

UDC11

CONTROL TEST
MD-11-DZUDB-B

EP-DZUDB-B-DL
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digital
MADE IN USA



IDENTIFICATION

PRODUCT CODE: MAINDEC-II-DZ UDB-B-D
PRODUCT NAME: UDCII CONTROL TEST
DATE CREATED: JANUARY 1973
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: R. WHITTON

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1: ABSTRACT

UDC11 CONTROL TEST TESTS VIRTUALLY ALL OF THE CONTROL LOGIC UP TO THE UDC BUS. MAINTENANCE LOGIC IS USED TO GENERATE UDC INTERRUPTS AND TO SINGLE STEP THE SCAN REGISTER. NOTE: THE UDC BUS CABLE TO THE SYSTEM UNITS CAN BE REMOVED FROM THE CONTROL WHILE THIS TEST IS RUN IF ERRORS RESULT DUE TO INTERRUPT MODULES GENERATING INTERRUPTS. IF THE MODULES GENERATING INTERRUPTS ARE IN THE FIRST FOUR ADDRESSES (000-004), THE MODULES MUST BE REMOVED SINCE REMOVING THE BUS CABLE WILL NOT DISCONNECT THESE MODULES FROM THE UDC BUS.

A POWER FAIL TEST IS INCLUDED. STARTING ADDRESS=000204. THIS TEST WILL TYPE A MESSAGE THAT IT IS WAITING FOR A POWER FAILURE AND WILL TYPE WHICH ONE OF TWO TYPES OF FAILURES OCCUR (UDC DC POWER OR PDP11) WHEN AND IF THEY HAPPEN.

2: REQUIREMENTS

2.1 EQUIPMENT

- A: PDP-11
- B: ASR33/39 TELETYPE
- C: UDC11 CONTROL

THE PROCESSOR AND TELETYPE MUST BE IN OPERATING CONDITION.

THE TELETYPE AND UDC11 CONTROL MUST HAVE THEIR STANDARD PERIPHERAL ADDRESSES, INTERRUPT LEVELS, AND INTERRUPT VECTOR ADDRESSES. REFER TO SECTION 7.2. IF YOUR SYSTEM DOES NOT HAVE STANDARD PERIPHERAL ADDRESSES.

2.2 STORAGE

THIS PROGRAM USES LOCATIONS 000000 THROUGH 012910.

3: LOADING PROCEDURE

THIS PROGRAM'S OBJECT TAPE IS PUNCHED IN ABSOLUTE FORMAT. THE ABS LOADER IS USED TO LOAD THE PROGRAM.

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4: USE PROCEDURE

- A: UDC BUS CABLE MAY BE UNPLUGGED FROM CONTROL
- B: LOAD EITHER ADDRESS 200 FOR CONTROL DIAGNOSTIC OR ADDRESS 204 FOR POWER FAIL TEST;
- C: PRESS START.
- D: THE PROGRAM IDENTIFIES ITSELF, TYPES SETUP INSTRUCTIONS, SR OPTIONS MESSAGE, AND HALTS.
- E: PERFORM SETUP (STEPS A AND B), AND SELECT DESIRED SR OPTIONS, IF ANY. NORMAL SR SETTING IS 000000.

THIS PROGRAM'S SR OPTIONS ARE:

SR0	0	1	HALT ON ERROR
SR14	0	1	ENTER SCOPE MODE
SR13	0	1	INHIBIT ERROR PRINTOUT
SR11	0	1	INHIBIT ITERATION
SR10	0	1	HALT AT END OF TEST CURRENTLY EXECUTING
SR9	0	1	SELECT THE TEST SPECIFIED BY SR7 THROUGH SR8
SR7	THROUGH	SR8	= NUMBER OF TEST TO BE SELECTED

SECTION 7.1 GIVES A COMPLETE EXPLANATION OF SR OPTIONS:

- F: PRESS CONT; THE PROGRAM BEGINS EXECUTION.
- G: AT THE END OF EACH PASS THE TELETYPE BELL RINGS ONCE, AND "END" IS TYPED.
- H: REFER TO SECTION 6.2 IF ERROR PRINTOUTS OCCUR.

EXECUTION TIME:

- A: ONE NORMAL ERROR FREE PASS TAKES APPROXIMATELY 1 MINUTES.
- B: ONE SINGLE ITERATION PASS (SR11=1) TAKES ABOUT 10 SECONDS.

*****E*****

THE SINGLE ITERATION PASS IS A CONVENIENT WAY TO QUICKLY DETERMINE IF ANY SOLID PROBLEMS EXIST. FOR A THOROUGH TEST, THE NORMAL ITERATION PASS SHOULD BE RUN.

4.1 RESTART PROCEDURE

TO RESTART THE PROGRAM WITHOUT GENERATING THE INITIAL PRINTOUTS PROCEED AS FOLLOWS:

- A: LOAD ADDRESS 000210
- B: PERFORM STEP E OF PREVIOUS PROCEDURE.
- C: PRESS START.

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5: PROGRAM AND/OR OPERATOR ACTION

5.1 NORMAL HALTS

LOC 001696 COMMON HALT. THIS HALT IS CONTAINED IN A SUBROUTINE THAT IS CALLED BY THOSE PARTS OF THE PROGRAM THAT REQUIRE THAT THE PROCESSOR STOP. THIS HALT NORMALLY OCCURS UPON COMPLETION OF NON-ERROR PRINTOUTS. THE CONSOLE DATA LIGHTS DISPLAY THE ADDRESS OF INSTRUCTION THAT GENERATED THE HALT REQUEST.

LOC 001330 ROUTINE END HALT. THIS HALT OCCURS UPON COMPLETION OF THE CURRENT TEST ROUTINE IF S010 IS SET. THE CONSOLE DATA LIGHTS DISPLAY THE NUMBER OF THE TEST JUST COMPLETED.

5.2 NORMAL PRINTOUTS

ALL NON-ERROR PRINTOUTS ARE NORMAL PRINTOUTS. INSTRUCTION, TITLE, AND USER ERROR PRINTOUTS ARE NORMAL PRINTOUTS.

6: ERRORS

ERRORS ARE REPORTED IN THIS PROGRAM BY THE FOLLOWING METHODS:

- A: UNCONDITIONAL ERROR HALTS, OR
- B: ERROR PRINTOUT FOLLOWED BY OPTIONAL ERROR HALT.

6.1 UNCONDITIONAL ERROR HALTS

AN UNCONDITIONAL ERROR HALT WILL OCCUR AT THE ADDRESSES LISTED BELOW IF THROUGH HARDWARE OR SOFTWARE FAILURE, PROGRAM CONTROL IS TRANSFERRED TO AN UNEXPECTED AREA BETWEEN 000000 AND 000376.

000002 RESERVED AREA
000006 ERROR TRAP
000012 RESERVED INSTRUCTION TRAP
000016 DEBUG TRAP
000022 IOT TRAP
000026 POWER FAIL TRAP
000040 THROUGH 000376 - SYSTEM SOFTWARE AND INTERRUPT VECTOR AREA, EXCEPT FOR UDC11 AND IY VECTORS.

TO FIND OUT WHERE THE PROGRAM WAS AT THE TIME THE FAILURE OCCURRED,

- A: EXAMINE CONTENTS OF REGISTER 6; (ADDRESS 177906).
- B: TRANSFER THE CONTENTS OF REG 6 TO THE SR, LOAD ADDRESS AND EXAMINE.
- C: THE DATA SHOWN IN THE DATA LIGHTS IS THE VALUE OF THE PC WHEN THE FAILURE OCCURRED.
- D: LOCATE IN PROGRAM LISTING THE DISPLAYED PC VALUE.

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(6.1 CONT'D)

E: THE INSTRUCTION THAT IMMEDIATELY PRECEDES THE ONE REFERENCED BY THE DISPLAYED PC VALUE IS THE INSTRUCTION THAT WAS/WAS BEING EXECUTED WHEN THE FAILURE OCCURRED.

AN UNCONDITIONAL ERROR HALT FAILURE IS AN ABNORMAL CONDITION INDICATING A HARDWARE FAILURE, OR MOST UNLIKELY, A PROGRAM FAILURE. THIS PROGRAM ASSUMES THAT THE PROCESSOR IS IN OPERATING CONDITION IN ORDER TO PERFORM ITS TESTS. ANY FURTHER STEPS REQUIRED TO DIAGNOSE AN UNCONDITIONAL ERROR HALT ARE NOT WITHIN THE SCOPE OF THIS PROGRAM.

6.2 ERROR PRINTOUTS

ERROR PRINTOUTS ARE GENERATED BY THE "ERRN" SUBROUTINE. THE "ERRN" SUBROUTINE IS CALLED BY AN "ERRORN" STATEMENT IN THE PROGRAM LISTING. AN ERROR PRINTOUT LOOKS AS FOLLOWS:

TXXX PC=VYYYY ICNT=ZZZZ. ADDITIONAL ERROR INFORMATION

WHERE:

TXXX IS THE NUMBER OF FAILING ROUTINE (OCTAL).

PC=VYYYY IS THE ADDRESS OF ERROR CALL.

ICNT=ZZZZ. IS THE ITERATION COUNT AT TIME OF FAILURE.

THE ADDITIONAL ERROR INFORMATION FURTHER DESCRIBES THE ERROR. THIS WILL USUALLY BE THE CONTROL AND STATUS REGISTERS.

UDCR=XXXXXX UDSR=XXXXXX

AFTER THE PRINTOUT IS COMPLETED, THE PROGRAM WILL HALT AT COMMON ERROR HALT AT LOC 002442 IF SR19 IS SET.

WHEN AN ERROR PRINTOUT OCCURS:

- A: LOOK UP THE ADDRESS REFERENCED BY PC VYYYYY IN THE LISTING.
- B: OPPOSITE THE PC VALUE IN "ERRORN" STATEMENT WILL BE FOUND, AND IN THE COMMENTS SECTION, A DESCRIPTION OF THE ERROR.
- C: AT THE BEGINNING OF THE TEST ROUTINE A DESCRIPTION OF THE TEST WILL BE FOUND.

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7. MISCELLANEOUS

7.1 SR OPTIONS

THE STANDARD SR OPTIONS ARE DESCRIBED HERE:

SR15 HALT ON ERROR: WITH SR15 SET TO A 1, THE PROGRAM WILL HALT AFTER AN ERROR OCCURS. PRESSING CONT WILL CAUSE PROGRAM TO RESUME OPERATION.

SR14 SCOPE. THIS OPTION CAUSES THE PROGRAM TO REMAIN IN THE CURRENT TEST ROUTINE. WHEN THE OPTION IS REMOVED, THE PROGRAM WILL COMPLETE THE CURRENT ROUTINE, AND WILL THEN GO ON TO THE NEXT ROUTINE.

SR13 INHIBIT ERROR PRINTOUT. THIS OPTION IF SET, WILL REMOVE ALL ERROR PRINTOUTS.

*****NOTE*****

SCOPE MODE OPERATION IS ACHIEVED BY LOCKING THE PROGRAM IN THE CURRENT ROUTINE, INHIBITING ERROR PRINTOUTS, AND BYPASSING ERROR HALTS.

SR11 INHIBIT ITERATION. SETTING THIS OPTION WILL CAUSE THE PROGRAM TO EXECUTE EACH TEST ONLY ONCE, INSTEAD OF THE NORMAL NUMBER OF ITERATIONS SELECTED FOR EACH TEST. TWO POSSIBLE USES OF THIS OPTION ARE:

- A. QUICK PASS. EACH TEST IS RUN ONLY ONCE.
- B. TO SKIP OVER A FAILING ROUTINE.

SR18 HALT AT END OF CURRENT ROUTINE. WITH THE OPTION SET, THE PROGRAM WILL HALT AT THE END OF EACH TEST, AND DISPLAY IN DATA LIGHTS THE NUMBER OF THE TEST JUST COMPLETED. THREE POSSIBLE USES OF THIS OPTION ARE:

- A. TO STEP THROUGH THE PROGRAM ONE ROUTINE AT A TIME.
- B. WHEN THE PROGRAM HAS BEEN RUNNING FOR A WHILE, TO FIND OUT HOW FAR IT HAS PROGRESSED.
- C. IN CASE OF A BLOW UP, ETC., TO STEP THROUGH ONE TEST AT A TIME UNTIL THE FAILURE REOCCURS. THE ROUTINE FOLLOWING THE PREVIOUSLY COMPLETED ROUTINE WOULD BE THE FAILING ROUTINE.

SR9 SELECT ROUTINE. WITH SR9 SET, THE PROGRAM WILL GO AND EXECUTE THE ROUTINE INDICATED BY SR7 THROUGH SR8, AFTER THE CURRENT ROUTINE HAS BEEN COMPLETED. IF THE OPTION IS REMOVED, THE PROGRAM WILL PROCEED TO EXECUTE THE ROUTINES FOLLOWING THE SELECTED ROUTINE.

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7.2 TESTING UDC11 AT NON-STANDARD ADDRESSES AND/OR VECTORS

THIS PROGRAM CAN TEST THE UDC11 AT NON-STANDARD ADDRESSES AND VECTORS PROVIDED THOSE ADDRESSES AND VECTORS ARE PROVIDED TO THE PROGRAM AS FOLLOWS:

A: AFTER LOADING PROGRAM REFER TO PROGRAM LISTING AND CHANGE LOCATIONS 001210 THROUGH 001244 TO REFLECT THE NEW UDC11 ADDRESSES AND VECTORS.

B: IF THE TELETYPE IS ALSO AT NON STANDARD ADDRESSES, CHANGE LOCATIONS 001200 THRU 001206 ALSO.

C: PROCEED TO USE THE PROGRAM; OR

D: USING STANDARD DUMP ROUTINES, DUMP OUT THE ENTIRE PROGRAM IN ABSOLUTE FORMAT TO HAVE AN OBJECT TAPE THAT REFLECTS YOUR SYSTEM, OR

E: DUMP OUT ONLY LOCATIONS 001210 THROUGH 001244 IN ABSOLUTE FORMAT, AND LOAD IT ALSO AFTER LOADING THE MAIN PROGRAM.

8: DESCRIPTION

THIS PROGRAM IS ORGANIZED INTO THREE MAIN SECTIONS:

- A: CONTROL ROUTINE.
- B: TEST ROUTINES.
- C: COMMON SUBROUTINES

8.1 CONTROL ROUTINE

THE CONTROL ROUTINE ASSUMES CONTROL WHEN THE PROGRAM IS STARTED. IT HAS THE FOLLOWING FUNCTIONS:

- A: CONTROL'S SEQUENCE OF TEST ROUTINES.
- B: MONORS AND ACTS ON SR OPTIONS.

THE CONTROL ROUTINE IS CALLED FROM A TEST ROUTINE BY THE "SCOPE" STATEMENT.

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0.2 TEST ROUTINES

THE ACTUAL TESTING IS PERFORMED BY A SET OF TEST ROUTINES THAT ARE NUMBERED SEQUENTIALLY FROM 0 TO 100 (OCTAL). EACH TEST ROUTINE IS PRECEDED BY A TEST HEADER THAT IS USED BY THE CONTROL ROUTINE IN ORDER TO PROPERLY SEQUENCE THROUGH THE TESTS. THE HEADER LOOKS AS FOLLOWS: (EXAMPLE)

```

.....
T201    20          (ROUTINE NUMBER 20)
        T21          (ADDRESS OF NEXT ROUTINE)
        100.         (TEST ITERATION COUNT)
        BAGA         (SCOPE ENTRY POINT)
.....

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THE FIRST 2 ITEMS ARE SELF EXPLANATORY. THE TEST ITERATION COUNT INDICATES TO THE CONTROL ROUTINE THE NUMBER OF TIMES THE TEST SHOULD BE PERFORMED BEFORE GOING ON TO THE NEXT ROUTINE.

THE SCOPE ENTRY POINT INDICATES TO THE CONTROL ROUTINE THE ADDRESS IT SHOULD RETURN TO AFTER THE FIRST ITERATION. THE ADDRESS MAY NOT NECESSARILY POINT TO THE FIRST INSTRUCTION OF THE TEST.

0.3 COMMON SUBROUTINES

ALL SUBROUTINES NEEDED BY EITHER THE CONTROL ROUTINE OR TEST ROUTINES ARE GROUPED TOGETHER. THE MOST SIGNIFICANT SUBROUTINE IS THE "ERRR" SUBROUTINE, WHICH IS CALLED BY AN "ERRORR" STATEMENT AND TYPES THE TEST NUMBER AND PC VALUE WHEN A FAILURE OCCURS.

10.0 LISTING

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000001
000002
000004
000010
000020
000040
000100
000200
000400
001000
002000
004000
010000
020000
040000
100000
000412
000402
000424
000404
001412
003412
001424
003424
007000

```
.ENDR  
.TITLE DZUDB-B CONTROL TEST  
.ABS  
  
JUBC=1I CONTROL TEST  
JMAINDEC=11-DZUDB-B  
JCOPYRIGHT 1971, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.  
J REVISION: JAN, 1973  
J ROBERT A. WHITTON  
J  
JSTANDARD SR SWITCH OPTION (SWITCH SET TO A 1)  
J  
J  
JISR15 = HALT ON ERROR  
JISR14 = SCOPE  
JISR13 = INHIBIT ERROR PRINTOUT  
JISR12 = INHIBIT TRACE  
JISR11 = INHIBIT ITERATIONS  
JISR10 = HALT AT END OF CURRENT TEST  
JISR9 = SELECT ROUTINE SPECIFIED BY SR7 THROUGH SR8  
JISR7 THROUGH SR8 = NUMBER OF TEST ROUTINE TO BE SELECTED  
JSYMBOL DEFINITIONS  
J  
JISR BIT DEFINITIONS  
J  
JISR10=10000  
JISR11=20000  
JISR12=40000  
JISR13=80000  
JISR14=160000  
JISR15=320000  
J  
JIC1=0IT110IT310IT0 IMINT,DEF INT,DEF SCAN EN  
JIC2=0IT110IT0 IMINT,OFF INT  
JIC3=0IT210IT410IT0 IMINT,IMM INT, IMM SCAN EN  
JIC4=0IT210IT0 IMINT,IMM INT  
JIC5=0ITC110IT9 ICI+STOP X  
JIC6=0ITC110IT910IT10 ICI+STOP X+Y  
JIC7=0ITC310IT9 ICS+STOP X  
JIC8=0ITC310IT910IT10 ICS+STOP X+Y  
JIC9=0IT910IT10IT11 ISTOP X+Y+WD
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628				
629	000000	PRTY000		IPRIORITY LEVEL DEFINITIONS
630	000040	PRTY1040		
631	000100	PRTY2080		
632	000140	PRTY30C0		
633	000200	PRTY40200		
634	000240	PRTY50240		
635	000300	PRTY60300		
636	000340	PRTY70340		
637				
638	177970	SR0177970		IPROCESSOR REGISTER DEFINITIONS
639	177776	PS0177776		
640	000027	PC0X7		
641	000026	SP0X6		
642				
643	009726	PO0SP0009726		IPOP STACK, SAME AS TST (0)+
644	022626	PO0SP20022626		IPOP STACK TWICE, SAME AS CMP (0)+,(0)+
645	009746	PUSH0009746		IPUSH STACK, SAME AS TST -(0)
646	024646	PUSH20024646		IPUSH STACK TWICE, SAME AS CMP -(0),-(0)
647	000240	NO0000240		
648	000000	OPEN00		
649	177777	X001		
650	000000	EMTX00		
651	177777	TLAST001		
652				
653				
654	000000	000		
655	000000	000002	00	UNASSIGNED TRAP
656	000002	000000	02	
657	000004	000006	HALT	IS0 OVERFLOW, BUS ERROR TRAP
658	000006	000000	02	
659	000010	000012	HALT	IPRESERVED INSTRUCTION TRAP
660	000012	000000	02	
661	000014	000016	HALT	ITRACE TRAP
662	000016	000000	02	
663	000020	000022	HALT	ITRAP TO CALL IOX
664	000022	000000	02	
665	000024	002432	PH0PLI PHRDN	IPOWER FAIL TRAP
666	000026	000340	PRTY7	
667	000030	002690	EMTVI EI INT	IENT TRAP
668	000032	000340	PRTY7	
669	000034	000036	TR0VI 02	ITRAP TRAP
670	000036	000000	HALT	

