ADDRESS - 200
:DESTINATION ADDRESS - NO OVERLAP OF SOURCE & DESTINATION STRINGS
:                      - STRINGS ADJACENT
:SOURCE DATA - ALL DIGITS IDENTICAL = 8; SIGN -; HIGH NIBBLE 8
:              - ALL DIGITS IDENTICAL = 0; SIGN -; HIGH NIBBLE 1
:              - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:              - DIGITS FROM STRING = 000888-
:              - DIGITS FROM STRING = 400000000000000000000000000000-
:ROUND DIGIT, SHIFT COUNT - 0,0
:                          - 5,-2
:                          - 9,2
:                          - 3,-3
:                          - 1,-3
:                          - 0,5
:
:TOTAL # OF TEST CONDITIONS = 540
:TOTAL # OF TESTS = (6 DATA TYPES + 1 INLINE)540 3760
```


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CZKEEC.P11

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ASHN TABLES

19169
19170
19171 102104 000020
19172 102106 000003
19173 102110 103506
19174 102112 103776
19175 102114 110320
19176 102116 103516
19177 102120 107116
19178 102122 107314
19179 102124 103412
19180 102126 103412
19181 102130 103412
19182 102132 103412
19183 102134 103412
19184 102136 105044
19185 102140 103412
19186 102142 000000
19187 102144 000000
19188 102146 000000
19189 102150 000000
19190 102152 000000
19191 102154 000000
19192 102156 000000
19193
19194
19195
19196
19197
19198
19199
19200
19201
19202
19203
19204
19205

;ENTRY 78A -- INSTRUCTION UNDER TEST - ASHN

```

;ASHN2: .WORD 20          ;INST=ASHN
        .WORD 3          ;TYPE = 1(BIT 0);11/44 OV TABLE(BIT 1-1)
        .WORD T1D       ;IP1 - SRC.LEN
        .WORD T2A       ;IP2 - SRC.ADR
        .WORD T50B      ;IP3 - RND.DGT,SHFT.CNT
        .WORD T1E       ;IP4 - DST.LEN
        .WORD T36A      ;IP5 - DST.ADR
        .WORD T219      ;IP6 - SRC DATA
        .WORD T0        ;IP7 - SRC SURR DATA
        .WORD T0        ;IP10 - SRC SURR LEN
        .WORD T0        ;IP11 - DST DATA
        .WORD T0        ;IP12 - DST SURR DATA
        .WORD T0        ;IP13 - DST SURR LEN
        .WORD T14       ;IP14 - SEP CONST
        .WORD T0        ;IP15 - SPECIAL HANDLING
        .WORD 0         ;IP16
        .WORD 0         ;IP17
        .WORD 0         ;IP20
        .WORD 0         ;IP21
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24
    
```

;THIS TABLE EXERCISE ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

;
; SOURCE LENGTH - 1,2
; DESTINATION LENGTH - 2,3
; SOURCE ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
; DESTINATION ADDRESS - NO OVERLAP
; SOURCE DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
; ROUND DIGIT, SHIFT COUNT - 7,-1
;                               7, 2
;
;TOTAL # OF TEST CONDITIONS = 8
;TOTAL # OF TESTS (6 DATA TYPES + 1 IN-LINE)8 = 56
    
```

PDP-11 CIS INST EXERCISER MALY11 27(655) 25-MAR-81 12:25 PAGE 147
 CZKEEC.P11 MULP TABLES

```

19207 .SBTTL          MULP TABLES
19208 .ENTRY 79 - INSTRUCTION UNDER TEST = MULP
19209 .
19210 .MULP: .WORD 26          ;INST=MULP
19211 .WORD 3          ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
19212 .WORD T0        ;IP1 - SRC1.LEN
19213 .WORD T2        ;IP2 - SRC1.ADR
19214 .WORD T0        ;IP3 - SRC2.LEN
19215 .WORD T161      ;IP4 - SRC2.ADR
19216 .WORD XT1       ;IP5 - DST.LEN
19217 .WORD T0        ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
19218 .WORD T22       ;IP7 - SRC1 DATA
19219 .WORD T7        ;IP10 - SRC1 SURR DATA
19220 .WORD T10       ;IP11 - SRC1 SURR LEN
19221 .WORD T22       ;IP12 - SRC2 DATA
19222 .WORD T20       ;IP13 - SRC2 SURR DATA
19223 .WORD T0        ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
19224 .              ; AS NOT TO DESTROY ANY OF SRC1)
19225 .WORD T11       ;IP15 - DST DATA
19226 .WORD T12       ;IP16 - DST SURR DATA
19227 .WORD T13       ;IP17 - DST SURR LEN
19228 .WORD T14       ;IP20 - SEPARATION CONSTRAINT
19229 .WORD T0        ;IP21 -SPECIAL HANDLING
19230 .WORD 0          ;IP22
19231 .WORD 0          ;IP23
19232 .WORD 0          ;IP24
19233 .
19234 .THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
19235 .
19236 .SOURCE 1 LENGTH - 0
19237 .SOURCE 2 LENGTH - 0
19238 .DESTINATION LENGTH - 0,1,5
19239 .SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
19240 .SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
19241 .              - SOURCE 2 STRING ADJACENT WITH DESTINATION STRING
19242 .SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
19243 .SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
19244 .
19245 .TOTAL # OF TEST CONDITIONS = 6
19246 .TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)6 - 18
19247 .

```

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 P11 P11 TABLES
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```

19249
19250
19251
19252
19253 102234 000026
19254 102236 000001
19255 102240 103412
19256 102242 103766
19257 102244 106042
19258 102246 105416
19259 102250 103416
19260 102252 103412
19261 102254 106152
19262 102256 104742
19263 102260 104760
19264 102262 105750
19265 102264 106024
19266 102266 103412
19267
19268 102270 104774
19269 102272 105012
19270 102274 105030
19271 102276 105044
19272 102300 103412
19273 102302 000000
19274 102304 000000
19275 102306 000000
19276
19277
19278
19279
19280
19281
19282
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19285
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19292
19293

```

ENTRY 80 - INSTRUCTION UNDER TEST = MULP

```

MULP1: .WORD 26          :INST=MULP
        .WORD 1          :TYPE = 1
        .WORD 10         :IP1 - SRC1.LEN
        .WORD T2        :IP2 - SRC1.ADR
        .WORD T2        :IP3 - SRC2.LEN
        .WORD T161      :IP4 - SRC2.ADR
        .WORD .XT1      :IP5 - DST.LEN
        .WORD T0        :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD T22      :IP7 - SRC1 DATA
        .WORD T7        :IP10 - SRC1 SURR DATA
        .WORD T10       :IP11 - SRC1 SURR LEN
        .WORD T17       :IP12 - SRC2 DATA
        .WORD T20       :IP13 - SRC2 SURR DATA
        .WORD T0        :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        : AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11      :IP15 - DST DATA
        .WORD T12      :IP16 - DST SURR DATA
        .WORD T13      :IP17 - DST SURR LEN
        .WORD T14      :IP20 - SEPARATION CONSTRAINT
        .WORD T0        :IP21 -SPECIAL HANDLING
        .WORD 0        :IP22
        .WORD 0        :IP23
        .WORD 0        :IP24

```

THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

SOURCE 1 LENGTH - 0
SOURCE 2 LENGTH - 1,5
DESTINATION LENGTH - 0,1,5
SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
- SOURCE 2 STRING ADJACENT WITH DESTINATION STRIN
SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
- ALL DIGITS IDENTICAL = 5; SIGN +
- ALL DIGITS IDENTICAL = 3; SIGN -
- ALL DIGITS IDENTICAL = 0; SIGN +

```

TOTAL # OF TEST CONDITIONS - 48

TOTAL # OF TESTS - (2 DATA TYPES + 1 INLINE)48 - 144

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 (ZKEEC.P11) MULP TABLES

```

19295          :ENTRY 8* - INSTRUCTION UNDER TEST = MULP
19296          :
19297 102310 000026 :MULP2: .WORD 26          :INST=MULP
19298 102312 000001 :        .WORD 1          :TYPE = 1
19299 102314 106042 :        .WORD T21       :IP1 - SRC1.LEN
19300 102316 103766 :        .WORD T2        :IP2 - SRC1.ADR
19301 102320 103412 :        .WORD T0        :IP3 - SRC2.LEN
19302 102322 105416 :        .WORD T161      :IP4 - SRC2.ADR
19303 102324 103416 :        .WORD XT        :IP5 - DST.LEN
19304 102326 103412 :        .WORD T0        :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
19305 102330 105750 :        .WORD T17       :IP7 - SRC1 DATA
19306 102332 104742 :        .WORD T7        :IP10 - SRC1 SURR DATA
19307 102334 104760 :        .WORD T10       :IP11 - SRC1 SURR LEN
19308 102336 106152 :        .WORD T22       :IP12 - SRC2 DATA
19309 102340 106024 :        .WORD T20       :IP13 - SRC2 SURR DATA
19310 102342 103412 :        .WORD T0        :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
19311          :        : AS NO1 TO DESTROY ANY OF SRC1)
19312 102344 104774 :        .WORD T11       :IP15 - DST DATA
19313 102346 105012 :        .WORD T12       :IP16 - DST SURR DATA
19314 102350 105030 :        .WORD T13       :IP17 - DST SURR LEN
19315 102352 105044 :        .WORD T14       :IP20 - SEPARATION CONSTRA1
19316 102354 103412 :        .WORD T0        :IP21 - SPECIAL HANDLING
19317 102356 000000 :        .WORD 0         :IP22
19318 102360 000000 :        .WORD 0         :IP23
19319 102362 000000 :        .WORD 0         :IP24

```

19320
19321
19322
19323
19324
19325
19326
19327
19328
19329
19330
19331
19332
19333
19334
19335
19336
19337

: THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

: SOURCE 1 LENGTH - 1,5
: SOURCE 2 LENGTH - 0
: DESTINATION LENGTH - 0,1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:                               - SOURCE 2 STRING ADJACENT WITH DESTINATION STRIN
: SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:                               - ALL DIGITS IDENTICAL = 5; SIGN +
:                               - ALL DIGITS IDENTICAL = 3; SIGN -
:                               - ALL DIGITS IDENTICAL = 0; SIGN +
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +

```

: TOTAL # OF TEST CONDITIONS = 48
: TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE) 48 = 144

19339
 19340
 19341 102364 000026
 19342 102366 000001
 19343 102370 106056
 19344 102372 103766
 19345 102374 106074
 19346 102376 105416
 19347 102400 103616
 19348 102402 103412
 19349 102404 105750
 19350 102406 104742
 19351 102410 104760
 19352 102412 105750
 19353 102414 106024
 19354 102416 103412
 19355
 19356 102420 104774
 19357 102422 105012
 19358 102424 105030
 19359 102426 105044
 19360 102430 103412
 19361 102432 000000
 19362 102434 000000
 19363 102436 000000
 19364
 19365
 19366
 19367
 19368
 19369
 19370
 19371
 19372
 19373
 19374
 19375
 19376
 19377
 19378
 19379
 19380
 19381
 19382
 19383
 19384

ENTRY 82 - INSTRUCTION UNDER TEST = MULP

```

MULP3: .WORD 26      ;INST=MULP
        .WORD 1       ;TYPE = 1
        .WORD T211    ;IP1 - SRC1.LEN
        .WORD T2      ;IP2 - SRC1.ADR
        .WORD T212    ;IP3 - SRC2.LEN
        .WORD T161    ;IP4 - SRC2.ADR
        .WORD T17     ;IP5 - DST.LEN
        .WORD T0      ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD T17     ;IP7 - SRC1 DATA
        .WORD T7      ;IP10 - SRC1 SURR DATA
        .WORD T10     ;IP11 - SRC1 SURR LEN
        .WORD T17     ;IP12 - SRC2 DATA
        .WORD T20     ;IP13 - SRC2 SURR DATA
        .WORD T0      ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        ; AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11     ;IP15 - DST DATA
        .WORD T12     ;IP16 - DST SURR DATA
        .WORD T13     ;IP17 - DST SURR LEN
        .WORD T14     ;IP20 - SEPARATION CONSTRAINT
        .WORD T0      ;IP21 - SPECIAL HANDLING
        .WORD 0       ;IP22
        .WORD 0       ;IP23
        .WORD 0       ;IP24
    
```

THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

SOURCE 1 LENGTH - 1,37
SOURCE 2 LENGTH - 1,37
DESTINATION LENGTH - 0,1,37
SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
                                - SOURCE 2 STRING ADJACENT WITH DEST STRING
SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                - ALL DIGITS IDENTICAL = 5; SIGN +
                - ALL DIGITS IDENTICAL = 3; SIGN -
                - ALL DIGITS IDENTICAL = 0; SIGN +
SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
                - ALL DIGITS IDENTICAL = 5; SIGN +
                - ALL DIGITS IDENTICAL = 3; SIGN -
                - ALL DIGITS IDENTICAL = 0; SIGN +
    
```

TOTAL # OF TEST CONDITIONS = 384
 TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)384 = 1152

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MULP TABLES

```

19386
19387
19388 102440 000026
19389 102442 000001
19390 102444 103436
19391 102446 103776
19392 102450 103436
19393 102452 105116
19394 102454 103436
19395 102456 103412
19396 102460 106754
19397 102462 103412
19398 102464 103412
19399 102466 106754
19400 102470 103412
19401 102472 103412
19402
19403 102474 103412
19404 102476 103412
19405 102500 103412
19406 102502 105044
19407 102504 103662
19408 102506 000000
19409 102510 000000
19410 102512 000000
19411
19412
19413
19414
19415
19416
19417
19418
19419
19420
19421
19422
19423
19424

```

:ENTRY 83 - INSTRUCTION UNDER TEST = MULP

```

:IMULP4: .WORD 26          :INST=MULP
          .WORD 1          :TYPE = 1
          .WORD T1A        :IP1 - SRC1.LEN
          .WORD T2A        :IP2 - SRC1.ADR
          .WORD T1A        :IP3 - SRC2.LEN
          .WORD T16A       :IP4 - SRC2.ADR
          .WORD T1A        :IP5 - DST.LEN
          .WORD T0         :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
          .WORD TP19       :IP7 - SRC1 DATA
          .WORD T0         :IP10 - SRC1 SURR DATA
          .WORD T0         :IP11 - SRC1 SURR LEN
          .WORD TP19       :IP12 - SRC2 DATA
          .WORD T0         :IP13 - SRC2 SURR DATA
          .WORD T0         :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
          : AS NOT TO DESTROY ANY OF SRC1)
          .WORD T0         :IP15 - DST DATA
          .WORD T0         :IP16 - DST SURR DATA
          .WORD T0         :IP17 - DST SURR LEN
          .WORD T14        :IP20 - SEPARATION CONSTRAINT
          .WORD TSPA       :IP21 - SPECIAL HANDLING
          .WORD 0          :IP22
          .WORD 0          :IP23
          .WORD 0          :IP24

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS

```

:
: SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
: DESTINATION LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
: SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
: SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:

```

:TOTAL # OF TEST CONDITIONS = 512

:TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512

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 CZKFECC.P11 MULP TABLES

```

19426
19427
19428 102514 000026
19429 102516 000003
19430 102520 103546
19431 102522 103766
19432 102524 103546
19433 102526 105116
19434 102530 103574
19435 102532 103412
19436 102534 106754
19437 102536 103412
19438 102540 103412
19439 102542 106754
19440 102544 103412
19441 102546 103412
19442
19443 102550 103412
19444 102552 103412
19445 102554 103412
19446 102556 105044
19447 102560 103662
19448 102562 000000
19449 102564 000000
19450 102566 000000
19451
19452
19453
19454
19455
19456
19457
19458
19459
19460
19461
19462
19463
19464

:ENTRY 83A - INSTRUCTION UNDER TEST = MULP
:
:MULP5: .WORD 26          :INST=MULP
        .WORD 3          :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
        .WORD T1H        :IP1 - SRC1.LEN
        .WORD T2         :IP2 - SRC1.ADR
        .WORD T1H        :IP3 - SRC2.LEN
        .WORD T16A       :IP4 - SRC2.ADR
        .WORD T1L        :IP5 - DST.LEN
        .WORD T0         :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD TP19       :IP7 - SRC1 DATA
        .WORD T0         :IP10 - SRC1 SURR DATA
        .WORD T0         :IP11 - SRC1 SUPR LEN
        .WORD TP19       :IP12 - SRC2 DATA
        .WORD T0         :IP13 - SRC2 SURR DATA
        .WORD T0         :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        : AS NOT TO DESTROY ANY OF SRC1)
        .WORD T0         :IP15 - DST DATA
        .WORD T0         :IP16 - DST SURR DATA
        .WORD T0         :IP17 - DST SURR LEN
        .WORD T14        :IP20 - SEPARATION CONSTRAINT
        .WORD TSPA       :IP21 - SPECIAL HANDLING
        .WORD 0          :IP22
        .WORD 0          :IP23
        .WORD 0          :IP24

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
:   SOURCE 1 LENGTH - 12,13,14,15
:   SOURCE 2 LENGTH - 12,13,14,15
:   DESTINATION LENGTH - 35
:   SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:   SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
:   SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:   SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:
:TOTAL # OF TEST CONDITIONS = 16
:TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)16 16
:

```


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 CZKEEC.P11 MULP TABLES

```

19466                                     :ENTRY 83B - INSTRUCTION UNDER TEST = MULP
19467                                     :
19468 102570 000026                       :MULP6: .WORD 26                       :INST=MULP
19469 102572 000007                       :.WORD 3                               :TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
19470 102574 103610                       :.WORD T1N                             :IP1 - SRC1.LEN
19471 102576 103766                       :.WORD T2                               :IP2 - SRC1.ADR
19472 102600 103636                       :.WORD T1Q                             :IP3 - SRC2.LEN
19473 102602 105116                       :.WORD T16A                            :IP4 - SRC2.ADR
19474 102604 103574                       :.WORD T1L                             :IP5 - DST.LEN
19475 102606 103412                       :.WORD T0                               :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
19476 102610 107012                       :.WORD TP19C                           :IP7 - SRC1 DATA
19477 102612 103412                       :.WORD T0                               :IP10 - SRC1 SURR DATA
19478 102614 103412                       :.WORD T0                               :IP11 - SRC1 SURR LEN
19479 102616 107024                       :.WORD TP19D                           :IP12 - SRC2 DATA
19480 102620 103412                       :.WORD T0                               :IP13 - SRC2 SURR DATA
19481 102622 103412                       :.WORD T0                               :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
19482                                     : AS NOT TO DESTROY ANY OF SRC1)
19483 102624 103412                       :.WORD T0                               :IP15 - DST DATA
19484 102626 103412                       :.WORD T0                               :IP16 - DST SURR DATA
19485 102630 103412                       :.WORD T0                               :IP17 - DST SURR LEN
19486 102632 105044                       :.WORD T14                             :IP20 - SEPARATION CONSTRAINT
19487 102634 103662                       :.WORD TSPA                             :IP21 - SPECIAL HANDLING
19488 102636 000000                       :.WORD 0                               :IP22
19489 102640 000000                       :.WORD 0                               :IP23
19490 102642 000000                       :.WORD 0                               :IP24
19491
19492                                     :THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
19493                                     :
19494                                     :SOURCE 1 LENGTH - 3
19495                                     :SOURCE 2 LENGTH - 0,3
19496                                     :DESTINATION LENGTH - 35
19497                                     :SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
19498                                     :SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
19499                                     :SOURCE 1 DATA - ALL DIGITS IDENTICAL = 0; SIGN +
19500                                     :                   ALL DIGITS IDENTICAL = 4; SIGN +
19501                                     :SOURCE 2 DATA - ALL DIGITS IDENTICAL - 0; SIGN +
19502
19503                                     :TOTAL # OF TEST CONDITIONS = 4
19504                                     :TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)4 = 4

```

19506
19507
19508
19509 102644 000026
19510 102646 000001
19511 102650 103602
19512 102652 103766
19513 102654 103602
19514 102656 105174
19515 102660 105030
19516 102662 103412
19517 102664 107002
19518 102666 103412
19519 102670 103412
19520 102672 107002
19521 102674 103412
19522 102676 103412
19523
19524 102700 103412
19525 102702 103412
19526 102704 103412
19527 102706 103412
19528 102710 103412
19529 102712 000000
19530 102714 000000
19531 102716 000000
19532
19533
19534
19535
19536
19537
19538
19539
19540
19541
19542
19543
19544
19545

```

:ENTRY 83C - INSTRUCTION UNDER TEST = MULP
:MULP7: .WORD 26          ;INST=MULP
        .WORD 1          ;TYPE = 1
        .WORD T1M       ;IP1 - SRC1.LEN
        .WORD T2        ;IP2 - SRC1.ADR
        .WORD T1M       ;IP3 - SRC2.LEN
        .WORD T16B      ;IP4 - SRC2.ADR
        .WORD T13       ;IP5 - DST.LEN
        .WORD T0        ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD TP19B     ;IP7 - SRC1 DATA
        .WORD T0        ;IP10 - SRC1 SURR DATA
        .WORD T0        ;IP11 - SRC1 SURR LEN
        .WORD TP19B     ;IP12 - SRC2 DATA
        .WORD T0        ;IP13 - SRC2 SURR DATA
        .WORD T0        ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        ; AS NOT TO DESTROY ANY OF SRC1)
        .WORD T0        ;IP15 - DST DATA
        .WORD T0        ;IP16 - DST SURR DATA
        .WORD T0        ;IP17 - DST SURR LEN
        .WORD T0        ;IP20 - SEPARATION CONSTRAINT
        .WORD T0        ;IP21 - SPECIAL HANDLING
        .WORD 0         ;IP22
        .WORD 0         ;IP23
        .WORD 0         ;IP24
    
```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:SOURCE 1 LENGTH - 17
:SOURCE 2 LENGTH - 17
:DESTINATION LENGTH - 5
:SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
:SOURCE 2 ADDRESS - 200
:DEST ADDRESS - NO OVERLAP WITH SOURCE STRINGS
:SOURCE 1 DATA = SOURCE 2 DATA - 00G000000000333+
    
```

```

:TOTAL # OF TEST CONDITIONS = 1
:TOTAL # OF TESTS (2 DATA TYPES + 1 IN-LINE) 1 3
    
```

```

19547
19548
19549
19550 102720 000027
19551 102722 000003
19552 102724 103412
19553 102726 103766
19554 102730 103412
19555 102732 105416
19556 102734 103416
19557 102736 103412
19558 102740 106152
19559 102742 104742
19560 102744 104760
19561 102746 106152
19562 102750 106024
19563 102752 103412
19564
19565 102754 104774
19566 102756 105012
19567 102760 105030
19568 102762 105044
19569 102764 103412
19570 102766 000000
19571 102770 000000
19572 102772 000000
19573
19574
19575
19576
19577
19578
19579
19580
19581
19582
19583
19584
19585
19586
19587
    
```

```

.SBTTL DIVP TABLES
:ENTRY 84 - INSTRUCTION UNDER TEST = DIVP
:
:IDIVP: .WORD 27 ;INST=DIVP
        .WORD 3 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1=1)
        .WORD T0 ;IP1 - SRC1.LEN
        .WORD T2 ;IP2 - SRC1.ADR
        .WORD T0 ;IP3 - SRC2.LEN
        .WORD T161 ;IP4 - SRC2.ADR
        .WORD XT1 ;IP5 - DST.LEN
        .WORD T0 ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD T22 ;IP7 - SRC1 DATA
        .WORD T7 ;IP10 - SRC1 SURR DATA
        .WORD T10 ;IP11 - SRC1 SURR LEN
        .WORD T22 ;IP12 - SRC2 DATA
        .WORD T20 ;IP13 - SRC2 SURR DATA
        .WORD T0 ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        ; AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11 ;IP15 - DST DATA
        .WORD T12 ;IP16 - DST SURR DATA
        .WORD T13 ;IP17 - DST SURR LEN
        .WORD T14 ;IP20 - SEPARATION CONSTRAINT
        .WORD T0 ;IP21 - SPECIAL HANDLING
        .WORD 0 ;IP22
        .WORD 0 ;IP23
        .WORD 0 ;IP24
    
```

```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
: SOURCE 1 LENGTH - 0
: SOURCE 2 LENGTH - 0
: DESTINATION LENGTH - 0,1,5
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
: - SOURCE 2 STRING ADJACENT WITH DESTINATION STRING
:
: SOURCE 1 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 3; SIGN +
:
:TOTAL # OF TEST CONDITIONS = 6
:TOTAL # OF TESTS - (2 DATA TYPES + 1 INLINE)6 18
:
    
```


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 CZKFECP11 DIVP TABLES

```

19633
19634
19635
19636 103050 000027
19637 103052 000001
19638 103054 106042
19639 103056 103766
19640 103060 103412
19641 103062 105416
19642 103064 103416
19643 103066 103412
19644 103070 105750
19645 103072 104742
19646 103074 104760
19647 103076 106152
19648 103100 106024
19649 103102 103412
19650
19651 103104 104774
19652 103106 105012
19653 103110 105030
19654 103112 105044
19655 103114 103412
19656 103116 000000
19657 103120 000000
19658 103122 000000
19659
19660
19661
19662
19663
19664
19665
19666
19667
19668
19669
19670
19671
19672
19673
19674
19675
19676

;ENTRY 86 - INSTRUCTION UNDER TEST = DIVP
;DIVP2: .WORD 27 ;INST=DIVP
        .WORD 1 ;TYPE = 1
        .WORD T21 ;IP1 - SRC1.LEN
        .WORD T2 ;IP2 - SRC1.ADR
        .WORD T0 ;IP3 - SRC2.LEN
        .WORD T161 ;IP4 - SRC2.ADR
        .WORD XT1 ;IP5 - DST.LEN
        .WORD T0 ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD T17 ;IP7 - SRC1 DATA
        .WORD T7 ;IP10 - SRC1 SURR DATA
        .WORD T10 ;IP11 - SRC1 SURR LEN
        .WORD T22 ;IP12 - SRC2 DATA
        .WORD T20 ;IP13 - SRC2 SURR DATA
        .WORD T0 ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        ; AS NOT TO DESTROY ANY OF SRC1)
        .WORD T11 ;IP15 - DST DATA
        .WORD T12 ;IP16 - DST SURR DATA
        .WORD T13 ;IP17 - DST SURR LEN
        .WORD T14 ;IP20 - SEPARATION CONSTRAINT
        .WORD T0 ;IP21 - SPECIAL HANDLING
        .WORD 0 ;IP22
        .WORD 0 ;IP23
        .WORD 0 ;IP24

;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
;
; SOURCE 1 LENGTH - 1,5
; SOURCE 2 LENGTH - 0
; DESTINATION LENGTH - 0,1,5
; SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
; SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
; - SOURCE 2 STRING ADJACENT WITH DESTINATION STRIN
; SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
; - ALL DIGITS IDENTICAL = 5; SIGN +
; - ALL DIGITS IDENTICAL = 3; SIGN -
; - ALL DIGITS IDENTICAL = 0; SIGN +
; SOURCE 2 DATA - ALL DIGITS IDENTICAL - 3; SIGN +
;
;TOTAL # OF TEST CONDITIONS =48
;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)48 = 144
;