672				
676	000040	000042	.+2	
(1)	000042	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000044	000046	.+2	
(1)	000046	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000050	000052	.+2	
(1)	000052	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000054	000056	.+2	
(1)	000056	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000060	000062	.+2	
(1)	000062	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000064	000066	.+2	
(1)	000066	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000070	000072	.+2	
(1)	000072	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000074	000076	.+2	
(1)	000076	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000100	000102	.+2	
(1)	000102	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000104	000106	.+2	
(1)	000106	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000110	000112	.+2	
(1)	000112	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000114	000116	.+2	
(1)	000116	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000120	000122	.+2	
(1)	000122	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000124	000126	.+2	
(1)	000126	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000130	000132	.+2	
(1)	000132	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000134	000136	.+2	
(1)	000136	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000140	000142	.+2	
(1)	000142	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000144	000146	.+2	
(1)	000146	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000150	000152	.+2	
(1)	000152	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000154	000156	.+2	
(1)	000156	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000160	000162	.+2	
(1)	000162	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000164	000166	.+2	
(1)	000166	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000170	000172	.+2	
(1)	000172	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000174	000176	.+2	
(1)	000176	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000200	000202	.+2	
(1)	000202	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000204	000206	.+2	
(1)	000206	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000210	000212	.+2	

(1)	000212	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000214	000216	.+2	
(1)	000216	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000220	000222	.+2	
(1)	000222	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000224	000226	.+2	
(1)	000226	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000230	000232	.+2	
(1)	000232	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000234	000236	.+2	
(1)	000236	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000240	000242	.+2	
(1)	000242	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000244	000246	.+2	
(1)	000246	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000250	000252	.+2	
(1)	000252	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000254	000256	.+2	
(1)	000256	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000260	000262	.+2	
(1)	000262	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000264	000266	.+2	
(1)	000266	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000270	000272	.+2	
(1)	000272	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000274	000276	.+2	
(1)	000276	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000300	000302	.+2	
(1)	000302	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000304	000306	.+2	
(1)	000306	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000310	000312	.+2	
(1)	000312	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000314	000316	.+2	
(1)	000316	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000320	000322	.+2	
(1)	000322	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000324	000326	.+2	
(1)	000326	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000330	000332	.+2	
(1)	000332	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000334	000336	.+2	
(1)	000336	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000340	000342	.+2	
(1)	000342	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000344	000346	.+2	
(1)	000346	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000350	000352	.+2	
(1)	000352	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000354	000356	.+2	
(1)	000356	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000360	000362	.+2	
(1)	000362	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000364	000366	.+2	

(1)	000366	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000370	000372	.+2	
(1)	000372	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000374	000376	.+2	
(1)	000376	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000400	000402	.+2	
(1)	000402	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000404	000406	.+2	
(1)	000406	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000410	000412	.+2	
(1)	000412	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000414	000416	.+2	
(1)	000416	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000420	000422	.+2	
(1)	000422	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000424	000426	.+2	
(1)	000426	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000430	000432	.+2	
(1)	000432	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000434	000436	.+2	
(1)	000436	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000440	000442	.+2	
(1)	000442	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000444	000446	.+2	
(1)	000446	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000450	000452	.+2	
(1)	000452	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000454	000456	.+2	
(1)	000456	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000460	000462	.+2	
(1)	000462	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000464	000466	.+2	
(1)	000466	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000470	000472	.+2	
(1)	000472	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000474	000476	.+2	
(1)	000476	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000500	000502	.+2	
(1)	000502	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000504	000506	.+2	
(1)	000506	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000510	000512	.+2	
(1)	000512	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000514	000516	.+2	
(1)	000516	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000520	000522	.+2	
(1)	000522	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000524	000526	.+2	
(1)	000526	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000530	000532	.+2	
(1)	000532	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000534	000536	.+2	
(1)	000536	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000540	000542	.+2	

(1)	002542	000020	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002544	000546	.02	
(1)	002546	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002550	000552	.02	
(1)	002552	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002554	000556	.02	
(1)	002556	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002560	000562	.02	
(1)	002562	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002564	000566	.02	
(1)	002566	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002570	000572	.02	
(1)	002572	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002574	000576	.02	
(1)	002576	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002600	000602	.02	
(1)	000602	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002604	000606	.02	
(1)	000606	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002610	000612	.02	
(1)	002612	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002614	000616	.02	
(1)	002616	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002620	000622	.02	
(1)	002622	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002624	000626	.02	
(1)	000626	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000630	000632	.02	
(1)	002632	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002634	000636	.02	
(1)	000636	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	002640	000642	.02	
(1)	000642	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000644	000646	.02	
(1)	000646	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000650	000652	.02	
(1)	000652	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000654	000656	.02	
(1)	000656	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000660	000662	.02	
(1)	000662	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000664	000666	.02	
(1)	000666	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000670	000672	.02	
(1)	000672	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000674	000676	.02	
(1)	000676	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000700	000702	.02	
(1)	000702	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000704	000706	.02	
(1)	000706	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000710	000712	.02	
(1)	000712	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000714	000716	.02	

(1)	000716	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000720	000722	.+2	
(1)	000722	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000724	000726	.+2	
(1)	000726	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000730	000732	.+2	
(1)	000732	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000734	000736	.+2	
(1)	000736	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000740	000742	.+2	
(1)	000742	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000744	000746	.+2	
(1)	000746	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000750	000752	.+2	
(1)	000752	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000754	000756	.+2	
(1)	000756	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000760	000762	.+2	
(1)	000762	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000764	000766	.+2	
(1)	000766	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000770	000772	.+2	
(1)	000772	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS
(1)	000774	000776	.+2	
(1)	000776	000000	HALT	ITRAPPED TO PREVIOUS ADDRESS

678		000200		.0200		
679	000200	000167	001044	JMP	START	IGO TO START OF PROGRAM
680						
681		000204		.0204		
682	000204	000167	002256	JMP	PHRTST	IPOWER FAIL TEST
683						
684		000210		.0210		
685	000210	000167	001064	JMP	GETRDY	IBYPASS INITIAL TYPEOUTS
686		000000		RO=XB		

```

687
(1)
(1)          001100          .....
(1)          ,01100
(1)
(1)          IRROUTINE TO TYPE ASCII MESSAGE; MESSAGE MUST TERMINATE WITH A B BYTE;
(1)          ;THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED,
(1)          ;NOTE1: SNULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER,
(1)          ;NOTE2: SFILLS CONTAINS THE NUMBR OF FILLER CHARACTERS REQUIRED.
(1)
(1)          ICALL
(1)          ;1) USING A TRAP INSTRUCTION
(1)          ;          TYPE          ,MESADR          ;MESADR IS FIRST ADDRESS OF AN ASCII STRING
(1)          ;OR
(1)          ;          TYPE
(1)          ;          MESADR
(1)
(1)          ;2) USING A JSR INSTRUCTION
(1)          ;          MOV          PSW,=(SP)          ;PUSH PROCESSOR STATUS WORD ON THE STACK
(1)          ;          JSR          PC,STYPE          ;CALL TYPE ROUTINE
(1)          ;          MESADDR          ;FIRST ADDRESS OF MESSAGE
(1)
(1)          CS1100          010046          STYPE:          MOV          RB,=(SP)          ;SAVE RB
(1)          001102          017600          000002          MOV          02(SP),RB          ;GET ADDRESS OF ASCII STRING
(1)          001106          062706          000002          000002          ADD          02,2(SP)          ;ADJUST RETURN PC
(1)          001114          112046          15i          MOV0         (RB)+,(SP)          ;PUSH CHARACTER TO BE TYPED ONTO STACK
(1)          001116          001003          BNE          25          ;BR IF IT ISN'T THE TERMINATOR
(1)          001120          009726          TST         (SP)+          ;IF TERMINATOR POP IT OFF THE STACK
(1)          001122          012600          MOV         (SP)+,RB          ;RESTORE RB
(1)          001124          000002          RTI          ;RETURN
(1)          001126          004767          000026          25i          JSR          PC,55          ;GO TYPE THIS CHARACTER
(1)          001132          122726          000012          35i          CMP0         012,(SP)+          ;CHECK IF THE CHAR. TYPED WAS A LINE FEED
(1)          001136          001366          RNE          15          ;GO GET NEXT CHAR, IF NOT LINE FEED
(1)          001140          016746          000034          MOV         SNULL,=(SP)          ;GET # OF FILLER CHARS. NEEDED
(1)          ;AND THE NULL CHAR.
(1)          001144          109366          000001          45i          DECB         1(SP)          ;DOES A NULL NEED TO BE TYPED?
(1)          001150          002770          BLT          35          ;BR IF NO--GO POP THE NULL OFF OF STACK
(1)          001152          004767          000002          JSR          PC,55          ;GO TYPE A NULL
(1)          001156          000772          BR          45          ;LOOP
(1)          001160          109777          0-0022          55i          TST0         0TPB          ;WAIT UNTIL PRINTER IS READY
(1)          001164          100375          BPL          55          ;LOAD CHAR TO BE TYPED INTO DATA REG.
(1)          001166          116677          000002          000014          MOV0         2(SP),0TPB
(1)          001174          000207          RTS         PC
(1)
688          001200          ,01200
689
690          ;VECTOR ASSIGNMENTS
691
692          001200          000          SNULL:          .BYTE          0
693          001201          002          SFILLS:          .BYTE          2
694          001202          177560          TK0:          177560          ;TTY KEYBOARD STATUS
695          001204          177562          TK1:          177562          ;TTY KEYBOARD BUFFER
696          001206          177564          TP0:          177564          ;TTY PRINTER STATUS
697          001210          177566          TP1:          177566          ;TTY PRINTER BUFFER
698          001212          171776          UDCR:          171776          ;UDC1 CONTROL REGISTER

```

699 001214 171774
700 001216 000234
701 001220 000236
702 001222 171772
703 001224 171770
704 001226 171000
705 001230 171002
706 001232 171004
707 001234 171010
708 001236 171020
709 001240 171040
710 001242 171100
711 001244 171200
712 001246 171400

UDSRI 171774
UTVI 234
UPLI 236
MCLKI 171772
UMODI 171770
UDCA1I 171000
UDCA2I 171002
UDCA3I 171004
UDCA4I 171010
UDCA5I 171020
UDCA6I 171040
UDCA7I 171100
UDCA8I 171200
UDCA9I 171400

IUBCI1 SCAN REGISTER
IUBCI1 TRAP VECTOR
IUBCI1 PRIORITY LEVEL
IUBCI1 MAINTENANCE CLOCK
IUBCI1 RESERVED MODULE ADDRESS
IUBCI1 RESERVED MODULE ADDRESS, CLASS 027
ICLASS 002
ICLASS 004
ICLASS 010
ICLASS 020
ICLASS 040
ICLASS 100
ICLASS 200
ICLASS 400

714										
715										START OF TEST CONTROLLER
716										
717	001250	012706	001100			STARTI	MOV	0100,SP		ISRT BOTTOM OF SP STACK
718	001254	009067	002650				CLR	RYNNO		
719	001260	104000					TYPE			ITYPE TITLE
720	001262	003376					MTIT			
721	001264	009737	000042				TST	0042		IMONITOR LOAD
722	001270	001003					BNE	GETRCDY		IYES, SKIP NEXT MESSAGE
723	001272	104000					TYPE			
724	001274	003264					MSETSR			
725	001276	104003					CHALT			
726	001300	012767	004142	002624		GETRCDYi	MOV	070,NXTST		IAADDRESS OF FIRST ROUTINE
727	001306	012767	000006	176470		GTADYXi	MOV	06,MACHER		IRPSET MACHER TRAP
728	001314	012767	000340	176454			MOV	0PRTY7,PS		ISRT PRIORITY 7
729	001322	016777	177672	177666			MOV	UPL,OUTV		IRESET TRAP
730	001330	009077	177664				CLR	OUPL		
731	001334	012706	001100				MOV	0100,SP		ISRT BOTTOM OF STACK
732	001340	104004					SRESET			ISSUE RESET
733	001342	002767	000236			GTADYAi	JSR	PC,FORWD		IROLL FORWARD TO NEXT ROUTINE
734	001346	032767	001000	176214			BIT	0019,SR		ICHECK SELECT ROUTINE SWITCH SET
735	001354	001002					BNE	GTADYC		IBRANCH IF SELECT ROUTINE SWITCH SET
736	001356	000177	002552				JMP	0CURTST		IGO RUN CURRENT ROUTINE
737	001362	016700	176202			GTADYCi	MOV	SR,XE		IGET (SR)
738	001366	042700	177400				BIC	0177400,X0		IMASK UNDESIREB BITS
739	001372	126700	002532				CMPO	RYNNO,X0		ICOMPARE RYNNO TO (RB)
740	001376	001002					BNE	GTADYD		IBRANCH IF ROUTINE NOT FOUND YET
741	001400	000177	002530				JMP	0CURTST		IGO RUN ROUTINE
742	001404	022767	177777	002520		GTADYDi	CMO	0=1,NXTST		INO, CHECK FOR LAST ROUTINE
743	001412	001353					BNE	GTADYA		IBRANCH IF NOT LAST ROUTINE
744	001414	104000					TYPE			ITYPE INCORRECT RTN SELECTED
745	001416	003356					MINCR7			
746	001420	104003					CHALT			ICOMMON HALT
747	001422	000726					BR	GETRCDY		ISRT OVER


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749
750
751
752 001424 012767 000340 177444 CHAINNI MOV 0PRTY7,1076
753 001432 009077 177554 CLR 0UDCR
754 001436 016767 002464 177430 MOV SCOPTR,1074
755 001444 012700 001074 MOV 01074,0P
756 001450 009267 002450 INC ICNT ;INCREMENT ICNT
757 001454 001002 ONE CHNAC ;BR IF RESULT NOT 0
758 001456 009167 002442 COM ICNT ;RESET ICNT TO -1
759 001462 032767 040000 176100 CHNACI BIT 0BIT14,SR ;CHECK FOR SCOPE OPTION
760 001470 001403 BEQ CHNA ;BRANCH IF SCOPE SWR NOT SET
761 001472 016716 002430 CHNABI MOV SCOPTR,(SP) ;SET UP RETURN TO ROUTINE
762 001476 000002 RTI
763
764 001500 032767 004000 176062 CHNAI BIT 0BIT11,SR ;TEST INHIBIT ITERATION SWITCH
765 001506 001003 ONE CHNAA ;BRANCH IF INHIBIT ITERATION SW SET
766 001510 009367 002406 DEC ICYR ;DECREMENT ITERATION COUNT
767 001514 001366 ONE CHNAB ;BRANCH IF COUNT NOT 0
768 001516 022626 CHNAAI POPSP2 ;POP STACK POINTER TWICE
769 001520 032767 002000 176042 BIT 0BIT10,SR ;IS ROUTINE END HALT SW SET?
770 001526 001403 BEQ CHNB ;BRANCH IF NOT SET
771 001530 016700 002374 MOV RTNNO,X0 ;ROUTINE END HALT; TEST 0IN LIGHTS;
772 001534 000000 HALT ;CHECK SELECT ROUTINE SWITCH
773 001536 032767 001000 176024 CHNBI BIT 0BIT9,SR ;BRANCH IF SELECT RTN SW SET
774 001544 001295 ONE GETRDY ;LIST TEST ?
775 001546 022767 177777 002356 CMP 0-1,NXTST ;BRANCH IF NOT LAST TEST
776 001554 001294 ONE GETDYX ;TYPE PROGRAM END BELL
777 001556 104000 TYPE
778 001560 004051 MP0END
779 001562 013709 000042 MOV 0042,X9 ;LINK TO MONITOR
780 001566 001644 BEQ GETRDY ;NO, REPEAT PROGRAM
781 001570 000003 RESET
782 001572 004719 LOGICI JSR X7,(9)
783 001574 000240 NOP
784 001576 000240 NOP
785 001600 000240 NOP
786 001602 000636 BR GETRDY ;GO REPEAT PROGRAM
787
788
789
790 001604 016709 002322 ;TEST CONTROLLER
791 001610 012567 002314 ;
792 001614 012567 002312 ;
793 001620 012567 002276 ;
794 001624 012567 002276 ;
795 001630 010567 002300 ;
796 001634 012767 000001 002262 MOV X9,CURTST ;ADDRESS OF NEXT ROUTINE
797 001642 000207 RTS PC ;GET NEXT ROUTINE NUMBER
;GET ADDRESS ON NEXT "NEXT" ROUTINE
;GET ITERATION COUNT
;GET SCOPE LOOP ENTRY POINTER
;ADDR OF NOW CURRENT TEST TO CURTST
;RESET ICNT TO 1

```

```

799
800          |
801          | ERROR HANDLER
802 301644 017767 177342 002264 ERRTI: MOV   @UDCR,UDCRT   |SAVE CONTENTS OF UDCR
803 001652 017767 177336 002260      MOV   @UDSR,UDSRT   |SAVE CONTENTS OF UDSR
804 001660 012767 003223 000166      MOV   @MSTR,ERR0
805 001666 009067 000200      CLR   ERRE
806 001672 004567 000240      JSR   %5,0ACNV      |CONVERT TO ASCII
807 001676 004136
808 001700 003233      MUDCR
809 301702 000000
810 001704 004567 000226      JSR   %5,0ACNV      |CONVERT TO ASCII
811 001710 004140
812 001712 003251      MUDSR
813 001714 000000
814 001716 000421
815 001720 012767 177777 000126 ERRI:  MOV   @-1,ERR0      |SET UP ONE MESSAGE CALL
816 001726 012767 000240 000122      MOV   @240,ERR0+2
817 001734 009067 000132      CLR   ERRE
818 001740 000413
819 001742 011667 000106      ERRI1: MOV   (SP),ERR0      |DEVELOP ADDITIONAL MESSAGE ADDR.
820 001746 017767 000102 000100      MOV   @ERR0,ERR0
821 001754 012767 000002 000110      MOV   @2,ERRE
822 001762 012767 177777 000066      MOV   @-1,ERR0+2
823 001770 032767 020000 175572 ERRAI: BIT   @BIT13,SR
824 001776 001030      BNE   ERRC
825 002000 011667 000064      MOV   (SP),ERR0      |DEVELOP CALLING ADDR
826 002004 162767 000002 000056      SUB   @2,ERR0
827 302012 004567 000120      JSR   %5,0ACNV      |CONVERT TEST 0 TO ASCII
828 002016 004130
829 002020 003161
830 002022 000003
831 002024 004567 000106      JSR   %5,0ACNV      |GO TO OCTAL TO ASCII CONVERT
832 002030 002070      ERRO      |SOURCE ADDRESS
833 002032 003174      MPC      |DESTINATION ADDRESS
834 002034 000006
835 002036 004567 000162      JSR   %5,0ACNV      |GO OF DIGITS TO CONVERT
836 002042 004124
837 002044 003212
838 002046 000005
839 002050 104001      TYPES
840 002052 003100
841 002054 000000      ERRI:  OPEN
842 002056 177777
843 002060 104017      ERRI:  EHALT
844 002062 066716 000004      ADD   ERRE,(SP)
845 002066 000002
846 002070 000000      ERRI:  OPEN
847 002072 000000      ERRI:  OPEN

```

```
049  
050  
051  
052 002074 005767 179478  
053 002100 100001  
054 002102 000000  
055 002104 000002  
056  
057  
058  
059 002106 104015  
060 002110 012507 000010  
061 002114 022707 177777 000010  
062 002122 001002  
063 002124 104014  
064 002126 000002  
065 002130 104000  
066 002132 000000  
067 002134 000765
```

CONDITIONAL ERROR HALT ROUTINE
EHLTI TST SR I CHECK FOR HALT ON ERROR
BPL EHLTA I BRANCH IF NO HALT DESIRED
HALT
EHLTAI RTI

SUBROUTINE TO OUTPUT A SERIES OF ASCII MESSAGES ON TELETYPE PRINTER
TYP5I SAV055
MOV (5),TYP5B I GET ADDRESS OF MESSAGE TO TYP5B
CMP @1,TYP5B I CHECK FOR TERMINATOR
RNE TYP5A I BRANCH IF NOT TERMINATOR
RST055
RTI I TERMINATOR REACHED, EXIT
TYP5AI TYPE I CALL ON TYP SUBROUTINE TO TYPE MESSAGE
TYP5BI OPEN I ADDRESS OF MESSAGE GOES HERE
BR TYP5+2 I GO PROCESS NEXT MESSAGE

```

869
870
871
872 002136 104011
873 002140 013567 000050
874 002144 012501
875 002146 012502
876 002150 060201
877 002152 016703 000044
878 002156 042703 177770
879 002162 062703 000060
880 002166 110341
881 002170 042767 000007 000024
882 002176 006067 000020
883 002202 006067 000014
884 002206 006067 000010
885 002212 003302
886 002214 001356
887 002216 104012
888 002220 000205
889 002222 000000
890
891
892
893 002224 104011
894 002226 012700 002402
895 002232 313501
896 002234 012567 000052
897 002240 012567 000050
898 002244 012702 002370
899 002250 012767 000005 000104
900 002256 012267 000104
901 002262 004767 000034
902 002266 003367 000070
903 002272 001371
904 002274 166700 000014
905 002300 010067 000004
906 002304 004567 000100
907 002310 000000
908 002312 000000
909 002314 000000
910 002316 104012
911 002320 000205

;
; SUBROUTINE FOR OCTAL TO ASCII CONVERSION
;
OACNVI SAVB4
MOV 0(5)+,OACNVX ;GET OCTAL VALUE
MOV (5)+,X1 ;GET DESTINATION ADDRESS
MOV (5)+,X2 ;GET CONVERT COUNT
ADD X2,X1 ;DEVELOP ADDR TO STORE 1ST CHAR.
OACNVAI MOV OACNVX,X3
BIC #177770,X3 ;ISOLATE LEAST SIGNIFICANT DIGIT
ADD #60,X3 ;CONVERT DIGIT TO ASCII
MOVB X3,(1) ;STORE ASCII CHARACTER
BIC #7,OACNVX
ROR OACNVX
ROR OACNVX
ROR OACNVX
DEC X2 ;DONE ALL DIGITS?
BNE OACNVA ;BRANCH IF NOT DONE
RSTB4
RTS X5 ;DONE, EXIT

OACNVXI OPEN

;
; SUBROUTINE FOR BINARY TO DECIMAL ASCII CONVERSION
;
BDCNVI SAVB4 ;SAVE REGS
MOV #DECVAL,X0 ;SET UP ADDR TO STORE DECIMAL ASCII
MOV 0(5)+,X1 ;BINARY VALUE TO R1
MOV (5)+,BDCNVC ;DESTINATION ADDR TO BDCNVC
MOV (5)+,BDCNV5 ;CHARACTER COUNT TO BDCNVD
MOV #ADTENP,X2 ;ADDR OF TEN POWER STRING
MOV #5,CNVCTR ;SET UP FOR 5 POWER CONVERSIONS
BDCNVAI MOV (2)+,TENPWR ;MOVE POWER OF TEN VALUE
JSR PC,SUBTEN ;PERFORM CONVERSION
DEC CNVCTR ;DONE 5 CONVERSIONS
BNE BDCNVA ;BRANCH IF NOT YET
SUB BDCNVD,X0
MOV X0,BDCNV8
JSR X5,BMOVE

BDCNVBI OPEN
BDCNVCi OPEN
BDCNVDi OPEN
RSTB4
RTS X5 ;RESTORE REGS AND EXIT

```

```

913
914 002322 009007 000036      |
915 002326 166701 000034      | SUBTENI CLR      DIGIT
916 002332 103403          | SUBTNAI SUB     TENPWR,X1      |SUBTRACT TEN POWER FROM BINARY VALUE
917 002334 009207 000024          |      OCS     SUBTND          |BRANCH IF UNSUCCESSFUL SUBTRACTION
918 002340 000772          |      INC     DIGIT
919 002342 066721 000020          |      BR     SUBTNA
920 002346 062767 000060 000010 | SUBTNBI ADD     TENPWR,X1      |RESTORE SUBTRACTED VALUE.
921 002354 116720 000004          |      ADD     #00,DIGIT        |CONVERT (DIGIT) TO ASCII
922 002360 000207          |      MOVB   DIGIT,(0)+       |MOVE ASCII CHAR TO DECVAL FIELD
923 002362 000000          |      RTS    PC               |EXIT
924 002364 000000          | CNVCTRI OPEN
925 002366 000000          | DIGITI  OPEN
926 002370 023420          | TENPWR; OPEN
927 002372 001790          | ADTENPI 10000;
928 002374 000144          |          1000;
929 002376 000012          |          100;
930 002400 000001          |          10;
931 002402      040      040 040 040 040 040 040 040 040 | DECVALI .BYTE 040,040,040,040,040,040
932 002405      040      040 040
933
934      |
935 002410 104011          | |SUBROUTINE TO MOVE A VARIABLE NUMBER OF BYTES
936 002412 012501          | |
937 002414 012502          | BMOVEI  SAV04              |SAVE REGS
938 002416 012503          |      MOV   (9)+,X1         |GET FROM ADDRESS
939 002420 112122          |      MOV   (9)+,X2         |GET TO ADDRESS
940 002422 009303          |      MOV   (9)+,X3         |GET COUNT
941 002424 001375          | BMOVAI  MOVB (1)+,(2)+     |MOVE BYTE
942 002426 104012          |      DEC   X3              |INCREMENT COUNT
943 002430 000205          |      ONE  BMOVA           |BRANCH IF NOT DONE
944      |
945      | UNEXPECTED POWER FAIL SERVICE
946      |
947 002432 012767 002442 175364 | PHARDNI MOV     @PHRUP,PHRPL  |SET UP FOR POWER UP
948 002440 000000          |      HALT
949 002442 012706 001100          | PHARUPI MOV     @1100,SP     |RESTORE STACK POINTER
950 002446 012767 002432 175390 |      MOV     @PHARDN,PHRPL  |SET UP FOR POWER DOWN
951 002454 000005          |      RESET
952 002456 104000          |      TYPE
953 002460 003532          |      MPRF
954 002462 000167 176612          |      JMP   GETRDYX         |GO TO NEXT TEST

```

```

956
957
958
959 002466 012706 001100
960 002472 012767 002566 179324
961 002500 012777 002620 176510
962 002506 012777 000300 176504
963 002514 104000
964 002516 003453
965 002520 012706 001100
966 002524 012777 000036 176460
967 002532 012767 000000 179236
968 002540 032777 040000 176444
969 002546 001774
970 002550 000240
971 002552 000240
972 002554 104000
973 002556 003571
974 002560 000001
975 002562 000005
976 002564 000755
977 002566 012767 002576 179230
978 002574 000000
979 002576 012767 002566 179220
980 002604 012706 001100
981 002610 000005
982 002612 104000
983 002614 003532
984 002616 000740
985 002620 032777 040000 176364
986 002626 001404
987 002630 104000
988 002632 003645
989 002634 000005
990 002636 000730
991 002640 104000
992 002642 003721
993 002644 000005
994 002646 000724

;
;POWER FAIL TEST
;
PHWTSTi MOV @100,SP ;SET UP SP AND STATUS
MOV @PWRDT,PWRPL ;SET UP FOR POWER DOWN
MOV @PWFDC,OUTV
MOV @PRTY0,OUPL
TYPE
MPWRT
PHUDCI MOV @100,SP
MOV @36,UDCR ;SET UP UDC CONTROL
MOV @PRTY0,PS
PHUDCAi BIT @BIT14,UDCR ;TEST POWER FAIL BIT
BEQ PHUDCA ;BRANCH IF CLEAR
NOP ;ALLOW TRAP TO START
NOP
TYPE
MPUDC ;EARCR; POWER FAIL BIT SET + NO TRAP
WAIT
RESET
BR PHUDC
PHADTi MOV @PWRDT,PWRPL ;SET UP FOR POWER UP
HALT
PHAUTi MOV @PWRDT,PWRPL
MOV @100,SP
RESET
TYPE
MPWRF
BR PHUDC
PHPDCi BIT @BIT14,UDCR
BEQ PHPDCX
TYPE
MPUDOK
RESET
BR PHUDC
PHPDCXi TYPE
MPUDNG
RESET
BR PHUDC

```

```

996
997
998
999 002650 011646
1000 002652 162716 000002
1001 002656 017616 000000
1002 002662 121667 001232
1003 002666 101402
1004 002670 000000
1005 002672 000776
1006 002674 006116
1007 002676 042716 177001
1008 002702 062716 004000
1009 002706 017616 000000
1010 002712 000136
1011
1012
1013
1014 002714 102015
1015 002716 010500
1016 002720 009740
1017 002722 000000
1018 002724 104014
1019 002726 000002
1020
1021
1022
1023 002730 104013
1024 002732 012700 052525
1025 002736 009100
1026 002740 010067 177770
1027 002744 000005
1028 002746 104016
1029 002750 000002
1030
1031
1032
1033 002752 104015
1034 002754 012500
1035 002756 012701 177742
1036 002762 062701 000300
1037 002766 000301
1038 002770 001376
1039 002772 000300
1040 002774 001372
1041 002776 104014
1042 003000 000002

;
;EMT HANDLER
;
;EMTINTI MOV (SP),=(SP) ;GET SAVED PC
; SUB 02,(SP) ;INCREMENT PC BY 2
; MOV 0(SP),(SP)
; CMPB (SP),EMTLIM ;CHECK IF CALL WITHIN LIMITS
; BLOS EMTA ;CALL IS NOT WITHIN LIMITS
; HALT
; OR ,=2
; EMTAI ROL (SP) ;EMT ARG X 2
; BIC 017001,(SP) ;REMOVE 7 MSB
; ADD 0EMTTAB,(SP) ;FORM EMT RTN ADDRESS
; MOV 0(SP),(SP)
; JMP 0(SP)+ ;GO TO EMT RETURN

;
;SUBROUTINE FOR COMMON HALTS
;
;CHLTI SAVBS
; MOV X5,X0 ;DEVELOP ADDRESS OF CALLER
; TST -(0)
; HALT ;HALT, ADDRESS OF CALL INSTRUCTION
; RSTBS ;IN DATA LIGHTS
; RTI

;
;SUBROUTINE TO ISSUE RESET
;
;SRSETTI SAVBS
; MOV 052525,X0 ;DATA TO RB
; COM X0
; MOV X0,SRSETT+4
; RESET ;ISSUE RESET, RB IS DISPLAYED
; RSTBS
; RTI

;
;SUBROUTINE TO DELAY A SPECIFIED NUMBER OF MILLISECONDS
;
;DL9I SAVBS
; MOV (5)+,X0 ;DELAY COUNTER TO RB
; MOV 0-36,X1 ;CONSTANT FOR TRAP TIME
; DL9AI ADD 0300,X1 ;1 MSEC COUNT TO R1
; DL9BI DEC X1 ;INCREMENT 1 MSEC COUNT
; BNE DLYB ;BRANCH IF NOT 0
; DEC X0 ;DECREMENT IT
; BNE DLYA ;BRANCH IF NOT DONE DELAYING
; RSTBS
; RTI ;EXIT

```

```

1044
1045
1046
1047 003022 012606 177764
1048 003026 012606 177764
1049 003012 012767 000002 000046
1050 003020 000414
1051
1052
1053
1054 003022 012767 000240 000036
1055 003030 000403
1056
1057
1058
1059 003032 012767 000002 000026
1060 003040 012606 177762
1061 003044 012606 177762
1062 003050 010546
1063 003052 010446
1064 003054 010346
1065 003056 010246
1066 003060 010146
1067 003062 010046
1068 003064 024646
1069 003066 000002
1070 003070 016625 000020
1071 003074 000002
1072
1073
1074
1075 003076 022626
1076 003100 012620
1077 003102 012601
1078 003104 012602
1079 003106 012603
1080 003110 012604
1081 003112 016646 177764
1082 003116 016646 177764
1083 003122 000002
1084
1085 003124 010566 000020
1086
1087
1088
1089 003130 022626
1090 003132 012600
1091 003134 012601
1092 003136 012602
1093 003140 012603
1094 003142 012604
1095 003144 012605
1096 003146 016646 177762
1097 003152 016646 177762

|
| SUBROUTINE TO SAVE REGS 0-4
|
SV041  MOV  (SP)+, -12, (SP)  I MOVE PC+PS UP STACK
      MOV  (SP)+, -12, (SP)
      MOV  @R7, SV05C
      BR   SV250
|
| SUBROUTINE TO SAVE REGS 0-5 AND PLACE ENT PC IN R5
|
SV05S1 MOV  @N0P, SV05C
      BR   SV05A
|
| SUBROUTINE TO SAVE REGS 0-5
|
SV051  MOV  @R7, SV05C  I MOVE PC+PS UP STACK
SV05A1 MOV  (SP)+, -14, (SP)
      MOV  (SP)+, -14, (SP)
      MOV  X5, -(SP)
SV05B1 MOV  X4, -(SP)
      MOV  X3, -(SP)
      MOV  X2, -(SP)
      MOV  X1, -(SP)
      MOV  X0, -(SP)
      PUSH2
SV05C1 RTI  I RTI OR NOP
      MOV  16, (SP), X5  I ENT PC TO R5
      RTI
|
| SUBROUTINE TO RESTORE REGS 0-4
|
RS041  POPSP2
      MOV  (SP)+, X0
      MOV  (SP)+, X1
      MOV  (SP)+, X2
      MOV  (SP)+, X3
      MOV  (SP)+, X4
      MOV  -12, (SP), -(SP)  I MOVE PC+PS DOWN STACK
      MOV  -12, (SP), -(SP)
      RTI
|
RS05B1 MOV  X5, 16, (SP)  I SET ENT PC TO R5
|
| SUBROUTINE TO RESTORE REGS 0-5
|
RS051  POPSP2
      MOV  (SP)+, X0
      MOV  (SP)+, X1
      MOV  (SP)+, X2
      MOV  (SP)+, X3
      MOV  (SP)+, X4
      MOV  (SP)+, X5
      MOV  -14, (SP), -(SP)  I MOVE PC+PS DOWN STACK
      MOV  -14, (SP), -(SP)

```



```

1090 003156 000002          RTI
1099          |
1100          | ASCII MESSAGES
1101          |
1102 003160      124      MEOI  .ASCII  (Y)
1103 003161      040      020040 020040 MNUMI  .ASCII  / PC= /
      003166 020040 041520 020075
1104 003174 020040 020040 020040 MPDI  .ASCII  / IENT= /
      003202 020040 041511 052116
      003210 020075
1105 003212 020040 020040 027040 MIENTI .ASCIZ  / ;<19><12>
      003220 009015      000
1106 003223      040      052440 041504 MSFRI  .ASCII  / UDCR= /
      003230 036522      040
1107 003233      040      020040 020040 MUOCR1 .ASCII  / UDSR= /
      003240 020040 052440 051504
      003246 036522      040
1108 003251      040      020040 020040 MUOSRI .ASCIZ  / <19><12>
      003256 020040 006440 000012
1109 003264 042523 020124 051123 MSETSR1 .ASCII  'SET SR OPTIONS. NORMAL SR = 000000.'
      003272 047440 052120 047511
      003300 051516 020056 047516
      003306 046522 046101 051440
      003314 020122 020075 030060
      003322 030060 030060      054
1110 003327      040      044124 047105          .ASCIZ  / WHEN PRESS CONTINUE/<19><12>
      003334 050040 042522 051523
      003342 041440 047117 044524
      003350 052516 006505 000012
1111 003356 047111 040526 044514 MINCRTI .ASCIZ  / INVALID TEST!/<19><12>
      003364 020104 042524 052123
      003372 004496 000012
1112 003376 009015 042125 026503 MFIPI  .ASCIZ  <19><12>/UDC=11 CONTROL TEST = MAINDEC=11=0ZUDB-A/<19><12>
      003404 030461 041440 047117
      003412 051124 046117 052040
      003420 051505 020124 020055
      003426 040515 047111 042504
      003434 026503 030461 042055
      003442 052532 041104 040455
      003450 009015      000
1113 003453      015 050012 053517 MPWRTI .ASCIZ  <19><12>/POWER FAIL TEST: WAITING FOR POWER FAILURE/<19><12>
      003460 051105 043040 044501
      003466 020114 042524 052123
      003474 020073 040527 052111
      003502 047111 020107 047506
      003510 020122 047520 042527
      003516 020122 040506 046111
      003524 051125 006505 000012
1114 003532 042522 047503 042526 MPWRFI .ASCIZ  /RECOVERED FROM POWER FAILURE/<19><12>
      003540 042522 020104 051106
      003546 046517 050040 053517
      003554 051105 043040 044501
      003562 052514 042522 009015
      003570      000
  
```