```

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 CZKEEC.P11 DIVP TABLES

```

19678                                     ;ENTRY 87 - INSTRUCTION UNDER TEST = DIVP
19679                                     ;
19680 103124 000027                       ;DIVP3: .WORD 27                       ;INST=DIVP
19681 103126 000001                       .WORD 1                               ;TYPE = 1
19682 103130 106056                       .WORD T211                           ;IP1 - SRC1.LEN
19683 103132 103766                       .WORD T2                               ;IP2 - SRC1.ADR
19684 103134 106074                       .WORD T212                           ;IP3 - SRC2.LEN
19685 103136 105416                       .WORD T161                           ;IP4 - SRC2.ADR
19686 103140 103616                       .WORD T17                             ;IP5 - DST.LEN
19687 103142 103412                       .WORD T0                               ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
19688 103144 105750                       .WORD T17                             ;IP7 - SRC1 DATA
19689 103146 104742                       .WORD T7                               ;IP10 - SRC1 SURR DATA
19690 103150 104760                       .WORD T10                             ;IP11 - SRC1 SURR LEN
19691 103152 105750                       .WORD T17                             ;IP12 - SRC2 DATA
19692 103154 106024                       .WORD T20                             ;IP13 - SRC2 SURR DATA
19693 103156 103412                       .WORD T0                               ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
19694                                     ; AS NOT TO DESTROY ANY OF SRC1)
19695 103160 104774                       .WORD T11                             ;IP15 - DST DATA
19696 103162 105012                       .WORD T12                             ;IP16 - DST SURR DATA
19697 103164 105030                       .WORD T13                             ;IP17 - DST SURR LEN
19698 103166 105044                       .WORD T14                             ;IP20 - SEPARATION CONSTRAINT
19699 103170 103412                       .WORD T0                               ;IP21 - SPECIAL HANDLING
19700 103172 000000                       .WORD 0                               ;IP22
19701 103174 000000                       .WORD 0                               ;IP23
19702 103176 000000                       .WORD 0                               ;IP24
19703
19704                                     ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
19705                                     ;
19706                                     ; SOURCE 1 LENGTH - 1,37
19707                                     ; SOURCE 2 LENGTH - 1,37
19708                                     ; DESTINATION LENGTH - 0,1,37
19709                                     ; SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
19710                                     ; SOURCE 2 ADDRESS, DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
19711                                     ; - SOURCE 2 STRING ADJACENT WITH DEST STRING
19712                                     ; SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
19713                                     ; - ALL DIGITS IDENTICAL = 5; SIGN +
19714                                     ; - ALL DIGITS IDENTICAL = 3; SIGN -
19715                                     ; - ALL DIGITS IDENTICAL = 0; SIGN +
19716                                     ; SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
19717                                     ; - ALL DIGITS IDENTICAL = 5; SIGN +
19718                                     ; - ALL DIGITS IDENTICAL = 3; SIGN -
19719                                     ; - ALL DIGITS IDENTICAL = 0; SIGN +
19720
19721                                     ;TOTAL # OF TEST CONDITIONS = 384
19722                                     ;TOTAL # OF TESTS = (2 DATA TYPES + 1 INLINE)384 1152
19723

```

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 CZKEEC.P11 DIVP TABLES

```

19725
19726
19727 103200 000027
19728 103202 000001
19729 103204 103436
19730 103206 103776
19731 103210 103436
19732 103212 105116
19733 103214 103436
19734 103216 103412
19735 103220 106754
19736 103222 103412
19737 103224 103412
19738 103226 106754
19739 103230 103412
19740 103232 103412
19741
19742 103234 103412
19743 103236 103412
19744 103240 103412
19745 103242 105044
19746 103244 103662
19747 103246 000000
19748 103250 000000
19749 103252 000000
19750
19751
19752
19753
19754
19755
19756
19757
19758
19759
19760
19761
19762
19763

:ENTRY 88 - INSTRUCTION UNDER TEST = DIVP
:
:DIVP4: .WORD 27          :INST=DIVP
        .WORD 1          :TYPE = 1
        .WORD T1A       :IP1 - SRC1.LEN
        .WORD T2A       :IP2 - SRC1.ADR
        .WORD T1A       :IP3 - SRC2.LEN
        .WORD T16A      :IP4 - SRC2.ADR
        .WORD T1A       :IP5 - DST.LEN
        .WORD T0        :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD TP19      :IP7 - SRC1 DATA
        .WORD T0        :IP10 - SRC1 SURR DATA
        .WORD T0        :IP11 - SRC1 SURR LEN
        .WORD TP19      :IP12 - SRC2 DATA
        .WORD T0        :IP13 - SRC2 SURR DATA
        .WORD T0        :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        : AS NOT TO DESTROY ANY OF SRC1)
        .WORD T0        :IP15 - DST DATA
        .WORD T0        :IP16 - DST SURR DATA
        .WORD T0        :IP17 - DST SURR LEN
        .WORD T14       :IP20 - SEPARATION CONSTRAINT
        .WORD TSPA      :IP21 - SPECIAL HANDLING
        .WORD 0         :IP22
        .WORD 0         :IP23
        .WORD 0         :IP24

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
:
: SOURCE 1 LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 2 LENGTH - 0,1,2,3,4,5,11,20
: DESTINATION LENGTH - 0,1,2,3,4,5,11,20
: SOURCE 1 ADDRESS - 201 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
: SOURCE 1 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
: SOURCE 2 DATA - DIGITS FROM STRING = 1234567891234567891234000891233; SIGN +
:
:TOTAL # OF TEST CONDITIONS = 512
:TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)512 = 512
:

```

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 'ZKEEC.PI' DIVP TABLES

```

19765 ;ENTRY 88A - INSTRUCTION UNDER TEST = DIVP
19766 ;
19767 103254 000027 ;DIVP5: .WORD 27 ;INST=DIVP
19768 103256 000003 ;.WORD 3 ;TYPE = 1(BIT 0);11/44 QV TABLE(BIT 1-1)
19769 103260 103540 ;.WORD T1G ;IP1 - SRC1.LEN
19770 103262 103766 ;.WORD T2 ;IP2 - SRC1.ADR
19771 103264 103540 ;.WORD T1G ;IP3 - SRC2.LEN
19772 103266 105116 ;.WORD T16A ;IP4 - SRC2.ADR
19773 103270 103540 ;.WORD T1G ;IP5 - DST.LEN
19774 103272 103412 ;.WORD T0 ;IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
19775 103274 106010 ;.WORD T17A ;IP7 - SRC1 DATA
19776 103276 103412 ;.WORD T0 ;IP10 - SRC1 SURR DATA
19777 103300 103412 ;.WORD T0 ;IP11 - SRC1 SURR LEN
19778 103302 106010 ;.WORD T17A ;IP12 - SRC2 DATA
19779 103304 103412 ;.WORD T0 ;IP13 - SRC2 SURR DATA
19780 103306 103412 ;.WORD T0 ;IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
19781 ; AS NOT TO DESTROY ANY OF SRC1)
19782 103310 103412 ;.WORD T0 ;IP15 - DST DATA
19783 103312 103412 ;.WORD T0 ;IP16 - DST SURR DATA
19784 103314 103412 ;.WORD T0 ;IP17 - DST SURR LEN
19785 103316 105044 ;.WORD T14 ;IP20 - SEPARATION CONSTRAINT
19786 103320 103662 ;.WORD TSPA ;IP21 - SPECIAL HANDLING
19787 103322 000000 ;.WORD 0 ;IP22
19788 103324 000000 ;.WORD 0 ;IP23
19789 103326 000000 ;.WORD 0 ;IP24
19790 ;
19791 ;THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:
19792 ;
19793 ; SOURCE 1 LENGTH - 11
19794 ; SOURCE 2 LENGTH - 11
19795 ; DESTINATION LENGTH - 11
19796 ; SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
19797 ; SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
19798 ; SOURCE 1 DATA - ALL DIGITS IDENTICAL = 7,0; SIGN = +
19799 ; SOURCE 2 DATA - ALL DIGITS IDENTICAL = 7,0; SIGN +
19800 ;
19801 ;TOTAL # OF TEST CONDITIONS = 4
19802 ;TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)4 = 4
19803 ;

```


19805
 19806
 19807 103330 000027
 19808 103332 000003
 19809 103334 103646
 19810 103336 103766
 19811 103340 103654
 19812 103342 105116
 19813 103344 103646
 19814 103346 103412
 19815 103350 107032
 19816 103352 103412
 19817 103354 103412
 19818 103356 107032
 19819 103360 103412
 19820 103362 103412
 19821
 19822 103364 103412
 19823 103366 103412
 19824 103370 103412
 19825 103372 105044
 19826 103374 103662
 19827 103376 000000
 19828 103400 000000
 19829 103402 000000
 19830
 19831
 19832
 19833
 19834
 19835
 19836
 19837
 19838
 19839
 19840
 19841
 19842
 19843

:ENTRY 888 - INSTRUCTION UNDER TEST = DIVP

```

:DIVP6: .WORD 27          :INST=DIVP
        .WORD 3          :TYPE = 1(BIT 0);11/44 OV TABLE(BIT 1=1)
        .WORD T1R       :IP1 - SRC1.LEN
        .WORD T2        :IP2 - SRC1.ADR
        .WORD T1S       :IP3 - SRC2.LEN
        .WORD T16A      :IP4 - SRC2.ADR
        .WORD T1R       :IP5 - DST.LEN
        .WORD T0        :IP6 - DST.ADR - SPECIFIED BY T16 USED FOR IP4
        .WORD TP19E     :IP7 - SRC1 DATA
        .WORD T0        :IP10 - SRC1 SURR DATA
        .WORD T0        :IP11 - SRC1 SURR LEN
        .WORD TP19E     :IP12 - SRC2 DATA
        .WORD T0        :IP13 - SRC2 SURR DATA
        .WORD T0        :IP14 - SRC2 SURR LEN (LENGTH SET TO 0 SO
        : AS NOT TO DESTROY ANY OF SRC1)
        .WORD T0        :IP15 - DST DATA
        .WORD T0        :IP16 - DST SURR DATA
        .WORD T0        :IP17 - DST SURR LEN
        .WORD T14       :IP20 - SEPARATION CONSTRAINT
        .WORD TSPA      :IP21 - SPECIAL HANDLING
        .WORD 0         :IP22
        .WORD 0         :IP23
        .WORD 0         :IP24
    
```

:THIS TABLE EXERCISES ALL COMBINATIONS OF THE FOLLOWING VARIABLE ASSIGNMENTS:

```

:
: SOURCE 1 LENGTH - 11
: SOURCE 2 LENGTH - 21
: DESTINATION LENGTH - 11
: SOURCE 1 ADDRESS - 200 (RELATIVE TO START OF TEST BUFFER)
: SOURCE 2 ADDRESS,DEST ADDRESS - NO OVERLAP OF ANY OF THE 3 STRINGS
: SOURCE 1 DATA - ALL DIGITS IDENTICAL = 7; SIGN +
: SOURCE 2 DATA - ALL DIGITS IDENTICAL = 7; SIGN +
:
: TOTAL # OF TEST CONDITIONS = 1
: TOTAL # OF TESTS = (1 DATA TYPE IN REG MODE)1 - 1
:
    
```

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ZKREC.P11 DIVP TABLES

```
19847          :ENTRY 89 -  
19848          :  
19849 103404 000000      .WORD 0  
19850 103406 000000      .WORD 0  
19851 103410 000000      .WORD 0
```

```

19853          .SBTTL  PARAMETER TABLES (LENGTHS,ADDRESSES,ETC)
19854          ;
19855          ;PARAMETER TABLES
19856          ;
19858 103412    TO:          ;DUMMY TABLE - USED WHEN AN INPUT PARAMETER
19859          ;          ; IS ALREADY SPECIFIED BY A PRECEDING INPUT PARAMETER T
19860          ;          ; ALSO PROVIDES A SINGLE ENTRY = 0 TABLE
19861 103412 000401      .WORD 401
19862 103414 000000      .WORD 0
19863          ;
19864 103416    XT1:        ;
19865 103416 000403      .WORD 403          ;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
19866 103420 000000      .WORD 0
19867 103422 000001      .WORD 1
19868 103424 000005      .WORD 5
19869 103426 000000      .WORD 0
19870 103430 000000      .WORD 0
19871 103432 000000      .WORD 0
19872 103434 000000      .WORD 0
19873          ;
19874 103436 000410    T1A:  .WORD 410
19875 103440 000000      .WORD 0
19876 103442 000001      .WORD 1
19877 103444 000002      .WORD 2
19878 103446 000003      .WORD 3
19879 103450 000004      .WORD 4
19880 103452 000005      .WORD 5
19881 103454 000011      .WORD 11
19882 103456 000020      .WORD 20
19883 103460 000000      .WORD 0
19884          ;
19885 103462 000403    T1B:  .WORD 403
19886 103464 000001      .WORD 1
19887 103466 000002      .WORD 2
19888 103470 000003      .WORD 3
19889 103472 000000      .WORD 0
19890          ;
19891 103474 000403    T1C:  .WORD 403
19892 103476 000002      .WORD 2
19893 103500 000004      .WORD 4
19894 103502 000006      .WORD 6
19895 103504 000000      .WORD 0
19896          ;
19897 103506 000402    T1D:  .WORD 402
19898 103510 000001      .WORD 1
19899 103512 000002      .WORD 2
19900 103514 000000      .WORD 0
19901          ;
19902 103516 000401    T1E:  .WORD 401
19903 103520 000002      .WORD 2
19904 103522 000000      .WORD 0
19905          ;
19906 103524 000404    T1F:  .WORD 404
19907 103526 000020      .WORD 20

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 CZKEEC.P11 PARAMETER TABLES (LENGTHS,ADDRESSES,ETC)

19908	103530	000016		.WORD 16
19909	103532	000017		.WORD 17
19910	103534	000003		.WORD 3
19911	103536	000000		.WORD 0
19912				
19913	103540	000401	T1G:	.WORD 401
19914	103542	000011		.WORD 11
19915	103544	000000		.WORD 0
19916				
19917	103546	000404	T1H:	.WORD 404
19918	103550	000012		.WORD 12
19919	103552	000013		.WORD 13
19920	103554	000014		.WORD 14
19921	103556	000015		.WORD 15
19922	103560	000000		.WORD 0
19923				
19924	103562	000404	T1K:	.WORD 404
19925	103564	000020		.WORD 20
19926	103566	000016		.WORD 16
19927	103570	000017		.WORD 17
19928	103572	000001		.WORD 1
19929				
19930	103574	000401	T1L:	.WORD 401
19931	103576	000035		.WORD 35
19932	103600	000000		.WORD 0
19933				
19934	103602	000401	T1M:	.WORD 401
19935	103604	000017		.WORD 17
19936	103606	000000		.WORD 0
19937				
19938	103610	000401	T1N:	.WORD 401
19939	103612	000003		.WORD 3
19940	103614	000000		.WORD 0
19941				
19942	103616	000403	T1P:	.WORD 403
19943	103620	000000		.WORD 0
19944	103622	000001		.WORD 1
19945	103624	000037		.WORD 37
19946	103626	000000		.WORD 0
19947	103630	000000		.WORD 0
19948	103632	000000		.WORD 0
19949	103634	000000		.WORD 0
19950				
19951	103636	000402	T1Q:	.WORD 402
19952	103640	000000		.WORD 0
19953	103642	000003		.WORD 3
19954	103644	000000		.WORD 0
19955				
19956	103646	000401	T1R:	.WORD 401
19957	103650	000011		.WORD 11
19958	103652	000000		.WORD 0
19959				
19960	103654	000401	T1S:	.WORD 401
19961	103656	000021		.WORD 21

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 CZKEEC.P11 PARAMETER TABLES (LENGTHS, ADDRESSES, ETC) PAGE 160-2

19962	103660	000000	.WORD	0	
19963					
19964	103662		TSPA:		
19965	103662	000401	.WORD	401	
19966	103664	140000	.WORD	140000	
19967	103666		T111:		
19968	103666	000403	.WORD	403	;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
19969	103670	000000	.WORD	0	
19970	103672	000001	.WORD	1	
19971	103674	000037	.WORD	37	
19972	103676	000000	.WORD	0	
19973	103700	000000	.WORD	0	
19974	103702	000000	.WORD	0	
19975	103704	000000	.WORD	0	
19976					
19977	103706		T112:		
19978	103706	000403	.WORD	403	;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
19979	103710	000000	.WORD	0	
19980	103712	000001	.WORD	1	
19981	103714	000037	.WORD	37	
19982	103716	000000	.WORD	0	
19983	103720	000000	.WORD	0	
19984	103722	000000	.WORD	0	
19985	103724	000000	.WORD	0	
19986					
19987	103726		TL1C:		
19988	103726	000403	.WORD	403	;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
19989	103730	000000	.WORD	0	
19990	103732	000001	.WORD	1	
19991	103734	000300	.WORD	300	
19992	103736	000000	.WORD	0	
19993	103740	000000	.WORD	0	
19994	103742	000000	.WORD	0	
19995	103744	000000	.WORD	0	
19996					
19997	103746		TL2C:		
19998	103746	000403	.WORD	403	;FIXED LENGTH ENTRIES;1 WORD/ENTRY;3 ENTRIES
19999	103750	000000	.WORD	0	
20000	103752	000001	.WORD	1	
20001	103754	000005	.WORD	5	
20002	103756	000000	.WORD	0	
20003	103760	000000	.WORD	0	
20004	103762	000000	.WORD	0	
20005	103764	000000	.WORD	0	
20006					
20007	103766		T2:		
20008	103766	000401	.WORD	401	
20009	103770	000200	.WORD	200	
20010	103772	000000	.WORD	0	
20011	103774	000000	.WORD	0	
20012					
20013	103776		T2A:		
20014	103776	000401	.WORD	401	
20015	104000	000201	.WORD	201	

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 (ZKEEC,P11) PARAMETER TABLES (LENGTHS,ADDRESSES,ETC)

20016	104002	000000		.WORD 0	
20017					
20018	104004	000402	T2AA:	.WORD 402	
20019	104006	000200		.WORD 200	
20020	104010	000201		.WORD 201	
20021	104012	000000		.WORD 0	
20022					
20023	104014	000401	T2B:	.WORD 401	
20024	104016	000230		.WORD 230	
20025	104020	000000		.WORD 0	
20026					
20027	104022		T4:		
20028	104022	040007		.WORD 40007	:VARIABLE LENGTH ENTRIES;7 ENTRIES
20029	104024	013701	003636	MOV TR1,R1	:ENTRY 1; NO OVERLAP; TR3-TR1+TR0+SEP. CONSTANT
20030	104030	063701	003634	ADD TR0,R1	
20031	104034	067701	075556	ADD @PTP14,R1	
20032	104040	010137	003642	MOV R1,TR3	
20033	104044	000207		RTS PC	
20034	104046	000000		0	
20035	104050	013701	003636	MOV TR1,R1	:ENTRY 2; NO OVERLAP; TR3-TR1-TR2-SEP CONSTANT
20036	104054	163701	003640	SUB TR2,R1	
20037	104060	167701	075532	SUB @PTP14,R1	
20038	104064	010137	003642	MOV R1,TR3	
20039	104070	000207		RTS PC	
20040	104072	000000		0	
20041	104074	005737	003634	TST TR0	
20042	104100	001465		BEQ 1\$	
20043	104102	013701	003636	MOV TR1,R1	:ENTRY 3; ADJACENT; TR3-TR1+TR0
20044	104106	063701	003634	ADD TR0,R1	:REDUNDANT WITH ENTRY 7 IF TR0 0
20045	104112	010137	003642	MOV R1,TR3	
20046	104116	000207		RTS PC	
20047	104120	000000		0	
20048	104122	005737	003640	TST TR2	
20049	104126	001452		BEQ 1\$	
20050	104130	013701	003636	MOV TR1,R1	:ENTRY 4; ADJACENT; TR3=TR1-TR2
20051	104134	163701	003640	SUB TR2,R1	:REDUNDANT WITH ENTRY 7 IF TR2=0
20052	104140	010137	003642	MOV R1,TR3	
20053	104144	000207		RTS PC	
20054	104146	000000		0	
20055	104150	013701	003634	MOV TR0,R1	:ENTRY 5; PARTIAL OVERLAP; TR3=TR1+TR0-(TR2/2)
20056	104154	013702	003640	MOV TR2,R2	:REDUNDANT WITH ENTRY 7 IF TR0-(TR2/2)=0
20057	104160	006202		ASR R2	
20058	104162	160201		SUB R2,R1	
20059	104164	005701		TST R1	
20060	104166	001432		BEQ 1\$	
20061	104170	063701	003636	ADD TR1,R1	
20062	104174	010137	003642	MOV R1,TR3	
20063	104200	000207		RTS PC	
20064	104202	000000		0	
20065	104204	005737	003634	TST TR0	
20066	104210	001421		BEQ 1\$	
20067	104212	013701	003636	MOV TR1,R1	:ENTRY 6; PARTIAL OVERLAP; TR3=TR1-(TR2/2)
20068	104216	013702	003640	MOV TR2,R2	:REDUNDANT WITH ENTRY 5 IF TR0=0
20069	104222	006202		ASR R2	:REDUNDANT WITH ENTRY 7 IF TR2/2 0

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PARAMETER TABLES (LENGTHS,ADDRESSES,ETC)

20070	104224	005702			TST R2	
20071	104226	001412			BEQ 1\$	
20072	104230	160201			SUB R2,R1	
20073	104232	010137	003642		MOV R1,TR3	
20074	104236	000207			RTS PC	
20075	104240	000000			0	
20076	104242	013737	003636	003642	MOV TR1,TR3	:ENTRY 7: COMPLETE OVERLAP; TR3-TR1
20077	104250	000207			RTS PC	
20078	104252	000000			0	
20079	104254	062706	000002	1\$:	ADD #2,SP	:FIXUP STACK POINTER
20080	104260	000137	042500		JMP REDNTC	:SKIP ENTRY TEST CONDITION - REDUNDANT
20081						
20082	104264			14A:		
20083	104264	040002			.WORD 40002	:VARIABLE LENGTH ENTRIES; 2 ENTRIES
20084	104266	013701	003634		MOV TR0,R1	:ENTRY 1; PARTIAL OVERLAP; TR3-TR1+TR0-(TR2/2)
20085	104272	013702	003640		MOV TR2,R2	
20086	104276	006202			ASR R2	
20087	104300	060201			SUB R2,R1	
20088	104302	063701	003636		ADD TR1,R1	
20089	104306	010137	003642		MOV R1,TR3	
20090	104312	000207			RTS PC	
20091	104314	000000			0	
20092	104316	013701	003636		MOV TR1,R1	:ENTRY 2; PARTIAL OVERLAP; TR3 TR1-(TR2/2)
20093	104322	013702	003640		MOV TR2,R2	
20094	104326	006202			ASR R2	
20095	104330	160201			SUB R2,R1	
20096	104332	010137	003642		MOV R1,TR3	
20097	104336	000207			RTS PC	
20098	104340	000000			0	
20099	104342			14I:		
20100	104342	040007			.WORD 40007	:VARIABLE LENGTH ENTRIES; 7 ENTRIES
20101	104344	013701	003642		MOV TR3,R1	:ENTRY 1; NO OVERLAP; TR1 TR2+TR3 +SEP. CONSTANT
20102	104350	063701	003640		ADD TR2,R1	
20103	104354	067701	075236		ADD @PTP14,R1	
20104	104360	010137	003636		MOV R1,TR1	
20105	104364	000207			RTS PC	
20106	104366	000000			0	
20107	104370	013701	003642		MOV TR3,R1	:ENTRY 2; NO OVERLAP; TR1-TR3-TR0-SEP CONSTANT
20108	104374	163701	003634		SUB TR0,R1	
20109	104400	167701	075212		SUB @PTP14,R1	
20110	104404	010137	003636		MOV R1,TR1	
20111	104410	000207			RTS PC	
20112	104412	000000			0	
20113	104414	005737	003640		TST TR2	
20114	104420	001465			BEQ 1\$	
20115	104422	013701	003642		MOV TR3,R1	:ENTRY 3; ADJACENT; TR1=TR3+TR2
20116	104426	063701	003640		ADD TR2,R1	:REDUNDANT WITH ENTRY 7 IF TR2=0
20117	104432	010137	003636		MOV R1,TR1	
20118	104436	000207			RTS PC	
20119	104440	000000			0	
20120	104442	005737	003634		TST TR0	
20121	104446	001452			BEQ 1\$	
20122	104450	013701	003642		MOV TR3,R1	:ENTRY 4; ADJACENT; TR1=TR3-TR0
20123	104454	163701	003634		SUB TR0,R1	:REDUNDANT WITH ENTRY 7 IF TR0 0

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 CZKEEC.P11 PARAMETER TABLES (LENGTHS, ADDRESSES, ETC)

20124	104460	010137	003636	MOV R1,TR1	
20125	104464	000207		RTS PC	
20126	104466	000000		0	
20127	104470	013701	003640	MOV TR2,R1	:ENTRY 5; PARTIAL OVERLAP; TR1=TR3+TR2-(TR0/2)
20128	104474	013702	003634	MOV TR0,R2	:REDUNDANT WITH ENTRY 7 IF TR2-(TR0/2)=0
20129	104500	006202		ASR R2	
20130	104502	160201		SUB R2,R1	
20131	104504	005701		TST R1	
20132	104506	001432		BEQ 1\$	
20133	104510	063701	003642	ADD TR3,R1	
20134	104514	010137	003636	MOV R1,TR1	
20135	104520	000207		RTS PC	
20136	104522	000000		0	
20137	104524	005737	003640	TST TR2	
20138	104530	001421		BEQ 1\$	
20139	104532	013701	003642	MOV TR3,R1	:ENTRY 6; PARTIAL OVERLAP; TR1=TR3-(TR0/2)
20140	104536	013702	003634	MOV TR0,R2	:REDUNDANT WITH ENTRY 5 IF TR2=0
20141	104542	006202		ASR R2	:REDUNDANT WITH ENTRY 7 IF TR0/2 = 0
20142	104544	005702		TST R2	
20143	104546	001412		BEQ 1\$	
20144	104550	160201		SUB R2,R1	
20145	104552	010137	003636	MOV R1,TR1	
20146	104556	000207		RTS PC	
20147	104560	000000		0	
20148	104562	013737	003642 003636	MOV TR3,TR1	:ENTRY 7; COMPLETE OVERLAP; TR1 TR3
20149	104570	000207		RTS PC	
20150	104572	000000		0	
20151	104574	062706	000002	1\$: ADD #2,SP	:FIXUP STACK POINTER
20152	104600	000137	042500	JMP REDNTC	:SKIP ENTRY TEST CONDITION - REDUNDANT
20153					
20154	104604			T41A:	
20155	104604	040001		.WORD 40001	
20156	104606	013701	003642	MOV TR3,R1	
20157	104612	063701	003640	ADD TR2,R1	
20158	104616	067701	074774	ADD @PTP14,R1	
20159	104622	010137	003636	MOV R1,TR1	
20160	104626	000207		RTS PC	
20161	104630	000000		0	
20162	104632			T411:	
20163	104632	040G01		.WORD 40001	:VARIABLE LENGTH ENTRY; 1 ENTRY
20164	104634	013701	003636	MOV TR1,R1	:ENTRY 1; NO OVERLAP; TR3 TR1+TR0+SEP. CONSTANT
20165	104640	063701	003634	ADD TR0,R1	
20166	104644	067701	074746	ADD @PTP14,R1	
20167	104650	010137	003642	MOV R1,TR3	
20168	104654	000207		RTS PC	
20169	104656	000000		0	
20170	104660			T5:	
20171	104660	000401		.WORD 401	
20172	104662	0G0377		.WORD 377	
20173	104664	000000		.WORD 0	
20174	104666	000000		.WORD 0	
20175	104670	000000		.WORD 0	
20176					
20177	104672			T511:	

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 CZKEEC.P11 PARAMETER TABLES (LENGTHS,ADDRESSES,ETC)

20178	104672	000403	.WORD	403	
20179	104674	000201	.WORD	201	
20180	104676	000377	.WORD	377	
20181	104700	000127	.WORD	127	
20182	104702	000000	.WORD	0	
20183	104704	000000	.WORD	0	
20184	104706	000000	.WORD	0	
20185					
20186	104710		T6:		
20187	104710	040001	.WORD	40001	;DATA DESCRIPTOR ENTRIES;# OF ENTRIES=1
20188	104712	020001	.WORD	020001	;ENTRY TYPE =1; STARTING BYTE=1;INCREMENT=1
20189	104714	000001	.WORD	1	
20190	104716	000000	.WORD	0	
20191	104720	000000	.WORD	0	
20192	104722	000000	.WORD	0	
20193	104724	000000	.WORD	0	
20194	104726	000000	.WORD	0	
20195	104730	000000	.WORD	0	
20196					
20197	104732		T6A:		
20198	104732	040001	.WORD	40001	;DATA DESCRIPTOR ENTRIES;# OF ENTRIES 1
20199	104734	020001	.WORD	020001	;ENTRY TYPE -1; STARTING BYTE=0;INCREMENT 1
20200	104736	000000	.WORD	0	
20201	104740	000000	.WORD	0	
20202	104742		T7:		
20203	104742	040001	.WORD	40001	;DATA DESCRIPTOR ENTRIES;# OF ENTRIES 1
20204	104744	000240	.WORD	240	;ENTRY TYPE=0; ALL BYTES IDENTICAL 240
20205	104746	000000	.WORD	0	
20206	104750	000000	.WORD	0	
20207	104752	000000	.WORD	0	
20208	104754	000000	.WORD	0	
20209	104756	000000	.WORD	0	
20210					
20211	104760		T10:		
20212	104760	000401	.WORD	401	
20213	104762	000003	.WORD	3	
20214	104764	000000	.WORD	0	
20215	104766	000000	.WORD	0	
20216	104770	000000	.WORD	0	
20217	104772	000000	.WORD	0	
20218					
20219	104774		T11:		
20220	104774	040001	.WORD	40001	;DATA DESCRIPTOR ENTRIES; # OF ENTRIES=1
20221	104776	000252	.WORD	252	;ENTRY TYPE=0; ALL BYTES IDENTICAL =252
20222	105000	000000	.WORD	0	
20223	105002	000000	.WORD	0	
20224	105004	000000	.WORD	0	
20225	105006	000000	.WORD	0	
20226	105010	000000	.WORD	0	
20227					
20228	105012		T12:		
20229	105012	040001	.WORD	40001	;DATA DESCRIPTOR ENTRIES; # OF ENTRIES=1
20230	105014	000360	.WORD	360	;ENTRY TYPE=0; ALL BYTES IDENTICAL = 360
20231	105016	000000	.WORD	0	

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CZKLEC.P11 PARAMETER TABLES (LENGTHS,ADDRESSES,ETC)

20232	105020	000000		.WORD	0
20233	105022	000000		.WORD	0
20234	105024	000000		.WORD	0
20235	105026	000000		.WORD	0
20236					
20237	105030		T13:		
20238	105030	000401		.WORD	401
20239	105032	000005		.WORD	5
20240	105034	000000		.WORD	0
20241	105036	000000		.WORD	0
20242	105040	000000		.WORD	0
20243	105042	000000		.WORD	0
20244					
20245	105044		T14:		
20246	105044	000401		.WORD	401
20247	105046	000010		.WORD	10
20248	105050	000000		.WORD	0
20249	105052	000000		.WORD	0
20250	105054	000000		.WORD	0
20251					
20252	105056		T14A:		
20253	105056	000401		.WORD	401
20254	105060	000100		.WORD	100
20255	105062	000000		.WORD	0
20256	105064	000000		.WORD	0
20257	105066	000000		.WORD	0
20258					
20259	105070		T15:		
20260	105070	000403		.WORD	403
20261	105072	000004		.WORD	4
20262	105074	000375		.WORD	375
20263	105076	000240		.WORD	240
20264	105100	000000		.WORD	0
20265	105102	000000		.WORD	0
20266	105104	000000		.WORD	0
20267	105106	000000		.WORD	0
20268					
20269	105110		T15A:		
20270	105110	000401		.WORD	401
20271	105112	000004		.WORD	4
20272	105114	000000		.WORD	0
20273	105116		T16A:		
20274	105116	040001		.WORD	40001
20275	105120	113701	003634	MOV B TR0,R1	
20276	105124	006201		ASR R1	
20277	105126	005201		INC R1	
20278	105130	063701	005636	ADD TR1,R1	
20279	105134	067701	074466	ADD @PTP20,R1	
20280	105140	010137	003642	MOV R1,TR3	
20281	105144	113701	003640	MOV B TR2,R1	
20282	105150	006201		ASR R1	
20283	105152	005201		INC R1	
20284	105154	063701	003642	ADD TR3,R1	
20285	105160	067701	074442	ADD @PTP20,R1	