```
1115 003571      125 041504 050040 MPUDCI .ASCIZ 'UDC POWER FAIL BIT SET, NO TRAP INITIATED'<15><12>
      003576 053517 051105 043040
      003604 044501 020114 044502
      003612 020124 042523 020124
      003620 049040 020117 051124
      003626 050101 044440 044516
      003634 044524 052101 042105
      003642 009015      000
1116 003645      122 041505 053117 MPUDOKI .ASCIZ 'RECOVERED FROM UDC EXPANDER POWER FAILURE'<15><12>
      003652 051105 042105 043040
      003660 049522 020115 042125
      003666 020103 054105 040520
      003674 042116 051105 050040
      003702 053517 051105 043040
      003710 044501 052514 042522
      003716 009015      000
1117 003721      124 040522 050120 MPUDNGI .ASCII 'TRAPPED DUE TO UDC EXPANDER POWER FAILURE;'<15><12>
      003726 042105 042040 042525
      003734 052040 020117 042125
      003742 020103 054105 040520
      003750 042116 051105 050040
      003756 053517 051105 043040
      003764 044501 052514 042522
      003772 020054 009015
1118 003776 049510 042527 042526 .ASCIZ 'HOWEVER ERROR BIT NOT SET IN STATUS WORD'<15><12>
      004004 020122 051105 047522
      004012 020122 044502 020124
      004020 049516 020124 042523
      004026 020124 047111 051440
      004034 040524 052524 020123
      004042 049527 042122 009015
      004050      000
1119 004051      007
1120 004052 049105 000504 000012 MPGENDI .BYTE 007
      .ASCIZ 'END'<15><12>
      .EVEN
|
| EMT DEFINITIONS AND ASSIGNMENTS
|
| EMTTAB|
      TYPE=EMT+EMTX
      .WORD STYPE
      EMTX=EMTX+I
      TYPE=EMT+EMTX
      .WORD TYPB
      EMTX=EMTX+I
      ERROR=EMT+EMTX
      .WORD ERR
      EMTX=EMTX+I
      CHALT=EMT+EMTX
      .WORD CHLT
      EMTX=EMTX+I
      SRESET=EMT+EMTX
      .WORD SRESET
      EMTX=EMTX+I
1121
1122
1123
1124
1125 004060
1126      104000
1127 004060 001100
1128      000001
1129      104001
1130 004062 002106
1131      000002
1132      104002
1133 004064 001720
1134      000003
1135      104003
1136 004066 002714
1137      000004
1138      104004
1139 004070 002730
1140      000005
```

1141		104005	SCOPE=EMT+EMTX
1142	004072	001424	,WORD CHAINN
1143		000006	EMTX=EMTX+1
1144		104006	ERROR1=EMT+EMTX
1145	004074	001742	,WORD ERR1
1146		000007	EMTX=EMTX+1
1147		104007	ERRORS=EMT+EMTX
1148	004076	001644	,WORD ERRST
1149		000010	EMTX=EMTX+1
1150		104010	DELAY=EMT+EMTX
1151	004100	002752	,WORD DLY
1152		000011	EMTX=EMTX+1
1153		104011	SAVB4=EMT+EMTX
1154	004102	003002	,WORD SVB4
1155		000012	EMTX=EMTX+1
1156		104012	RSTB4=EMT+EMTX
1157	004104	003076	,WORD RSB4
1158		000013	EMTX=EMTX+1
1159		104013	SAVB5=EMT+EMTX
1160	004106	003032	,WORD SVB5
1161		000014	EMTX=EMTX+1
1162		104014	RSTB5=EMT+EMTX
1163	004110	003124	,WORD RSB5
1164		000015	EMTX=EMTX+1
1165		104015	SAVB5S=EMT+EMTX
1166	004112	003022	,WORD SVB5S
1167		000016	EMTX=EMTX+1
1168		104016	RSTB5S=EMT+EMTX
1169	004114	00313C	,WORD RSB5S
1170		000017	EMTX=EMTX+1
1171		104017	EMALT=EMT+EMTX
1172	004116	002074	,WORD EMLT
1173		000020	EMTX=EMTX+1
1174	004120	000017	EMLI=EMT+EMTX-1
1175			
1176			STORAGE
1177			
1178	004122	000000	ICTRI OPEN
1179	004124	000000	ICNTI OPEN
1180	004126	000000	SCOPII OPEN
1181	004130	000000	RTNNOI OPEN
1182	004132	000000	NXTSTI OPEN
1183	004134	000000	CURTSTI OPEN
1184	004136	000000	UDCRTI OPEN
1185	004140	000000	UDSRTI OPEN

iCURRENT ITERATION COUNT
iACCUMULATED ITERATION COUNT
iCURRENT SCOPE POINTER

```

1187 |
1188 | |START OF TEST ROUTINES
1189 | |
1190 | |
1191 | |.....
1192 | 004142 000000 |T0| 0 |ROUTINE NUMBER 0
1193 | 004144 004174 | | T1 |ADDRESS OF NEXT ROUTINE
1194 | 004146 001790 | | 1000. |TEST ITERATION COUNT
1195 | 004150 004192 | | A1A |SCOPE ENTRY POINT
1196 | 000000 | | X=X+1 |
1197 | |.....
1198 | |TEST ABILITY TO REFERENCE UDCR WITHOUT TRAPPING
1199 | 004152 012767 004160 173624 |A1A| MOV @A1B,MACHER |SET UP BUS TRAP ERROR
1200 | 004160 009777 179026 | | TST @UDCR |REFERENCE UDCR
1201 | 004164 104005 | | |OR IF NO TRAP OCCURS
1202 | 004166 104002 |A1B| ERROR |TRAPPED WHEN REFERENCING UDCR
1203 | 004170 022626 | | POPSP2 |
1204 | 004172 104005 | | SCOPE |
1205 | |
1206 | |.....
1207 | 004174 000001 |T1| 1 |ROUTINE NUMBER 1
1208 | 004176 004226 | | T2 |ADDRESS OF NEXT ROUTINE
1209 | 004200 001790 | | 1000. |TEST ITERATION COUNT
1210 | 004202 004204 | | A2A |SCOPE ENTRY POINT
1211 | 000001 | | X=X+1 |
1212 | |.....
1213 | |TEST ABILITY TO REFERENCE UDSR WITHOUT TRAPPING
1214 | 004204 012767 004220 173572 |A2A| MOV @A2B,MACHER |SET UP BUS TRAP ERROR
1215 | 004212 009777 174776 | | TST @UDSR |REFERENCE UDSR
1216 | 004216 104005 | | |OR IF NO TRAP OCCURS
1217 | 004220 104002 |A2B| ERROR |TRAPPED WHEN REFERENCING UDSR
1218 | 004222 022626 | | POPSP2 |
1219 | 004224 104005 | | SCOPE |
1220 | |
1221 | |.....
1222 | 004226 000002 |T2| 2 |ROUTINE NUMBER 2
1223 | 004230 004260 | | T3 |ADDRESS OF NEXT ROUTINE
1224 | 004232 001790 | | 1000. |TEST ITERATION COUNT
1225 | 004234 004236 | | A3A |SCOPE ENTRY POINT
1226 | 000002 | | X=X+1 |
1227 | |.....
1228 | |TEST ABILITY TO REFERENCE UDCA1 WITHOUT TRAPPING
1229 | 004236 012767 004252 173540 |A3A| MOV @A3B,MACHER |SET UP BUS TRAP ERROR
1230 | 004244 009777 174756 | | TST @UDCA1 |REFERENCE UDCA1
1231 | 004250 104005 | | |OR IF NO TRAP OCCURS
1232 | 004252 104002 |A3B| ERROR |TRAPPED WHEN REFERENCING UDCA1
1233 | 004254 022626 | | POPSP2 |
1234 | 004256 104005 | | SCOPE |
1235 | |
1236 | |.....
1237 | 004260 000003 |T3| 3 |ROUTINE NUMBER 3
1238 | 004262 004312 | | T4 |ADDRESS OF NEXT ROUTINE
1239 | 004264 001790 | | 1000. |TEST ITERATION COUNT
1240 | 004266 004270 | | A4A |SCOPE ENTRY POINT

```

```
1241          000003          X0X+1          |
1242          |.....|
1243          |TEST ABILITY TO REFERENCE UDC12 WITHOUT TRAPPING
1244 004270 012767 004304 173506 A401 MOV  #A40,MACHER |SET UP BUS TRAP ERROR
1245 004276 009777 174726          TST  0UDCA2 |REFERENCE UDCA2
1246 004302 104005          SCOPE |OR IF NO TRAP OCCURS
1247 004304 104002 A401 ERROR |TRAPPED WHEN REFERENCING UDCA2
1248 004306 022626          POPSP2
1249 004310 104005          SCOPE
1250          |
1251          |.....|
1252 004312 000004          T41  4          |ROUTINE NUMBER 4
1253 004314 004344          T5          |ADDRESS OF NEXT ROUTINE
1254 004316 001750          1000. |TEST ITERATION COUNT
1255 004320 004322          ASA          |SCOPE ENTRY POINT
1256          000004          X0X+1          |
1257          |.....|
1258          |TEST ABILITY TO REFERENCE UDC13 WITHOUT TRAPPING
1259 004322 012767 004336 173494 A501 MOV  #A50,MACHER |SET UP BUS TRAP ERROR
1260 004330 009777 174676          TST  0UDCA3 |REFERENCE UDCA3
1261 004334 104005          SCOPE |OR IF NO TRAP OCCURS
1262 004336 104002 A501 ERROR |TRAPPED WHEN REFERENCING UDCA3
1263 004340 022626          POPSP2
1264 004342 104005          SCOPE
1265          |
1266          |.....|
1267 004344 000005          T51  5          |ROUTINE NUMBER 5
1268 004346 004376          T6          |ADDRESS OF NEXT ROUTINE
1269 004350 001750          1000. |TEST ITERATION COUNT
1270 004352 004354          A6A          |SCOPE ENTRY POINT
1271          000005          X0X+1          |
1272          |.....|
1273          |TEST ABILITY TO REFERENCE UDC14 WITHOUT TRAPPING
1274 004354 012767 004370 173422 A601 MOV  #A60,MACHER |SET UP BUS TRAP ERROR
1275 004362 009777 174646          TST  0UDCA4 |REFERENCE UDCA4
1276 004366 104005          SCOPE |OR IF NO TRAP OCCURS
1277 004370 104002 A601 ERROR |TRAPPED WHEN REFERENCING UDCA4
1278 004372 022626          POPSP2
1279 004374 104005          SCOPE
1280          |
1281          |.....|
1282 004376 000006          T61  6          |ROUTINE NUMBER 6
1283 004400 004430          T7          |ADDRESS OF NEXT ROUTINE
1284 004402 001750          1000. |TEST ITERATION COUNT
1285 004404 004406          A7A          |SCOPE ENTRY POINT
1286          000006          X0X+1          |
1287          |.....|
1288          |TEST ABILITY TO REFERENCE UDC15 WITHOUT TRAPPING
1289 004406 012767 004422 173370 A701 MOV  #A70,MACHER |SET UP BUS TRAP ERROR
1290 004414 009777 174616          TST  0UDCA5 |REFERENCE UDCA5
1291 004420 104005          SCOPE |OR IF NO TRAP OCCURS
1292 004422 104002 A701 ERROR |TRAPPED WHEN REFERENCING UDCA5
1293 004424 022626          POPSP2
1294 004426 104005          SCOPE
```

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1295 |
1296 | .....
1297 004430 000007 *7| 7 |ROUTINE NUMBER 7
1298 004432 004462 T10 |ADDRESS OF NEXT ROUTINE
1299 004434 001750 1000. |TEST ITERATION COUNT
1300 004436 004440 A0A |SCOPE ENTRY POINT
1301 | X0X+1 |
1302 | .....
1303 |TEST ABILITY TO REFERENCE UDCA6 WITHOUT TRAPPING
1304 004440 012767 004454 173336 A0A1 MOV SA00,MACHER |SET UP BUS TRAP ERROR
1305 004446 009777 174566 TST 0UDCA6 |REFERENCE UDCA6
1306 004452 104005 |SCOPE
1307 004454 104002 A0B1 ERROR |OR IF NO TRAP OCCURS
1308 004456 022626 POPSP2 |TRAPPED WHEN REFERENCING UDCA6
1309 004460 104005 SCOPE
1310 |
1311 | .....
1312 004462 000010 T101 10 |ROUTINE NUMBER 10
1313 004464 004514 T11 |ADDRESS OF NEXT ROUTINE
1314 004466 001750 1000. |TEST ITERATION COUNT
1315 004470 004472 A9A |SCOPE ENTRY POINT
1316 | X0X+1 |
1317 | .....
1318 |TEST ABILITY TO REFERENCE UDCA7 WITHOUT TRAPPING
1319 004472 012767 004506 173384 A9A1 MOV SA90,MACHER |SET UP BUS TRAP ERROR
1320 004500 009777 174536 TST 0UDCA7 |REFERENCE UDCA7
1321 004504 104005 |SCOPE
1322 004506 104002 A9B1 ERROR |OR IF NO TRAP OCCURS
1323 004510 022626 POPSP2 |TRAPPED WHEN REFERENCING UDCA7
1324 004512 104005 SCOPE
1325 |
1326 | .....
1327 004514 000011 T111 11 |ROUTINE NUMBER 11
1328 004516 004546 T12 |ADDRESS OF NEXT ROUTINE
1329 004520 001750 1000. |TEST ITERATION COUNT
1330 004522 004524 A10A |SCOPE ENTRY POINT
1331 | X0X+1 |
1332 | .....
1333 |TEST ABILITY TO REFERENCE UDCA8 WITHOUT TRAPPING
1334 004524 012767 004540 173252 A10A1 MOV SA100,MACHER |SET UP BUS TRAP ERROR
1335 004532 009777 174506 TST 0UDCA8 |REFERENCE UDCA8
1336 004536 104005 |SCOPE
1337 004540 104002 A10B1 ERROR |OR IF NO TRAP OCCURS
1338 004542 022626 POPSP2 |TRAPPED WHEN REFERENCING UDCA8
1339 004544 104005 SCOPE
1340 |
1341 | .....
1342 004546 000012 T121 12 |ROUTINE NUMBER 12
1343 004550 004600 T13 |ADDRESS OF NEXT ROUTINE
1344 004552 001750 1000. |TEST ITERATION COUNT
1345 004554 004556 A11A |SCOPE ENTRY POINT
1346 | X0X+1 |
1347 | .....
1348 |TEST ABILITY TO REFERENCE UDCA9 WITHOUT TRAPPING
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1349 004556 012767 004572 173220 A1I1A1 MOV #A110,MACHR ISET UP BUS TRAP ERROR
1350 004564 005777 174456 TST UDCA9 IREFERENCE UDCA9
1351 004570 104005 SCOPE IOR IF NO TRAP OCCURS
1352 004572 104002 A1I0I1 ERROR ITRAPPED WHEN REFERENCING UDCA9
1353 004574 022626 POPSP2
1354 004576 104005 SCOPE
1355
1356
1357 004600 000013 T13I 13 IROUTINE NUMBER 13
1358 004602 004704 T14 IADDRESS OF NEXT ROUTINE
1359 004604 000144 100. ITEST ITERATION COUNT
1360 004606 004610 B1A ISCOPE ENTRY POINT
1361 000013 XAX+1
1362
1363 ITEST THAT UDCR BIT 0 CAN BE SET AND CLEARED
1364 004610 005077 174376 B1A1 CLR UDCR ICLEAR UDCR
1365 004614 052777 000001 174370 B1B #BIT0,UDCR ISET UDCR BIT 0
1366 004622 032777 000001 174362 BIT #BIT0,UDCR ISEE IF BIT IS SET
1367 004630 001002 ONE .+6 IBRANCH IF SET
1368 004632 104002 ERROR IBIT 0 FAILED TO SET
1369 004634 104005 SCOPE
1370 004636 042777 000001 174346 B1C #BIT0,UDCR ICLEAR UDCR BIT 0
1371 004644 032777 000001 174340 BIT #BIT0,UDCR ISEE IF BIT HAS CLEARED
1372 004652 001401 BEQ .+6 IBRANCH IF BIT IS CLEAR
1373 004654 104002 ERROR IBIT 0 DID NOT CLEAR
1374 004656 052777 000001 174326 B1B #BIT0,UDCR ISET UDCR BIT 0 (RIF)
1375 004664 005777 174356 TST UDCA9 IADDRESS MODULE
1376 004670 032777 000001 174314 BIT #BIT0,UDCR
1377 004676 001001 ONE .+6
1378 004700 104002 ERROR IRIFF CLEARED BIT 0
1379 004702 104005 SCOPE
1380
1381
1382 004704 000014 T14I 14 IROUTINE NUMBER 14
1383 004706 004704 T15 IADDRESS OF NEXT ROUTINE
1384 004710 000144 100. ITEST ITERATION COUNT
1385 004712 004714 B2A ISCOPE ENTRY POINT
1386 000014 XAX+1
1387
1388 ITEST THAT UDCR BIT 1 CAN BE SET AND CLEARED
1389 004714 005077 174272 B2A1 CLR UDCR ICLEAR UDCR
1390 004720 052777 000002 174264 B1B #BIT1,UDCR ISET UDCR BIT 1
1391 004726 032777 000002 174256 BIT #BIT1,UDCR ISEE IF BIT IS SET
1392 004734 001002 ONE .+6 IBRANCH IF SET
1393 004736 104002 ERROR IUDCR BIT 1 FAILED TO SET
1394 004740 104005 SCOPE
1395 004742 042777 000002 174242 B1C #BIT1,UDCR ICLEAR UDCR BIT 1
1396 004750 032777 000002 174234 BIT #BIT1,UDCR ISEE IF BIT IS CLEAR
1397 004756 001401 BEQ .+6 IBRANCH IF BIT IS CLEAR
1398 004760 104002 ERROR IUDCR BIT 1 FAILED TO CLEAR
1399 004762 104005 SCOPE
1400
1401
1402 004764 000015 T15I 15 IROUTINE NUMBER 15
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1403 004766 009044          T16          IADDRESS OF NEXT ROUTINE
1404 004770 008144          100.        ITEST ITERATION COUNT
1405 004772 004774          B3A         ISCOPE ENTRY POINT
1406          008015          X=X+1
1407          |
1408          |.....|
1409 004774 009077 174212      B3A1 CLR      UDCR          ICLEAR UDCR
1410 005000 052777 000004 174204      BIS      #BIT2,UDCR       ISET UDCR BIT 2
1411 005006 032777 000004 174176      BIT      #BIT2,UDCR       ISEE IF BIT IS SET
1412 005014 001002          ONE        .+6          IBRANCH IF SET
1413 005016 104002          ERROR
1414 005020 104005          SCOPE
1415 005022 042777 000004 174162      BIC      #BIT2,UDCR       ICLEAR UDCR BIT 2
1416 005030 032777 000004 174154      BIT      #BIT2,UDCR       ISEE IF BIT IS CLEAR
1417 005036 001401          BEQ        .+4          IBRANCH IF BIT IS CLEAR
1418 005040 104002          ERROR
1419 005042 104005          SCOPE
1420          |
1421          |.....|
1422 005044 008016          T161       16          IROUTINE NUMBER 16
1423 005046 009124          T17        17          IADDRESS OF NEXT ROUTINE
1424 005050 008144          100.        ITEST ITERATION COUNT
1425 005052 009054          B4A         ISCOPE ENTRY POINT
1426          008016          X=X+1
1427          |
1428          |.....|
1429 005054 009077 174132      B4A1 CLR      UDCR          ICLEAR UDCR
1430 005060 052777 000010 174124      BIS      #BIT3,UDCR       ISET UDCR BIT 3
1431 005066 032777 000010 174116      BIT      #BIT3,UDCR       ISEE IF BIT IS SET
1432 005074 001002          ONE        .+6          IBRANCH IF SET
1433 005076 104002          ERROR
1434 005100 104005          SCOPE
1435 005102 042777 000010 174102      BIC      #BIT3,UDCR       ICLEAR UDCR BIT 3
1436 005110 032777 000010 174074      BIT      #BIT3,UDCR       ISEE IF BIT IS CLEAR
1437 005116 001401          BEQ        .+4          IBRANCH IF BIT IS CLEAR
1438 005120 104002          ERROR
1439 005122 104005          SCOPE
1440          |
1441          |.....|
1442 005124 008017          T171       17          IROUTINE NUMBER 17
1443 005126 009204          T20        20          IADDRESS OF NEXT ROUTINE
1444 005130 008144          100.        ITEST ITERATION COUNT
1445 005132 009134          B5A         ISCOPE ENTRY POINT
1446          008017          X=X+1
1447          |
1448          |.....|
1449 005134 009077 174052      B5A1 CLR      UDCR          ICLEAR UDCR
1450 005140 052777 000020 174044      BIS      #BIT4,UDCR       ISET UDCR BIT 4
1451 005146 032777 000020 174036      BIT      #BIT4,UDCR       ISEE IF BIT IS SET
1452 005154 001002          ONE        .+6          IBRANCH IF SET
1453 005156 104002          ERROR
1454 005160 104005          SCOPE
1455 005162 042777 000020 174022      BIC      #BIT4,UDCR       ICLEAR UDCR BIT 4
1456 005170 032777 000020 174014      BIT      #BIT4,UDCR       ISEE IF BIT IS CLEAR

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1457 005176 001401          BEQ      ,+4          IBRANCH IF BIT IS CLEAR
1458 005200 104002          ERROR
1459 005202 104005          SCOPE
1460
1461 |.....|
1462 005204 000020 T201 20          IROUTINE NUMBER 20
1463 005206 000204 T21  T21        IADDRESS OF NEXT ROUTINE
1464 005210 000144      100.        ITEST ITERATION COUNT
1465 005212 000214      06A         ISCOPE ENTRY POINT
1466 000020      X+X+1
1467 |.....|
1468 ITEST THAT UDCR BIT 0 CAN BE SET AND CLEARED
1469 005214 000077 173772 06A1 CLR      UDCR      ICLEAR UDCR
1470 005220 052777 000400 173764 BIS      0BIT0,UDCR  ISET UDCR BIT 0
1471 005226 032777 000400 173756 BIT      0BIT0,UDCR  ISEE IF BIT IS SET
1472 005234 001002      ONE      ,+4          IBRANCH IF SET
1473 005236 104002          ERROR
1474 005240 104005          SCOPE
1475 005242 042777 000400 173742 BIC      0BIT0,UDCR  ICLEAR UDCR BIT 0
1476 005250 032777 000400 173734 BIT      0BIT0,UDCR  ISEE IF BIT IS CLEAR
1477 005256 001401          BEQ      ,+4          IBRANCH IF BIT IS CLEAR
1478 005260 104002          ERROR
1479 005262 104005          SCOPE
1480
1481 |.....|
1482 005264 000021 T211 21          IROUTINE NUMBER 21
1483 005266 000344 T22  T22        IADDRESS OF NEXT ROUTINE
1484 005270 000144      100.        ITEST ITERATION COUNT
1485 005272 000274      07A         ISCOPE ENTRY POINT
1486 000021      X+X+1
1487 |.....|
1488 ITEST THAT UDCR BIT 9 CAN BE SET AND CLEARED
1489 005274 000077 173712 07A1 CLR      UDCR      ICLEAR UDCR
1490 005300 052777 001000 173704 BIS      0BIT9,UDCR  ISET UDCR BIT 9
1491 005306 032777 001000 173696 BIT      0BIT9,UDCR  ISEE IF BIT IS SET
1492 005314 001002      ONE      ,+4          IBRANCH IF SET
1493 005316 104002          ERROR
1494 005320 104005          SCOPE
1495 005322 042777 001000 173662 BIC      0BIT9,UDCR  ICLEAR UDCR BIT 9
1496 005330 032777 001000 173654 BIT      0BIT9,UDCR  ISEE IF BIT IS CLEAR
1497 005336 001401          BEQ      ,+4          IBRANCH IF BIT IS CLEAR
1498 005340 104002          ERROR
1499 005342 104005          SCOPE
1500
1501 |.....|
1502 005344 000022 T221 22          IROUTINE NUMBER 22
1503 005346 000424 T23  T23        IADDRESS OF NEXT ROUTINE
1504 005350 000144      100.        ITEST ITERATION COUNT
1505 005352 000354      08A         ISCOPE ENTRY POINT
1506 000022      X+X+1
1507 |.....|
1508 ITEST THAT UDCR BIT 10 CAN BE SET AND CLEARED
1509 005354 000077 173632 08A1 CLR      UDCR      ICLEAR UDCR
1510 005360 052777 002000 173624 BIS      0BIT10,UDCR ISET UDCR BIT 10
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1511	005366	032777	002000	173616	BIT	#BIT10,UDCR	ISEE IF BIT IS SET
1512	005374	001002			BNE	.+6	IBRANCH IF SET
1513	005376	104002			ERROR		IUDCR BIT 10 FAILED TO SET
1514	005400	104005			SCOPE		
1515	005402	042777	002000	173602	BIC	#BIT10,UDCR	ICLEAR UDCR BIT 10
1516	005410	032777	002000	173574	BIT	#BIT10,UDCR	ISEE IF BIT IS CLEAR
1517	005416	001401			BEQ	.+4	IBRANCH IF BIT IS CLEAR
1518	005420	104002			ERROR		IUDCR BIT 10 FAILED TO CLEAR
1519	005422	104005			SCOPE		
1520							
1521							
1522	005424	000023			T23I	23	ROUTINE NUMBER 23
1523	005426	000504				T24	ADDRESS OF NEXT ROUTINE
1524	005430	000144				100.	TEST ITERATION COUNT
1525	005432	000434				B9A	SCOPE ENTRY POINT
1526		000023				X=X+1	
1527							
1528							
1529	005434	000077	173552		B9AI	CLR UDCR	ICLEAR UDCR
1530	005440	052777	004000	173544	BIS	#BIT11,UDCR	ISET UDCR BIT 11
1531	005446	032777	004000	173536	BIT	#BIT11,UDCR	ISEE IF BIT IS SET
1532	005454	001002			BNE	.+6	IBRANCH IF SET
1533	005456	104002			ERROR		IUDCR BIT 11 FAILED TO SET
1534	005460	104005			SCOPE		
1535	005462	042777	004000	173522	BIC	#BIT11,UDCR	ICLEAR UDCR BIT 11
1536	005470	032777	004000	173514	BIT	#BIT11,UDCR	ISEE IF BIT IS CLEAR
1537	005476	001401			BEQ	.+4	IBRANCH IF BIT IS CLEAR
1538	005500	104002			ERROR		IUDCR BIT 11 FAILED TO CLEAR
1539	005502	104005			SCOPE		
1540							
1541							
1542	005504	000024			T24I	24	ROUTINE NUMBER 24
1543	005506	000540				T25	ADDRESS OF NEXT ROUTINE
1544	005510	000005				5.	TEST ITERATION COUNT
1545	005512	000514				C1A	SCOPE ENTRY POINT
1546		000024				X=X+1	
1547							
1548							
1549	005514	052777	000001	173470	C1AI	BIS #BIT0,UDCR	ISET UDCR BIT 0
1550	005522	104004			SRESET		ISSUE RESET TO CLEAR BIT
1551	005524	032777	000001	173460	BIT	#BIT0,UDCR	ISEE IF BIT IS CLEAR
1552	005532	001401			BEQ	.+4	IBRANCH IF BIT IS CLEAR
1553	005534	104002			ERROR		IRESET FAILED TO CLEAR UDCR BIT 0
1554	005536	104005			SCOPE		
1555							
1556							
1557	005540	000025			T25I	25	ROUTINE NUMBER 25
1558	005542	000574				T26	ADDRESS OF NEXT ROUTINE
1559	005544	000005				5.	TEST ITERATION COUNT
1560	005546	000550				C2A	SCOPE ENTRY POINT
1561		000025				X=X+1	
1562							
1563							
1564	005550	052777	000002	173434	C2AI	BIS #BIT1,UDCR	ISET UDCR BIT 1

1565	005556	104004			SRESET		ISSUE RESET TO CLEAR BIT
1566	005560	032777	000002	173424	BIT	#BIT1,UDCR	ISSE IF BIT IS CLEAR
1567	005566	001401			BEG	,+4	IBRANCH IF BIT IS CLEAR
1568	005570	104002			ERROR		IRESET FAILED TO CLEAR UDCR BIT 1
1569	005572	104005			SCOPE		
1570							
1571						
1572	005574	000026			T26:	26	ROUTINE NUMBER 26
1573	005576	000630				T27	ADDRESS OF NEXT ROUTINE
1574	005600	000005				9,	ITEST ITERATION COUNT
1575	005602	000604				C3A	SCOPE ENTRY POINT
1576		000026				X=X+1	
1577						
1578					TEST THAT RESET INSTRUCTION CLEARS UDCR BIT 2		
1579	005604	032777	000004	173400	C3A:	018	ISSET UDCR BIT 2
1580	005612	104004			SRESET		ISSUE RESET TO CLEAR BIT
1581	005614	032777	000004	173370	BIT	#BIT2,UDCR	ISSE IF BIT IS CLEAR
1582	005622	001401			BEG	,+4	IBRANCH IF BIT IS CLEAR
1583	005624	104002			ERROR		IRESET FAILED TO CLEAR UDCR BIT 2
1584	005626	104005			SCOPE		
1585							
1586						
1587	005630	000027			T27:	27	ROUTINE NUMBER 27
1588	005632	000604				T30	ADDRESS OF NEXT ROUTINE
1589	005634	000005				9,	ITEST ITERATION COUNT
1590	005636	000640				C4A	SCOPE ENTRY POINT
1591		000027				X=X+1	
1592						
1593					TEST THAT RESET INSTRUCTION CLEARS UDCR BIT 3		
1594	005640	032777	000010	173344	C4A:	018	ISSET UDCR BIT 3
1595	005646	104004			SRESET		ISSUE RESET TO CLEAR BIT
1596	005650	032777	000010	173334	BIT	#BIT3,UDCR	ISSE IF BIT IS CLEAR
1597	005656	001401			BEG	,+4	IBRANCH IF BIT IS CLEAR
1598	005660	104002			ERROR		IRESET FAILED TO CLEAR UDCR BIT 3
1599	005662	104005			SCOPE		
1600							
1601						
1602	005664	000030			T30:	30	ROUTINE NUMBER 30
1603	005666	000720				T31	ADDRESS OF NEXT ROUTINE
1604	005670	000005				9,	ITEST ITERATION COUNT
1605	005672	000674				C5A	SCOPE ENTRY POINT
1606		000030				X=X+1	
1607						
1608					TEST THAT RESET INSTRUCTION CLEARS UDCR BIT 4		
1609	005674	032777	000020	173310	C5A:	018	ISSET UDCR BIT 4
1610	005702	104004			SRESET		ISSUE RESET TO CLEAR BIT
1611	005704	032777	000020	173300	BIT	#BIT4,UDCR	ISSE IF BIT IS CLEAR
1612	005712	001401			BEG	,+4	IBRANCH IF BIT IS CLEAR
1613	005714	104002			ERROR		IRESET FAILED TO CLEAR UDCR BIT 4
1614	005716	104005			SCOPE		
1615							
1616						
1617	005720	000031			T31:	31	ROUTINE NUMBER 31
1618	005722	000754				T32	ADDRESS OF NEXT ROUTINE

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1619 005724 000005          9;          ITEST ITERATION COUNT
1620 005726 000730          C6A        ISCOPE ENTRY POINT
1621          000031          X=X+1      I
1622          I.....I
1623          ITEST THAT RESET INSTRUCTION CLEARS UDCR BIT 5
1624 005730 052777 000040 173254 C6A1  BIS      #BIT5,UDCR  ISET UDCR BIT 5
1625 005736 104004          SRESET    IISSUE RESET TO CLEAR BIT
1626 005740 032777 000040 173244  BIT      #BIT5,UDCR  ISEE IF BIT IS CLEAR
1627 005746 001401          BEQ      ,+4      IBRANCH IF BIT IS CLEAR
1628 005750 104002          ERROR    IRESET FAILED TO CLEAR UDCR BIT 5
1629 005752 104005          SCOPE
1630          I
1631          I.....I
1632 005754 000032          T321  32          IROUTINE NUMBER 32
1633 005756 000010          T33          IADDRESS OF NEXT ROUTINE
1634 005760 000005          9;          ITEST ITERATION COUNT
1635 005762 000764          C7A        ISCOPE ENTRY POINT
1636          000032          X=X+1      I
1637          I.....I
1638          ITEST THAT RESET INSTRUCTION CLEARS UDCR BIT 6
1639 005764 052777 000100 173220 C7A1  BIS      #BIT6,UDCR  ISET UDCR BIT 6
1640 005772 104004          SRESET    IISSUE RESET TO CLEAR BIT
1641 005774 032777 000100 173210  BIT      #BIT6,UDCR  ISEE IF BIT IS CLEAR
1642 006002 001401          BEQ      ,+4      IBRANCH IF BIT IS CLEAR
1643 006004 104002          ERROR    IRESET FAILED TO CLEAR UDCR BIT 6
1644 006006 104005          SCOPE
1645          I
1646          I.....I
1647 006010 000033          T331  33          IROUTINE NUMBER 33
1648 006012 000044          T34          IADDRESS OF NEXT ROUTINE
1649 006014 000005          9;          ITEST ITERATION COUNT
1650 006016 000020          C8A        ISCOPE ENTRY POINT
1651          000033          X=X+1      I
1652          I.....I
1653          ITEST THAT RESET INSTRUCTION CLEARS UDCR BIT 7
1654 006020 052777 000200 173164 C8A1  BIS      #BIT7,UDCR  ISET UDCR BIT 7
1655 006026 104004          SRESET    IISSUE RESET TO CLEAR BIT
1656 006030 032777 000200 173154  BIT      #BIT7,UDCR  ISEE IF BIT IS CLEAR
1657 006036 001401          BEQ      ,+4      IBRANCH IF BIT IS CLEAR
1658 006040 104002          ERROR    IRESET FAILED TO CLEAR UDCR BIT 7
1659 006042 104005          SCOPE
1660          I
1661          I.....I
1662 006044 000034          T341  34          IROUTINE NUMBER 34
1663 006046 000100          T35          IADDRESS OF NEXT ROUTINE
1664 006050 000005          9;          ITEST ITERATION COUNT
1665 006052 000054          C9A        ISCOPE ENTRY POINT
1666          000034          X=X+1      I
1667          I.....I
1668          ITEST THAT RESET INSTRUCTION CLEARS UDCR BIT 8
1669 006054 052777 000400 173130 C9A1  BIS      #BIT8,UDCR  ISET UDCR BIT 8
1670 006062 104004          SRESET    IISSUE RESET TO CLEAR BIT
1671 006064 032777 000400 173120  BIT      #BIT8,UDCR  ISEE IF BIT IS CLEAR
1672 006072 001401          BEQ      ,+4      IBRANCH IF BIT IS CLEAR
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1673 006074 104022          ERROR          IRPST FAILED TO CLEAR UDCR BIT 8
1674 006076 104035          SCOPE
1675
1676 |
1677 |.....|
1677 006100 000035 *35: 35          ROUTINE NUMBER 35
1678 006102 006134          T36          ADDRESS OF NEXT ROUTINE
1679 006104 000025          S.          TEST ITERATION COUNT
1680 006106 006110          C10A        SCOPE ENTRY POINT
1681          000035          X=X+1
1682 |
1683 |.....|
1683 ITTEST THAT RESET INSTRUCTION CLEARS UDCR BIT 9
1684 006110 052777 001000 173074 C10A1 BIS #BIT9,UDCR ISET UDCR BIT 9
1685 006116 104024          SRESET     ISSUE RESET TO CLEAR BIT
1686 006120 052777 001000 173064 BIT #BIT9,UDCR ISEE IF BIT IS CLEAR
1687 006126 001401          BEQ ,+4     BRANCH IF BIT IS CLEAR
1688 006130 104002          ERROR      IRESET FAILED TO CLEAR UDCR BIT 9
1689 006132 104035          SCOPE
1690 |
1691 |.....|
1692 006134 000036 *36: 36          ROUTINE NUMBER 36
1693 006136 006170          T37          ADDRESS OF NEXT ROUTINE
1694 006140 000005          S.          TEST ITERATION COUNT
1695 006142 006144          C11A        SCOPE ENTRY POINT
1696          000036          X=X+1
1697 |
1698 |.....|
1698 ITTEST THAT RESET INSTRUCTION CLEARS UDCR BIT 10
1699 006144 052777 002000 173040 C11A1 BIS #BIT10,UDCR ISET UDCR BIT 10
1700 006152 104004          SRESET     ISSUE RESET TO CLEAR BIT
1701 006154 052777 002000 173030 BIT #BIT10,UDCR ISEE IF BIT IS CLEAR
1702 006162 001401          BEQ ,+4     BRANCH IF BIT IS CLEAR
1703 006164 104002          ERROR      IRESET FAILED TO CLEAR UDCR BIT 10
1704 006166 104035          SCOPE
1705 |
1706 |.....|
1707 006170 000037 *37: 37          ROUTINE NUMBER 37
1708 006172 006224          T40          ADDRESS OF NEXT ROUTINE
1709 006174 000005          S.          TEST ITERATION COUNT
1710 006176 006200          C12A        SCOPE ENTRY POINT
1711          000037          X=X+1
1712 |
1713 |.....|
1713 ITTEST THAT RESET INSTRUCTION CLEARS UDCR BIT 11
1714 006200 052777 004000 173004 C12A1 BIS #BIT11,UDCR ISET UDCR BIT 11
1715 006206 104004          SRESET     ISSUE RESET TO CLEAR BIT
1716 006210 052777 004000 172774 BIT #BIT11,UDCR ISEE IF BIT IS CLEAR
1717 006216 001401          BEQ ,+4     BRANCH IF BIT IS CLEAR
1718 006220 104002          ERROR      IRESET FAILED TO CLEAR UDCR BIT 11
1719 006222 104005          SCOPE
1720 |
1721 |.....|
1722 006224 000040 *40: 40          ROUTINE NUMBER 40
1723 006226 006200          T41          ADDRESS OF NEXT ROUTINE
1724 006230 000005          S.          TEST ITERATION COUNT
1725 006232 006234          C13A        SCOPE ENTRY POINT
1726          000040          X=X+1
```