```

;FOR USE WITH PACKED STRINGS ONLY
;ENTRY 1; NO OVERLAP
;TR3=TR1+[(TR0/2)+1]+SEP. CONST.
;TR5=TR3+[(TR2/2)+1]+SEP. CONST

```

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20286	105164	010137	003646		MOV R1,TR5	
20287	105170	000207			RTS PC	
20288	105172	000000			0	
20289						
20290	105174	040001		T16B:	.WORD 40001	:FOR USE WITH PACKED STRINGS ONLY
20291	105176	013737	003636	003642	MOV TR1,TR3	:S1A=S2A; S1 - S2
20292	105204	113701	003640		MOV B TR2,R1	:DA - S2A+[(S2L/2)+1]+SEP CONST
20293	105210	006201			ASR R1	
20294	105212	005201			INC R1	
20295	105214	063701	003642		ADD TR3,R1	
20296	105220	067701	074402		ADD @PTP20,R1	
20297	105224	010137	003646		MOV R1,TR5	
20298	105230	000207			RTS PC	
20299	105232	000000			0	
20300						
20301	105234			T16:		
20302	105234	040002			.WORD 40002	:FOR USE WITH PACKED STRINGS ONLY
20303	105236	113701	003634		MOV B TR0,R1	:ENTRY 1; NO OVERLAP
20304	105242	006201			ASR R1	: TR3=TR1+[(TR0/2)+1]+SEP. CONSTANT
20305	105244	005201			INC R1	: TR5=TR3+[(TR2/2)+1]+SEP. CONSTANT
20306	105246	063701	003636		ADD TR1,R1	
20307	105252	067701	074350		ADD @PTP20,R1	
20308	105256	010137	003642		MOV R1,TR3	
20309	105262	113701	003640		MOV B TR2,R1	
20310	105266	006201			ASR R1	
20311	105270	005201			INC R1	
20312	105272	063701	003642		ADD TR3,R1	
20313	105276	067701	074324		ADD @PTP20,R1	
20314	105302	010137	003646		MOV R1,TR5	
20315	105306	000207			RTS PC	
20316	105310	000000			0	
20317	105312	113701	003634		MOV B TR0,R1	:ENTRY 2; ALIGNED SRC2 - DST
20318	105316	006201			ASR R1	: TR3=TR1+[(TR0/2)+1]+SEP. CONSTANT
20319	105320	005201			INC R1	: TR5=TR3+[(TR2/2)-(TR4/2)]
20320	105322	063701	003636		ADD TR1,R1	
20321	105326	067701	074274		ADD @PTP20,R1	
20322	105332	010137	003642		MOV R1,TR3	
20323	105336	113701	003640		MOV B TR2,R1	
20324	105342	006201			ASR R1	
20325	105344	113702	003644		MOV B TR4,R2	
20326	105350	006202			ASR R2	
20327	105352	160201			SUB R2,R1	
20328	105354	063701	003642		ADD TR3,R1	
20329	105360	010137	003646		MOV R1,TR5	
20330	105364	013701	003642		MOV TR3,R1	:DST MUST NOT OVERLAP SRC1
20331	105370	167701	074232		SUB @PTP20,R1	:FIND END OF SRC1
20332	105374	023701	003646		CMP TR5,R1	:COMPARE END WITH START OF DST
20333	105400	103401			BLO 1\$:OVERLAP-SKIP TEST CONDITION
20334	105402	000207			RTS PC	
20335	105404	062706	000002	1\$:	ADD #2,SP	:FIXUP STACK POINTER
20336	105410	000137	042764		JMP NXC	:SKIP TEST CONDITION - INVALID
20337	105414	000000			0	
20338						
20339	105416			T161:		

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20340	105416	040002		.WORD 40002	:FOR USE WITH PACKED STRINGS ONLY
20341	105420	113701	003634	MOV B TR0,R1	:ENTRY 1: NO OVERLAP
20342	105424	006201		ASR R1	: TR3=TR1+[(TR0/2)+1]+SEP. CONSTANT
20343	105426	005201		INC R1	: TR5=TR3+[(TR2/2)+1]+SEP. CONSTANT
20344	105430	063701	003636	ADD TR1,R1	
20345	105434	067701	074166	ADD @PTP20,R1	
20346	105440	010137	003642	MOV R1,TR3	
20347	105444	113701	003640	MOV B TR2,R1	
20348	105450	006201		ASR R1	
20349	105452	005201		INC R1	
20350	105454	063701	003642	ADD TR3,R1	
20351	105460	067701	074142	ADD @PTP20,R1	
20352	105464	010137	003646	MOV R1,TR5	
20353	105470	000207		RTS PC	
20354	105472	000000		0	
20355	105474	113701	003634	MOV B TR0,R1	:ENTRY 2: ADJACENT
20356	105500	006201		ASR R1	: TR3=TR1+(TR0/2)+1
20357	105502	005201		INC R1	: TR5=TR3+(TR2/2)+1
20358	105504	063701	003636	ADD TR1,R1	
20359	105510	010137	003642	MOV R1,TR3	
20360	105514	113701	003640	MOV B TR2,R1	
20361	105520	006201		ASR R1	
20362	105522	005201		INC R1	
20363	105524	063701	003642	ADD TR3,R1	
20364	105530	010137	003646	MOV R1,TR5	
20365	105534	000207		RTS PC	
20366	105536	000000		0	
20367					
20368	105540			T16ZA:	
20369	105540	040001		.WORD 40001	
20370	105542	113701	003634	MOV B TR0,R1	:ENTRY 1: NO OVERLAP
20371	105546	063701	003636	ADD TR1,R1	: TR3=TR1+TR0+SEP CONST
20372	105552	067701	074050	ADD @PTP20,R1	: TR5=TR3+TR2+SEP CONST
20373	105556	010137	003642	MOV R1,TR3	
20374	105562	113701	003640	MOV B TR2,R1	
20375	105566	063701	003642	ADD TR3,R1	
20376	105572	067701	074030	ADD @PTP20,R1	
20377	105576	010137	003646	MOV R1,TR5	
20378	105602	000207		RTS PC	
20379	105604	000000		0	
20380	105606			T16Z:	:FOR USE WITH ZONED STRINGS
20381	105606	040002		.WORD 40002	
20382	105610	113701	003634	MOV B TR0,R1	:ENTRY 1: NO OVERLAP
20383	105614	063701	003636	ADD TR1,R1	: TR3=TR1+TR0+SEP CONST
20384	105620	067701	074002	ADD @PTP20,R1	: TR5=TR3+TR2+SEP CONST
20385	105624	010137	003642	MOV R1,TR3	
20386	105630	113701	003640	MOV B TR2,R1	
20387	105634	063701	003642	ADD TR3,R1	
20388	105640	067701	073762	ADD @PTP20,R1	
20389	105644	010137	003646	MOV R1,TR5	
20390	105650	000207		RTS PC	
20391	105652	000000		0	
20392	105654	113701	003634	MOV B TR0,R1	:ENTRY 2 - ALIGNED SRC2 - DST
20393	105660	063701	003636	ADD TR1,R1	: TR3=TR1+TR0+SEP CONST

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20394	105664	067701	073736	ADD @PTP20,R1	; TR5-TR3+TR2-TR4
20395	105670	010137	003642	MOV R1,TR3	
20396	105674	113701	003640	MOV# TR2,R1	
20397	105700	063701	003642	ADD TR3,R1	
20398	105704	113702	003644	MOV# TR4,R2	
20399	105710	160201		SUB R2,R1	
20400	105712	010137	003646	MOV R1,TR5	
20401	105716	013701	003642	MOV TR3,R1	;DST MUST NOT OVERLAP SRC1
20402	105722	167701	073700	SUB @PTP20,R1	;FIND END OF SRC1
20403	105726	023701	003646	CMP TR5,R1	;COMPARE END WITH START OF DST
20404	105732	103401		BLO 1\$	
20405	105734	000207		RTS PC	
20406	105736	062706	000002	ADD #2,SP	;FIXUP STACK POINTER
20407	105742	000137	042764	JMP NXTC	;SKIP TEST CONDITION - INVALID
20408	105746	000000		0	
20409					
20410	105750				T17:
20411	105750	040004		.WORD 40004	
20412	105752	100037		.WORD 100037	;DATA DESCRIPTOR TYPE 4 - PACKED STRING,
20413	105754	003370		.WORD SSTG12	; PRE SPECIFIED STRING;SIGN POSITIVE
20414	105756	000000		.WORD 0	
20415	105760	060134		.WORD 060134	;DATA DESCRIPTOR TYPE 3 - PACKED STRING;
20416					; ALL DIGITS IDENTICAL - 5; SIGN POSITIVE
20417	105762	000000		.WORD 0	
20418	105764	060075		.WORD 060075	;DATA DESCRIPTOR TYPE 3 - PACKED STRING;
20419					; ALL DIGITS IDENTICAL - 3; SIGN NEGATIVE
20420	105766	000000		.WORD 0	
20421	105770	060014		.WORD 060014	;DATA DESCRIPTOR TYPE 3 - PACKED STRING;
20422					; ALL DIGITS IDENTICAL - 0; SIGN POSITIVE
20423	105772	000000		.WORD 0	
20424	105774	000000		.WORD 0	
20425	105776	000000		.WORD 0	
20426	106000	000000		.WORD 0	
20427	106002	000000		.WORD 0	
20428	106004	000000		.WORD 0	
20429	106006	000000		.WORD 0	
20430					
20431	106010	040002		.WORD 40002	T17A:
20432	106012	060174		.WORD 060174	;ALL DIGITS = 7+
20433	106014	000000		.WORD 0	
20434	106016	060014		.WORD 060014	;ALL DIGITS = 0+
20435	106020	000000		.WORD 0	
20436	106022	000000		.WORD 0	
20437	106024				T20:
20438	106024	040001		.WORD 40001	;DATA DESCRIPTOR TYPE ENTRIES; # OF ENTRIES=1
20439	106026	000127		.WORD 127	;ENTRY TYPE=0; ALL BYTES IDENTICAL - 127
20440	106030	000000		.WORD 0	
20441	106032	000000		.WORD 0	
20442	106034	000000		.WORD 0	
20443	106036	000000		.WORD 0	
20444	106040	000000		.WORD 0	
20445					
20446	106042				T21:
20447	106042	000402		.WORD 402	

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20448	106044	000001		.WORD 1
20449	106046	000005		.WORD 5
20450	106050	000000		.WORD 0
20451	106052	000000		.WORD 0
20452	106054	000000		.WORD 0
20453				
20454	106056		T211:	
20455	106056	000402		.WORD 402
20456	106060	000001		.WORD 1
20457	106062	000037		.WORD 37
20458	106064	000000		.WORD 0
20459	106066	000000		.WORD 0
20460	106070	000000		.WORD 0
20461	106072	000000		.WORD 0
20462				
20463	106074		T212:	
20464	106074	000402		.WORD 402
20465	106076	000001		.WORD 1
20466	106100	000037		.WORD 37
20467	106102	000000		.WORD 0
20468	106104	000000		.WORD 0
20469	106106	000000		.WORD 0
20470	106110	000000		.WORD 0
20471	106112	000000		.WORD 0
20472				
20473	106114		TL210:	
20474	106114	000402		.WORD 402
20475	106116	000001		.WORD 1
20476	106120	000005		.WORD 5
20477	106122	000000		.WORD 0
20478	106124	000000		.WORD 0
20479	106126	000000		.WORD 0
20480	106130	000000		.WORD 0
20481				
20482	106132		TL220:	
20483	106132	000402		.WORD 402
20484	106134	000001		.WORD 1
20485	106136	000005		.WORD 5
20486	106140	000000		.WORD 0
20487	106142	000000		.WORD 0
20488	106144	000000		.WORD 0
20489	106146	000000		.WORD 0
20490	106150	000000		.WORD 0
20491				
20492	106152		T22:	
20493	106152	040001		.WORD 40001
20494	106154	060074		.WORD 060074
20495	106156	000000		.WORD 0
20496	106160	000000		.WORD 0
20497	106162	000000		.WORD 0
20498	106164	000000		.WORD 0
20499	106166	000000		.WORD 0
20500	106170	000000		.WORD 0
20501				

;DATA DESCRIPTOR TYPE 3 - PACKED STRING
; ALL DIGITS IDENTICAL - 3; SIGN POSITIVE

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PARAMETER TABLES (LENGTHS, ADDRESSES, ETC)

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20502	106172		T23:		
20503	106172	040001		.WORD 40001	:DATA DESCRIPTOR TYPE ENTRIES; # OF ENTRIES = 1
20504	106174	000120		.WORD 120	:ENTRY TYPE=0; ALL BYTES IDENTICAL = 120
20505	106176	000000		.WORD 0	
20506	106200	000000		.WORD 0	
20507	106202	000000		.WORD 0	
20508	106204	000000		.WORD 0	
20509	106206	000000		.WORD 0	
20510					
20511	106210		T24:		
20512	106210	000401		.WORD 401	
20513	106212	120606		.WORD XLTLB1	
20514	106214	000000		.WORD 0	
20515	106216	000000		.WORD 0	
20516	106220	000000		.WORD 0	
20517	106222	000000		.WORD 0	
20518					
20519	106224		T25:		
20520	106224	000402		.WORD 402	
20521	106226	000001		.WORD 1	
20522	106230	000240		.WORD 240	
20523	106232	000000		.WORD 0	
20524	106234	000000		.WORD 0	
20525	106236	000000		.WORD 0	
20526	106240	000000		.WORD 0	
20527					
20528	106242		T25A:		
20529	106242	000401		.WORD 401	
20530	106244	000007		.WORD 007	
20531	106246	000000		.WORD 0	
20532	106250		T26:		
20533	106250	001001		.WORD 1001	
20534	106252	040003		.WORD 040003	:DATA DESCRIPTOR TYPE 2 - CHAR STRING
20535	106254	003250		.WORD SSTG1	: STRING PRE-SPECIFIED AT SSTG1.
20536	106256	000000		.WORD 0	
20537	106260	000000		.WORD 0	
20538	106262	000000		.WORD 0	
20539	106264	000000		.WORD 0	
20540					
20541	106266		T27:		
20542	106266	000401		.WORD 401	
20543	106270	000256		.WORD 256	:TABLE LENGTH = 256 BYTES
20544	106272	000000		.WORD 0	
20545	106274	000000		.WORD 0	
20546	106276	000000		.WORD 0	
20547	106300	000000		.WORD 0	
20548					
20549	106302		T30:		
20550	106302	000403		.WORD 403	
20551	106304	000000		.WORD 0	
20552	106306	000001		.WORD 1	
20553	106310	000377		.WORD 377	
20554	106312	000000		.WORD 0	
20555	106314	000000		.WORD 0	

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20556	106316	000000				.WORD 0	
20557	106320	000000				.WORD 0	
20558	106322				T30A:		
20559	106322	000401				.WORD 401	
20560	106324	000252				.WORD 252	
20561	106326	000000				.WORD 0	
20562	106330				T31A:		
20563	106330	040001				.WORD 40001	
20564	106332	013701	003634			MOV TR0,R1	:ENTRY 1; NO OVERLAP
20565	106336	063701	003636			ADD TR1,R1	:TR5 = TR0+TR1+SEP CONSTANT
20566	106342	067701	073250			ADD @PTP14,R1	
20567	106346	010137	003646			MOV R1,TR5	
20568	106352	000207				RTS PC	
20569	106354	000000				0	
20570	106356				T31:		
20571	106356	040002				.WORD 40002	
20572	106360	013701	003634			MOV TR0,R1	:ENTRY 1; NO OVERLAP
20573	106364	063701	003636			ADD TR1,R1	:TR5 = TR0+TR1+SEP CONSTANT
20574	106370	067701	073222			ADD @PTP14,R1	
20575	106374	010137	003646			MOV R1,TR5	
20576	106400	000207				RTS PC	
20577	106402	000000				0	
20578	106404	013737	003636	003646		MOV TR1,TR5	:ENTRY 2; OVERLAP
20579	106412	000207				RTS PC	:TR5 - TR1
20580	106414	000000				0	
20581							
20582	106416				T32:		
20583	106416	040003				.WORD 40003	:DATA DESCRIPTOR ENTRIES; # OF ENTRIES - 3
20584	106420	001000				.WORD 1000	:ENTRY TYPE 0; ALL BYTES IDENTICAL 0
20585							: NOTE: 1000 RATHER THAN 0 IS USED HERE BECAUSE
20586							: 0 CAN BE USED ONLY FOR DELIMITING TABLE
20587							: ENTRIES.
20588	106422	000000				.WORD 0	:ENTRY DELIMITER.
20589	106424	000377				.WORD 377	:ENTRY TYPE 0; ALL BYTES IDENTICAL 377
20590	106426	000000				.WORD 0	
20591	106430	020001				.WORD 20001	:ENTRY TYPE=1;STARTING BYTE-1;INC-1
20592	106432	000001				.WORD 1	
20593	106434	000000				.WORD 0	
20594	106436	000000				.WORD 0	
20595	106440	000000				.WORD 0	
20596	106442	000000				.WORD 0	
20597	106444	000000				.WORD 0	
20598							
20599	106446				T33:		
20600	106446	000403				.WORD 403	
20601	106450	000000				.WORD 0	
20602	106452	000001				.WORD 1	
20603	106454	000020				.WORD 20	
20604	106456	000000				.WORD 0	
20605	106460	000000				.WORD 0	
20606	106462	000000				.WORD 0	
20607	106464	000000				.WORD 0	
20608							
20609	106466	000401			T33A:	.WORD 401	

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 (ZKFE) PARAMETER TABLES (LENGTHS, ADDRESSES, ETC)

20610	106470	000012		.WORD 12	
20611	106472	000000		.WORD 0	
20612	106474	000000		.WORD 0	
20613	106476	000000		.WORD 0	
20614	106500	000000		.WORD 0	
20615					
20616	106502		T331:		
20617	106502	000403		.WORD 403	
20618	106504	000000		.WORD 0	
20619	106506	000001		.WORD 1	
20620	106510	000037		.WORD 37	
20621	106512	000000		.WORD 0	
20622	106514	000000		.WORD 0	
20623	106516	000000		.WORD 0	
20624	106520	000000		.WORD 0	
20625	106522		T332:		
20626	106522	000403		.WORD 403	
20627	106524	000000		.WORD 0	
20628	106526	000001		.WORD 1	
20629	106530	000037		.WORD 37	
20630	106532	000000		.WORD 0	
20631	106534	000000		.WORD 0	
20632	106536	000000		.WORD 0	
20633	106540	000000		.WORD 0	
20634					
20635	106542	000401	T333:	.WORD 401	
20636	106544	000037		.WORD 37	
20637	106546	000000		.WORD 0	
20638	106550	000000		.WORD 0	
20639	106552	000000		.WORD 0	
20640	106554	000000		.WORD 0	
20641					
20642	106556		T34A:		
20643	106556	040001		.WORD 40001	
20644	106560	113701	003634	MOVB TRO,R1	:ENTRY 1; NO OVERLAP
20645	106564	006201		ASR R1	
20646	106566	005201		INC R1	:NOTE: SRC IS PACKED, THEREFORE # BYTES # (DIGITS/2)+
20647	106570	063701	003636	ADD TR1,R1	;TR3 = TR1+[(TRO/2)+1] + SEP CONSTANT
20648	106574	067701	073014	ADD @PTP13,R1	
20649	106600	010137	003642	MOV R1,TR3	
20650	106604	000207		RTS PC	
20651	106606	000000		0	
20652	106610		T34:		
20653	106610	040002		.WORD 40002	
20654	106612	113701	003634	MOVB TRO,R1	:ENTRY 1; NO OVERLAP
20655	106616	006201		ASR R1	
20656	106620	005201		INC R1	:NOTE: SRC IS PACKED, THEREFORE # BYTES = # (DIGITS/2)+
20657	106622	063701	003636	ADD TR1,R1	;TR3 = TR1+[(TRO/2)+1] + SEP CONSTANT
20658	106626	067701	072762	ADD @PTP13,R1	
20659	106632	010137	003642	MOV R1,TR3	
20660	106636	000207		RTS PC	
20661	106640	000000		0	
20662	106642	113701	003634	MOVB TRO,R1	:ENTRY 2; ADJACENT
20663	106646	006201		ASR R1	; TR3 = TR1+[(TRO/2)+1]

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20664	106650	005201		INC R1	
20665	106652	063701	003636	ADD TR1,R1	
20666	106656	010137	003642	MOV R1,TR3	
20667	106662	000207		RTS PC	
20668	106664	003000		0	
20669					
20670	106666			T35:	
20671	106666	040003		.WORD 40003	
20672	106670	060074		.WORD 060074	;DATA DESCRIPTOR TYPE 3 - PACKED STRING
20673					; ALL DIGITS IDENTICAL=3; SIGN POSITIVE
20674	106672	000000		.WORD 0	
20675	106674	060215		.WORD 060215	;DATA DESCRIPTOR TYPE 3 - PACKED STRING
20676					; ALL DIGITS IDENTICAL=8; SIGN NEGATIVE
20677	106676	000000		.WORD 0	
20678	106700	060015		.WORD 060015	;DATA DESCRIPTOR TYPE 3 - PACKED STRING
20679					; ALL DIGITS IDENTICAL = 0;SIGN NEGATIVE
20680	106702	000000		.WORD 0	
20681	106704	000000		.WORD 0	
20682	106706	000000		.WORD 0	
20683	106710	000000		.WORD 0	
20684	106712	000000		.WORD 0	
20685	106714	000000		.WORD 0	
20686					
20687	106716			T35A:	
20688	106716	040004		.WORD 40004	
20689	106720	060074		.WORD 060074	;DATA DESCRIPTOR TYPE 3 - PACKED STRING
20690					; ALL DIGITS IDENTICAL=3; SIGN POSITIVE
20691	106722	000000		.WORD 0	
20692	106724	060215		.WORD 060215	;DATA DESCRIPTOR TYPE 3 - PACKED STRING
20693					; ALL DIGITS IDENTICAL=8; SIGN NEGATIVE
20694	106726	000000		.WORD 0	
20695	106730	060015		.WORD 060015	;DATA DESCRIPTOR TYPE 3 - PACKED STRING
20696					; ALL DIGITS IDENTICAL = 0;SIGN NEGATIVE
20697	106732	000000		.WORD 0	
20698	106734	100037		.WORD 100037	;DATA DESCRIPTOR TYPE 4 - PACKED STRING
20699	106736	003370		.WORD SSTG12	; PRE SPECIFIED STRING; SIGN POSITIVE
20700	106740	000000		.WORD 0	
20701	106742	000000		.WORD 0	
20702	106744	000000		.WORD 0	
20703	106746	000000		.WORD 0	
20704	106750	000000		.WORD 0	
20705	106752	000000		.WORD 0	
20706					
20707	106754	040001		TP19:	
20708	106756	100037		.WORD 40001	
20709	106760	003370		.WORD 100037	
20710	106762	000000		.WORD SSTG12	
20711				.WORD 0	
20712	106764	040002		TP19A:	
20713	106766	100013		.WORD 40002	
20714	106770	003610		.WORD 100013	;DATA DESC TYPE 4; PACKED STRING
20715	106772	000000		.WORD SSTG14	;PRESPECIFIED DATA; SIGN +
20716	106774	100013		.WORD 0	
20717	106776	003616		.WORD 100013	
				.WORD SSTG15	

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20718	107000	000000		.WORD 0	
20719					
20720	107002	040001	TP19B:	.WORD 40001	
20721	107004	100017		.WORD 100017	
20722	107006	003624		.WORD SSTG16	
20723	107010	000000		.WORD 0	
20724					
20725	107012	040002	TP19C:	.WORD 40002	;PACKED STRING
20726	107014	060014		.WORD 060014	; ALL DIGITS IDENTICAL = 0; SIGN +
20727	107016	000000		.WORD 0	
20728	107020	060114		.WORD 060114	; ALL DIGITS IDENTICAL = 4; SIGN +
20729	107022	000000		.WORD 0	
20730					
20731	107024	040001	TP19D:	.WORD 40001	;PACKED STRING
20732	107026	060014		.WORD 060014	; ALL DIGITS IDENTICAL = 0; SIGN +
20733	107030	000000		.WORD 0	
20734					
20735	107032	040001	TP19E:	.WORD 40001	;PACKED STRING
20736	107034	060174		.WORD 060174	; ALL DIGITS IDENTICAL = 7; SIGN +
20737	107036	000000		.WORD 0	
20738					
20739	107040	040001	TP99:	.WORD 40001	;DATA DESC TYPE 3; PACKED STRING
20740	107042	060235		.WORD 060235	;ALL DIGITS IDENTICAL = 9; SIGN -
20741	107044	000000		.WORD 0	
20742					
20743	107046		T35B:		
20744	107046	040005		.WORD 40005	
20745	107050	060215		.WORD 060215	;DATA DESCRIPTOR TYPE 3 - PACKED STRING
20746					; ALL DIGITS IDENTICAL=8; SIGN NEGATIVE
20747	107052	000000		.WORD 0	
20748	107054	060015		.WORD 060015	;DATA DESCRIPTOR TYPE 3 - PACKED STRING
20749					; ALL DIGITS IDENTICAL = 0;SIGN NEGATIVE
20750	107056	000000		.WORD 0	
20751	107060	100037		.WORD 100037	;DATA DESCRIPTOR TYPE 4 - PACKED STRING
20752	107062	003370		.WORD SSTG12	; PRE SPECIFIED STRING; SIGN POSITIVE
20753	107064	000000		.WORD 0	
20754	107066	100037		.WORD 100037	;DATA DESCRIPTOR TYPE 4 - PACKED STRING
20755	107070	003410		.WORD STG12B	; PRE SPECIFIED STRING;SIGN NEG
20756	107072	000000		.WORD 0	
20757	107074	100037		.WORD 100037	
20758	107076	003430		.WORD STG12C	
20759	107100	000000		.WORD 0	
20760	107102	000000		.WORD 0	
20761	107104	000000		.WORD 0	
20762	107106	000000		.WORD 0	
20763	107110	000000		.WORD 0	
20764	107112	000000		.WORD 0	
20765	107114	000000		.WORD 0	
20766					
20767	107116		T36A:		
20768	107116	040001		.WORD 40001	
20769	107120	113701		MOVB TR0,R1	;ENTRY 1; NO OVERLAP
20770	107124	063701		ADD TR1,R1	; NOTE SRC IS ZONED THEREFORE #BYTES-#DIGITS
20771	107130	067701		ADD @PTP13,R1	;TR3 - TR0+TR1+SEP CONSTANT

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20772	107134	010137	003642		MOV R1,TR3	
20773	107140	000207			RTS PC	
20774	107142	000000			0	
20775	107144			T36:		
20776	107144	040002			.WORD 40002	
20777	107146	113701	003634		MOV B TR0,R1	:ENTRY 1; NO OVERLAP
20778	107152	063701	003636		ADD TR1,R1	: NOTE SRC IS ZONED THEREFORE #BYTES=#DIGITS
20779	107156	067701	072432		ADD @PTP13,R1	:TR3 = TR0+TR1+SEP CONSTANT
20780	107162	010137	003642		MOV R1,TR3	
20781	107166	000207			RTS PC	
20782	107170	000000			0	
20783	107172	113701	003634		MOV B TR0,R1	
20784	107176	063701	003636		ADD TR1,R1	:ENTRY 2; ADJACENT
20785	107202	010137	003642		MOV R1,TR3	: TR3 = TR0 + TR1
20786	107206	123727	003635	000100	CMP B TR0+1,#100	:IF DATA TYPE - TRAILING SEPARATE
20787	107214	001002			BNE 1\$: THEN TR3 - TR0 + TR1 + 1
20788	107216	005237	003642		INC TR3	
20789	107222	000207		T3:	RTS PC	
20790	107224	000000			0	
20791						
20792	107226			T37:		
20793	107226	040003			.WORD 40003	
20794	107230	073463			.WORD 073463	:DATA DESCRIPTOR TYPE 3 - ZONED STRING
20795						: ALL DIGITS IDENTICAL 3; SIGN POSITIVE
20796						: HIGH NIBBLE - 7.
20797	107232	000000			.WORD 0	
20798	107234	074207			.WORD 074207	:DATA DESCRIPTOR TYPE 3 - ZONED STRING
20799						: ALL DIGITS IDENTICAL -8; SIGN NEGATIVE
20800						: HIGH NIBBLE = 8.
20801	107236	000000			.WORD 0	
20802	107240	070407			.WORD 070407	:DATA DESCRIPTOR TYPE 3 - ZONED STRING
20803						: ALL DIGITS IDENTICAL 0; SIGN NEGATIVE
20804						: HIGH NIBBLE - 1.
20805	107242	000000			.WORD 0	
20806	107244	000000			.WORD 0	
20807	107246	000000			.WORD 0	
20808	107250	000000			.WORD 0	
20809	107252	000000			.WORD 0	
20810	107254	000000			.WORD 0	
20811						
20812	107256			T37A:		
20813	107256	040004			.WORD 40004	
20814	107260	073463			.WORD 073463	:DATA DESCRIPTOR TYPE 3 - ZONED STRING
20815						: ALL DIGITS IDENTICAL -3; SIGN POSITIVE
20816						: HIGH NIBBLE = 7.
20817	107262	000000			.WORD 0	
20818	107264	074207			.WORD 074207	:DATA DESCRIPTOR TYPE 3 - ZONED STRING
20819						: ALL DIGITS IDENTICAL =8; SIGN NEGATIVE
20820						: HIGH NIBBLE = 8.
20821	107266	000000			.WORD 0	
20822	107270	070407			.WORD 070407	:DATA DESCRIPTOR TYPE 3 - ZONED STRING
20823						: ALL DIGITS IDENTICAL - 0; SIGN NEGATIVE
20824						: HIGH NIBBLE - 1.
20825	107272	000000			.WORD 0	

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20826	107274	110037	.WORD	110037	;DATA DESCRIPTOR TYPE 4 - ZONED STRING
20827	107276	003450	.WORD	SSTG13	;PRE SPECIFIED STRING; SIGN POSTIVE
20828	107300	000000	.WORD	0	
20829	107302	000000	.WORD	0	
20830	107304	000000	.WORD	0	
20831	107306	000000	.WORD	0	
20832	107310	000000	.WORD	0	
20833	107312	000000	.WORD	0	
20834					
20835	107314		TZ19:		
20836	107314	040001	.WORD	40001	
20837	107316	110037	.WORD	110037	
20838	107320	003450	.WORD	SSTG13	
20839	107322	000000	.WORD	0	
20840	107324		T37B:		
20841	107324	040005	.WORD	40005	
20842	107326	074207	.WORD	074207	;DATA DESCRIPTOR TYPE 3 - ZONED STRING ; ALL DIGITS IDENTICAL 8; SIGN NEGATIVE ; HIGH NIBBLE = 8.
20843					
20844					
20845	107330	000000	.WORD	0	
20846	107332	070407	.WORD	070407	;DATA DESCRIPTOR TYPE 3 - ZONED STRING ; ALL DIGITS IDENTICAL 0; SIGN NEGATIVE ; HIGH NIBBLE - 1.
20847					
20848					
20849	107334	000000	.WORD	0	
20850	107336	110037	.WORD	110037	;DATA DESCRIPTOR TYPE 4 - ZONED STRING ;PRE SPECIFIED STRING; SIGN POSTIVE
20851	107340	003450	.WORD	SSTG13	

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20853 107342 000000

.WORD 0

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20855	107344	110037	.WORD 110037
20856	107346	003510	.WORD STG13B
20857	107350	000000	.WORD 0
20858	107352	110037	.WORD 110037
20859	107354	003550	.WORD STG13C
20860	107356	000000	.WORD 0
20861	107360	000000	.WORD 0
20862	107362	000000	.WORD 0
20863	107364	000000	.WORD 0
20864	107366	000000	.WORD 0
20865	107370	000000	.WORD 0
20866			
20867	107372		

T40:

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 CZKFECLP11 PARAMETER TABLES (LENGTHS,ADDRESSES,ETC)

20869	107372	000405	.WORD 405	;LONG INTEGER - HIGH WORD
20870	107374	000000	.WORD 0	: 0+
20871	107376	100000	.WORD 100000	: 0-
20872	107400	077777	.WORD 077777	: 77777+
20873	107402	177777	.WORD 177777	: 77777-
20874	107404	000005	.WORD 05	: 5+
20875	107406	000000	.WORD 0	
20876	107410	000000	.WORD 0	
20877	107412	000000	.WORD 0	
20878	107414	000000	.WORD 0	
20879	107416	000000	.WORD 0	
20880				
20881	107420		T40A: .WORD 401	
20882	107420	000401	.WORD 401	
20883	107422	000000	.WORD 0	
20884				
20885	107424	000403	T40B: .WORD 403	
20886	107426	000000	.WORD 0	
20887	107430	000231	.WORD 231	
20888	107432	000252	.WORD 252	
20889	107434	000000	.WORD 0	
20890	107436		T41A: .WORD 401	
20891	107436	000401	.WORD 401	
20892	107440	177777	.WORD 177777	
20893	107442		T40AA: .WORD 401	
20894	107442	000401	.WORD 401	
20895	107444	000005	.WORD 5	
20896	107446		T41AA: .WORD 401	
20897	107446	000401	.WORD 401	
20898	107450	000004	.WORD 4	
20899	107452		T41: .WORD 403	;LONG INTEGER - LOW WORD
20900	107452	000403	.WORD 403	
20901	107454	000000	.WORD 0	
20902	107456	000004	.WORD 4	
20903	107460	177777	.WORD 177777	
20904	107462	000000	.WORD 0	
20905	107464	000000	.WORD 0	
20906	107466	000000	.WORD 0	
20907	107470	000000	.WORD 0	
20908				
20909	107472	000403	T41B: .WORD 403	
20910	107474	120360	.WORD 120360	
20911	107476	000000	.WORD 0	
20912	107500	000125	.WORD 125	
20913	107502	000000	.WORD 0	
20914				
20915	107504		T42: .WORD 40001	
20916	107504	040001	.WORD 40001	
20917	107506	077623	.WORD 077623	;DATA DESCRIPTOR TYPE 3 - ZONED STRING
20918				: ALL DIGITS IDENTICAL = 9;SIGN +
20919				: HIGH NIBBLE = 17
20920	107510	000000	.WORD 0	
20921	107512	000000	.WORD 0	
20922	107514	000000	.WORD 0	

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20923	107516	000000	.WORD 0
20924	107520	000000	.WORD 0
20925			
20926	107522		T43:

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20928	107522	000401		.WORD 401	
20929	107524	000011		.WORD 11	
20930	107526	000000		.WORD 0	
20931	107530	000000		.WORD 0	
20932	107532	000000		.WORD 0	
20933	107534	000000		.WORD 0	
20934					
20935	107536		T43A:		
20936	107536	000401		.WORD 401	
20937	107540	000101		.WORD 101	
20938	107542	000000		.WORD 0	
20939	107544	000000		.WORD 0	
20940	107546	000000		.WORD 0	
20941	107550	000000		.WORD 0	
20942					
20943	107552		T44A:		
20944	107552	040001		.WORD 40001	
20945	107554	113701	003634	MOVB TR0,R1	:ENTRY 1; NO OVERLAP
20946	107560	006201		ASR R1	: TR3=TR1+[(TR0/2)+1] + SEP CONST
20947	107562	005201		INC R1	
20948	107564	063701	003636	ADD TR1,R1	
20949	107570	067701	072022	ADD @PTP14,R1	
20950	107574	010137	003642	MOV R1,TR3	
20951	107600	000207		RTS PC	
20952	107602	000000		0	
20953	107604		T44:		
20954	107604	040002		.WORD 40002	
20955	107606	113701	003634	MOVB TR0,R1	:ENTRY 1; NO OVERLAP
20956	107612	006201		ASR R1	: TR3=TR1+[(TR0/2)+1] + SEP CONST
20957	107614	005201		INC R1	
20958	107616	063701	003636	ADD TR1,R1	
20959	107622	067701	071770	ADD @PTP14,R1	
20960	107626	010137	003642	MOV R1,TR3	
20961	107632	000207		RTS PC	
20962	107634	000000		0	
20963	107636	105737	003634	TSTB TR0	:IF EITHER SRC1=0 OR SRC2=0 BUT NOT BOTH
20964	107642	001004		BNE 1\$: THEN SKIP THIS TEST CONDITION.
20965	107644	105737	003640	TSTB TR2	:SRC1=0
20966	107650	001404		BEQ 2\$:BRANCH IF SRC2 ALSO = 0,
20967	107652	000417		BR 3\$:SKIP TEST
20968	107654	105737	003640	TSTB TR2	:SRC1 NOT = 0
20969	107660	001414		BEQ 3\$:SKIP TEST IF SRC2 = 0
20970	107662	113701	003634	MOVB TR0,R1	:ENTRY 2; ALIGNED SRC1-SRC2 LEAST SIGN DIGIT
20971	107666	006201		ASR R1	: TR3=TR1+(TR0/2)-(TR2/2)
20972	107670	113702	003640	MOVB TR2,R2	
20973	107674	006202		ASR R2	
20974	107676	160201		SUB R2,R1	
20975	107700	063701	003636	ADD TR1,R1	
20976	107704	010137	003642	MOV R1,TR3	
20977	107710	000207		RTS PC	
20978	107712	062706	000002	ADD #2,SP	:FIXUP STACK POINTER
20979	107716	000137	042764	JMP NXC	:SKIP TEST CONDITION - INVALID
20980	107722	000000		0	
20981					

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20982	107724			T45:		
20983	107724	040004		.WORD	40004	
20984	107726	100037		.WORD	100037	;DATA DESC. TYPE 4 - PACKED STRING
20985	107730	003370		.WORD	SSTG12	; ALL DIGITS IDENTICAL = 3 SIGN +
20986	107732	000000		.WORD	0	
20987	107734	060075		.WORD	060075	;DATA DESC. TYPE 3 - PACKED STRING
20988						; ALL DIGITS IDENTICAL = 3, SIGN -
20989	107736	000000		.WORD	0	
20990	107740	060014		.WORD	060014	;DATA DESC TYPE 3 - PACKED STRING
20991						; ALL DIGITS IDENTICAL=0, SIGN POS
20992	107742	000000		.WORD	0	
20993	107744	060015		.WORD	060015	;DATA DESC TYPE 3 - PACKED STG
20994						; ALL DIGITS IDENTICAL = 0, SIGN -
20995	107746	000000		.WORD	0	
20996	107750	000000		.WORD	0	
20997	107752	000000		.WORD	0	
20998	107754	000000		.WORD	0	
20999	107756	000000		.WORD	0	
21000						
21001	107760			T46A:		
21002	107760	040001		.WORD	40001	;FOR CMPN ONLY
21003	107762	113701	003634	MOV B	TR0,R!	;ENTRY 1; NO OVERLAP

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2100 107766 063701 003636

ADD TR1,R1

; TR3=TR1+TRO+SEP CONST

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21007 107772 067701 071620
21008 107776 010137 003642

ADD @PTP14,R1
MOV R1,TR3

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21010	110002	000207			RTS PC	
21011	110004	000000			0	
21012	110006			T46:		
21013	110006	040004			.WORD 40004	:FOR CMPN ONLY
21014	110010	113701	003634		MOV B TR0,R1	:ENTRY 1: NO OVERLAP
21015	110014	063701	003636		ADD TR1,R1	: TR3=TR1+TR0+SEP CONST
21016	110020	067701	071572		ADD @PTP14,R1	
21017	110024	010137	003642		MOV R1,TR3	
21018	110030	000207			RTS PC	
21019	110032	000000			0	
21020	110034	023727	002446	000001	CMP S1TYPE,#1	:SKIP TEST IS EITHER SRC DATA TYPE IS NOT 0 OR 1.
21021	110042	101066			BHI 2\$	
21022	110044	023727	002450	000001	CMP S2TYPE,#1	
21023	110052	101062			BHI 2\$	
21024	110054	105737	003634		TST B TR0	:ENTRY 2: ADJACENT
21025	110060	001453			BEQ 1\$: TR3=TR1+TR0
21026	110062	113701	003634		MOV B TR0,R1	: REDUNDANT WITH ENTRY 4 IF TR0=0
21027	110066	063701	003636		ADD TR1,R1	
21028	110072	010137	003642		MOV R1,TR3	
21029	110076	000207			RTS PC	
21030	110100	000000			0	
21031	110102	023727	002446	000001	CMP S1TYPE,#1	:SKIP TEST IS EITHER SRC DATA TYPE IS NOT 0 OR 1.
21032	110110	101043			BHI 2\$	
21033	110112	023727	002450	000001	CMP S2TYPE,#1	
21034	110120	101037			BHI 2\$	
21035	110122	113701	003634		MOV B TR0,R1	:ENTRY 3: PARTIAL OVERLAP
21036	110126	113702	003640		MOV B TR2,R2	: TR3=TR1+TR0-(TR2/2)
21037	110132	006202			ASR R2	: REDUNDANT WITH ENTRY 4 IF
21038	110134	160201			SUB R2,R1	: TR0-(TR2/2)-0
21039	110136	005701			TST R1	
21040	110140	001423			BEQ 1\$	
21041	110142	063701	003636		ADD TR1,R1	
21042	110146	010137	003642		MOV R1,TR3	
21043	110152	000207			RTS PC	
21044	110154	000000			0	
21045	110156	023727	002446	000001	CMP S1TYPE,#1	:SKIP TEST IS EITHER SRC DATA TYPE IS NOT 0 OR 1.
21046	110164	101015			BHI 2\$	
21047	110166	023727	002450	000001	CMP S2TYPE,#1	
21048	110174	101011			BHI 2\$	
21049	110176	013737	003636	003642	MOV TR1,TR3	:ENTRY 4: COMPLETE OVERLAP
21050	110204	000207			RTS PC	: TR3=TR1
21051	110206	000000			0	
21052	110210	062706	000002	1\$:	ADD #2,SP	:FIXUP STACK POINTER
21053	110214	000137	042500		JMP REDNTC	:SKIP ENTRY TEST CONDITION - REDUNDANT
21054	110220	062706	000002	2\$:	ADD #2,SP	
21055	110224	000137	042764		JMP NXTC	:SKIP TEST CONDITION - ILLEGAL
21056						
21057	110230			T47:		
21058	110230	040004			.WORD 40004	:DATA DESC TYPE 3 - ZONED STRING
21059	110232	070607			.WORD 070607	: ALL DIGITS IDENTICAL = 8, SIGN -
21060						: HIGH NIBBLE = 1
21061						
21062	110234	000000			.WORD 0	
21063	110236	077603			.WORD 077603	:DATA DESC TYPE 3 - ZONED STRING

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21064				; ALL DIGITS IDENTICAL - 8, SIGN +
21065				; HIGH NIBBLE = 17
21066	110240	000000	.WORD 0	
21067	110242	070403	.WORD 070403	;DATA DESC TYPE 3 - ZONED STG
21068				; ALL DIGITS IDENTICAL - 0, SIGN +
21069				; HIGH NIBBLE = 1
21070	110244	000000	.WORD 0	
21071	110246	074007	.WORD 074007	;DATA DESC TYPE 3 - ZONED STRING
21072				; ALL DIGITS IDENTICAL - 0, SIGN -
21073				; HIGH NIBBLE = 8
21074	110250	000000	.WORD 0	
21075	110252	000000	.WORD 0	
21076	110254	000000	.WORD 0	
21077	110256	000000	.WORD 0	
21078	110260	000000	.WORD 0	
21079	110262	000000	.WORD 0	
21080				
21081	110264		T50:	
21082	110264	000406	.WORD 406	
21083	110266	000000	.WORD 0	;RND.DGT=0, SHFT.CNT=0
21084	110270	002776	.WORD 002776	;RND.DGT=5, SHFT.CNT=-2
21085	110272	004402	.WORD 004402	;RND.DGT=9, SHFT.CNT=+2
21086	110274	001775	.WORD 001775	;RND.DGT=3, SHFT.CNT=-3
21087	110276	000775	.WORD 000775	;RND.DGT=1, SHFT.CNT=-3
21088	110300	000005	.WORD 000005	;RND.DGT=0, SHFT.CNT 5
21089	110302	000000	.WORD 0	
21090	110304	000000	.WORD 0	
21091	110306	000000	.WORD 0	
21092	110310	000000	.WORD 0	
21093	110312	000000	.WORD 0	
21094				
21095	110314		T50A:	
21096	110314	000401	.WORD 401	
21097	110316	002777	.WORD 002777	
21098				
21099	110320	000402	T50B: .WORD 402	
21100	110322	003777	.WORD 003777	;RND.DGT = 7,SHFT.CT=-1
21101	110324	003402	.WORD 003402	;RND.DGT = 7,SHFT.CT=2
21102	110326	000000	.WORD 0	
21103				
21104	110330	000404	T50C: .WORD 404	
21105	110332	003777	.WORD 3777	;RND.DGT = 7,SHFT.CT=-1
21106	110334	003776	.WORD 3776	;RND.DGT = 7,SHFT.CT=-2
21107	110336	000400	.WORD 0400	;RND.DGT = 1,SHFT.CT=0
21108	110340	004003	.WORD 4003	;RND.DGT = 8,SHFT.CT=3
21109	110342	000000	.WORD 0	
21110				
21111	110344	000402	T50D: .WORD 402	
21112	110346	001376	.WORD 1376	;RND.DGT = 2,SHFT.CT=-2
21113	110350	004775	.WORD 4775	;RND.DGT = 9,SHFT.CT=-3
21114	110352	000000	.WORD 0	
21115				
21116	110354		T51:	
21117	110354	001004	.WORD 1004	;PACKED STRINGS

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21118	110356	100012	.WORD 100012	;DATA DESC TYPE 4 - PRE SPECIFIED STRING
21119				; OF TEN DIGITS
21120	110360	003254	.WORD SSTG2	;+2,147,483,648
21121	110362	100012	.WORD 100012	
21122	110364	003310	.WORD SSTG4	;+2,147,483,647
21123	110366	100012	.WORD 100012	
21124	110370	003330	.WORD SSTG6	; -2,147,483,648
21125	110372	100012	.WORD 100012	
21126	110374	003350	.WORD SSTG 0	; -2,147,483,649
21127	110376	100012	.WORD 100012	
21128	110400	003262	.WORD SSTG2A	;+4,294,967,294
21129	110402	100012	.WORD 100012	
21130	110404	003270	.WORD SSTG2B	;+42,949,672,940
21131	110406	000000	.WORD 0	
21132	110410	000000	.WORD 0	
21133	110412	000000	.WORD 0	
21134	110414	000000	.WORD 0	
21135				
21136	110416		T52:	
21137	110416	001004	.WORD 1004	;ZONED STRINGS
21138	110420	110012	.WORD 110012	;DATA DESC TYPE 4 - PRE SPECIFIED STRING
21139				; OF 10 DIGITS
21140	110422	003276	.WORD SSTG3	;+2,147,483,648
21141	110424	110012	.WORD 110012	
21142	110426	003316	.WORD SSTG5	;+2,147,483,647
21143	110430	110012	.WORD 110012	
21144	110432	003336	.WORD SSTG7	; -2,147,483,648
21145	110434	110012	.WORD 110012	
21146	110436	003356	.WORD SSTG11	; -2,147,483,649
21147	110440	000000	.WORD 0	
21148	110442	000000	.WORD 0	
21149	110444	000000	.WORD 0	
21150	110446	000000	.WORD 0	
21151				
21153	110450	000401	T53:	.WORD 401
21154	110452	177777	.WORD 177777	
21155	110454	000000	.WORD 0	
21156	110456	000000	.WORD 0	
21157				
21158	110460	000401	T54:	.WORD 401
21159	110462	111111	.WORD 111111	
21160	110464	000000	.WORD 0	
21161	110466	000000	.WORD 0	
21162				
21163				
21164	110470	000401	T55:	.WORD 401
21165	110472	122222	.WORD 122222	
21166	110474	000000	.WORD 0	
21167	110476	000000	.WORD 0	
21168				
21169	110500	000401	T56:	.WORD 401
21170	110502	133333	.WORD 133333	
21171	110504	000000	.WORD 0	
21172	110506	000000	.WORD 0	

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21173
21174 110510 000401
21175 110512 144444

T57: .WORD 401
.WORD 144444

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 CZKEEC.P11 PARAMETER TABLES (LENGTHS,ADDRESSES,ETC)

21177	110514	000000			.WORD 0	
21178	110516	000000			.WORD 0	
21179						
21180	110520	000401			T60: .WORD 401	
21181	110522	155555			.WORD 155555	
21182	110524	000000			.WORD 0	
21183	110526	000000			.WORD 0	
21184						
21185	110530				T61: .WORD 40010	:LOAD DESC - DESC ADDRESS TABLE
21186	110530	040010			BIC #7,TINST	:VARIABLE LENGTH ENTRIES; 8 ENTRIES
21187	110532	042737	000007	050164	MOV TBADR,TR0	:ENTRY 1;RN=R0;OPCODE = 0760X0
21188	110540	013737	001640	003634	MOV TBADR,R2	: LOAD PTR ADDRESS INTO R0
21189	110546	013702	001640		MOV R2,R1	: LOAD 1ST PTR WITH 1ST DESC ADDR.
21190	110552	010201			ADD TBLEN,R1	
21191	110554	063701	001642		SUB #10,R1	: 1ST DESC ADDR=TBADR+TBLEN-10
21192	110560	162701	000010		MOV R1,(R2)	
21193	110564	010112			SUB #10,R1	: LOAD 2ND PTR WITH 2ND DESC ADDR.
21194	110566	162701	000010		MOV R1,2(R2)	: 2ND DESC ADDR=TBADR+TBLEN-20
21195	110572	010162	000002		SUB #10,R1	: LOAD 3RD PTR WITH 3RD DESC ADDR.
21196	110576	162701	000010		MOV R1,4(R2)	: 3RD DESC ADDR=TBADR+TBLEN-30
21197	110602	010162	000004		MOV TINST,EINSTR	
21198	110606	013737	050164	046310	RTS PC	
21199	110614	000207			0	
21200	110616	000000				
21201						
21202	110620	052737	000001	050164	BIS #1,TINST	:ENTRY 2;RN=R1;OPCODE 0760X1
21203	110626	013737	001640	003636	MOV TBADR,TR1	
21204	110634	000744			BR 1\$	
21205	110636	000000			0	
21206						
21207	110640	042737	000007	050164	BIC #7,TINST	
21208	110646	052737	000002	050164	BIS #2,TINST	:ENTRY 3;RN=R2;OPCODE 0760X2
21209	110654	013737	001640	003640	MOV TBADR,TR2	
21210	110662	000731			BR 1\$	
21211	110664	000000			0	
21212						
21213	110666	052737	000003	050164	BIS #3,TINST	:ENTRY 4;RN=R3;OPCODE=0760X3
21214	110674	013737	001640	003642	MOV TBADR,TR3	
21215	110702	000721			BR 1\$	
21216	110704	000000			0	
21217						
21218	110706	042737	000007	050164	BIC #7,TINST	
21219	110714	052737	000004	050164	BIS #4,TINST	:ENTRY 5;RN=R4;OPCODE=0760X4
21220	110722	013737	001640	003644	MOV TBADR,TR4	
21221	110730	000706			BR 1\$	
21222	110732	000000			0	
21223						
21224	110734	052737	000005	050164	BIS #5,TINST	:ENTRY 6;RN=R5;OPCODE=0760X5
21225	110742	013737	001640	003646	MOV TBADR,TR5	
21226	110750	000676			BR 1\$	
21227	110752	000000			0	
21228						
21229	110754	042737	000007	050164	BIC #7,TINST	
21230	110762	052737	000006	050164	BIS #6,TINST	:ENTRY 7;RN=R6;OPCODE=0760X6

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 CZKEEC.P11 READ A DECIMAL NUMBER FROM THE TTY

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(1) 111174 112001      2$:  MOVB  (R0)+,R1      ;;PICKUP THIS CHARACTER
(1) 111176 001424      BEQ   3$              ;;GET OUT IF ZERO
(1) 111200 122701 000060  CMPB  #'0,R1         ;;MAKE SURE THIS CHARACTER
(1) 111204 003032      BGT   5$              ;;IS A DIGIT BETWEEN 0 & 9
(1) 111206 122701 000071  CMPB  #'9,R1
(1) 111212 002427      BLT   5$
(1) 111214 032716 170000  BIT   #'(7777),(SP) ;;DON'T LET NUMBER GET TO BIG
(1) 111220 001024      BNE   5$              ;;BR IF NUMBER WOULD OVERFLOW
(1) 111222 006316      ASL   (S?)           ;;*2
(1) 111224 011646      MOV   (SP),-(SP)    ;;SAVE FOR LATER
(1) 111226 006316      ASL   (SP)           ;;*4
(1) 111230 006316      ASL   (SP)           ;;*8
(1) 111232 062616      ADD   (SP)+,(SP)    ;;*10
(1) 111234 102416      BVS   5$             ;;OVERFLOW ISN'T ALLOWED
(1) 111236 162701 000060  SUB   #'0,R1         ;;STRIP AWAY THE ASCII JUNK
(1) 111242 060116      ADD   R1,(SP)       ;;ADD IN THIS DIGIT
(1) 111244 102412      BVS   5$             ;;OVERFLOW ISN'T ALLOWED
(1) 111246 000752      BR    2$             ;;LOOP
(1) 111250 005702      3$:  TST   R2           ;;CHECK IF NUMBER IS NEG
(1) 111252 001401      BEQ   4$             ;;BR IF NO
(1) 111254 005416      NEG   (SP)           ;;YES--NEGATE THE NUMBER
(1) 111256 012666 000012  4$:  MOV   (SP)+,12(SP) ;;SAVE THE RESULT
(3) 111262 012602      MOV   (SP)+,R2       ;;POP STACK INTO R2
(3) 111264 012601      MOV   (SP)+,R1       ;;POP STACK INTO R1
(3) 111266 012600      MOV   (SP)+,R0       ;;POP STACK INTO R0
(1) 111270 000002      RTI                    ;;RETURN
(1) 111272 005726      5$:  TST   (SP)+         ;;CLEAN PARTIAL NUMBER FROM STACK
(1) 111274 105010      (LRS (R0)           ;;SET A TERMINATOR
(1) 111276 104401      TYPE                    ;;TYPE THE INPUT UP TO BAD CHAR.
(1) 111300 000000      6$:  .WORD  0           ;;POINTER GOES HERE
(1) 111302 104401 111310  TYPE   $QUES         ;;'"' 'CR' & 'LF'
(1) 111306 000720      BR    1$             ;;TRY AGAIN
(1) 111310 077          $QUES: .ASCII '?'     ;;QUESTION MARK
(1) 111311 015          $CRLF: .ASCII <15>   ;;CARRIAGE RETURN
(1) 111312 000012      $LF:  .ASCII <12>   ;;LINEFEED
21263 .SBTTL TTY INPUT ROUTINE
(1)
(2)
(1) 111314 177560      ;;*****
(1) 111316 177562      $TKS: .WORD 177560   ;;TTY KBD STATUS
(1)                      $TKB: .WORD 177562   ;;TTY KBD BUFFER
(1)                      .ENABL  LSB
(1)
(1)                      .DSABL  LSB
(1)
(2)
(1)                      ;;*****
(1)                      ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
(1)                      ;*CALL:
(1)                      ;*      RDCHR           ;;INPUT A SINGLE CHARACTER FROM THE TTY
(1)                      ;*      RETURN HERE      ;;CHARACTER IS ON THE STACK
(1)                      ;*                      ;;WITH PARITY BIT STRIPPED OFF
(1)
(1)