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1727 | .....  
1728 | ITEST THAT RESET INSTRUCTION CLEARS UDCR BIT 12  
1729 | 006234 052777 010000 172750 C13AI BIS #BIT12,UDCR ISET UDCR BIT 12  
1730 | 006242 104004 SRESET IISSUE RESET TO CLEAR BIT  
1731 | 006244 032777 010000 172740 BIT #BIT12,UDCR ISEE IF BIT IS CLEAR  
1732 | 006252 001401 BEQ ,+4 IBRANCH IF BIT IS CLEAR  
1733 | 006254 104002 ERROR IRESET FAILED TO CLEAR UDCR BIT 12  
1734 | 006256 104005 SCOPE  
1735 | |  
1736 | .....  
1737 | T41I 41 IROUTINE NUMBER 41  
1738 | 006260 000041 T42 IADDRESS OF NEXT ROUTINE  
1739 | 006262 006314 S, ITEST ITERATION COUNT  
1740 | 006264 000005 C14A ISCOPE ENTRY POINT  
1741 | 006266 006270 X0X+1  
1742 | |  
1743 | .....  
1744 | ITEST THAT RESET INSTRUCTION CLEARS UDCR BIT 13  
1745 | 006270 052777 020000 172714 C14AI BIS #BIT13,UDCR ISET UDCR BIT 13  
1746 | 006276 104004 SRESET IISSUE RESET TO CLEAR BIT  
1747 | 006300 032777 020000 172704 BIT #BIT13,UDCR ISEE IF BIT IS CLEAR  
1748 | 006306 001401 BEQ ,+4 IBRANCH IF BIT IS CLEAR  
1749 | 006310 104002 ERROR IRESET FAILED TO CLEAR UDCR BIT 13  
1750 | 006312 104005 SCOPE  
1751 | |  
1752 | .....  
1753 | T42I 42 IROUTINE NUMBER 42  
1754 | 006314 000042 T43 IADDRESS OF NEXT ROUTINE  
1755 | 006316 006350 S, ITEST ITERATION COUNT  
1756 | 006320 000005 C15A ISCOPE ENTRY POINT  
1757 | 006322 006324 X0X+1  
1758 | |  
1759 | .....  
1760 | ITEST THAT RESET INSTRUCTION CLEARS UDCR BIT 14  
1761 | 006324 052777 040000 172600 C15AI BIS #BIT14,UDCR ISET UDCR BIT 14  
1762 | 006332 104004 SRESET IISSUE RESET TO CLEAR BIT  
1763 | 006334 032777 040000 172650 BIT #BIT14,UDCR ISEE IF BIT IS CLEAR  
1764 | 006342 001401 BEQ ,+4 IBRANCH IF BIT IS CLEAR  
1765 | 006344 104002 ERROR IRESET FAILED TO CLEAR UDCR BIT 14  
1766 | 006346 104005 SCOPE  
1767 | |  
1768 | .....  
1769 | T43I 43 IROUTINE NUMBER 43  
1770 | 006350 000043 T44 IADDRESS OF NEXT ROUTINE  
1771 | 006352 006404 S, ITEST ITERATION COUNT  
1772 | 006354 000005 C16A ISCOPE ENTRY POINT  
1773 | 006356 006360 X0X+1  
1774 | |  
1775 | .....  
1776 | ITEST THAT RESET INSTRUCTION CLEARS UDCR BIT 15  
1777 | 006360 052777 100000 172624 C16AI BIS #BIT15,UDCR ISET UDCR BIT 15  
1778 | 006366 104004 SRESET IISSUE RESET TO CLEAR BIT  
1779 | 006370 032777 100000 172614 BIT #BIT15,UDCR ISEE IF BIT IS CLEAR  
1780 | 006376 001401 BEQ ,+4 IBRANCH IF BIT IS CLEAR  
1781 | 006400 104002 ERROR IRESET FAILED TO CLEAR UDCR BIT 15  
1782 | 006402 104005 SCOPE
```

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1781 |.....|
1782 006404 000044 |T44| 44 |ROUTINE NUMBER 44 |
1783 006406 006430 | | T45 |ADDRESS OF NEXT ROUTINE |
1784 006410 000012 | | 10 |TEST ITERATION COUNT |
1785 006412 006414 | | C17A |SCOPE ENTRY POINT |
1786 | | 000044 | | X=X+1 | |
1787 |.....|
1788 |TEST THAT INIT CLEARS SCAN REGISTER |
1789 006414 104004 |C17A| SRESET |
1790 006416 109777 |172572| TSTB OUDSR |TEST IF SCAN REGISTER = 0 |
1791 006422 001401 | | BEQ ,+6 |BRANCH IF REGISTER = 0 |
1792 006424 104007 | | ERRORS |
1793 006426 104005 | | SCOPE |
1794 | | |
1795 |.....|
1796 006430 000045 |T45| 45 |ROUTINE NUMBER 45 |
1797 006432 006694 | | T46 |ADDRESS OF NEXT ROUTINE |
1798 006434 000062 | | 90 |TEST ITERATION COUNT |
1799 006436 006440 | | D1A |SCOPE ENTRY POINT |
1800 | | 000045 | | X=X+1 | |
1801 |.....|
1802 |TEST THAT X SCAN REG COUNTS CORRECTLY USING MAINT CLOCK |
1803 006440 104004 |D1A| SRESET |CLEAR SCAN REGISTER |
1804 006442 009777 |172534| TST OMCLK |GENERATE STROBE |
1805 006446 127727 |172542| 000040| CMPB OUDSR,#40 |CHECK COUNT |
1806 006454 001402 | | BEQ ,+6 |BRANCH IF COUNT CORRECT |
1807 006456 104007 | | ERRORS |IX DID NOT COUNT TO 1 |
1808 006460 104005 | | SCOPE |
1809 006462 009777 |172534| TST OMCLK |
1810 006466 127727 |172522| 000100| CMPB OUDSR,#100 |
1811 006474 001402 | | BEQ ,+6 |
1812 006476 104007 | | ERRORS |IX DID NOT COUNT TO 2 |
1813 006500 104005 | | SCOPE |
1814 006502 009777 |172514| TST OMCLK |
1815 006506 127727 |172502| 000140| CMPB OUDSR,#140 |
1816 006514 001402 | | BEQ ,+6 |
1817 006516 104007 | | ERRORS |IX DID NOT COUNT TO 3 |
1818 006520 104005 | | SCOPE |
1819 006522 009777 |172474| TST OMCLK |
1820 006526 127727 |172462| 000200| CMPB OUDSR,#200 |
1821 006534 001402 | | BEQ ,+6 |
1822 006536 104007 | | ERRORS |IX DID NOT COUNT TO 4 |
1823 006540 104005 | | SCOPE |
1824 006542 009777 |172454| TST OMCLK |
1825 006546 127727 |172442| 000240| CMPB OUDSR,#240 |
1826 006554 001402 | | BEQ ,+6 |
1827 006556 104007 | | ERRORS |IX DID NOT COUNT TO 5 |
1828 006560 104005 | | SCOPE |
1829 006562 009777 |172434| TST OMCLK |
1830 006566 127727 |172422| 000300| CMPB OUDSR,#300 |
1831 006574 001402 | | BEQ ,+6 |
1832 006576 104007 | | ERRORS |IX DID NOT COUNT TO 6 |
1833 006600 104005 | | SCOPE |
1834 006602 009777 |172414| TST OMCLK |
```

1835	006606	127727	172402	000340	CMPB	0UDSR,0340	
1836	006614	001402			BEG	,+6	
1837	006616	104007			ERRORS		ix DID NOT COUNT TO 7
1838	006620	104005			SCOPE		
1839	006622	009777	172364		TST	0UDCR	
1840	006626	001402			BEG	,+6	ibRANCH IF CONT REG CLEAR
1841	006630	104007			ERRORS		
1842	006632	104005			SCOPE		
1843	006634	009777	172362		TST	0MCLK	
1844	006640	027727	172346	100000	CMP	0UDCR,0BITIS	ionLY SCAN ERROR SHOULD BE SET
1845	006646	001401			BEG	,+6	
1846	006650	104007			ERRORS		
1847	006652	104005			SCOPE		
1848							
1849							
1850	006654	000046					
1851	006656	007110					
1852	006660	000062					
1853	006662	006664					
1854		000046					
1855							
1856							
1857	006664	104004					
1858	006666	012777	001400	172316	MOV	0BIT9BIT0,0UDCR	iset STOP X+MAIN+
1859	006674	009777	172322		TST	0MCLK	igENERATE STROBE
1860	006700	127727	172310	000004	CMPB	0UDSR,04	icHECK COUNT
1861	006706	001402			BEG	,+6	ibRANCH IF COUNT CORRECT
1862	006710	104007			ERRORS		iy DID NOT COUNT TO 1
1863	006712	104005			SCOPE		
1864	006714	009777	172302		TST	0MCLK	
1865	006720	127727	172270	000010	CMPB	0UDSR,010	
1866	006726	001402			BEG	,+6	
1867	006730	104007			ERRORS		iy DID NOT COUNT TO 2
1868	006732	104005			SCOPE		
1869	006734	009777	172262		TST	0MCLK	
1870	006740	127727	172250	000014	CMPB	0UDSR,014	
1871	006746	001402			BEG	,+6	
1872	006750	104007			ERRORS		iy DID NOT COUNT TO 3
1873	006752	104005			SCOPE		
1874	006754	009777	172242		TST	0MCLK	
1875	006760	127727	172230	000020	CMPB	0UDSR,020	
1876	006766	001402			BEG	,+6	
1877	006770	104007			ERRORS		iy DID NOT COUNT TO 4
1878	006772	104005			SCOPE		
1879	006774	009777	172222		TST	0MCLK	
1880	007000	127727	172210	000024	CMPB	0UDSR,024	
1881	007006	001402			BEG	,+6	
1882	007010	104007			ERRORS		iy DID NOT COUNT TO 5
1883	007012	104005			SCOPE		
1884	007014	009777	172202		TST	0MCLK	
1885	007020	127727	172170	000030	CMPB	0UDSR,030	
1886	007026	001402			BEG	,+6	
1887	007030	104007			ERRORS		iy DID NOT COUNT TO 6
1888	007032	104005			SCOPE		

```

|
|.....
|T461 46 ROUTINE NUMBER 46
| T47 ADDRESS OF NEXT ROUTINE
| 50; TEST ITERATION COUNT
| D24 SCOPE ENTRY POINT
| X=X+1
|
|.....

```

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|.....
|TEST THAT Y SCAN REG COUNTS CORRECTLY USING MAIN CLOCK
|D241 SRESET CLEAR SCAN REGISTER

```



```
1889 007034 009777 172162          TST      @MCLK
1890 007040 127727 172150 000034        CMPB     @UDSR,#34
1891 007046 001402          BEQ      .+6
1892 007050 104007          ERRORS                      ;Y DID NOT COUNT TO 7
1893 007052 104005          SCOPE
1894 007054 027727 172132 001400        CMP      @UDCR,@BIT0BIT1@      ;BR IF ONLY STOP X+MAINT SET
1895 007062 001402          BEQ      .+6
1896 007064 104007          ERRORS
1897 007066 104005          SCOPE
1898 007070 009777 172126          TST      @MCLK                      ;STROBE TO ERROR
1899 007074 027727 172112 101400        CMP      @UDCR,@BIT5BIT4BIT3BIT2@ ;ONLY SCAN ERR,STP X,MAINT SET
1900 007102 001401          BEQ      .+4
1901 007104 104007          ERRORS
1902 007106 104005          SCOPE
1903
1904
1905 007110 000047          |.....|
1906 007112 007244          T47: 47          ;ROUTINE NUMBER 47
1907 007114 000062          T50          ;ADDRESS OF NEXT ROUTINE
1908 007116 007120          D3A          ;TEST ITERATION COUNT
1909          000047          X+X+1          ;SCOPE ENTRY POINT
1910          |.....|
1911          ;TEST THAT WD SCAN REG COUNTS CORRECTLY USING MAINT CLK
1912 007120 104004          D3A: SRESET          ;CLEAR SCAN REGISTER
1913 007122 012777 003400 172062        MOV      @BIT0BIT1BIT0BIT0@, @UDCR ;SET STP X+Y+MAINT
1914 007130 009777 172066          TST      @MCLK          ;GENERATE STROBE
1915 007134 127727 172054 000001        CMPB     @UDSR,#1          ;CHECK COUNT
1916 007142 001402          BEQ      .+6          ;BRANCH IF COUNT CORRECT
1917 007144 104007          ERRORS                      ;W DID NOT COUNT TO 1
1918 007146 104005          SCOPE
1919 007150 009777 172046          TST      @MCLK
1920 007154 127727 172034 000002        CMPB     @UDSR,#2          ;
1921 007162 001402          BEQ      .+6
1922 007164 104007          ERRORS                      ;W DID NOT COUNT TO 2
1923 007166 104005          SCOPE
1924 007170 009777 172026          TST      @MCLK
1925 007174 127727 172014 000003        CMPB     @UDSR,#3          ;
1926 007202 001402          BEQ      .+6
1927 007204 104007          ERRORS                      ;W DID NOT COUNT TO 3
1928 007206 104005          SCOPE
1929 007210 027727 171776 003400        CMP      @UDCR,@BIT0BIT1@;BIT1@
1930 007216 001402          BEQ      .+6          ;BRANCH IF ONLY STP X+Y+MAINT SET
1931 007220 104007          ERRORS
1932 007222 104005          SCOPE
1933 007224 009777 171772          TST      @MCLK                      ;STROBE TO ERROR
1934 007230 027727 171756 103400        CMP      @UDCR,@BIT5BIT4BIT3BIT2@
1935 007236 001401          BEQ      .+4          ;BR IF ONLY SCAN ERROR,STP X+Y,MAINT SET
1936 007240 104007          ERRORS
1937 007242 104005          SCOPE
1938
1939          |.....|
1940 007244 000050          T50: 50          ;ROUTINE NUMBER 50
1941 007246 007334          T51          ;ADDRESS OF NEXT ROUTINE
1942 007250 000144          100.          ;TEST ITERATION COUNT
```

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1943 007252 007254          E1A          iSCOPE ENTRY POINT          •
1944          000090          X0X+1          i          •
1945          .....
1946          iTEST THAT DEF INT CAN BE GENERATED BY MAINT + DEF INT EN          •
1947 007254 012777 000402 171730 E1A1  MOV      #BITC2,0UDCR  iSET MAINT+DEF INT EN          •
1948 007262 032777 010000 171722          BIT      #BIT12,0UDCR  iCHECK DEF INT BEING GENERATED          •
1949 007270 001002          BNE      .+6          iBRANCH IF SET          •
1950 007272 104007          ERRORS          •
1951 007274 104005          SCOPE          •
1952 007276 032777 020000 171706          BIT      #BIT13,0UDCR  iCHECK IF IMM INT SET          •
1953 007304 001402          BEQ      .+6          iBRANCH IF CLEAR          •
1954 007306 104007          ERRORS          •
1955 007310 104005          SCOPE          •
1956 007312 042777 000400 171672          BIC      #BIT8,0UDCR   iCLEAR MAINT FLOP          •
1957 007320 032777 010000 171664          BIT      #BIT12,0UDCR  iCHECK IF DEF INT CLEAR          •
1958 007326 001401          BEQ      .+4          iBRANCH IF CLEAR          •
1959 007330 104007          ERRORS          •
1960 007332 104005          SCOPE          •
1961          i          •
1962          .....
1963 007334 000091          T511  91          iROUTINE NUMBER 91          •
1964 007336 007442          T52          iADDRESS OF NEXT ROUTINE          •
1965 007340 000012          10;          iTEST ITERATION COUNT          •
1966 007342 007344          E2A          iSCOPE ENTRY POINT          •
1967          X0X+1          i          •
1968          .....
1969          iTEST THAT DEF SCAN STARTS AND SETS SCAN ERROR, NO TRAP #807          •
1970 007344 104004          E2A1  SRESET          •
1971 007346 012777 000412 171636          MOV      #BITC1,0UDCR  iSET MAINT,DEF INT,DEF SCAN EN          •
1972 007354 104010          DELAY          •
1973 007356 000001          1          •
1974 007360 032777 100000 171624          BIT      #BIT15,0UDCR  iWAIT 1 MS          •
1975 007366 001002          BNE      .+6          iDID SCAN ERROR SET?          •
1976 007370 104007          ERRORS          iBRANCH IF BIT IS SET          •
1977 007372 104005          SCOPE          •
1978 007374 032777 000040 171610          BIT      #BIT5,0UDCR   iDID SCAN ERROR SET DEF DONE?          •
1979 007402 001002          BNE      .+6          iBRANCH IF BIT IS SET          •
1980 007404 104007          ERRORS          •
1981 007406 104005          SCOPE          •
1982 007410 104004          SRESET          •
1983 007412 032777 100000 171572          BIT      #BIT15,0UDCR  iDID SCAN ERROR CLEAR?          •
1984 007420 001402          BEQ      .+6          iBRANCH IF CLEAR          •
1985 007422 104007          ERRORS          •
1986 007424 104005          SCOPE          •
1987 007426 032777 000040 171556          BIT      #BIT5,0UDCR   iDID DEF SCAN DONE CLEAR?          •
1988 007434 001401          BEQ      .+4          iBRANCH IF CLEAR          •
1989 007436 104007          ERRORS          •
1990 007440 104005          SCOPE          •
1991          i          •
1992          .....
1993 007442 000092          T521  92          iROUTINE NUMBER 92          •
1994 007444 007516          T53          iADDRESS OF NEXT ROUTINE          •
1995 007446 000012          10;          iTEST ITERATION COUNT          •
1996 007450 007452          E20A          iSCOPE ENTRY POINT          •

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1997      000092      XXX+1      i
1998      |
1999      |.....|
2000      007452  104004      E20A1  SRESET      iINITIALIZE CONTROL
2001      007454  012777  000412  171530      MOV      @BITC1,@UDCR      iSET MAINT,DEF INT,DEF SCAN EN
2002      007462  032777  000001  171522      BIT      @BIT0,@UDCR      iDID RIP SET WITH START SCAN
2003      007470  001402      BEQ      ,+4      iBRANCH IF RIP CLEAR
2004      007472  104007      ERRORS
2005      007474  104005      SCOPE
2006      007476  104010      DELAY      iWAIT FOR SCAN DONE
2007      007500  000001
2008      007502  022777  120452  171502      CMP      @120452,@UDCR      iSCAN ERR,DEF INT,MAINT,DEF SCAN DONE
2009      007510  001001      BNE      ,+4      iDEF SCAN EN,DEF INT EN
2010      007512  104007      ERRORS      iSHOULD ALL BE SET
2011      007514  104005      SCOPE
2012      |
2013      |.....|
2014      007516  000093      T531    93      iROUTINE NUMBER 93
2015      007520  007572      T54      iADDRESS OF NEXT ROUTINE
2016      007522  000012      10:      iTEST ITERATION COUNT
2017      007524  007526      E2CA    iSCOPE ENTRY POINT
2018      000093      XXX+1      i
2019      |.....|
2020      |TEST THAT RIP DOES NOT CLEAR WITH DEF START SCAN
2021      007526  104004      E2CA1  SRESET      iINITIALIZE CONTROL
2022      007530  012777  000413  171494      MOV      @BITC1@BIT0,@UDCR      iSET MAINT,DEF INT,DEF SCAN,RIP
2023      007536  032777  000001  171446      BIT      @BIT0,@UDCR      iDID RIP CLEAR WITH START SCAN
2024      007544  001002      BNE      ,+4      iBRANCH IF RIP SET
2025      007546  104007      ERRORS
2026      007550  104005      SCOPE
2027      007552  104010      DELAY
2028      007554  000001
2029      007556  022777  120453  171426      CMP      @120453,@UDCR      iSCAN ERR,D INT,MAINT,D SCAN DONE
2030      007564  001001      BNE      ,+4      iD SCAN EN,D INT EN ALL SET
2031      007566  104007      ERRORS
2032      007570  104005      SCOPE
2033      |
2034      |.....|
2035      007572  000094      T541    94      iROUTINE NUMBER 94
2036      007574  007646      T55      iADDRESS OF NEXT ROUTINE
2037      007576  000012      10:      iTEST ITERATION COUNT
2038      007600  007602      E3A     iSCOPE ENTRY POINT
2039      000094      XXX+1      i
2040      |.....|
2041      |TEST THAT SCAN ERROR SETS SCAN VALUE TO ALL ONES
2042      007602  104004      E3A1  SRESET
2043      007604  012777  000416  171400      MOV      @BITC1@BIT2,@UDCR      iSET MAINT,DEF INT,DEF SCAN EN,IMM EN
2044      007612  104010      DELAY      iWAIT 1 MS
2045      007614  000001
2046      007616  127727  171372  000377      CMPB     @UDSR,@377      iCHECK IF SCAN VALUE 377
2047      007624  001402      BEQ      ,+4      iBRANCH IF SCAN = 377
2048      007626  104007      ERRORS
2049      007630  104005      SCOPE
2050      007632  104004      SRESET
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2051 007634 104777 171354      TSTB   0UDSR      IDID RESET CLEAR SCAN REGISTER?
2052 007640 001401      BEQ    ,+4       IBRANCH IF CLEARED
2053 007642 104007      ERRORS
2054 007644 104005      SCOPE
2055
2056 |
2057 007646 000095      T591   95        IROUTINE NUMBER 95
2058 007650 007736      T56    T56        IADDRESS OF NEXT ROUTINE
2059 007652 000144      100.   100.       ITEST ITERATION COUNT
2060 007654 007696      E4A    E4A        ISCOPE ENTRY POINT
2061      000095      X=X+1
2062 |
2063 |TEST THAT DEF SCAN START CLEARS SCAN ERROR + DEF SCAN DONE
2064 007656 012777 000412 171326  E4A1   MOV    @BITC1,0UDCR  ISET MAINT,DEF INT+SCAN EN
2065 007664 104010      DELAY
2066 007666 000001      1
2067 007670 042777 000012 171314  BIC   @BIT1|BIT3,0UDCR  ISET DEF INT EN LOW+HIGH+CLEAR DEF SCAN EN
2068 007676 052777 000002 171306  BIS   @BIT1,0UDCR     ITO CLEAR SCAN EN+DONE
2069 007704 000240      NOP
2070 007706 032777 100000 171276  BIT   @BIT15,0UDCR   IWAIT FOR DLY CLEAR DONE
2071 007714 001402      BEQ    ,+4       IDID SCAN ERROR CLEAR?
2072 007716 104007      ERRORS
2073 007720 104005      SCOPE
2074 007722 032777 000040 171262  BIT   @BIT9,0UDCR    IDID DEF SCAN DONE CLEAR?
2075 007730 001401      BEQ    ,+4       IBRANCH IF CLEAR
2076 007732 104007      ERRORS
2077 007734 104005      SCOPE
2078 |
2079 |
2080 007736 000096      T561   96        IROUTINE NUMBER 96
2081 007740 010004      T59    T59        IADDRESS OF NEXT ROUTINE
2082 007742 000144      100.   100.       ITEST ITERATION COUNT
2083 007744 007746      E5A    E5A        ISCOPE ENTRY POINT
2084      000096      X=X+1
2085 |
2086 |TEST THAT DEF SCAN ENABLE WILL INHIBIT SCAN + RIF CLEARS DONE
2087 007746 012777 000403 171236  E5A1   MOV    @BITC2|BIT0,0UDCR  ISET MAINT,RIF+DEF INT
2088 007754 104010      DELAY
2089 007756 000001      1
2090 007760 032777 000040 171224  BIT   @BIT9,0UDCR    ICHECK IF DEF SCAN DONE CLEAR
2091 007766 001402      BEQ    ,+4       IBRANCH IF CLEAR
2092 007770 104007      ERRORS
2093 007772 104005      SCOPE
2094 007774 052777 000014 171210  BIS   @BIT3|BIT2,0UDCR  ISET DEF SCAN EN,IMM INT
2095 010002 104010      DELAY
2096 010004 000001      1
2097 010006 042777 000400 171176  BIC   @BIT0,0UDCR    ICLEAR TO PREVENT NEW SCAN
2098 010014 032777 000001 171170  BIT   @BIT0,0UDCR    IDID RIF STAY SET?
2099 010022 001002      BNE   ,+4       IBRANCH IF SET
2100 010024 104007      ERRORS
2101 010026 104005      SCOPE
2102 010030 009777 171204      TST   0UDCA6      IADDRESS MOD TO RIF
2103 010034 000240      NOP
2104 010036 032777 100040 171146  BIT   @BIT15|BIT9,0UDCR  IDID RIF CLEAR ERROR+DONE?
```