```

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 CZKEEC.P11 TTY INPUT ROUTINE

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(1) 111320 011646 $RDCHR: MOV (SP),-(SP) ;;PUSH DOWN THE PC
(1) 111322 016666 000004 000002 MOV 4(SP),2(SP) ;;SAVE THE PS
(1) 111330 105777 177760 1$: TSTB @STKS ;;WAIT FOR
(1) 111334 100375 BPL 1$ ;;A CHARACTER
(1) 111336 117766 177754 000004 MOVB @STKB,4(SP) ;;READ THE TTY
(1) 111344 042766 177600 000004 BIC #^C<177>,4(SP) ;;GET RID OF JUNK IF ANY
(1) 111352 026627 000004 000023 CMP 4(SP),#23 ;;IS IT A CONTROL-S?
(1) 111360 001013 BNE 3$ ;;BRANCH IF NO
(1) 111362 105777 177726 2$: TSTB @STKS ;;WAIT FOR A CHARACTER
(1) 111366 100375 BPL 2$ ;;LOOP UNTIL ITS THERE
(1) 111370 117746 177722 MOVB @STKB,-(SP) ;;GET CHARACTER
(1) 111374 042716 177600 BIC #^C177,(SP) ;;MAKE IT 7-BIT ASCII
(1) 111400 022627 000021 CMP (SP)+,#21 ;;IS IT A CONTROL-Q?
(1) 111404 001366 BNE 2$ ;;IF NOT DISCARD IT
(1) 111406 000750 BR 1$ ;;YES, RESUME
(1) 111410 026627 000004 000021 3$: CMP 4(SP),#$XON ;;IS IT A RANDOM XON? ;RAN001
(1) 111416 001744 BEQ 1$ ;;BRANCH IF YES ;RAN001
(1) 111420 026627 000004 000140 CMP 4(SP),#140 ;;IS IT UPPER CASE?
(1) 111426 002407 BLT 4$ ;;BRANCH IF YES
(1) 111430 026627 000004 000175 CMP 4(SP),#175 ;;IS IT A SPECIAL CHAR?
(1) 111436 003003 BGT 4$ ;;BRANCH IF YES
(1) 111440 042766 000040 000004 BIC #40,4(SP) ;;MAKE IT UPPER CASE
(1) 111446 000002 4$: RTI ;;GO BACK TO USER
(2) *****
(1) *THIS ROUTINE WILL INPUT A STRING FROM THE TTY
(1) *CALL:
(1) * RDLIN ;;INPUT A STRING FROM THE TTY
(1) * RETURN HERE ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
(1) * ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
(1)
(1) 111450 010346 $RDLIN: MOV R3,-(SP) ;;SAVE R3
(1) 111452 012703 111556 1$: MOV #$TTYIN,R3 ;;GET ADDRESS
(1) 111456 022703 111566 2$: CMP #$TTYIN+8.,R3 ;;BUFFER FULL?
(1) 111462 101405 BLOS 4$ ;;BR IF YES
(1) 111464 104402 RDCHR ;;GO READ ONE CHARACTER FROM THE TTY
(1) 111466 112613 MOVB (SP)+,(R3) ;;GET CHARACTER
(1) 111470 122713 000177 10$: CMPB #177,(R3) ;;IS IT A RUBOUT
(1) 111474 001003 BNE 3$ ;;SKIP IF NOT
(1) 111476 104401 111310 4$: TYPE $QUES ;;TYPE A '?'
(1) 111502 000763 BR 1$ ;;CLEAR THE BUFFER AND LOOP
(1) 111504 111337 111554 3$: MOVB (R3),9$ ;;ECHO THE CHARACTER
(1) 111510 104401 111554 TYPE ,9$
(1) 111514 122723 000015 CMPB #15,(R3)+ ;;CHECK FOR RETURN
(1) 111520 001356 BNE 2$ ;;LOOP IF NOT RETURN
(1) 111522 105063 177777 CLRB -1(R3) ;;CLEAR RETURN (THE 15)
(1) 111526 104401 111312 TYPE ,SLF ;;TYPE A LINE FEED
(1) 111532 012603 MOV (SP)+,R3 ;;RESTORE R3
(1) 111534 011646 MOV (SP),-(SP) ;;ADJUST THE STACK AND PUT ADDRESS OF THE
(1) 111536 016666 000004 000002 MOV 4(SP),2(SP) ;; FIRST ASCII CHARACTER ON IT
(1) 111544 012766 111556 000004 MOV #$TTYIN,4(SP)
(1) 111552 000002 RTI ;;RETURN
(1) 111554 000 9$: .BYTE 0 ;;STORAGE FOR ASCII CHAR. TO TYPE
(1) 111555 000 .BYTE 0 ;;TERMINATOR
(1) 111556 000010 $TTYIN: .BLKB 8. ;;RESERVE 8 BYTES FOR TTY INPUT
    
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 CZKEEC.P11 TTY INPUT ROUTINE

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(1) 111566 052536 005015 000 $CNTLU: .ASCIZ /^U/<15><12>      ;;CONTROL 'U'
(1) 111573 136 006507 000012 $CNTLG: .ASCIZ /^G/<15><12>      ;;CONTROL 'G'
(1) 111600 005015 053523 020122 $MSWR: .ASCIZ <15><12>/SWR - /
(1) 111606 020075 000
(1) 111611 040 047040 053505 $MNEW: .ASCIZ / NEW = /
(1) 111616 036440 000040
21264 .SBTTL TYPE ROUTINE
(1)
(2)
(1) *****
(1) *ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
(1) *THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
(1) *NOTE1: $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
(1) *NOTE2: $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
(1) *NOTE3: $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
(1) *
(1) *CALL:
(1) *1) USING A TRAP INSTRUCTION
(1) * TYPE ,MESADR ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
(1) *OR
(1) * TYPE
(1) * MESADR
(1) *
(1)
(1) 111622 105737 112175 $TYPE: TSTB $TPFLG ;;IS THERE A TERMINAL?
(1) 111626 100002 BPL 1$ ;;BR IF YES
(1) 111630 000000 HALT ;;HALT HERE IF NO TERMINAL
(1) 111632 000430 BR 3$ ;;LEAVE
(1) 111634 010046 1$: MOV R0,-(SP) ;;SAVE R0
(1) 111636 017600 000002 MOV @2(SP),R0 ;;GET ADDRESS OF ASCIZ STRING
(1) 111642 122737 000001 001134 CMPB #APTENV,$ENV ;;RUNNING IN APT MODE
(1) 111650 001011 BNE 62$ ;;NO,GO CHECK FOR APT CONSOLE
(1) 111652 132737 000100 001135 BITB #APTSPool,$ENVM ;;SPOOL MESSAGE TO APT
(1) 111660 001405 BEQ 62$ ;;NO,GO CHECK FOR CONSOLE
(1) 111662 010037 111672 MOV R0,61$ ;;SETUP MESSAGE ADDRESS FOR APT
(1) 111666 004737 001156 JSR PC,$ATY3 ;;SPOOL MESSAGE TO APT
(1) 111672 000000 61$: .WORD 0 ;;MESSAGE ADDRESS
(1) 111674 132737- 000040 001135 62$: BITB #APTCSUP,$ENVM ;;APT CONSOLE SUPPRESSED
(1) 111702 001003 BNE 60$ ;;YES,SKIP TYPE OUT
(1) 111704 112046 2$: MOVB (R0)+,-(SP) ;;PUSH CHARACTER TO BE TYPED ONTO STACK
(1) 111706 001005 BNE 4$ ;;BR IF IT ISN'T THE TERMINATOR
(1) 111710 005726 TST (SP)+ ;;IF TERMINATOR POP IT OFF THE STACK
(1) 111712 012600 60$: MOV (SP)+,R0 ;;RESTORE R0
(1) 111714 062716 000002 3$: ADD #2,(SP) ;;ADJUST RETURN PC
(1) 111720 000002 RTI ;;RETURN
(1) 111722 122716 000011 4$: CMPB #HT,(SP) ;;BRANCH IF <HT>
(1) 111726 001430 BEQ 8$
(1) 111730 122716 000200 CMPB #CRLF,(SP) ;;BRANCH IF NOT <CRLF>
(1) 111734 001006 BNE 5$
(1) 111736 005726 TST (SP)+ ;;POP <CR><LF> EQUIV
(1) 111740 104401 TYPE ;;TYPE A CR AND LF
(1) 111742 111311 $CRLF
(1) 111744 105037 112162 CLRB $CHARCNT ;;CLEAR CHARACTER COUNT
(1) 111750 000755 BR 2$ ;;GET NEXT CHARACTER
(1) 111752 004737 112034 5$: JSR PC,$TYPEC ;;GO TYPE THIS CHARACTER
    
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CZKEEC.P11      TYPE ROUTINE

(1) 111756 123726 112174          6$:  CMPB  $FILLC,(SP)+  ;;IS IT TIME FOR FILLER CHARS.?
(1) 111762 001350                    BNE  2$              ;;IF NO GO GET NEXT CHAR.
(1) 111764 013746 112172          MOV  $NULL,-(SP)    ;;GET # OF FILLER CHARS. NEEDED
(1)                                     ;;AND THE NULL CHAR.
(1) 111770 105366 000001          7$:  DECB  1(SP)      ;;DOES A NULL NEED TO BE TYPED?
(1) 111774 002770                    BLT  6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
(1) 111776 004737 112034          JSR  PC,$TYPEC     ;;GO TYPE A NULL
(1) 112002 105337 112162          DECB  $CHARCNT     ;;DO NOT COUNT AS A COUNT
(1) 112006 000770                    BR   7$              ;;LOOP
(1)
(1)                                     ;HORIZONTAL TAB PROCESSOR
(1)
(1) 112010 112716 000040          8$:  MOVB  #' ,(SP)  ;;REPLACE TAB WITH SPACE
(1) 112014 004737 112034          9$:  JSR  PC,$TYPEC  ;;TYPE A SPACE
(1) 1*2020 132737 000007 112162  BITB  #7,$CHARCNT  ;;BRANCH IF NOT AT
(1) 112026 001372                    BNE  9$              ;;TAB STOP
(1) 112030 005726                    TST  (SP)+          ;;POP SPACE OFF STACK
(1) 112032 000724                    BR   2$              ;;GET NEXT CHARACTER
(1) 112034
(1) 112034 105777 177254          $TYPEC: TSTB  @ $TKS      ;;CHAR IN KYBD BUFFER? ;MJD001
(1) 112040 100022                    BPL  10$            ;;BR IF NOT ;MJD001
(1) 112042 017746 177250          MOV  @ $TKB,-(SP)  ;;GET CHAR ;MJD001
(1) 112046 042716 177600          BIC  #177600,(SP) ;;STRIP EXTRANEIOUS BITS ;MJD001
(1) 112052 122716 000023          CMPB  # $XOFF,(SP) ;;WAS CHAR XOFF ;MJD001
(1) 112056 001012                    BNE  102$           ;;BR IF NOT ;MJD001
(1) 112060
(1) 112060 105777 177230          101$: TSTB  @ $TKS      ;;WAIT FOR CHAR ;MJD001
(1) 112064 100375                    BPL  101$           ;;MJD001
(1) 112066 117716 177224          MOVB  @ $TKB,(SP)  ;;GET CHAR ;MJD001
(1) 112072 042716 177600          BIC  #177600,(SP) ;;STRIP IT ;MJD001
(1) 112076 122716 000021          CMPB  # $XON,(SP) ;;WAS IT XON? ;MJD001
(1) 112102 001366                    BNE  101$           ;;BR IF NOT ;MJD001
(1) 112104
(1) 112104 005726          102$: TST  (SP)+      ;;FIX STACK ;MJD001
(1) 112106
(1) 112106 105777 000054          10$:  TSTB  @ $TPS      ;;WAIT UNTIL PRINTER IS READY ;MJD001
(1) 112112 100375                    BPL  10$              ;MJD001
(1) 112114 126627 000002 000021  CMPB  2(SP),# $XON  ;;IS CHARACTER A RANDOM XON? ;MJD001
(1) 112122 001420                    BEQ  $TYPEX         ;;BRANCH IF YES ;RAN001
(1) 112124 116677 000002 000036  MOVB  2(SP),@ $TPB  ;;LOAD CHAR TO BE TYPED INTO DATA REG. ;RAN001
(1) 112132 122766 000015 000002  CMPB  #CR,2(SP)    ;;IS CHARACTER A CARRIAGE RETURN?
(1) 112140 001003                    BNE  1$              ;;BRANCH IF NO
(1) 112142 105037 112162          CLRB  $CHARCNT     ;;YES--CLEAR CHARACTER COUNT
(1) 112146 000406                    BR   $TYPEX         ;;EXIT
(1) 112150 122766 000012 000002  1$:  CMPB  #LF,2(SP)  ;;IS CHARACTER A LINE FEED?
(1) 112156 001402                    BEQ  $TYPEX         ;;BRANCH IF YES
(1) 112160 105227                    INCB  (PC)+         ;;COUNT THE CHARACTER
(1) 112162 000000          $CHARCNT: .WORD 0  ;;CHARACTER COUNT STORAGE
(1) 112164 000207          $TYPEX: RTS  PC
(1)
(1) 112166 177564          $TPS: .WORD 177564 ;;TTY PRINTER STATUS REG. ADDRESS
(1) 112170 177566          $TPB: .WORD 177566 ;;TTY PRINTER BUFFER REG. ADDRESS
(1) 112172 000          $NULL: .BYTE 0    ;;CONTAINS NULL CHARACTER FOR FILLS
(1) 112173 002          $FILLS: .BYTE 2   ;;CONTAINS # OF FILLER CHARACTERS REQUIRE'

```

PDP-11 CIS INST EXERCISER
CZKEEC.P11 TYPE ROUTINE

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(1) 112174 012
(1) 112175 000
21265

\$FILLC: .BYTE 12 ;:INSERT FILL CHARS. AFTER A 'LINE FEED'
\$TPFLG: .BYTE 0 ;:'TERMINAL AVAILABLE' FLAG (BIT<07>-0 YES)
.SBTTL TRAP DECODER

(1)
(2)
(1)
(1)
(1)
(1)
(1)

;:THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE 'TRAP' INSTRUCTION
;:AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
;:OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
;:GO TO THAT ROUTINE.

(1) 112176 010046
(1) 112200 016600 000002
(1) 112204 005740
(1) 112206 111000
(1) 112210 006300
(1) 112212 016000 112232
(1) 112216 000200

\$TRAP: MOV R0,-(SP) ;:SAVE R0
MOV 2(SP),R0 ;:GET TRAP ADDRESS
TST -(R0) ;:BACKUP BY 2
MOVB (R0),R0 ;:GET RIGHT BYTE OF TRAP
ASL R0 ;:POSITION FOR INDEXING
MOV \$TRPAD(R0),R0 ;:INDEX TO TABLE
RTS R0 ;:GO TO ROUTINE

(1)
(1)
(1)
(1)
(1)
(1)
(1)

;;THIS IS USE TO HANDLE THE 'GETPRI' MACRO

(1) 112220 011646
(1) 112222 016666 000004 000002
(1) 112230 000002
(3)
(3)
(3)
(3)
(3)

\$TRAP2: MOV (SP),-(SP) ;:MOVE THE PC DOWN
MOV 4(SP),2(SP) ;:MOVE THE PSW DOWN
RTI ;:RESTORE THE PSW

.SBTTL TRAP TABLE

;:THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
;:BY THE 'TRAP' INSTRUCTION.

(3) 112232 112220
(3) 112234 111622
(1)
(1)
(3) 112236 111320
(3) 112240 111450
(3) 112242 111132
21266

: ROUTINE
:-----
\$TRPAD: .WORD \$TRAP2
\$TYPE ;:CALL=TYPE TRAP+1(104401) TTY TYPEOUT ROUTINE

\$RDCHR ;:CALL=RDCHR TRAP+2(104402) TTY TYPEIN CHARACTER ROUTINE
\$RDLIN ;:CALL=RDLIN TRAP+3(104403) TTY TYPEIN STRING ROUTINE
\$RDDEC ;:CALL=RDDEC TRAP+4(104404) READ A DECIMAL NUMBER FROM TTY
.SBTTL POWER DOWN AND UP ROUTINES

(1)
(2)
(1)
(1) 112244 012737 112404 000024
(1) 112252 012737 000340 000026
(3) 112260 010046
(3) 112262 010146
(3) 112264 010246
(3) 112266 010346
(3) 112270 010446
(3) 112272 010546
(3) 112274 017746 067436
(1) 112300 010637 112410
(1) 112304 012737 112316 000024

;:POWER DOWN ROUTINE
\$PWRDN: MOV # \$ILLUP,@#PWRVEC ;:SET FOR FAST UP
MOV #340,@#PWRVEC+2 ;:PRIO:7
MOV R0,-(SP) ;:PUSH R0 ON STACK
MOV R1,-(SP) ;:PUSH R1 ON STACK
MOV R2,-(SP) ;:PUSH R2 ON STACK
MOV R3,-(SP) ;:PUSH R3 ON STACK
MOV R4,-(SP) ;:PUSH R4 ON STACK
MOV R5,-(SP) ;:PUSH R5 ON STACK
MOV @SWR,-(SP) ;:PUSH @SWR ON STACK
MOV SP,\$SAVR6 ;:SAVE SP
MOV # \$PWRUP,@#PWRVEC ;:SET UP VECTOR

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CZKEEC.P11 POWER DOWN AND UP ROUTINES

```

(1) 112312 000000 HALT
(1) 112314 000776 BR .-2 ;;HANG UP
(1)
(2)
(1)
*****
:POWER UP ROUTINE
(1) 112316 012737 112404 000024 $PWRUP: MOV $ILLUP,@#PWRVEC ;;SET FOR FAST DOWN
(1) 112324 013706 112410 MOV $SAVR6,SP ;;GET SP
(1) 112330 005037 112410 CLR $SAVR6 ;;WAIT LOOP FOR THE TTY
(1) 112334 005237 112410 1$: INC $SAVR6 ;;WAIT FOR THE INC
(1) 112340 001375 BNE 1$ ;;OF WORD
(3) 112342 012677 067370 MOV (SP)+,@SWR ;;POP STACK INTO @SWR
(3) 112346 012605 MOV (SP)+,R5 ;;POP STACK INTO R5
(3) 112350 012604 MOV (SP)+,R4 ;;POP STACK INTO R4
(3) 112352 012603 MOV (SP)+,R3 ;;POP STACK INTO R3
(3) 112354 012602 MOV (SP)+,R2 ;;POP STACK INTO R2
(3) 112356 012601 MOV (SP)+,R1 ;;POP STACK INTO R1
(3) 112360 012600 MOV (SP)+,R0 ;;POP STACK INTO R0
(1) 112362 012737 112244 000024 MOV #$PWRD@,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
(1) 112370 012737 000340 000026 MOV #340,@#PWRVEC+2 ;;PRIO:7
(1) 112376 104401 TYPE ;;REPORT THE POWER FAILURE
(1) 112400 112412 $PWRMG: .WORD $POWER ;;POWER FAIL MESSAGE POINTER
(1) 112402 000002 RTI
(1) 112404 000000 $ILLUP: HALT ;;THE POWER UP SEQUENCE WAS STARTED
(1) 112406 000776 BR .-2 ;; BEFORE THE POWER DOWN WAS COMPLETE
(1) 112410 000000 $SAVR6: 0 ;;PUT THE SP HERE
(1) 112412 005015 047520 042527 $POWER: .ASCIZ <15><12>'POWER'
(1) 112420 000122 .EVEN
(1)
*****
21268
21273 000377
21274 076130
21275
21276 :CIS STACK 'PROBE AHEAD' MEMORY MANAGEMENT ABORT TESTS
21277 :
21278 :
21279 : NOTE: THESE THREE TESTS ARE FOR THE 11/44 ONLY
21280 : THEY ARE NOT TO BE RUN ON THE 11/23 OR 11/24 BECAUSE
21281 : THESE PROCESSORS TREAT PROBE AHEAD DIFFERENTLY - THEY
21282 : ONLY PROBE AHEAD SPECIFIC NUMBER OF WORDS NEEDED FOR
21283 : GIVEN INST.
21284 :
21285 : THE NEXT THREE TESTS ARE AIMED AT TESTING THE KT
21286 : PAGE FAULT ROM (11/44 SCHEMATIC PAGE K1-8) AND ASSOCIATED LOGIC.
21287 :
21288 : EACH OF THESE 3 TESTS SETUP THE STACK POINTER SUCH THAT
21289 : WHEN THE CIS PROCESSOR CHECKS TO SEE IF THERE IS ENOUGH
21290 : SPACE ON THE STACK (200 BYTES) THE ANSWER FOUND SHOULD BE
21291 : NO BECAUSE A PORTION OF THE STACK IS IN PROTECTED MEMORY.
21292 :
21293 : EACH OF THESE 3 TESTS VERIFY THAT THE CIS INSTRUCTION ABORTS
21294 : UNDER SEVERAL CONDITIONS OF MEMORY MANAGEMENT PAGE PROTECTION.
21295 : ALL OF THE PAGE PROTECTION DATA IS LISTED IN TABLE 'PDRTAB'.
21296 :
21297 :

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PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 168-8
 CZKEEC.P11 POWER DOWN AND UP ROUTINES

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21298 ;SETUP PAR'S FOR DIRECT MAPPING
21299 ;
21300 112422 005737 002162 PROBAH: TST MMFLG ;11/70 TYPE MEM MGMT?
21301 112426 001002 BNE 4$ ;BRANCH IF YES
21302 112430 000137 053622 5$: JMP DONE ;SKIP THESE MEM MGMT ABORT TESTS
21303
21304 112434 005737 002160 4$: TST PT34 ;IS THIS AN 11/34 TYPE PROCESSOR?
21305 112440 001373 BNE 5$ ;BRANCH IF YES
21306 112442 005037 172516 CLR @#MMR3 ;CLEAR OUT D-SPACE ENABLES
21307 112446 010637 113572 MOV SP,STK1 ;SAVE STACK POINTER
21308
21309 112452 012737 000000 172340 MOV #0,@#KIPAR0 ;SETUP KERNEL I-SPACE PAR'S
21310 112460 012737 000200 172342 MOV #200,@#KIPAR1
21311 112466 012737 000400 172344 MOV #400,@#KIPAR2
21312 112474 012737 000600 172346 MOV #600,@#KIPAR3
21313 112502 012737 001000 172350 MOV #1000,@#KIPAR4
21314 112510 012737 001200 172352 MOV #1200,@#KIPAR5
21315 112516 012737 001400 172354 MOV #1400,@#KIPAR6
21316 112524 012737 177600 172356 MOV #177600,@#KIPAR7
21317
21318 112532 012737 000000 172240 MOV #0,@#SIPAR0 ;SETUP SUPERVISOR I-SPACE PAR'S
21319 112540 012737 000200 172242 MOV #200,@#SIPAR1
21320 112546 012737 000400 172244 MOV #400,@#SIPAR2
21321 112554 012737 000600 172246 MOV #600,@#SIPAR3
21322 112562 012737 001000 172250 MOV #1000,@#SIPAR4
21323 112570 012737 001200 172252 MOV #1200,@#SIPAR5
21324 112576 012737 001400 172254 MOV #1400,@#SIPAR6
21325 112604 012737 177600 172256 MOV #177600,@#SIPAR7
21326
21327 112612 012737 000000 177640 MOV #0,@#UIPAR0 ;SETUP USER I-SPACE PAR'S
21328 112620 012737 000200 177642 MOV #200,@#UIPAR1
21329 112626 012737 000400 177644 MOV #400,@#UIPAR2
21330 112634 012737 000600 177646 MOV #600,@#UIPAR3
21331 112642 012737 001000 177650 MOV #1000,@#UIPAR4
21332 112650 012737 001200 177652 MOV #1200,@#UIPAR5
21333 112656 012737 001400 177654 MOV #1400,@#UIPAR6
21334 112664 012737 177600 177656 MOV #177600,@#UIPAR7
21335
21336
21337 ;SETUP PDR'S FOR R/W ACCESS
21338 ;
21339
21340 112672 012700 172300 MOV #KIPDR0,R0
21341 112676 012720 177406 1$: MOV #177406,(R0)+
21342 112702 020027 172316 CMP R0,#KIPDR7
21343 112706 101773 BLOS 1$
21344
21345 112710 012700 172200 MOV #SIPDR0,R0
21346 112714 012720 177406 2$: MOV #177406,(R0)+
21347 112720 020027 172216 CMP R0,#SIPDR7
21348 112724 101773 BLOS 2$
21349
21350 112726 012700 177600 MOV #UIPDR0,R0
21351 112732 012720 177406 3$: MOV #177406,(R0)+

```

21352 112736 020027 177616
21353 112742 101773
21354

CMP RO.#UIPDR7
BLOS 3\$

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 CZKEEC.P11 POWER DOWN AND UP ROUTINES

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21356 :*****
21357 :SBTTL MEMORY MGMT ABORT TESTS
21358 :KERNEL MODE CIS STACK PROBE AHEAD MEM MGMT ABORT TESTS
21359 :
21360 :
21361 KMTSTS:
21362 112744 005237 001120 INC $TESTN ;UPDATE TEST NUMBER FOR APT
21363 112750 012737 113450 000250 MOV #MMHDLR,@#MMVEC ;SETUP MEM MGMT INTERRUPT VECTOR
21364 112756 012737 000340 000252 MOV #PR7,@#MMVEC+2
21365 112764 012701 113054 MOV #1$,R1 ;SETUP INTR RETURN ADDRESS
21366 112770 012700 113574 MOV #PDRTAB,R0
21367 112774 012706 060070 3$: MOV #60070,SP
21368 :
21369 113000 011037 172304 2$: MOV (R0),@#KIPDR2 ;PROTECT PART OF STACK
21370 113004 012737 000001 177572 MOV #1,@#MMR0 ;TURN ON MEMORY MGMT
21371 :
21372 113012 004737 113472 JSR PC,SAVR ;SAVE REGISTERS
21373 :
21374 113016 076130 MOVCI ;EXECUTE THE CIS INSTRUCTION
21375 113020 113462 SRC.PTR
21376 113022 113466 DST.PTR
21377 113024 000377 FILL
21378 113026 000240 NOP ;TO LOOP ON THIS TEST REPLACE
21379 113030 000240 NOP ; THE TWO NOPS WITH A JMP TO 3$.
21380 113032 PRINTB #NOABO ;PRINT CIS INST FAILED TO ABORT
(6) 113032 012746 013565 MOV #NOABO,-(SP)
(3) 113036 010600 MOV SP,R0
(4) 113040 004737 066232 JSR PC,FPRINT
21381 113044 012737 000001 001114 MOV #1,$MSGTY ;SET APT FATAL ERROR INDICATOR ;;REV-C
21382 113052 000000 HALT ;CIS INSTRUCTION SHOULD HAVE ABORTED BUT DIDN'T
21383 :
21384 113054 004737 113524 1$: JSR PC,RESR ;RESTORE REGISTERS
21385 113060 062700 000002 ADD #2,R0 ;UPDATE PROTECTION SCHEME TO NEXT TABLE CASE
21386 113064 005710 TST (R0) ;ANY CASES LEFT TO TRY?
21387 113066 001344 BNE 2$ ;BRANCH IF YES
21388 :
21389 113070 005037 177572 CLR @#MMR0 ;NO - PREPARE TO EXIT TEST
21390 113074 012737 177406 172304 MOV #177406,@#KIPDR2 ;RESTORE R/W ACCESS TO STACK AREA
21391 113102 000400 BR SMTSTS ;GO TO NEXT TEST
21392 :
21393 :