2105	010044	001401			BEG	.+6		IBRANCH IF CLEAR
2106	010046	104007			ERRORS			
2107	010050	032777	000001	171134	BIT	#BIT0,0UDCR		IF RIP STILL SET?
2108	010056	001001			BNE	.+6		IBRANCH IF SET
2109	010060	104007			ERRORS			ICLARED IN ERROR
2110	010062	104005			SCOPE			
2111								
2112								
2113	010064	000057			T57:	57		IROUTINE NUMBER 57
2114	010066	010146				T60		IADDRESS OF NEXT ROUTINE
2115	010070	001750				1000.		ITERATION COUNT
2116	010072	010074				E6A		ISCOPE ENTRY POINT
2117		000057				X0X+1		
2118								
2119								
2120	010074	012777	001412	171110	E6A:	MOV	#BIT0,0UDCR	IF SET MAIN, DEF INT+SCAN, STOP V
2121	010102	104010				DELAY		WAIT IMS
2122	010104	000001				1		
2123	010106	032777	100000	171076	BIT	#BIT15,0UDCR		IF SCAN ERROR SET
2124	010114	001002			BNE	.+6		IBRANCH IF SET
2125	010116	104007			ERRORS			
2126	010120	104005			SCOPE			
2127	010122	032777	000040	171062	BIT	#BIT5,0UDCR		IF DEF DONE SET
2128	010130	001002			BNE	.+6		IBRANCH IF SET
2129	010132	104007			ERRORS			
2130	010134	104005			SCOPE			
2131	010136	042777	000001	171046	BIC	#BIT0,0UDCR		IGENERATE RIP
2132	010144	104005			SCOPE			
2133								
2134								
2135	010146	000060			T60:	60		IROUTINE NUMBER 60
2136	010150	010230				T61		IADDRESS OF NEXT ROUTINE
2137	010152	001750				1000.		ITERATION COUNT
2138	010154	010156				E7A		ISCOPE ENTRY POINT
2139		000060				X0X+1		
2140								
2141								
2142	010156	012777	003412	171026	E7A:	MOV	#BIT0,0UDCR	IF SET MAIN, DEF INT+SCAN, STOP WD
2143	010164	104010				DELAY		WAIT IMS
2144	010166	000001				1		
2145	010170	032777	100000	171014	BIT	#BIT15,0UDCR		IF SCAN ERROR SET
2146	010176	001002			BNE	.+6		IBRANCH IF SET
2147	010200	104007			ERRORS			
2148	010202	104005			SCOPE			
2149	010204	032777	000040	171000	BIT	#BIT5,0UDCR		IF DEF DONE SET
2150	010212	001002			BNE	.+6		IBRANCH IF SET
2151	010214	104007			ERRORS			
2152	010216	104005			SCOPE			
2153	010220	042777	000001	170764	BIC	#BIT0,0UDCR		IGENERATE RIP
2154	010226	104005			SCOPE			
2155								
2156								
2157	010230	000061			T61:	61		IROUTINE NUMBER 61
2158	010232	010310				T62		IADDRESS OF NEXT ROUTINE

```
2159 010234 001790          1000.          ITEST ITERATION COUNT
2160 010236 010240          E8A           ISCOPE ENTRY POINT
2161          000061          X=X+1
2162          |-----|
2163          ITEST THAT DEF INT WITH STOP X,Y,WD SET WILL NOT SET ERROR
2164 010240 012777 007402 170744 E8A1 MOV 0BITC2IBITC9,0UDCR ISET MAINT,DEF INT EN,STOP X,Y,WD
2165 010246 052777 000010 170736 BIS 0BIT3,0UDCR ISET DEF SCAN EN
2166 010254 104010 DELAY IWAIT FOR SCAN DONE
2167 010256 000001 1
2168 010260 032777 100000 170724 BIT 0BIT15,0UDCR ICHECK THAT SCAN ERR DID NOT SET
2169 010266 001402 BEQ ,+4 IBRANCH IF CLEAR
2170 010270 104007 ERRORS
2171 010272 104005 SCOPE
2172 010274 032777 000040 170710 BIT 0BIT5,0UDCR ICHECK IF DEF SCAN DONE SET
2173 010302 001001 BNE ,+4 IBRANCH IF DONE SET
2174 010304 104007 ERRORS
2175 010306 104005 SCOPE
2176          |
2177          |-----|
2178 010310 000062 T621 62 IROUTINE NUMBER 62
2179 010312 010306 T63 IADDRESS OF NEXT ROUTINE
2180 010314 001790 1000. ITEST ITERATION COUNT
2181 010316 010320 E9A ISCOPE ENTRY POINT
2182          000062          X=X+1
2183          |-----|
2184          ITEST THAT DEF INT WITH STOP X,Y,WD SET WILL SCAN TO ADR 0
2185 010320 012777 007402 170664 E9A1 MOV 0BITC2IBITC9,0UDCR ISET MAINT,DEF INT,STP X,Y,WD
```

2197	010326	052777	000010	170656	BIS	#BIT3,0UDCR	ISET DEF SCAN EN
2198	010334	104010			DELAY		WAIT FOR DONE
2199	010336	000001			1		
2200	010340	104777	170650		TSTB	0UDSR	ITEST FOR SCAN OF 0
2201	010344	001402			BEO	.+6	
2202	010346	104007			ERRORS		
2203	010350	104005			SCOPE		
2204	010352	022777	017452	170632	CHP	#17452,0UDCR	IDEF INT,STP X,Y,WD,MAIN*,DEF DONE
2205	010360	001401			BEO	.+6	IDEF SCAN EN,DEF INT
2206	010362	104007			ERRORS		
2207	010364	104005			SCOPE		
2208							
2209						
2210	010366	000063	T631		03		ROUTINE NUMBER 63
2211	010370	010456			T64		ADDRESS OF NEXT ROUTINE
2212	010372	000144			100.		ITEST ITERATION COUNT
2213	010374	010376			F1A		SCOPE ENTRY POINT
2214		000063			X0X+1		
2215						
2216					ITEST THAT IMM INT CAN BE GENERATED BY MAINT+IMM INT EN		
2217	010376	012777	000404	170606	F1A1	MOV	#BIT4,0UDCR
2218	010404	032777	020000	170600		BIT	#BIT13,0UDCR
2219	010412	001002			BNE	.+6	BRANCH IF SET
2220	010414	104007			ERRORS		
2221	010416	104005			SCOPE		
2222	010420	032777	010000	170564	BIT	#BIT12,0UDCR	CHECK IF DEF INT SET
2223	010426	001402			BEO	.+6	BRANCH IF CLEAR
2224	010430	104007			ERRORS		
2225	010432	104005			SCOPE		
2226	010434	042777	000400	170550	BIC	#BIT0,0UDCR	CLEAR MAINT
2227	010442	032777	020000	170542	BIT	#BIT13,0UDCR	CHECK IF IMM INT CLEAR
2228	010450	001401			BEO	.+6	BRANCH IF CLEAR
2229	010452	104007			ERRORS		
2230	010454	104005			SCOPE		
2231							
2232						
2233	010456	000064	T641		04		ROUTINE NUMBER 64
2234	010460	010564			T69		ADDRESS OF NEXT ROUTINE
2235	010462	000012			10;		ITEST ITERATION COUNT
2236	010464	010466			F2A		SCOPE ENTRY POINT
2237		000064			X0X+1		
2238						
2239					ITEST THAT IMM SCAN STARTS AND SPTS SCAN ERROR, NO TRAP AS07		
2240	010466	104004			F2A1	SRESET	
2241	010470	012777	000424	170514		MOV	#BIT3,0UDCR
2242	010476	104010			DELAY		WAIT IMS
2243	010500	000001			1		
2244	010502	032777	100000	170502	BIT	#BIT15,0UDCR	IF SCAN ERROR SET?
2245	010510	001002			BNE	.+6	BRANCH IF BIT IS SET
2246	010512	104007			ERRORS		
2247	010514	104005			SCOPE		
2248	010516	032777	000200	170466	BIT	#BIT7,0UDCR	IF SCAN ERROR SET IMM DONE?
2249	010524	001002			BNE	.+6	BRANCH IF BIT IS SET
2250	010526	104007			ERRORS		

2251	010530	104005			SCOPE		
2252	010532	104004			SRESET		
2253	010534	032777	100000	170450	BIT	#BIT15,0UDCR	IDID SCAN ERROR CLEAR?
2254	010542	001402			BEG	.*6	IBRANCH IF CLEAR
2255	010544	104007			ERRORS		
2256	010546	104005			SCOPE		
2257	010550	032777	000200	170434	BIT	#BIT7,0UDCR	IDID IMM SCAN DONE CLEAR?
2258	010556	001401			BEG	.*6	IBRANCH IF CLEAR
2259	010560	104007			ERRORS		
2260	010562	104005			SCOPE		
2261							
2262							
2263	010564	000005			T69:	05	ROUTINE NUMBER 65
2264	010566	010640				T66	ADDRESS OF NEXT ROUTINE
2265	010570	000012				10.	TEST ITERATION COUNT
2266	010572	010574				F20A	SCOPE ENTRY POINT
2267		000005				X=X+1	
2268							
2269							
2270	010574	104004			ITEST THAT RIF DOES NOT SET WITH IMM START SCAN		
2271	010576	012777	000424	170406	F20A: SRESET		INITIALIZE CONTROL
2272	010604	032777	000001	170400	MOV	#BITCS,0UDCR	SET MAIN DEF INT,DEF SCAN EN
2273	010612	001402			BIT	#BIT0,0UDCR	IDID RIF SET WITH START SCAN
2274	010614	104007			BEG	.*6	
2275	010616	104005			ERRORS		RIF SET IN ERROR
2276	010620	104010			SCOPE		
2277	010622	000001			DELAY		WAIT FOR SCAN DONE
2278	010624	022777	120624	170360	1		
2279	010632	001401			CHP	#120624,0UDCR	SCAN ERR,IMM INT,MAIN,IMM SCAN DONE
2280	010634	104007			BEG	.*6	IMM SCAN EN, DEF INT EN
2281	010636	104005			ERRORS		
2282					SCOPE		
2283							
2284	010640	000006			T66:	06	ROUTINE NUMBER 66
2285	010642	010730				T67	ADDRESS OF NEXT ROUTINE
2286	010644	000144				100.	TEST ITERATION COUNT
2287	010646	010650				F3A	SCOPE ENTRY POINT
2288		000006				X=X+1	
2289							
2290							
2291	010650	012777	000424	170334	ITEST THAT IMM SCAN START CLEARS SCAN ERROR + IMM SCAN DONE		
2292	010656	104010			F3A: MOV	#BITCS,0UDCR	SET MAIN,IMM INT,SCAN EN
2293	010660	000001			DELAY		WAIT UNTIL ERROR AND DONE SETS
2294	010662	042777	000004	170322	1		
2295	010670	032777	000004	170314	BIC	#BIT2,0UDCR	SET IMM INT EN LOW+HIGH
2296	010676	000240			BIS	#BIT2,0UDCR	TO CLEAR SCAN ERROR+DONE
2297	010700	017700	170306		NOP		WAIT FOR DLY CLEAR DONE
2298	010704	032700	100000		MOV	0UDCR,X0	
2299	010710	001402			BIT	#BIT15,X0	IDID SCAN ERROR CLEAR
2300	010712	104005			BEG	.*6	IBRANCH IF CLEAR
2301	010714	104007			SCOPE		
2302	010716	032700	000100		ERRORS		
2303	010722	001401			BIT	#BIT6,X0	IDID IMM SCAN DONE CLEAR?
2304	010724	104007			BEG	.*6	IBRANCH IF CLEAR
					ERRORS		


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2305 010726 104005          SCOPE
2306
2307 |
2308 010730 000067          T67: 67          ;ROUTINE NUMBER 67
2309 010732 011090          T70          ;ADDRESS OF NEXT ROUTINE
2310 010734 000144          100.         ;TEST ITERATION COUNT
2311 010736 010740          F4A          ;SCOPE ENTRY POINT
2312          000067          X=X+1
2313 |
2314 |TEST THAT IMM SCAN ENABLE WILL INHIBIT SCAN + RIF CLEARS DONE
2315 010740 012777 000404 170244 F4A: MOV      #BITC4,UDCR    ;SET MAIN+IMM INT
2316 010746 104010          DELAY          ;WAIT SCAN SHOULD NOT START
2317 010750 000001          1
2318 010752 032777 000100 170232 BIT      #BIT6,UDCR    ;CHECK IF IMM SCAN DONE CLEAR
2319 010760 001402          BEQ          .+6     ;BRANCH IF CLEAR
2320 010762 104007          ERRORS
2321 010764 104005          SCOPE
2322 010766 052777 000020 170216 BIS      #BIT4,UDCR    ;SET IMM SCAN ENABLE
2323 010774 104010          DELAY          ;WAIT FOR ERROR AND DONE
2324 010776 000001          1
2325 011000 042777 000400 170204 BIC      #BIT8,UDCR    ;CLEAR TO PREVENT NEW SCAN
2326 011006 052777 000001 170176 BIS      #BIT8,UDCR    ;SET RIF
2327 011014 032777 100200 170170 BIT      #BIT15|BIT9,UDCR ;IS ERROR + DONE STILL SET?
2328 011022 001001          BNE          .+4     ;BRANCH IF SET
2329 011024 104007          ERRORS          ;SETTING RIF FLOP CLEARED ERROR OR DONE
2330 011026 009777 170210 TST      UDCA7        ;ADDRESS MODULE TO RIF
2331 011032 000240          NOP
2332 011034 032777 100200 170150 BIT      #BIT15|BIT9,UDCR ;DID RIF CLEAR ERROR + DONE
2333 011042 001401          BEQ          .+4     ;BRANCH IF CLEAR
2334 011044 104007          ERRORS
2335 011046 104005          SCOPE
2336 |
2337 |
2338 011050 000070          T70: 70          ;ROUTINE NUMBER 70
2339 011052 011132          T71          ;ADDRESS OF NEXT ROUTINE
2340 011054 001750          1000.        ;TEST ITERATION COUNT
2341 011056 011060          F5A          ;SCOPE ENTRY POINT
2342          000070          X=X+1
2343 |
2344 |TEST THAT Y FAULT CAN BE GENERATED IN IMM MODE, NO TRAPS PS=9
2345 011060 012777 001424 170124 F5A: MOV      #BITC7,UDCR    ;SET MAIN, IMM INT+SCAN, STOP Y
2346 011066 104010          DELAY          ;WAIT IMS
2347 011070 000001          1
2348 011072 032777 100000 170112 BIT      #BIT15,UDCR    ;TEST IF SCAN ERROR SET
2349 011100 001002          BNE          .+6     ;BRANCH IF SET
2350 011102 104007          ERRORS
2351 011104 104005          SCOPE
2352 011106 032777 000200 170076 BIT      #BIT7,UDCR    ;TEST IF IMM DONE SET
2353 011114 001002          BNE          .+6     ;BRANCH IF SET
2354 011116 104007          ERRORS
2355 011120 104005          SCOPE
2356 011122 042777 000001 170062 BIC      #BIT8,UDCR    ;GENERATE RIF
2357 011130 104005          SCOPE
2358 |
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2359
2360 011132 200071
2361 011134 211214
2362 011136 001750
2363 011140 211142
2364 000071
2365
2366
2367 011142 212777 003424 170042 F6A1
2368 011150 104010
2369 011152 000021
2370 011154 032777 100000 170030
2371 011162 001002
2372 011164 104007
2373 011166 104005
2374 011170 032777 000200 170014
2375 011176 001002
2376 011200 104007
2377 011202 104005
2378 011204 042777 000001 170000
2379 011212 104005
2380
2381
2382 011214 000072
2383 011216 011274
2384 011220 001750
2385 011222 011224
2386 000072
2387
2388
2389 011224 012777 007404 167700 F7A1
2390 011232 052777 000020 167752
2391 011240 104010
2392 011242 000001
2393 011244 032777 100000 167740
2394 011252 001402
2395 011254 104007
2396 011256 104005
2397 011260 032777 000200 167724
2398 011266 001001
2399 011270 104007
2400 011272 104005
2401
2402
2403 011274 000073
2404 011276 011352
2405 011300 001750
2406 011302 011304
2407 000073
2408
2409
2410 011304 012777 007404 167700 F8A1
2411 011312 052777 000020 167672
2412 011320 104010