```

PDP-11 CIS INST EXERCISER MACY11 27(655) 25-MAR-81 12:25 PAGE 168-11
CZKEEC.P11 MEMORY MGMT ABORT TESTS

```

21395 ;*****
21396 ;SUPERVISOR MODE CIS STACK PROBEAHEAD MEMORY MGMT ABORT TESTS
21397 ;
21398 ;
21399 ;
21400 SMTSTS:
21401 113104 005237 001120 INC $TESTN ;UPDATE TEST NUMBER FOR APT
21402 113110 012737 113450 000250 MOV #MMHDLR,@MMVEC ;SETUP MEM MGMT INTERRUPT VECTOR
21403 113116 012737 040340 000252 MOV #040340,@MMVEC+2
21404 113124 012701 113230 MOV #1$,P1 ;SETUP INTR RETURN ADDRESS
21405 113130 012700 113574 MOV #PDRTAB,R0
21406 113134 012737 040340 177776 MOV #040340,@PSW ;SWITCH TO SUPERVISOR MODE
21407 113142 012706 060070 3$: MOV #60070,SP
21408 ;
21409 113146 011037 172204 2$: MOV (R0),@SIPDR2 ;PROTECT PART OF STACK
21410 113152 012737 000001 177572 MOV #1,@MMR0 ;TURN ON MEMORY MGMT
21411 ;
21412 113160 004737 113472 JSR PC,SAVR ;SAVE REGISTERS
21413 ;
21414 113164 076130 MOVCI ;EXECUTE THE CIS INSTRUCTION
21415 113166 113462 SRC.PTR
21416 113170 113466 DST.PTR
21417 113172 000377 FILL
21418 ;
21419 113174 000240 NOP ;TO LOOP ON THIS TEST, REPLACE THE
21420 113176 000240 NOP ; TWO NOPS WITH A JMP TO 3$.
21421 113200 012737 000340 177776 MOV #340,@PSW ;SWITCH BACK TO KERNEL MODE BEFORE HALT
21422 113206 PRINTB #NOABO ;PRINT CIS INST FAILED TO ABORT
(6) 113206 012746 013565 MOV #NOABO,-(SP)
(3) 113212 010600 MOV SP,R0
(4) 113214 004737 066232 JSR PC,FPRINT
21423 113220 012737 000001 001114 MOV #1,$MSGTY ;SET APT FATAL ERROR INDICATOR ;;REV-C
21424 113226 000000 HALT ;CIS INSTRUCTION SHOULD HAVE ABORTED BUT DIDN'T
21425 ;
21426 113230 004737 113524 1$: JSR PC,RESR ;RESTORE REGISTERS
21427 113234 062700 000002 ADD #2,R0 ;UPDATE PROTECTION SCHEME TO NEXT TABLE CASE
21428 113240 005710 TST (R0) ;ANY CASES LEFT TO TRY?
21429 113242 001341 BNE 2$ ;BRANCH IF YES
21430 ;
21431 113244 005037 177572 CLR @MMR0 ;NO - PREPARE TO EXIT TEST
21432 113250 012737 177406 172204 MOV #177406,@SIPDR2 ;RESTORE R/W ACCESS TO STACK AREA
21433 113256 000400 BR UMTSTS ;GO TO NEXT TEST
21434 ;
21435 ;

```

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 (ZKREC.P11) MEMORY MGMT ABORT TESTS

```

21437 ;*****
21438
21439 ;USER MODE CIS STACK PROBEAHEAD MEM MGMT ABORT TESTS
21440 ;
21441
21442 UMTSTS:
21443 113260 005237 001120 INC $TESTN ;UPDATE TEST NUMBER FOR APT
21444 113264 012737 113450 000250 MOV #MMHDLR,@MMVEC ;SETUP MEM MGMT INTERRUPT VECTOR
21445 113272 012737 140340 000252 MOV #140340,@MMVEC+2
21446 113300 012701 113404 MOV #1$,R1 ;SETUP INTR RETURN ADDRESS
21447 113304 012700 113574 MOV #PDRTAB,R0
21448 113310 012737 140340 177776 MOV #140340,@PSW ;SWITCH TO USER MODE
21449 113316 012706 060070 3$: MOV #60070,SP
21450
21451 113322 011037 177604 2$: MOV (R0),@UIPDR2 ;PROTECT PART OF STACK
21452 113326 012737 000001 177572 MOV #1,@MMRO ;TURN ON MEMORY MGMT
21453
21454 113334 004737 113472 JSR PC,SAVR ;SAVE REGISTERS
21455
21456 113340 076130 MOVCI ;EXECUTE THE CIS INSTRUCTION
21457 113342 113462 SRC.PTR
21458 113344 113466 DST.PTR
21459 113346 000377 FILL
21460
21461 113350 000240 NOP ;TO LOOP ON THIS TEST REPLACE THE
21462 113352 000240 NOP ; TWO NOPS WITH A JMP TO 3$.
21463 113354 012737 000340 177776 MOV #340,@PSW ;SWITCH BACK TO KERNEL MODE BEFORE HALT
21464 113362 PRINTB #NOABO ;PRINT CIS INST FAILED TO ABORT
    (6) 113362 012746 013565 MOV #NOABO,-(SP)
    (3) 113366 010600 MOV SP,R0
    (4) 113370 004737 066232 JSR PC,FPRINT
21465 113374 012737 000001 001114 MOV #1,$MSGTY ;SET APT FATAL ERROR INDICATOR ;:REV-C
21466 113402 000000 HALT ;CIS INSTRUCTION SHOULD HAVE ABORTED BUT DIDN'T
21467
21468 113404 004737 113524 1$: JSR PC,RESR ;RESTORE REGISTERS
21469 113410 062700 000002 ADD #2,R0 ;UPDATE PROTECTION SCHEME TO NEXT TABLE CASE
21470 113414 005710 TST (R0) ;ANY CASES LEFT TO TRY?
21471 113416 001341 BNE 2$ ;BRANCH IF YES
21472
21473 113420 005037 177572 CLR @MMRO ;NO - PREPARE TO EXIT TEST
21474 113424 012737 177406 177604 MOV #177406,@UIPDR2 ;RESTORE R/W ACCESS TO STACK AREA
21475 113432 012737 000000 177776 MOV #0,@PSW ;SWITCH BACK TO KERNEL MODE
21476 113440 013706 113572 MOV STK1,SP ;RESTORE NORMAL STACK POINTER
21477 113444 000137 053622 JMP DONE
21478
    
```

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 CZKEEC.P11 MEMORY MGMT ABORT TESTS

```

21480 ;MEMORY MANAGEMENT TRAP HANDLER
21481 ;
21482 113450 ;MMHDLR:
21483 113450 005037 177572 CLR @MMR0 ;TURN OFF MEM MGMT
21484 113454 005726 TST (SP)+ ;FIX UP STACK
21485 113456 005726 TST (SP)+
21486 113460 000111 JMP (R1) ;RETURN VIA R1
21487
21488
21489 ;CIS INSTRUCTION SOURCE AND DESTINATION DESCRIPTORS
21490 ;
21491 ;
21492 113462 000001 SRC.PTR: .WORD 1
21493 113464 076000 .WORD 76000
21494 113466 000001 DST.PTR: .WORD 1
21495 113470 076001 .WORD 76001
21496
21497 ;SUBROUTINES
21498 ;
21499 113472 010037 113556 ;SAVR: MOV R0,SVR0 ;SAVE REGISTERS
21500 113476 010137 113560 MOV R1,SVR1
21501 113502 010237 113562 MOV R2,SVR2
21502 113506 010337 113564 MOV R3,SVR3
21503 113512 010437 113566 MOV R4,SVR4
21504 113516 010537 113570 MOV R5,SVR5
21505 113522 000207 RTS PC
21506
21507 113524 013700 113556 ;RESR: MOV SVR0,R0 ;RESTORE REGISTERS
21508 113530 013701 113560 MOV SVR1,R1
21509 113534 013702 113562 MOV SVR2,R2
21510 113540 013703 113564 MOV SVR3,R3
21511 113544 013704 113566 MOV SVR4,R4
21512 113550 013705 113570 MOV SVR5,R5
21513 113554 000207 RTS PC
21514
21515 113556 000000 SVR0: .WORD 0
21516 113560 000000 SVR1: .WORD 0
21517 113562 000000 SVR2: .WORD 0
21518 113564 000000 SVR3: .WORD 0
21519 113566 000000 SVR4: .WORD 0
21520 113570 000000 SVR5: .WORD 0
21521
21522 113572 000000 STK1: .WORD 0
21523
21524 ;PROTECTION TABLE (WORD FORMAT = PDR FORMAT)
21525 113574 PDRTAB:
21526 113574 177000 177000 ;ACF=00 ED=0 PLF=176
21527 113576 177410 177410 ;ACF=00 ED=1 PLF=177
21528 113600 177400 177400 ;ACF=00 ED=0 PLF=177
21529 113602 100010 100010 ;ACF=00 ED=1 PLF=0
21530
21531 113604 177002 177002 ;ACF=01 ED=0 PLF=176
21532 113606 177412 177412 ;ACF=01 ED=1 PLF=177
21533 113610 177402 177402 ;ACF=01 ED=0 PLF=177

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 CZKEEC.P11 MEMORY MGMT ABORT TESTS

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21534 113612 100012          100012          ;ACF=01          ED-1 PLF=0
21535
21536 113614 177004          177004          ;ACF=10          ED=0  PLF=176
21537 113616 177414          177414          ;ACF=10          ED=1  PLF=177
21538 113620 177404          177404          ;ACF=10          ED=0  PLF=177
21539 113622 100014          100014          ;ACF=10          ED=1  PLF=0
21540
21541 113624 177006          177006          ;ACF=11          ED=0  PLF=176
21542 113626 177416          177416          ;ACF=11          ED=1  PLF=177
21543 113630 000000          0
21544
21545
21546
21548          120000          .=120000
21553          .SBTTL          CIS INST EXECUTION STACK
21554          ;CIS INSTRUCTION EXECUTION STACK
21555          ;
21556 120000 000200          .BLKW ^D128
21557 120400 111111          PRECSK: .WORD 111111
21558 120402 000100          .BLKW ^D64
21559 120602
21560          CSTACK:          ;NOTE THIS STACK AREA IS INITIALIZED TO
          ; 055555 PRIOR TO EACH TEST.
21561 120602 111111          PSTCSK: .WORD 111111
21562 120604 000000          SAVKCC: .WORD 0
21563          .SBTTL          TRANSLATION TABLES FOR MOVTC
21564          ;TRANSLATION TABLES FOR MOVTC
21565          ;
21566 120606 000400          XLTBL1: .BLKB ^D256
21567 121206          ELTBL:
21568
21569
21570          .EVEN
21571          000001          .END

```


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 CZKEEC.P11 CROSS REFERENCE TABLE

FLE	053264	13269	13272#												
FLODIS	001526	6981#	11769												
FLOPTR	001746	7096#	11754*	11761	11834*	12012*	12013	12040*	12586*	12613*	12639*	12864*	13444	13459	
		13473	13486	13500	13512										
FORM1	010012	8694#	15582												
FORM10	010666	8703#	15664	15671											
FORM11	010740	8704#	15678	15734											
FORM12	011022	8705#	15685	15741											
FORM13	011200	8709#	14838												
FORM14	011260	8710#	14840												
FORM15	011366	8712#	14849												
FORM16	011375	8713#	14851												
FORM17	011401	8714#	14859												
FORM18	011411	8715#	14863												
FORM19	014002	8744#	14887												
FORM2	010072	8695#	15594												
FORM20	014125	8746#	14888												
FORM21	014160	8747#	14767	15789	15791										
FORM22	014163	8748#	15306												
FORM23	014200	8749#	15319	15330											
FORM24	014216	8750#	15317	15332											
FORM25	014234	8751#	15337												
FORM26	014257	8752#	15351												
FORM27	014302	8753#	1538												
FORM3	010160	8696#	15600	15606											
FORM30	014306	8754#	15765												
FORM31	014336	8755#	15764												
FORM32	014342	8756#	15420												
FORM33	014362	8757#	15433												
FORM34	014366	8758#	15417												
FORM35	014373	8759#	15419												
FORM36	014400	8760#	11584	12970											
FORM37	014462	8761#	12980												
FORM38	014501	8762#	13763												
FORM39	014560	8763#	13764												
FORM4	010226	8697#	15612	15618											
FORM40	014653	8764#	15768												
FORM41	014733	8766#	15748	15754											
FORM42	015031	8767#	14194	14511											
FORM43	015120	8768#	14195	14512											
FORM44	015201	8769#	14245												
FORM45	015254	8770#	14246												
FORM46	015333	8771#	14247												
FORM47	015404	8772#	14281												
FORM48	015465	8773#	14269												
FORM49	015543	8774#	14270												
FORM5	010302	8698#	15624												
FORM6	010366	8699#	15630												
FORM7	010440	8700#	15636	15643	15692	15699	15720	15727							
FORM8	010534	8701#	15650	15706											
FORM9	010612	8702#	15657	15713											
FPRINT	066232	11308	11322	11401	11406	11409	11416	11455	11457	11458	11471	11480	11483	11493	
		11584	12756	12819	12821	12834	12970	12980	12982	12983	13760	13763	13764	13770	
		14074	14075	14098	14103	14104	14120	14121	14191	14194	14195	14226	14229	14242	

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ZKFEC.P11 CROSS REFERENCE TABLE

MAPH24= 170320	6869#
MAPH25= 170326	6869#
MAPH26= 170332	6869#
MAPH27= 170336	6869#
MAPH3 = 170216	6869#
MAPH30= 170342	6869#
MAPH31= 170346	6869#
MAPH32= 170352	6869#
MAPH33= 170356	6869#
MAPH34= 170362	6869#
MAPH35= 170366	6869#
MAPH36= 170372	6869#
MAPH37= 170376	6869#
MAPH4 = 170222	6869#
MAPH5 = 170226	6869#
MAPH6 = 170232	6869#
MAPH7 = 170236	6869#
MAPL0 = 170200	6869#
MAPL00= 170200	6869#
MAPL01= 170204	6869#
MAPL02= 170210	6869#
MAPL03= 170214	6869#
MAPL04= 170220	6869#
MAPL05= 170224	6869#
MAPL06= 170230	6869#
MAPL07= 170234	6869#
MAPL1 = 170204	6869#
MAPL10= 170240	6869#
MAPL11= 170244	6869#
MAPL12= 170250	6869#
MAPL13= 170254	6869#
MAPL14= 170260	6869#
MAPL15= 170264	6869#
MAPL16= 170270	6869#
MAPL17= 170274	6869#
MAPL2 = 170210	6869#
MAPL20= 170300	6869#
MAPL21= 170304	6869#
MAPL22= 170310	6869#
MAPL23= 170314	6869#
MAPL24= 170320	6869#
MAPL25= 170324	6869#
MAPL26= 170330	6869#
MAPL27= 170334	6869#
MAPL3 = 170214	6869#
MAPL30= 170340	6869#
MAPL31= 170344	6869#
MAPL32= 170350	6869#
MAPL33= 170354	6869#
MAPL34= 170360	6869#
MAPL35= 170364	6869#
MAPL36= 170370	6869#
MAPL37= 170374	6869#
MAPL4 = 170220	6869#

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 CZKEEC.P11 CROSS REFERENCE TABLE

RANDTA	001774	7107#	12071*	12298	12313	12345	12402	12424	12444*					
RANGE	065602	14882	14953#	14963										
RCHAR	065600	14132*	14133*	14134	14137	14139	14141	14735*	14736*	14737	14739	14743	14748	14752
		14756	14906*	14907	14909*	14910*	14911	14913	14918	14925	14927	14929	14931	14943
		14946#	15007*	15030*	15512*	15513	15515*	15516*	15517	15519	15521	15525*		
RDLHR =	104402	21263	21265#											
RDDEC =	104404	12758	21265#											
RDLIN =	104403	21262	21265#											
RECC	070640	12877	15533#											
RECLAT	061650	14185	14260	14294#										
REDNTC	042500	11855#	20080	20152	21053									
REDTC	001424	6929#	11506*	11855*										
REGCK	050674	12879	12881#											
REGERR	050772	12884	12886	12888	12890	12892	12894	12897#						
REGOP	047276	12551	12668#											
REGSET	002056	7132#	13713*	13728*	13740	13763	15768							
RESPTP	053356	13293	13299#	13318										
RESR	113524	21384	21426	21468	21507#									
RESVEC =	C00010	6869#	11303*	11304*	11340*	11342*	13579*	13581*	13674*					
RFN	054400	12570	12590	13540#										
RFNITE	053442	13249	13305	13327#										
RFNX	054300	12619	12657	13517#										
RF1	054134	11917	12501	12842	12865	13466#	13547							
RF1X	054146	12553	13468	13472#	13523									
RF2	054166	11920	12506	12850	13480#	13551								
RF2X	054200	13481	13485#	13527										
RF3	054222	11890	11926	11980	11996	12512	12855	13494#	13555					
RF3X	054234	11794	13495	13499#	13531									
RF4	054252	11790	11845	11871	11900	11983	12859	13506#	13559					
RF4X	054264	13507	13511#	13535										
RGPRO6	062102	14211	14255	14274	14349#	14524								
RLL	002226	7186#	14957*	14964*	14965	14968*	15037	15039	15045*					
RN	064334	12174	12183	12205	12347	12427	12449	12455	13238	13866	13879	14652	14683	14693
		14716	14718	14775	14786	14798#								
RNCON	064414	11327*	11387*	11584	14589	14595	14601*	14607	14613*	14619	14625*	14631	14637*	14801*
		14804	14815#											
RNIIB	002000	7109#	12454*	12457										
RPTFIG	002276	7206#	12614	12955*	14921*									
RPTYPE	064266	11695	11702	11709	14774#									
RP1	064416	11332*	11388*	11584	14590	14596	14602*	14608	14614*	14620	14626*	14632	14638*	14799
		14806*	14813	14816#										
RP2	064420	11337*	11389*	11584	14591	14597	14603*	14609	14615*	14621	14627*	14633	14639*	14805
		14809	14812*	14817#										
RRNGSV	063536	11944	14636#											
RRNGSW	063466	11659	14624#											
RRNGSX	063346	12006	14600#											
RRNGSY	063416	11739	14612#											
RIBL FN	001644	7034#	11906	11949										
RTC	042024	11732#	12985											
RTS(LPV	065336	14879	14896#											
RUL	002230	7187#	14965*	14967*	14969*	14970*	15037							
RZTYPE	064314	11698	11705	11712	14785#	14789								
RO	7000000	6869#	6919*	8851	8858*	8859	8860	8861	8862	8863	8864*	8865	8868	8870*
		8871*	8872	8873*	8875*	8876	8879*	8987*	8988*	8996*	8997*	9015	9017	9023*

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(ZKEEC.P11 CROSS REFERENCE TABLE)

9024	9025*	9026*	9027*	9028*	9029*	9035*	9036*	9044*	9045*	9066	9068	9077*
9078	9079*	9080*	9081*	9082*	9083*	9090*	9091*	9099	9119	9126*	9127	9128*
9129*	9130*	9131*	9132*	9138*	9139*	9144	9155*	9157	9174	9184*	9185*	9193
9205*	9206	9211*	9212*	9214	9226*	9227*	9229	9241*	9242	9243*	9244	9252*
9253	9254*	9255	9260*	9262	9268	9303	9312	9313*	9316	9318	9334*	9344
9370*	9371	9373*	9394*	9395	9409*	9410	9425*	9426	9427	9434	9435	9443*
9445	9450	9460	9470	9480	9522	9531*	9554*	9555*	9561*	9567	9575*	9576*
9577*	9598*	9599*	9604*	9611*	9612	9617*	9624*	9630*	9633*	9635*	9642*	9698*
9714*	9743*	9754*	9778*	9779*	9780	9813*	9822*	9844*	9860*	9952*	9955*	9956
9986*	9993	9996*	10003	10006*	10018*	10044*	10161*	10180*	10254*	10255*	10256*	10257*
10258*	10259*	10260*	10281*	10291*	10296*	10316*	10349*	10359*	10364*	10385*	10403*	10454*
10466*	10467	10469*	10470*	10471	10479*	10485*	10486	10498*	10510*	10529*	10543*	10555*
10575*	10584*	10608*	10610	10613*	10652*	10686*	10701*	10727*	10733*	10777*	10784*	10832*
10866*	11154*	11155*	11156*	11157*	11158*	11159*	11160*	11161*	11308*	11322*	11379*	11380*
11381*	11382	11401*	11406*	11409*	11416*	11455*	11457*	11458*	11471*	11480*	11483*	11493*
11509*	11512*	11513	11579*	11580*	11584*	11598*	11599	11607	11617	11638	11649	11696
11699	11703	11706	11710	11713	11745*	11746	11748*	11750*	11751	11755	12175	12184
12188	12206	12316	12348	12405	12428	12432	12436	12450*	12451	12453*	12454	12456*
12457*	12463	12465*	12714*	12715	12755	12756*	12757*	12799	12819*	12821*	12834*	12970*
12980*	12982*	12983*	13239*	13240	13348*	13349	13388*	13396	13583	13585	13604	13703*
13718*	13743	13760*	13763*	13764*	13770*	13867*	13869	13873	13876*	13877	13880	13911*
13912*	13913	13916*	13917*	13918	13921*	13922*	13923	13926*	13927*	13928	13931*	13932*
13933	14074*	14075*	14098*	14103*	14104*	14120*	14121*	14191*	14194*	14195*	14226*	14229*
14242*	14245*	14246*	14247*	14266*	14269*	14270*	14278*	14281*	14299*	14302*	14332	14350*
14372*	14373*	14374	14379	14405*	14406*	14407	14413	14456*	14457*	14458	14508*	14511*
14512*	14653*	14654*	14655	14657	14658*	14659*	14660	14685*	14690*	14691	14694*	14695
14717	14719	14767*	14776	14778*	14780*	14787*	14788	14799*	14802*	14803*	14804*	14805*
14806	14807*	14808*	14809*	14810*	14811*	14812	14813*	14835*	14837*	14838*	14839*	14840*
14843*	14849*	14851*	14858*	14859*	14863*	14868*	14869*	14884*	14887*	14888*	15059	15083
15099	15107	15127*	15128	15138	15204	15205*	15206*	15217	15219*	15230*	15306*	15308*
15317*	15319*	15321*	15330*	15332*	15334*	15337*	15341*	15346*	15349*	15351*	15355*	15360*
15363*	15378	15389*	15404*	15417*	15419*	15420*	15433*	15444	15445*	15446*	15447	15448*
15449*	15492*	15493	15579*	15582*	15585*	15588*	15591*	15594*	15597*	15600*	15603*	15606*
15609*	15612*	15615*	15618*	15621*	15624*	15627*	15630*	15633*	15636*	15640*	15643*	15647*
15650*	15654*	15657*	15661*	15664*	15668*	15671*	15675*	15678*	15682*	15685*	15689*	15692*
15696*	15699*	15703*	15706*	15710*	15713*	15717*	15720*	15724*	15727*	15731*	15734*	15738*
15741*	15745*	15748*	15751*	15754*	15764*	15765*	15768*	15781*	15789*	15791*	21262*	21264*
21265*	21266*	21340*	21341*	21342	21345*	21346*	21347	21350*	21351*	21352	21366*	21369
21380*	21385*	21386	21405*	21409	21422*	21427*	21428	21447*	21451	21464*	21469*	21470
21499	21507*											
6869#	6919*	8852	8874*	8875	8880*	8989*	8990*	8994	8998	9019	9037*	9038*
9042	9046	9073	9092*	9093*	9106	9113	9117	9119*	9140*	9141*	9146	9154*
9159	9164	9186*	9187*	9191	9204*	9213*	9214	9216	9222*	9228*	9229	9231
9237*	9242*	9244	9246	9248*	9253*	9255	9257	9259*	9260	9263	9304	9305*
9308*	9309	9314	9320	9335*	9345	9347*	9357	9364	9370	9374*	9394	9409
9414*	9421*	9425	9443	9523	9524*	9528*	9529	9547	9559*	9562*	9568	9569*
9575	9578*	9598	9611	9630	9699*	9715*	9744*	9749*	9755*	9760*	9814*	9823*
9845*	9854*	9989*	9990*	9994	10011*	10012	10016*	10017*	10026	10031	10033*	10042*
10043*	10047*	10159*	10179*	10282*	10292*	10297*	10314*	10350*	10360*	10365*	10384*	10404*
10406*	10407	10455*	10480*	10482*	10499*	10511*	10530*	10544*	10546*	10551	10556*	10563*
10567*	10568*	10571	10572*	10573*	10574	10580*	10581*	10587*	10588*	10593	10595*	10614*
10615*	10618*	10619*	10625	10627*	10653*	10687*	10702*	10728*	10734*	10778*	10785*	10833*
10868*	11147*	11148	11151	11166*	11170*	11174*	11178*	11183*	11188*	11189	11192	11195
11199*	11200	11201	11202*	11203	11204	11209*	11210	11213	11216	11222*	11226*	11230*

R1 -Z000001

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ZKREC.P11 CROSS REFERENCE TABLE

11234*	11238*	11242*	11243	11246	11249	11252	11256*	11257	11258	11259*	11260	11261
11262*	11263	11264	11510*	11513	11599*	11600*	11601*	11602*	11603	11607*	11608*	11610
11611*	11617*	11618*	11619*	11620	11621*	11622	11627*	11628	11633*	11634	11638*	11639*
11641	11649*	11650	11651	11653*	11654*	11655	11656	11666*	11667*	11668*	11669*	11670
11673	11674*	11675*	11676	11677*	11678*	11679*	11680*	11681*	11682	11683*	11684*	11685*
11686*	11687	11688*	11689*	11690	11751*	11752*	11753*	11754	11755*	11756*	11757*	11758
11761*	11762*	11763*	11764*	11765*	11766*	11767*	11768*	11769*	11770	11792*	11793	11795
11798	11810	11822	11847*	11873*	11874*	11875	11892*	11895*	11898	11902	11919*	11922
11925*	11928	11930*	11953*	11955*	11956*	11957*	11958*	11960	11982	11986	11997	12001
2005	2013*	2014*	2015	2044*	2045	2046	2047*	2048	2052*	2053	2054*	2056*
12057	12059	12061	12063	12065	12067	12079*	12082*	12089*	12092*	12099*	12107*	12123*
12124*	12125*	12126*	12127*	12128*	12129*	12130	12146*	12148*	12160*	12167*	12181*	12196*
12197*	12203*	12208*	12210*	12214*	12216*	12225*	12230*	12231*	12232*	12233*	12234*	12235*
12236*	12237	12240*	12241*	12242*	12243*	12244*	12245*	12247	12248	12251*	12260*	12262*
12267*	12271*	12280*	12281*	12282*	12283*	12284*	12285*	12286*	12287	12290*	12291*	12292
12316*	12318*	12334*	12335*	12336*	12337	12339*	12354*	12355*	12356*	12357*	12358*	12359*
12360*	12361	12365*	12369*	12374*	12379*	12382*	12383*	12384*	12385*	12386*	12387*	12388*
12389	12393*	12394*	12399*	12405*	12407*	12418*	12419*	12420*	12421*	12426*	12430*	12434*
12438*	12440*	12476*	12478	12479	12503	12508	12514	12529*	12530*	12532*	12533*	12554*
12557	12562	12565*	12571	12574	12591	12593	12599	12600	12601*	12602	12603	12605
12606	12607*	12608	12609	12620	12622	12624*	12625	12626*	12627	12658	12660	12661*
12663*	12686*	12687*	12688	12690	12716*	12717	12800	12844	12852	12856	12860	12867
12900*	12914*	12921	12923	12927*	12929	12934*	12936	12939*	12941	12943	13003*	13004*
13005*	13011*	13012*	13013*	13022*	13023*	13024	13026	13104*	13105*	13106	13108*	13109*
13110*	13111*	13112*	13113	13115*	13116*	13117*	13118*	13119*	13120	13134*	13135*	13136
13141*	13142*	13143	13146*	13147*	13148	13157*	13158*	13159	13162*	13163*	13164	13167*
13168*	13169	13179*	13180*	13181	13183*	13184*	13185*	13186*	13187*	13188	13206*	13207*
13208	13211*	13212*	13213	13215*	13216*	13217*	13218*	13219*	13220	13254*	13255*	13256*
13257	13259	13266	13274	13290	13300	13312	13331*	13352	13358*	13359*	13360*	13361
13444*	13445	13447*	13449*	13450*	13451*	13452*	13453*	13454*	13455	13459*	13460*	13461*
13462*	13463	13469*	13473*	13474*	13475*	13476*	13477*	13482*	13486*	13487*	13488*	13489*
13490*	13491*	13496*	13500*	13501*	13502*	13503*	13508*	13512	13513*	13514*	13537*	13561*
13704*	13719*	13745	13764	14307*	14308*	14309*	14310	14313*	14333	14351*	14377*	14378
14379	14410*	14411	14413	14422*	14423	14424*	14425	14426*	14443*	14444*	14445*	14449*
14450	14451*	14452	14453*	14471*	14472*	14473*	14566*	14567	14568*	14569	14570*	14579*
14580*	14581*	14669*	14670*	14671*	14672*	14673	14844*	14846	14848	14852	14854*	15039*
15040	15041	15042	15043	15044	15058	15059*	15060	15081	15086	15097	15102	15110
15113	15115	15120	15133*	15136	15203	15210*	15211	15215	15231*	15307*	15311*	15312*
15313	15315	15320*	15324*	15325*	15326	15328	15333*	15340*	15345*	15348*	15354*	15359*
15362*	15380	15383	15384	15392	15396*	15405*	15409*	15410	15478*	15479	15481	15483*
15485	15488	15492	15495	15509*	15521*	15523	15534*	15535*	15536*	15538*	15541*	20029*
20030*	20031*	20032	20035*	20036*	20037*	20038	20043*	20044*	20045	20050*	20051*	20052
20055*	20058*	20059	20061*	20062	20067*	20072*	20073	20084*	20087*	20088*	20089	20092*
20095*	20096	20101*	20102*	20103*	20104	20107*	20108*	20109*	20110	20115*	20116*	20117
20122*	20123*	20124	20127*	20130*	20131	20133*	20134	20139*	20144*	20145	20156*	20157*
20158*	20159	20164*	20165*	20166*	20167	20275*	20276*	20277*	20278*	20279*	20280	20281*
20282*	20283*	20284*	20285*	20286	20292*	20293*	20294*	20295*	20296*	20297	20303*	20304*
20305*	20306*	20307*	20308	20309*	20310*	20311*	20312*	20313*	20314	20317*	20318*	20319*
20320*	20321*	20322	20323*	20324*	20327*	20328*	20329	20330*	20331*	20332	20341*	20342*
20343*	20344*	20345*	20346	20347*	20348*	20349*	20350*	20351*	20352	20355*	20356*	20357*
20358*	20359	20360*	20361*	20362*	20363*	20364	20370*	20371*	20372*	20373	20374*	20375*
20376*	20377	20382*	20383*	20384*	20385	20386*	20387*	20388*	20389	20392*	20393*	20394*
20395	20396*	20397*	20399*	20400	20401*	20402*	20403	20564*	20565*	20566*	20567	20572*
20573*	20574*	20575	20644*	20645*	20646*	20647*	20648*	20649	20654*	20655*	20656*	20657*

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CZKEEC.P11 CROSS REFERENCE TABLE

20658*	20659	20662*	20663*	20664*	20665*	20666	20769*	20770*	20771*	20772	20777*	20778*
20779*	20780	20783*	20784*	20785	20945*	20946*	20947*	20948*	20949*	20950	20955*	20956*
20957*	20958*	20959*	20960	20970*	20971*	20974*	20975*	20976	21003*	21005*	21007*	21008
21014*	21015*	21016*	21017	21026*	21027*	21028	21035*	21038*	21039	21041*	21042	21190*
21191*	21192*	21193	21194*	21195	21196*	21197	21262*	21266*	21365*	21404*	21446*	21486
21500	21508*											

R*0 =%000000
R*1 =%000001
R12 =%000002
R13 =%000003
R14 =%000004
R*5 =%000005
R2 =%000002

6869#												
6869#												
6869#												
6869#												
6869#												
6869#	8853	8881*	8994*	8998*	9003*	9004*	9010	9014	9019	9021*	9042*	9046*
9051*	9052*	9058	9065	9073	9075*	9097*	9101*	9106*	9107*	9109	9112	9117
9122	9142*	9144	9148	9150	9153*	9155	9158	9174	9176	9178	9180*	9188*
9190	9193	9195	9200*	9202*	9205	9219*	9220	9234*	9235	9261*	9262*	9263*
9264*	9265*	9266*	9267*	9316*	9318*	9319	9322*	9326	9328	9333*	9337*	9338*
9339*	9340*	9371*	9372*	9395*	9396	9397*	9398	9401*	9405*	9416*	9445*	9446
9447*	9448	9450*	9451	9456*	9458	9460*	9461	9464*	9465*	9467	9470*	9471*
9473	9480*	9481*	9482	9485*	9486*	9525	9532*	9537*	9542*	9544*	9545	9563*
9570	9571*	9572*	9576	9579*	9595*	9597*	9600*	9601*	9602*	9603*	9604	9612*
9613*	9616*	9617	9620*	9751	9762	9792	9800	9846*	9847	9874*	9875*	9876*
9877*	9878*	9879*	9880*	9953*	9959	9963*	9966	9973*	9974*	9979*	10019*	10022*
10023	10045*	10061*	10062*	10063*	10064*	10065*	10066*	10067*	10183	10210	10277*	10288
10324*	10325*	10326*	10327*	10328*	10329*	10330*	10345*	10356	10392*	10393*	10394*	10395*
10396*	10397*	10398*	10411	10457*	10486*	10487	10503*	10504	10506*	10515*	10549	10590
10623	10630*	10631*	10632*	10633*	10634*	10635*	10636*	10654*	10659	10693	10708	10732
10738	10768*	10769*	10770*	10771*	10772*	10773*	10774*	10870	10872*	10873	10876	10917*
10920*	10921*	10922*	10923*	11148*	11149	11150	11151*	11152	11153	11189*	11190	11191
11192*	11193	11194	11210*	11211	11212	11213*	11214	11215	11216*	11217	11218	11243*
11244	11245	11246*	11247	11248	11249*	11250	11251	11507*	11511*	11512	11609*	11610*
11612	11640*	11641*	11642	11644*	11645*	11646	11793*	11808*	11820*	11832*	11897*	11898*
11902*	11906	11908	11954*	11957	11958	12140*	12141*	12142	12152*	12153*	12154*	12155
12177*	12179*	12180*	12181	12186*	12190*	12192*	12327*	12328*	12329*	12330	12477*	12478*
12555*	12557*	12558*	12559	12560*	12564*	12566*	12574*	12575*	12577*	12579	12580*	12581
12583*	12587*	12599*	12602*	12605*	12608*	12610*	12660*	12662*	12663	12718*	12719	12801
12901*	12915*	12923	12928*	12931	12933*	12936	12940*	12942	12944	13266*	13267*	13268
13278*	13286*	13290*	13291*	13292	13312*	13313	13317	13705*	13720*	13747	13764	14334
14352*	14376*	14378*	14409*	14411	14668*	14679*	14691*	14695*	14697*	14698	14845*	14846
15057	15060*	15061	15063	15065	15067	15069	15071	15073	15075	15077	15081*	15082*
15086*	15087	15089	15091	15097*	15098*	15102*	15103*	15104	15106*	15110*	15112*	15117*
15118*	15119*	15122*	15125*	15132*	15136*	15137*	15148*	15149*	15150	15180*	15181*	15182
15206	15209*	15213*	15216*	15221	15226*	15385*	15386*	15388*	15390*	15400*	15421*	15422*
15423*	15424*	15425*	15426*	15429*	15430*	15446	20056*	20057*	20058	20068*	20069*	20070
20072	20085*	20086*	20087	20093*	20094*	20095	20128*	20129*	20130	20140*	20141*	20142
20144	20325*	20326*	20327	20398*	20399	20972*	20973*	20974	21036*	21037*	21038	21189*
21190	21193*	21195*	21197*	21236*	21237*	21238*	21239	21240*	21241	21244*	21245	21262*
21266*	21501	21509*										

R3 =%000003

6869#	8854	8882*	8999*	9000*	9001	9008*	9012	9014*	9017*	9047*	9048*	9049
9056*	9060	9065*	9071*	9102*	9103*	9104	9111*	9115	9121*	9122	9124*	9143*
9146	9148	9150	9152*	9154	9160	9164	9168	9170	9172*	9189*	9191	9195
9197*	9203*	9229*	9232*	9735	9736	9782*	9833*	9838*	9841*	9846	9954*	9962*
9964	9971*	9980*	10151*	10186*	10189	10193*	10198*	10204*	10207*	10212*	10218	10223
10234	10240*	10245*	10246	10257	10436*	10437*	10465*	10467*	10468*	10471*	10472	10475

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 ZKFECP11 CROSS REFERENCE TABLE

		15022*	15023	15028*	15030	15032*	15046*	15127	15128*	15203*	15204*	15230	15231	15306*	
		15317*	15319*	15330*	15332*	15337*	15351*	15389*	15417*	15419*	15420*	15433*	15444*	15448*	
		15449	15498*	15579*	15582*	15585*	15588*	15591*	15594*	15597*	15600*	15603*	15606*	15609*	
		15612*	15615*	15618*	15621*	15624*	15627*	15630*	15633*	15636*	15640*	15643*	15647*	15650*	
		15654*	15657*	15661*	15664*	15668*	15671*	15675*	15678*	15682*	15685*	15689*	15692*	15696*	
		15699*	15703*	15706*	15710*	15713*	15717*	15720*	15724*	15727*	15731*	15734*	15738*	15741*	
		15745*	15748*	15751*	15754*	15764*	15765*	15768*	15769*	15781*	15789*	15791*	20079*	20151*	
		20335*	20406*	20978*	21052*	21054*	21262*	21263*	21264*	21265*	21266*	21307	21367*	21380*	
		21407*	21422*	21449*	21464*	21476*	21484	21485							
		7126#	14209	14318*											
		7159#	11740*	11866	11886	11976	12049	12898	13028	13570*	15269				
		21375	21415	21457	21492#										
		11577	14587#												
		11945	14630#												
		11657	14618#												
		11987	14594#												
		11730	14606#												
		77572	6869#												
		77574	6869#												
		77576	6869#												
		172516	6869#												
		2000006	6869#												
		003250	7401#	20535											
		003350	7444#	21126											
		003356	7448#	21146											
		003370	7454#	20413	20699	20709	20752	20985							
		003450	7481#	20827	20838	20851									
		003610	7532#	20714											
		003616	7536#	20717											
		003624	7540#	20722											
		003254	7391	7406#	21120										
		003262	7410#	21128											
		003270	7414#	21130											
		003276	7418#	21140											
		003310	7424#	21122											
		003316	7428#	21142											
		003330	7434#	21124											
		003336	7438#	21144											
		001100	6869#	11284	11293										
		037066	6897	11273#	12991	13405									
		062252	14186	14387#	14504										
		002570	7333#	12746*	14364*	14388									
		002572	7334#	12715*	14365*	14392									
		002574	7335#	12717*	14366*	14395									
		002576	7336#	12719*	14367*	14397									
		002600	7337#	12721*	14368*	14399									
		002602	7338#	12723*	14369*	14401									
		002604	7339#	12725*	14370*	14403									
		002606	7340#	12726*	12729*	12743	14371*	14390							
		002120	7149#	12053*	12079	12089	12099	12146	12196	12214	12225	12251	12290	12369	12394
			12421												
		002312	7212#	12142*	12180	12337*									
		002112	7146#	12045*	12054	12055*	12082	12093	12101	12103	12109*	12111*	12120	12132	12134*
			12135*	12136*	12137*	12138*	12140	12148	12239	12240	12246*	12247*	12262	12289*	12294

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 CZKEEC.P11 CROSS REFERENCE TABLE

TRAP10	012154	8724#	14103												
TRAP4	012136	8723#	14074												
TRL	002110	7145#	11982*	11990	11997*	12009	12023*	12026*	12027*	12028	12033*	12034*			
TRN	003634	7549#	11922	11928	12503	12508	12514	12529	12571	12591	12844	12852	12856	12860	
		12867	13003	13469	13482	13496	13508	13561							
TRNR	003654	7561#	13004	13011											
TRPINF	012310	8728#	13770	14075	14104	14121									
TRPLOC	002172	7172#	14077	14073*	14075	14101*	14102*	14104	14118*	14119*	14121				
TRTVEC=	000014	6869#													
TR0	003634	7550#	12490	12539	12632*	12714	12972*	20030	20041	20044	20055	20065	20084	20108	
		20120	20123	20128	20140	20165	20275	20303	20317	20341	20355	20370	20382	20392	
		20564	20572	20644	20654	20662	20769	20777	20783	20786	20945	20955	20963	20970	
		21003	21014	21024	21026	21035	21188*								
TROR	003654	7562#	12799*	12883	14844										
TR1	003636	7551#	12491	12540	12633*	12716	12973*	20029	20035	20043	20050	20061	20067	20076	
		20088	20092	20104*	20110*	20117*	20124*	20134*	20145*	20148*	20159*	20164	20178	20291	
		20306	20320	20344	20358	20371	20383	20393	20565	20573	20578	20647	20657	20665	
		20770	20778	20784	20948	20958	20975	21005	21015	21027	21041	21049	21203*		
TR1R	003656	7563#	12800*	12885											
TR2	003640	7552#	12492	12541	12634*	12718	12974*	20036	20048	20051	20056	20068	20085	20093	
		20102	20113	20116	20127	20137	20157	20281	20292	20309	20323	20347	20360	20374	
		20386	20396	20965	20968	20972	21036	21209*							
TR2R	003660	7564#	12801*	12887											
TR3	003642	7553#	12493	12542	12593	12635*	12720	12975*	20032*	20038*	20045*	20052*	20062*	20073*	
		20076*	20089*	20096*	20101	20107	20115	20122	20133	20139	20148	20156	20167*	20280*	
		20284	20291*	20295	20308*	20312	20322*	20328	20330	20346*	20350	20359*	20363	20373*	
		20375	20385*	20387	20395*	20397	20401	20649*	20659*	20666*	20772*	20780*	20785*	20788*	
		20950*	20960*	20976*	21008*	21017*	21028*	21042*	21049*	21214*					
TR3R	003662	7565#	12802*	12889											
TR4	003644	7554#	12494	12543	12636*	12722	12976*	20325	20398	21220*					
TR4R	003664	7566#	12803*	12891											
TR5	003646	7555#	12495	12544	12637*	12724	12977*	20286*	20297*	20314*	20329*	20332	20352*	20364*	
		20377*	20389*	20400*	20403	20567*	20575*	20578*	21225*						
TR5R	003666	7567#	12804*	12893											
TR6	003650	7556#	12496	12678	12684*	14838	21231*								
TR6R	003670	7568#	12808*	12810*	12895	14852									
TSP	002234	7189#	12675*	12745	12811										
TSPA	103662	15955	16062	16230	16317	16438	16546	16672	16801	16923	17041	17120	17227	17336	
		17451	17600	17823	18038	18297	18514	18718	18936	19023	19149	19407	19447	19487	
		19746	19786	19826	19964#										
TSTPSW	001756	7100#	12732*	12733*	12734*	12737*	12741*	12742	12746	12784					
TTR0	002240	7191#	12539*	12972	15354										
TTR1	002242	7192#	12540*	12973	15355										
TTR2	002244	7193#	12541*	12974	15359										
TTR3	002246	7194#	12542*	12975	15360										
TTR4	002250	7195#	12543*	12976	15362										
TTR5	002252	7196#	12544*	12977	15363										
TTR6	002254	7197#													
TW0SET	002064	7135#	13594*	13612*	13670*	13694	13738								
TW1	002304	7209#	11670*	11671	11672										
TW2	002306	7210#	11673*	11674	11677	11683	11688								
TYPE =	104401	11352	11522	11525	11554	13378	13382	13418	13420	13422	13424	13589	13608	13620	
		13642	13666	14873	14880	14961	14989	14999	15026	15092	15095	15124	15164	15192	
		15229	15779	15787	21262	21263	21264	21265#	21266						

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CZKEEC.P11 CROSS REFERENCE TABLE

TYPE0	041226	6938	11605#											
TYPE1	041376	6939	11637#											
TYPFLD	002454	7286#	11895											
TYPLO	044406	7217	12195#	12342										
TYPLS	044462	7219	12213#	12222	12380									
TYPSET	052150	13074	13079	13096#	13125	13144	13160	13201	13232					
TYPSP	002336	7220	7221	7222#	7279	7280								
TYPSZ	044244	7214	12160#	12366										
TYPTAB	002316	7214#	12154											
TYPTO	044300	7216	12171#	12198	12343									
TYPTS	044416	7218	12200#	12217	12226	12375								
TYPJZ	044276	7215	12169#											
TYP3P	044526	12158	12229#											
TYP3Z	044060	12122#												
TYP4P	045466	12277	12382#											
TYP4Z	044762	12276	12279#											
TZ19	107314	17113	17150	17596	18027	18030	18067	18070	18503	18506	18929	18932	19142	19178
T\$ARGC=	C00001	20835#												
		11308#	11322#	11401#	11406#	11409#	11416#	11455#	11457#	11458#	11471#	11480#	11483#	11493#
		11584#	12756#	12819#	12821#	12834#	12970#	12980#	12982#	12983#	13760#	13763#	13764#	13770#
		14074#	14075#	14098#	14103#	14104#	14120#	14121#	14191#	14194#	14195#	14226#	14229#	14242#
		14245#	14246#	14247#	14266#	14269#	14270#	14278#	14281#	14299#	14302#	14508#	14511#	14512#
		14767#	14835#	14837#	14838#	14839#	14840#	14843#	14849#	14851#	14858#	14859#	14863#	14868#
		14869#	14884#	14887#	14888#	15306#	15317#	15319#	15330#	15332#	15337#	15351#	15389#	15417#
		15419#	15420#	15433#	15448#	15579#	15582#	15585#	15588#	15591#	15594#	15597#	15600#	15603#
		15606#	15609#	15612#	15615#	15618#	15621#	15624#	15627#	15630#	15633#	15636#	15640#	15643#
		15647#	15650#	15654#	15657#	15661#	15664#	15668#	15671#	15675#	15678#	15682#	15685#	15689#
		15692#	15696#	15699#	15703#	15706#	15710#	15713#	15717#	15720#	15724#	15727#	15731#	15734#
		15738#	15741#	15745#	15748#	15751#	15754#	15764#	15765#	15768#	15781#	15789#	15791#	21380#
		21422#	21464#											
TO	103412	15912	15948	15949	15950	15951	15952	16025	16060	16061	16137	16143	16184	16224
		16225	16227	16228	16273	16310	16311	16312	16313	16314	16394	16431	16432	16433
		16434	16435	16510	16544	16545	16620	16626	16664	16666	16667	16669	16670	16758
		16795	16796	16798	16799	16880	16917	16918	16920	16921	17001	17035	17036	17037
		17038	17039	17080	17114	17115	17116	17117	17118	17151	17152	17153	17154	17155
		17157	17190	17224	17225	17226	17260	17261	17262	17263	17300	17333	17334	17335
		17372	17411	17448	17449	17483	17484	17486	17523	17562	17597	17598	17630	17632
		17635	17641	17647	17671	17676	17682	17688	17717	17720	17726	17732	17764	17770
		17776	17811	17813	17814	17816	17817	17819	17820	17821	17847	17849	17852	17858
		17861	17862	17864	17888	17893	17899	17905	17933	17936	17942	17948	17979	17985
		17988	17989	17991	18026	18028	18029	18031	18032	18034	18035	18036	18066	18068
		18069	18071	18072	18074	18075	18076	18078	18102	18104	18107	18113	18119	18145
		18150	18156	18162	18191	18194	18200	18206	18238	18244	18250	18285	18287	18288
		18290	18291	18293	18294	18295	18321	18323	18326	18332	18335	18336	18338	18362
		18367	18373	18379	18409	18412	18418	18424	18455	18461	18464	18465	18467	18502
		18504	18505	18507	18508	18510	18511	18512	18538	18540	18545	18550	18578	18585
		18590	18622	18627	18632	18669	18674	18712	18713	18715	18716	18745	18747	18752
		18757	18787	18794	18799	18834	18839	18844	18884	18889	18930	18931	18933	18934
		18970	18975	19017	19018	19019	19020	19021	19056	19057	19058	19059	19060	19062
		19096	19101	19143	19144	19145	19146	19147	19179	19180	19181	19182	19183	19185
		19212	19214	19217	19223	19229	19255	19260	19266	19272	19301	19304	19310	19316
		19348	19354	19360	19395	19397	19398	19400	19401	19403	19404	19405	19435	19437
		19438	19440	19441	19443	19444	19445	19475	19477	19478	19480	19481	19483	19484
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 CZKEEC.P11 CROSS REFERENCE TABLE

.SWRHI	103#		
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.SAPT8	5085#	6860#	6918
.SAPTH	5341#	6860#	6913
.SAPTY	5516#	6860#	6919
.SASTA	5387#		
.SCATC	916#	6859#	6897
.SCMTA	1027#		
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.SDB20	4794#		
.SDIV	4574#		
.SEOP	2173#		
.SERRO	2654#		
.SERRT	2849#		
.SMULT	4511#		
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.SRAND	4261#		
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.SRDOC	3766#		
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.SR2AZ	4938#		
.SSAVE	3932#		
.SSB2D	4755#		
.SSB20	4856#		
.SSCOP	2408#		
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.STRAP	4034#	6859#	21265
.STYPB	3257#		
.STYPD	3180#		
.STYPE	2936#	6859#	21264
.STYPO	3084#		
.S4OCA	955#		
.1170	509#	6859#	6869

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CZKEEC.P11 CROSS REFERENCE TABLE

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	9465	9531	9575	9598	9611	9616	9620	9630	9647	9658	9662	9971	9983	9988	9990
	10201	10204	10207	10210	10212	10243	10467	10471	10486	10503	10849	10850	10875	10878	11179
	11184	11602	11608	11611	11619	11626	11632	11639	11644	11645	11654	11669	11753	11757	11769
	11834	11898	11902	11919	11925	11930	11949	11952	11958	12012	12027	12093	12154	12180	12291
	12295	12324	12329	12394	12398	12413	12421	12530	12533	12558	12566	12567	12575	12579	12580
	12586	12610	12611	12613	12624	12628	12639	12661	12662	12864	12914	12915	12933	12934	13004
	13012	13102	13145	13161	13166	13210	13251	13253	13255	13256	13286	13290	13291	13295	13301
	13332	13333	13334	13360	13454	13462	13469	13482	13496	13508	14149	14309	14373	14406	14416
	14439	14467	14575	14659	14671	14690	14760	14804	14805	14809	14854	14896	14897	14935	14936
	14937	14970	14971	14991	15004	15005	15028	15032	15045	15046	15149	15181	15215	15446	15483
	15498	15536	15769	20030	20031	20044	20061	20079	20088	20102	20103	20116	20133	20151	20157
	20158	20165	20166	20278	20279	20284	20285	20295	20296	20306	20307	20312	20313	20320	20321
	20328	20335	20344	20345	20350	20351	20358	20363	20371	20372	20375	20376	20383	20384	20387
	20388	20393	20394	20397	20406	20565	20566	20573	20574	20647	20648	20657	20658	20665	20770
	20771	20778	20779	20784	20948	20949	20958	20959	20975	20978	21005	21007	21015	21016	21027
	21041	21052	21054	21191	21237	21262	21264	21385	21427	21469					
ASL	9549	9550	9551	9552	9600	9601	9602	9603	10874	10877	11106	11107	11108	11109	11601
	11618	11625	11631	11653	11667	11668	11684	11685	11752	11756	11768	11802	11803	11804	11805
	11814	11815	11816	11817	11826	11827	11828	11829	12153	12163	12164	12165	12166	12328	13117
	13118	13277	13359	13450	13451	13453	13461	13477	13488	13491	13514	14308	14658	14670	
	15015	15016	15017	15117	15118	15119	15535	21262	21265						
ASR	6919	9310	9337	9338	9339	9340	9530	10567	11137	11679	11680	11681	11689	12125	12126
	12127	12128	12134	12135	12136	12137	12232	12233	12234	12235	12241	12242	12243	12244	12282
	12283	12284	12285	12303	12304	12305	12306	12357	12358	12359	12360	12384	12385	12386	12387
	12392	12395	12420	12554	13110	13111	13112	13185	13186	13187	13217	13218	13219	13475	13502
	13503	15422	15423	15424	15425	20057	20069	20086	20094	20129	20141	20276	20282	20293	20304
	20310	20318	20324	20326	20342	20348	20356	20361	20645	20655	663	20946	20956	20971	20973
	21037														
BCC	9972	9981	10187	10194	10199	10202	10205	10208	10211	10213					
BEQ	6919	9011	9016	9020	9059	9067	9074	9114	9118	9123		9147	9151	9171	9175
	9179	9192	9194	9196	9215	9230	9236	9245	9256	9258		9321	9327	9331	9349
	9351	9353	9399	9431	9452	9474	9541	9560	9574	9639		9651	9678	9690	9693
	9696	9707	9711	9721	9728	9738	9831	9848	9865	9950		10029	10032	10038	10040
	10052	10155	10165	10178	10230	10274	10289	10302	10304	10311	10342	10357	10370	10372	10379
	10412	10425	10428	10453	10474	10495	10516	10538	10542	10565	10591	10594	10605	10611	10626
	10651	10660	10672	10675	10689	10704	10724	10743	10762	10828	10837	10839	10844	10857	10871
	11069	11114	11284	11293	11321	11349	11393	11496	11516	11519	11521	11576	11624	11630	11643
	11692	11720	11747	11796	11842	11894	11905	11924	11929	11943	11948	11968	11994	11999	12025
	12050	12058	12060	12062	12064	12066	12068	12077	12081	12091	12102	12106	12144	12173	12176
	12185	12189	12202	12207	12299	12312	12314	12341	12346	12349	12403	12423	12425	12429	12433
	12437	12504	12510	12515	12548	12550	12563	12572	12582	12592	12596	12621	12623	12659	12681
	12689	12691	12699	12704	12806	12818	12830	12833	12846	12853	12857	12861	12868	12874	12879
	12896	12906	12911	12924	12937	12969	12979	12989	13025	13027	13035	13039	13041	13043	13079
	13089	13153	13175	13205	13237	13248	13258	13263	13265	13269	13284	13293	13305	13318	13329
	13341	13347	13351	13353	13377	13390	13410	13412	13414	13446	13584	13695	13739	13741	13860
	13870	13881	13884	13886	13891	13946	14023	14025	14031	14071	14090	14093	14135	14138	14140
	14142	14182	14214	14217	14235	14241	14262	14277	14296	14339	14526	14661	14675	14701	14738
	14777	14834	14842	14847	14853	14857	14862	14867	14891	14908	14912	14926	14928	14930	14994
	14996	15024	15038	15062	15064	15066	15068	15070	15072	15074	15076	15078	15088	15090	15114
	15116	15218	15267	15270	15277	15280	15283	15287	15290	15293	15296	15300	15314	15327	15339
	15344	15353	15358	15381	15395	15480	15482	15486	15491	15514	15518	15520	15763	20042	20049
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 CZKEEC.P11 CROSS REFERENCE TABLE

BGE	*2410														
BGT	11910	11961	12266	12480	15013	15225	21262	21263							
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BHIS	21023	21032	21034	21046	21048										
BIC	9872	10059	10505	11613	14265	14375	14380	14408	14414						
	9305	9311	9322	9347	9372	9397	9447	9464	9471	9481	9485	9524	9532	9569	9571
	9613	9663	9974	10017	10175	10280	10320	10348	10391	10443	10465	10468	10470	10515	10573
	10580	10587	10615	10618	10681	10683	10823	10887	10899	11022	11027	11559	11580	11600	11675
	11678	11767	11807	11819	11831	11895	12014	12026	12051	12055	12056	12078	12129	12131	12133
	12138	12141	12236	12238	12245	12246	12255	12258	12286	12288	12289	12307	12336	12356	12388
	12390	12450	12453	12456	12465	12687	12731	12733	12744	12748	12798	12872	12875	12876	13023
	13105	13109	13116	13135	13142	13147	13158	13163	13168	13180	13184	13207	13212	13216	13239
	13245	13246	13261	13267	13280	13363	13447	13449	13460	13474	13487	13501	13513	13701	13709
	13710	13711	13712	13715	13742	13758	13867	14133	14162	14171	14177	14208	14250	14285	14500
	14653	14685	14694	14736	14787	14909	14910	14968	14969	14982	15014	15022	15082	15098	15103
	15112	15137	15139	15161	15189	15312	15325	15426	15430	15515	15516	15540	21187	21207	21218
	21229	21263	21264												
BICB	9554	9599	10840	11037	11046	12160	12418	12426	14706	15121					
BIS	9572	9665	9749	9760	9868	9870	9873	10023	10055	10057	10060	10183	10231	10236	10248
	10253	10308	10312	10323	10376	10380	10383	10444	10581	10586	10588	10602	10606	10619	10629
	10765	10767	10888	10889	10900	10914	11129	11435	11438	11451	11808	11820	11832	12247	12270
	12457	12734	12737	12741	12768	12776	12778	12783	13178	13242	13243	13700	13716	13724	13725
	13726	13727	13756	13876	13894	13898	13900	14184	14215	14218	14219	14322	14517	14537	14552
	15018	15162	15190	15216	15541	21202	21208	21213	21219	21224	21230	21235			
BISB	9555	9604	10842	11110	11115	12167	12430	12434	12438	12440	14838	14840	14859	14863	14887
	14888	15122	15538												
BIT	9314	9320	9451	9461	9547	9677	9689	9692	9695	9949	10154	10223	10249	10273	10341
	10424	10427	10537	10671	10674	10806	10809	10827	10856	11020	11025	11055	11087	11784	11839
	11864	11866	11884	11886	11915	11942	11976	12049	12175	12184	12188	12206	12275	12348	12416
	12428	12432	12436	12472	12486	12545	12805	12832	12847	12898	13007	13028	13036	13049	13055
	13061	13078	13085	13093	13176	13234	13349	13445	13696	13880	14181	14189	14239	14261	14275
	14338	14506	14681	14776	14833	14907	15269	15276	15279	15282	15286	15289	15292	15295	15299
	15338	15343	15352	15357	15380	15513	15760	21262							
BITB	6919	9220	9235	10838	11284	11293	21264								
BLE	10451														
BLO	8993	9007	9041	9055	9096	9110	9483	9731	9765	10021	10721	10740	11514	11694	11701
	11708	14225	15105	15212	20333	20404									
BLOS	9661	10322	10382	11722	12452	12464	12922	12930	13914	13919	13924	13929	13934	14705	21263
	21343	21348	21353												
BLT	11647	11877	15011	15166	15194	15224	21262	21263	21264						
BMI	9296	9307	9515	9527	9557	9742	9753	9843	10000	10226	10279	10286	10347	10354	10408
	10448	10497	10865	12401	13338										
BNE	6919	8866	8869	8877	9165	9221	9247	9324	9329	9359	9366	9379	9381	9387	9393
	9408	9413	9420	9424	9428	9436	9449	9459	9462	9468	9476	9534	9536	9548	9582
	9584	9587	9592	9594	9607	9610	9615	9623	9629	9632	9705	9781	9796	9858	9957
	9965	9967	9998	10027	10222	10224	10233	10235	10250	10307	10319	10375	10390	10439	10478
	10536	10550	10552	10579	10601	10617	10624	10694	10709	10749	10754	10807	10810	10826	11021
	11026	11056	11088	11112	11284	11293	11351	11385	11400	11581	11583	11594	11726	11776	11785
	11800	11812	11824	11840	11857	11865	11867	11885	11887	11916	11935	11977	12017	12110	12151
	12221	12224	12254	12259	12269	12276	12309	12321	12417	12475	12489	12546	12594	12598	12615
	12677	12728	12736	12740	12751	12753	12761	12771	12816	12848	12882	12884	12886	12888	12890
	12892	12894	12899	12903	12909	12913	12932	12948	12950	12952	12954	12957	13010	13029	13031
	13037	13050	13056	13062	13068	13072	13077	13084	13101	13123	13125	13133	13140	13144	13149
	13160	13165	13170	13177	13191	13193	13209	13222	13224	13235	13241	13314	13316	13321	13355

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CZKEEC.P11 CROSS REFERENCE TABLE

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	13897	13908	13951	13953	13975	13982	13999	14006	14027	14029	14033	14039	14043	14095	14097
	14180	14190	14389	14391	14394	14396	14398	14400	14402	14404	14412	14459	14503	14507	14678
	14682	14699	14703	14708	14740	14744	14749	14753	14757	14872	14914	14919	14932	14984	14988
	14998	15273	15316	15329	15387	15391	15393	15411	15416	15489	15524	15767	15771	15775	15783
	20787	20964	21243	21262	21263	21264	21266	21301	21305	21387	21429	21471	21471	21471	21471
BPL	9657	9787	9794	9802	9806	9837	9867	9960	10054	10220	10239	10247	10252	10476	14131
	14734	14905	14942	14980	15020	15160	15188	15511	21263	21264					
BR	6919	8995	9002	9013	9018	9022	9043	9050	9064	9072	9076	9098	9105	9116	9120
	9125	9167	9173	9181	9201	9298	9317	9341	9354	9361	9368	9402	9406	9411	9417
	9422	9429	9437	9454	9517	9539	9543	9585	9588	9590	9596	9605	9608	9618	9621
	9626	9634	9636	9643	9653	9671	9673	9680	9709	9769	9771	9774	9790	9798	9810
	9853	9869	9942	9969	9984	10007	10030	10034	10056	10147	10215	10237	10295	10309	10363
	10377	10414	10430	10441	10462	10490	10508	10520	10540	10569	10596	10603	10628	10664	10677
	10697	10712	10746	10750	10755	10763	10766	10830	10841	10851	10853	10859	10903	11064	11090
	11167	11171	11175	11180	11185	11223	11227	11231	11235	11239	11271	11284	11290	11293	11311
	11324	11329	11334	11479	11482	11489	11491	11499	11524	11635	11697	11704	11711	11749	11809
	11821	11907	11951	12002	12041	12085	12095	12116	12168	12169	12178	12182	12187	12191	12193
	12198	12204	12209	12211	12217	12222	12226	12256	12261	12301	12317	12326	12351	12353	12406
	12415	12431	12435	12439	12441	12568	12576	12584	12604	12612	12629	12665	12679	12711	12738
	12764	12772	12775	12777	12782	12786	12795	12809	12820	12863	12925	12935	12981	13052	13058
	13064	13086	13137	13150	13171	13200	13231	13270	13287	13307	13380	13524	13528	13532	13536
	13548	13552	13556	13560	13603	13616	13635	13644	13652	13655	13658	13661	13678	13714	13755
	13757	13768	13865	13888	13895	13899	13948	13960	13973	13990	13997	14013	14035	14037	14041
	14045	14143	14145	14147	14187	14236	14342	14415	14440	14468	14505	14554	14576	14680	14692
	14696	14742	14747	14751	14755	14779	14836	14850	14855	14860	14883	14886	14889	14895	14917
	14924	14934	14956	14960	14963	14966	14986	15025	15029	15033	15079	15085	15093	15096	15101
	15109	15126	15141	15153	15167	15195	15214	15220	15227	15318	15331	15342	15347	15356	15361
	15399	15403	15418	15484	15487	15494	15581	15587	15593	15599	15605	15611	15617	15623	15629
	15635	15642	15649	15656	15663	15670	15677	15684	15691	15698	15705	15712	15719	15726	15733
	15740	15747	15753	15773	15777	15785	15790	20967	21204	21210	21215	21221	21226	21232	21253
	21262	21263	21264	21266	21391	21433									
BVS	21262														
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CLC	14800														
CLR	8857	9005	9025	9026	9027	9053	9079	9080	9081	9108	9128	9129	9130	9325	9333
	9389	9400	9401	9405	9416	9421	9453	9456	9469	9488	9538	9558	9589	9655	9672
	9676	9681	9683	9684	9685	9703	9719	9724	9725	9726	9739	9740	9776	9779	9783
	9784	9785	9789	9797	9835	9859	9863	9875	9876	9877	9878	9881	9941	9944	9945
	9946	9947	9948	9955	9958	9975	9985	10004	10008	10019	10050	10064	10065	10146	10149
	10150	10151	10152	10153	10163	10228	10255	10256	10267	10268	10269	10272	10277	10300	10325
	10326	10334	10335	10336	10337	10340	10345	10368	10393	10394	10401	10402	10422	10423	10431
	10432	10433	10434	10435	10457	10491	10506	10509	10539	10553	10562	10599	10631	10632	10635
	10663	10669	10670	10678	10718	10769	10770	10771	10772	10803	10812	10831	10855	10860	10907
	10908	10922	10923	10937	10939	10947	10956	11016	11017	11032	11033	11041	11042	11078	11119
	11120	11282	11283	11284	11288	11289	11291	11292	11293	11300	11302	11304	11339	11342	11344
	11346	11354	11361	11362	11363	11364	11365	11367	11368	11369	11492	11503	11504	11505	11506
	11507	11563	11571	11572	11573	11574	11615	11616	11724	11740	11741	11744	11966	12071	12560
	12589	12618	12656	12747	12749	12796	12838	12839	12840	12841	12945	12955	12962	13080	13126
	13127	13128	13129	13196	13226	13278	13372	13373	13375	13415	13537	13581	13612	13617	13670
	13679	13713	13789	13864	13878	13887	13889	13912	13917	13922	13927	13932	14068	14087	14117
	14144	14165	14172	14174	14426	14431	14453	14457	14461	14464	14498	14536	14540	14551	14555
	14570	14572	14697	14758	14759	14838	14840	14859	14863	14865	14887	14888	14892	14894	14915

	14978	15151	15183	15207	15209	15275	15297	15379	15400	15434	15506	15507	15508	15792	21262
CLRB	21266	21306	21389	21431	21473	21483									
CMP	6919	9061	9069	9217	9232	9748	9759	10585	15228	15405	21262	21263	21264	9084	9094
	8868	8876	8991	9006	9010	9015	9019	9030	9039	9054	9058	9066	9073	9244	9255
	9109	9113	9117	9122	9133	9144	9146	9164	9174	9191	9193	9214	9229	9244	9255
	9326	9328	9398	9448	9458	9467	9473	9482	9660	9727	9763	9780	9956	9964	9966
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	11906	11908	11922	11928	11960	11969	12059	12061	12063	12065	12067	12120	12172	12201	12220
	12223	12268	12340	12422	12451	12463	12479	12503	12508	12514	12547	12549	12571	12581	12591
	12593	12595	12597	12622	12658	12676	12680	12688	12690	12735	12739	12750	12760	12815	12817
	12844	12852	12856	12860	12867	12878	12883	12885	12887	12889	12891	12893	12895	12905	12908
	12910	12912	12921	12929	12931	13024	13026	13038	13040	13042	13076	13083	13088	13124	13132
	13136	13139	13143	13148	13152	13159	13164	13169	13192	13199	13208	13223	13230	13240	13292
	13317	13352	13521	13525	13529	13533	13545	13549	13553	13557	13680	13743	13745	13747	13749
	13751	13753	13861	13869	13871	13873	13896	13913	13918	13923	13928	13933	13974	13998	14024
	14026	14032	14042	14070	14092	14094	14096	14134	14179	14223	14263	14297	14310	14374	14379
	14388	14390	14392	14395	14397	14399	14401	14403	14407	14411	14413	14458	14502	14655	14674
	14676	14698	14700	14702	14707	14737	14739	14743	14748	14752	14756	14788	14846	14852	14911
	14913	14918	14925	14927	14929	14931	14983	14987	14993	14995	14997	15010	15012	15023	15037
	15061	15063	15065	15067	15069	15071	15073	15075	15077	15087	15089	15104	15223	15313	15315
	15326	15328	15481	15485	15488	15517	15523	15774	20332	20403	21020	21022	21031	21033	21045
CMPB	21047	21242	21263	21342	21347	21352									
	6919	9148	9150	9168	9170	9176	9178	9195	9246	9257	9323	9330	9348	9350	9352
	9357	9380	9383	9392	9407	9412	9419	9423	9427	9430	9435	9533	9535	9573	9583
	9586	9591	9606	9609	9622	9628	9638	9730	9737	9871	10026	10058	10177	10452	10472
	10477	10494	10625	10650	10688	10703	10742	12923	12936	13262	13583	13585	13604	14137	14139
COM	14141	14704	15113	15115	15410	15519	20786	21262	21263	21264					
DEC	9803	9807	9962	9963	10240	10241	11380	12692	13069	14754	15539				
	9152	9153	9172	9180	9222	9237	9248	9259	9356	9414	9486	9559	9642	9652	9997
	10015	10043	10406	10461	10612	10872	11111	11858	11859	11936	11937	12084	12094	12109	12114
	12149	12216	12263	12264	12267	12297	12319	12320	12325	12408	12409	12414	12565	12573	12769
DECB	12939	12940	13282	13311	13315	14801	14922	15219	15390						
	9786	9793	9842	10278	10285	10346	10353	10437	10446	10460	10518	10519	10546	10662	10864
EMT	15159	15165	15187	15193	21264										
HALT	6869														
	6897	7062	7222	9433	9479	9641	11310	12070	12700	12787	12788	12789	12790	12791	12837
	13091	13155	13766	14077	14100	14106	14123	14197	14231	14249	14273	14283	14304	14514	21264
INC	21266	21382	21424	21466											
	6919	9198	9308	9528	9624	9654	9766	9767	9788	9804	9808	9829	9839	9973	10002
	10024	10033	10047	10182	10245	10287	10355	10410	10568	10595	10627	10695	10710	10741	10745
	10902	11063	11089	11138	11381	11511	11621	11718	11723	11725	11727	11855	11933	12108	12197
	12399	12961	13075	13103	13173	13203	13374	13520	13544	14183	14188	14222	14253	14516	14553
	14654	15213	15396	15397	20277	20283	20294	20305	20311	20319	20343	20349	20357	20362	20646
INCB	20656	20664	20788	20947	20957	21266	21362	21401	21443						
IOT	10482	15409	21264												
JMP	6869														
	6897	6899	6900	6901	9208	9223	9238	9249	9382	9388	9390	10522	10665	11065	11066
	11126	11196	11205	11219	11253	11265	11398	11405	11407	11411	11412	11413	11414	11418	11419
	11420	11421	11425	11428	11429	11434	11437	11439	11443	11446	11450	11452	11456	11461	11462
	11463	11464	11473	11474	11475	11476	11485	11486	11487	11488	11603	11770	11777	11783	11835
	11848	11853	11860	11879	11911	11931	11938	11962	11971	12039	12072	12073	12086	12096	12117
	12155	12158	12227	12272	12277	12310	12330	12342	12343	12366	12370	12375	12380	12445	12481
	12525	12551	12552	12666	12823	12958	12985	12986	12991	12996	13044	13045	13046	13047	13073

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CZKEEC.P11 CROSS REFERENCE TABLE

	13074	13081	13094	13096	13130	13197	13201	13228	13232	13244	13249	13297	13323	13330	13367
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JSR	14878	14879	20080	20152	20336	20407	20979	21053	21055	21302	21477	21486			
	6919	8878	9297	9299	9360	9367	9415	9516	9518	9702	9718	9750	9761	9791	9799
	9809	9817	9825	9828	9852	9862	9982	9995	10005	10025	10046	10049	10162	10181	10276
	10284	10294	10299	10317	10344	10352	10362	10367	10388	10409	10459	10484	10502	10514	10533
	10548	10559	10583	10589	10622	10657	10692	10707	10731	10737	10747	10752	10758	10760	10781
	10788	10802	10804	10805	10808	10822	10835	10869	10886	10898	10913	10944	10953	10962	11015
	11018	11019	11024	11036	11045	11054	11062	11076	11086	11098	11105	11125	11308	11322	11323
	11328	11333	11347	11378	11397	11401	11403	11404	11406	11409	11410	11416	11417	11424	11426
	11433	11436	11442	11444	11445	11449	11455	11457	11458	11460	11471	11472	11480	11481	11483
	11484	11493	11494	11497	11560	11577	11584	11595	11596	11597	11657	11659	11695	11698	11702
	11705	11709	11712	11730	11739	11782	11788	11790	11794	11843	11845	11849	11851	11868	11871
	11888	11890	11900	11917	11920	11926	11944	11945	11978	11980	11983	11987	11988	11995	11996
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	12404	12427	12449	12455	12462	12501	12505	12506	12511	12512	12516	12520	12553	12570	12590
	12619	12657	12693	12696	12705	12756	12767	12812	12819	12821	12834	12842	12849	12850	12854
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	13468	13481	13495	13507	13523	13527	13531	13535	13547	13551	13555	13559	13569	13760	13762
	13763	13764	13770	13866	13879	14074	14075	14098	14103	14104	14120	14121	14136	14178	14185
	14186	14191	14193	14194	14195	14202	14203	14211	14226	14228	14229	14242	14244	14245	14246
	14247	14255	14260	14266	14268	14269	14270	14274	14278	14280	14281	14299	14301	14302	14501
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	14786	14832	14835	14837	14838	14839	14840	14843	14849	14851	14858	14859	14863	14864	14868
	14869	14875	14882	14884	14885	14887	14888	14938	14954	14958	15008	15031	15084	15100	15108
	15140	15278	15281	15284	15288	15291	15294	15298	15302	15306	15309	15317	15319	15322	15330
	15332	15335	15337	15350	15351	15364	15389	15401	15406	15407	15412	15417	15419	15420	15427
	15431	15433	15448	15522	15526	15579	15580	15582	15585	15586	15588	15591	15592	15594	15597
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	15628	15630	15633	15634	15636	15640	15641	15643	15647	15648	15650	15654	15655	15657	15661
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	15697	15699	15703	15704	15706	15710	15711	15713	15717	15718	15720	15724	15725	15727	15731
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MFPI	12807	14340													
MOV	6919	8851	8852	8853	8854	8855	8856	8858	8859	8860	8861	8862	8863	8864	8872
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	9104	9106	9111	9112	9121	9126	9131	9132	9134	9138	9140	9142	9143	9149	9156
	9157	9158	9159	9160	9161	9162	9166	9169	9177	9184	9186	9188	9189	9190	9197
	9200	9202	9203	9204	9207	9211	9213	9226	9228	9241	9242	9252	9253	9261	9262
	9263	9264	9265	9266	9267	9269	9303	9304	9309	9313	9332	9334	9335	9344	9345
	9346	9373	9374	9375	9396	9404	9432	9446	9455	9463	9478	9484	9522	9523	9525
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	9856	9860	9861	9874	9879	9880	9943	9951	9952	9953	9954	9968	9986	9987	9989
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	10195	10200	10206	10209	10214	10227	10254	10257	10258	10259	10260	10260	10270	10271	10275
	10281	10282	10283	10290	10291	10292	10293	10296	10297	10298	10305	10313	10314	10315	10316

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 CZKEEC.P11 CROSS REFERENCE TABLE

10324	10327	10328	10329	10330	10338	10339	10343	10349	10350	10351	10358	10359	10360	10361
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10405	10413	10421	10426	10429	10436	10440	10442	10445	10454	10455	10456	10458	10469	10479
10480	10481	10483	10489	10498	10499	10500	10501	10507	10510	10511	10512	10513	10517	10529
10530	10531	10532	10543	10544	10545	10547	10555	10556	10557	10558	10566	10570	10572	10574
10575	10576	10577	10584	10592	10609	10613	10614	10620	10621	10630	10633	10634	10636	10652
10653	10654	10655	10656	10661	10668	10673	10676	10680	10682	10684	10685	10686	10687	10690
10691	10696	10698	10700	10701	10702	10705	10706	10711	10713	10715	10725	10726	10727	10728
10729	10730	10732	10733	10734	10735	10736	10759	10768	10773	10774	10777	10778	10779	10780
10784	10785	10786	10787	10813	10814	10815	10816	10817	10818	10819	10820	10821	10824	10829
10832	10833	10834	10845	10846	10847	10848	10858	10861	10862	10863	10866	10867	10868	10873
10876	10879	10880	10881	10882	10883	10884	10885	10890	10891	10892	10893	10894	10895	10896
10897	10905	10906	10909	10910	10911	10912	10917	10920	10921	10927	10928	10929	10930	10931
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10959	10960	10961	11023	11028	11030	11031	11034	11035	11039	11040	11043	11044	11048	11049
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11104	11117	11118	11121	11122	11123	11124	11128	11131	11134	11136	11147	11148	11149	11150
11151	11152	11153	11154	11155	11156	11157	11158	11159	11160	11161	11162	11166	11170	11174
11178	11183	11188	11189	11190	11191	11192	11193	11194	11195	11199	11200	11201	11202	11203
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11322	11327	11332	11337	11338	11340	11343	11345	11355	11357	11358	11359	11379	11382	11387
11388	11389	11390	11401	11406	11409	11416	11455	11457	11458	11465	11471	11477	11478	11480
11483	11490	11493	11500	11502	11508	11509	11510	11557	11579	11584	11598	11599	11606	11607
11609	11610	11617	11627	11628	11633	11634	11638	11640	11641	11649	11650	11651	11655	11656
11666	11670	11673	11676	11682	11687	11690	11696	11699	11703	11706	11710	11713	11729	11742
11743	11745	11748	11750	11751	11754	11755	11758	11761	11792	11793	11797	11801	11813	11825
11847	11873	11892	11897	11946	11953	11954	11955	11956	11957	11982	11986	11997	12000	12001
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12152	12177	12179	12186	12190	12192	12196	12214	12225	12230	12237	12251	12257	12280	12287
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12374	12379	12382	12389	12391	12393	12396	12397	12411	12412	12419	12444	12454	12476	12477
12478	12490	12491	12492	12493	12494	12495	12496	12539	12540	12541	12542	12543	12544	12555
12559	12561	12564	12569	12574	12577	12578	12583	12587	12588	12599	12600	12602	12603	12605
12606	12608	12609	12617	12625	12627	12632	12633	12634	12635	12636	12637	12642	12643	12644
12645	12646	12647	12649	12650	12651	12652	12653	12654	12660	12663	12668	12669	12670	12671
12672	12673	12675	12678	12682	12683	12684	12685	12686	12695	12700	12709	12710	12712	12713
12714	12715	12716	12717	12718	12719	12720	12721	12722	12723	12724	12725	12726	12732	12742
12743	12745	12746	12754	12755	12756	12757	12759	12762	12766	12784	12794	12797	12799	12800
12801	12802	12803	12804	12808	12810	12811	12819	12821	12822	12831	12834	12835	12836	12880
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13106	13108	13113	13115	13120	13134	13141	13146	13154	13157	13162	13167	13179	13181	13183
13188	13194	13195	13206	13211	13213	13215	13220	13225	13227	13250	13252	13254	13259	13266
13274	13300	13312	13319	13322	13331	13348	13358	13361	13388	13427	13428	13429	13430	13431
13444	13448	13455	13459	13463	13473	13486	13500	13512	13561	13570	13579	13591	13593	13594
13595	13598	13610	13611	13613	13615	13624	13625	13626	13627	13629	13630	13631	13632	13633
13634	13641	13647	13650	13653	13668	13669	13671	13672	13673	13674	13675	13677	13681	13703
13704	13705	13706	13707	13708	13718	13719	13720	13721	13722	13723	13728	13760	13761	13763
13764	13765	13770	13790	13791	13792	13793	13794	13795	13796	13797	13799	13800	13801	13802
13803	13804	13805	13806	13808	13809	13810	13811	13812	13813	13814	13815	13817	13818	13819

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 CZKEEC.P11 CROSS REFERENCE TABLE

NEG	15148	15180	21262												
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	12710	12780	12792	12905	12908	13397	13398	13399	13624	13625	13626	13627	13630	13631	13632
	13633	21378	21379	21419	21420	21461	21462								
RESET	13395														
ROL	10185	10186	10192	10193	10197	10198	11762	11763	11764	11765	11766	14802	14803	14807	14808
	14810	14811	15152	15154	15155	15156	15158	15184	15186						
ROR	9979	9980													
RTI	11284	11293	14107	14124	14163	14220	14528	21262	21263	21264	21265	21266			
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	9489	9519	9564	9580	9666	9818	9826	9834	9882	10001	10068	10261	10331	10399	10415
	10637	10775	10782	10789	10924	10935	10945	10954	10963	11139	11163	12362	12458	12466	12467
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 CZKEEC.P11 CROSS REFERENCE TABLE

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ZKEEC.P11 CROSS REFERENCE TABLE

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 CZKEEC.P11 CROSS REFERENCE TABLE

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 CZKEEC.P11 CROSS REFERENCE TABLE

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 CZKEEC.P11 CROSS REFERENCE TABLE

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ERRORS DETECTED: 0

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