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|.....|
T711 71 ROUTINE NUMBER 71
T72 ADDRESS OF NEXT ROUTINE
1000. ITES* ITERATION COUNT
F6A ISCOPE ENTRY POINT
X=X+1
|.....|
ITEST THAT NO FAULT CAN BE GENERATED IN IMM MODE, NO TRAPS PS=7
F6A1 MOV #BITC0,0UDCR ISET MAINT, IMM INT+SCAN, STOP WD
DELAY INAI+IMS
1
BIT #BIT15,0UDCR ITES* IF SCAN ERROR SET
BNE .+6 IBRANCH IF SET
ERRORS
SCOPE
BIT #BIT7,0UDCR ITES* IF IMM DONE SET
BNE .+6 IBRANCH IF SET
ERRORS
SCOPE
BIC #BIT2,0UDCR IGENERATE RIP
SCOPE
|
T721 72 ROUTINE NUMBER 72
T73 ADDRESS OF NEXT ROUTINE
1000. ITES* ITERATION COUNT
F7A ISCOPE ENTRY POINT
X=X+1
|.....|
ITEST THAT IMM INT WITH STOP X,Y, WD SET WILL NOT SET ERROR
F7A1 MOV #BITC4|BITC9,0UDCR ISET MAINT, IMM INT EN, STP X+Y+WD
BIS #BIT4,0UDCR ISET IMM SCAN EN
DELAY
1
BIT #BIT15,0UDCR ICHECK THAT SCAN ERROR DID NOT SET
BEO .+6 IBRANCH IF CLEAR
ERRORS
SCOPE
BIT #BIT7,0UDCR ICHECK IF IMM SCAN DONE SET
BNE .+6 IBRANCH IF DONE SET
ERRORS
SCOPE
|
T731 73 ROUTINE NUMBER 73
T74 ADDRESS OF NEXT ROUTINE
1000. ITES* ITERATION COUNT
F8A ISCOPE ENTRY POINT
X=X+1
|.....|
ITEST THAT IMM INT WITH STOP X+Y+WD SET WILL SCAN TO 0
F8A1 MOV #BITC4|BITC9,0UDCR ISET MAINT, IMM INT EN, STP X+Y+WD
BIS #BIT4,0UDCR ISET IMM SCAN EN
DELAY

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2413 011322 000001          1
2414 011324 100777 167664  TSTB  @UDCR          ITEST FOR SCAN ADR OF 0
2415 011330 001402          BEQ    .+6
2416 011332 104007          ERRORS
2417 011334 104005          SCOPE
2418 011336 022777 027624 167646  CMP    @27624,@UDCR  IDEF INT,STOP X+Y+WD,MAINT,IMM DONE
2419 011344 001401          BEQ    .+4          IDEF SCAN EN,DEF INT+RIF SET
2420 011346 104007          ERRORS
2421 011350 104005          SCOPE
2422
2423 |
2424 011352 000074          T74: 74          IROUTINE NUMBER 74
2425 011354 011404          T75          IADDRESS OF NEXT ROUTINE
2426 011356 000031          25:          ITEST ITERATION COUNT
2427 011360 011362          G1A          ISCOPE ENTRY POINT
2428 000074          X=X+1
2429 |
2430 ITEST THAT DEF VALID SETS
2431 011362 104004          G1A: SRESET
2432 011364 016701 167622  MOV    UDCR,X1          IMOVE ADDRESS INTI RB
2433 011370 012700 001000  MOV    @BIT9,X0
2434 011374 012777 006412 167610  MOV    @BITC1|BITI1|BITI0,@UDCR  ISET MAINT,DEF INT,SCAN EN
2435 011402 050011          BIS    X0,(1)          ISET STOP X
2436 011404 104010          DELAY
2437 011406 000001          1
2438 011410 052777 000024 167574  BIS    @BIT2|BIT4,@UDCR  ISET IMM + SCAN EN
2439 011416 032777 100000 167570  BIT    @BIT15,@UDCR  IDEF VALID SHOULD BE SET
2440 011424 001002          BNE    .+6          IBRANCH IF DEF VALID SET
2441 011426 104007          ERRORS
2442 011430 104005          SCOPE
2443 011432 104010          DELAY
2444 011434 000001          1
2445 011436 100777 167552  TSTB  @UDCR          IIS SCAN 0?
2446 011442 001402          BEQ    .+6          IBRANCH IF SCAN IS 0
2447 011444 104007          ERRORS
2448 011446 104005          SCOPE
2449 011450 022777 039676 167534  CMP    @39676,@UDCR  IIMM+DEF INT,STP X+Y+WD,MAINT
2450 011456 001401          BEQ    .+4          IIMM+DEF DONE,SCAN EN,INT EN
2451 011460 104007          ERRORS
2452 011462 104005          SCOPE
2453
2454 |
2455 011464 000075          T79: 75          IROUTINE NUMBER 75
2456 011466 011566          T76          IADDRESS OF NEXT ROUTINE
2457 011470 000031          25:          ITEST ITERATION COUNT
2458 011472 011474          G2A          ISCOPE ENTRY POINT
2459 000075          X=X+1
2460 |
2461 ITEST THAT IMM INT OVERRIDES DEF
2462 011474 104004          G2A: SRESET
2463 011476 016701 167510  MOV    UDCR,X1          IMOVE ADDRESS I NTO RB
2464 011502 012700 000004  MOV    @BIT2,X0
2465 011506 012777 000432 167476  MOV    @BITC1|BITA,@UDCR  ISET MAINT,DEF INT,SCAN ENABS
2466 011514 050011          BIS    X0,(1)          ISET IMM INT

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2467	011516	104010			DELAY				!WAIT FOR SCAN DONE
2468	011520	000001			1				
2469	011522	032777	100000	167462	BIT	#BIT15,UDCR			!SCAN ERROR SHOULD BE SET
2470	011530	001002			BNE	.+6			
2471	011532	104007			ERRORS				
2472	011534	104005			SCOPE				
2473	011536	032777	000200	167446	BIT	#BIT7,UDCR			!IMM DONE SHOULD BE SET
2474	011544	001002			BNE	.+6			
2475	011546	104007			ERRORS				
2476	011550	104005			SCOPE				
2477	011552	032777	000040	167432	BIT	#BIT5,UDCR			!DEF DONE SHOULD NOT BE SET
2478	011560	001401			BEO	.+4			
2479	011562	104007			ERRORS				
2480	011564	104005			SCOPE				
2481									
2482									
2483	011566	000076							
2484	011570	011634			T76I	76			!ROUTINE NUMBER 76
2485	011572	000144				T77			!ADDRESS OF NEXT ROUTINE
2486	011574	011576				100.			!TEST ITERATION COUNT
2487		000076				G2AA			!SCOPE ENTRY POINT
2488						X=X+1			
2489									
2490	011576	012777	011630	167412	!TEST THAT WHEN IMM+DEF ENABLED				!NO TRAPS OCCUR
2491	011604	012777	000036	167400	G2AAI	MOV	#GRAAER,OUTV		!PRIME FOR TRAP ERROR
2492	011612	000067	166160			MOV	#36,UDCR		!SET IMM+DEF ENABLES
2493	011616	000777	167370			CLR	PS		!PS=0
2494	011622	000777	167366			TST	UDCR		!ADDRESS CONTROL SHOULD NOT TRAP
2495	011626	104005				TST	UDCR		
2496	011630	104007				SCOPE			
2497	011632	104005			G2AAERi	ERRORS			!TRAPPED WITH NO INTERRUPT
2498						SCOPE			
2499									
2500	011634	000077							
2501	011636	011794			T77I	77			!ROUTINE NUMBER 77
2502	011640	000144				T100			!ADDRESS OF NEXT ROUTINE
2503	011642	011644				100.			!TEST ITERATION COUNT
2504		000077				G3A			!SCOPE ENTRY POINT
2505						X=X+1			
2506									
2507	011644	012777	011716	167344	!TEST THAT IMMEDIATE INTERRUPT TRAPS TO CORRECT LOCATION				
2508	011652	012777	000000	167340	G3AI	MOV	#G3OK,OUTV		!PRIME FOR GOOD RETURN
2509	011660	012767	000000	166110		MOV	#PRTY0,OUPL		
2510	011666	016781	167320			MOV	#PRTY0,PS		
2511	011672	012700	002000			MOV	UDCR,X1		!MOVE ADDRESS INTO R0
2512	011676	012777	009424	167306		MOV	#BIT10,X0		!PUT STOP Y INTO R0
2513	011704	050011				MOV	#BITCJIBITIBIT1,UDCR		!SET MAINY, IMM INT, IMM SCAN EN
2514	011706	104010				BIS	X0,(1)		!SET STOP Y TO STOP SCAN
2515	011710	000001				DELAY			
2516	011712	104007				1			
2517	011714	104005				ERRORS			!SHOULD TRAP BEFORE GETTING HERE
2518	011716	012777	011750	167272		SCOPE			
2519	011724	000777	167262		G3OKI	MOV	#G3ERRX,OUTV		!PRIME FOR SERVICE TRAP
2520	011730	000777	167260			TST	UDCR		!ADDRESS CONTROL TO SEE IF TRAP CAUSED
						TST	UDCR		

```
2521 011734 022777 027624 167250      CMP      #27624,0UDCR      IMM INT,STOP X+Y+WD
2522 011742 001401      BEQ      ,*4              IMINT,IMM DONE,IMM SCAN EN,IMM INT SE*
2523 011744 104007      ERRORS
2524 011746 104005      SCOPE
2525 011750 104007      G3ERRXi ERRORS          ITRAPPED WHILE SERVICING TRAP
2526 011752 104005      SCOPE
2527
2528
2529 011754 000100      T100i   100              IROUTINE NUMBER 100
2530 011756 012074      T101    T101              IADDRESS OF NEXT ROUTINE
2531 011760 000144      100.    100.              ITEST ITERATION COUNT
2532 011762 011764      G4A     G4A              ISCOPE ENTRY POINT
2533 000100      X=X+1
2534
2535 I-----I
2536 011764 012777 012036 167224      G4Ai   MOV      #G4OK,OUTV      IPRIME FOR GOOD RETURN
2537 011772 012777 000000 167220      MOV      #PRTY0,DUPL
2538 012000 012767 000000 165770      MOV      #PRTY0,PS
2539 012006 016701 167200      MOV      UDCR,X1          IMOVE ADDRESS INTO R1
2540 012012 012700 001000      MOV      #BIT9,X0          IPUT STOP X IN R0
2541 012016 012777 000412 167166      MOV      #BITC1IBITIBITIT1,UDCR
2542 012024 050011      BIS      X0,(1)          ISET STOP X TO STOP SCAN
2543 012026 104010      DELAY
2544 012030 000001      1
2545 012032 104007      ERRORS          ISHOULD TRAP BEFORE GETTING HERE
2546 012034 104005      SCOPE
2547 012036 012777 012070 167152      G4OKi   MOV      #G4ERRX,OUTV      IPRIME FOR SERVICE TRAP
2548 012044 009777 167142      TST      0UDCR          IADDRESS CONTROL TO SEE IF
2549 012050 009777 167140      TST      0UDCR          ITHIS CAUSES SERVICE TRAP
2550 012054 322777 017452 167130      CMP      #17452,0UDCR      IDEF DONE,SCAN EN,INT
2551 012062 001401      BEQ      ,*4              ISTOP X+Y+WD
2552 012064 104007      ERRORS
2553 012066 104005      SCOPE
2554 012070 104007      G4ERRXi ERRORS          ITRAPPED WHILE SERVICING TRAP
2555 012072 104005      SCOPE
2556
2557
2558 012074 000101      T101i   101              IROUTINE NUMBER 101
2559 012076 012204      T102    T102              IADDRESS OF NEXT ROUTINE
2560 012100 000144      100.    100.              ITEST ITERATION COUNT
2561 012102 012104      G5A     G5A              ISCOPE ENTRY POINT
2562 000101      X=X+1
2563
2564 I-----I
2565 012104 012777 012154 167104      G5Ai   MOV      #G5ERR,OUTV      IPRIME FOR ERROR RETURN
2566 012112 012777 000300 167100      MOV      #PRTY0,DUPL
2567 012120 012767 000300 165650      MOV      #PRTY0,PS          ISET PS=0
2568 012126 016701 167060      MOV      UDCR,X1          IMOVE ADDRESS INTO R0
2569 012132 012700 002000      MOV      #BIT10,X0         IPUT STOP Y IN R0
2570 012136 012777 005424 167046      MOV      #BITC3IBITIBITIT1,UDCR ISET MAINT,IMM INT,IMM SCAN EN
2571 012144 050011      BIS      X0,(1)          ISET STOP Y TO STOP SCAN
2572 012146 104010      DELAY
2573 012150 000001      1
2574 012152 000402      BR      ,*4              IWAIT,NO TRAP SHOULD OCCUR
                               IBRANCH IF NO TRAP
```

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2575 012154 104007          G5ERR1  ERRORS          IMM TRAP WHEN PS=6
2576 012156 104005          SCOPE
2577 012160 012777 012202 167030  MOV      @G5OK,OUTV    IPRIME FOR GOOD RETURN
2578 012166 012767 000240 165602  MOV      @PRTY3,PS     ILOWER PS TO 3
2579 012174 000240          NOP
2580 012176 000240          NOP
2581 012200 104007          ERRORS          INO TRAP PS=5
2582 012202 104005          G5OK1  SCOPE
2583
2584
2585 012204 000102          T1021  102          IROUTINE NUMBER 102
2586 012206 012314          T103          IADDRESS OF NEXT ROUTINE
2587 012210 000144          100.         ITEST ITERATION COUNT
2588 012212 012214          G6A         ISCOPE ENTRY POINT
2589          000102          X=X+1
2590
2591
2592 012214 012777 012264 166774  G6A1  MOV      @G6ERR,OUTV  IPRIME FOR ERROR RETURN
2593 012222 012777 000200 166770  MOV      @PRTY4,OUTV
2594 012230 012767 000200 165540  MOV      @PRTY4,PS     ISET PS=4
2595 012236 016701 166750  MOV      UDCR,X1       IMOVE ADDRESS INTO R0
2596 012242 012700 001000  MOV      @BIT0,X0      IPUT STOP X IN R0
2597 012246 012777 000412 166736  MOV      @BIT1:BIT0:BIT1,UDCR  ISET MAINT,DEF INT,SCAN EN
2598 012254 050011  BIS      X0,(1)        ISET STOP X TO STOP SCAN
2599 012256 104010  DELAY
2600 012260 000001  1          IWAIT,NO TRAP SHOULD OCCUR
2601 012262 000402  BR      .+6
2602 012264 104007          G6ERR1  ERRORS          IDEF TRAPPED WHEN PS=4
2603 012266 104005          SCOPE
2604 012270 012777 012312 166720  MOV      @G6OK,OUTV   IPRIME FOR GOOD RETURN
2605 012276 012767 000140 165472  MOV      @PRTY3,PS     ILOWER PS TO 3
2606 012304 000240          NOP
2607 012306 000240          NOP
2608 012310 104007          ERRORS          INO TRAP PS=3
2609 012312 104005          G6OK1  SCOPE
2610
2611
2612 012314 000103          T1031  103          IROUTINE NUMBER 103
2613 012316 012410          T104          IADDRESS OF NEXT ROUTINE
2614 012320 001750          1000.        ITEST ITERATION COUNT
2615 012322 012324          G7A         ISCOPE ENTRY POINT
2616          000103          X=X+1
2617
2618
2619 012324 012777 012404 166664  G7A1  MOV      @G7ERR,OUTV  IPRIME FOR ERROR RETURN
2620 012332 012777 000036 166652  MOV      @36,UDCR     ISET IMM+DEF INT+SCAN ENABS
2621 012340 012767 000000 165430  MOV      @PRTY0,PS     ISET PS TO 0
2622 012346 012777 177777 166650  MOV      @177777,@UMOD ILOAD UDC BUS WITH ONES
2623 012354 000777 166644  TST      @UMOD         IUDC BUS SHOULD BE 0
2624 012360 001402  BEQ      .+6
2625 012362 104007          ERRORS
2626 012364 104005          SCOPE
2627 012366 000077 166632  CLR      @UMOD         ICLEAR UDC BUS
2628 012372 000777 166626  TST      @UMOD
```

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2629 012376 001401          BEQ      ,+4
2630 012400 104007          ERRORS
2631 012402 104005          SCOPE
2632 012404 104007          G7ERRI  ERRORS          IDATA TRANSFERS CAUSED TRAP
2633 012406 104005          SCOPE
2634
2635
2636 012410 000104          |
2637 012412 012506          |.....|
2638 012414 001750          *1041  104          IRoutine NUMBER 104
2639 012416 012420          T105          IADDRESS OF NEXT ROUTINE
2640 000104          1000.         ITEST ITERATION COUNT
2641          G0A          ISCOPE ENTRY POINT
2642          X=X+1          |
2643 012420 012777 012502 166570          |.....|
2644 012426 012777 000036 166556          ITEST THAT DATA TRANSFERS WILL NOT CAUSE FALSE TRAPS
2645 012434 012767 000000 165334          G0A1  MOV      #G0ERR,OUTV          IPRIME FOR ERROR RETURN
2646 012442 012777 125252 166554          MOV      #36,UDCR          ISET IMM+DEF INT AND SCAN ENABS
2647 012450 005777 166550          MOV      #PRTY0,PS          ISET PS TO 0
2648 012454 001402          MOV      #125252,0UMOD          ILOAD JDC BUS WITH PATTERN
2649 012456 104007          TST      0UMOD          IJDC BUS SHOULD BE 0
2650 012460 104005          BEQ      ,+6
2651 012462 012777 052525 166534          MOV      #52525,0UMOD          ILOAD COMPLIMENT PATTERN
2652 012470 005777 166530          TST      0UMOD
2653 012474 001401          BEQ      ,+4
2654 012476 104007          ERRORS
2655 012500 104005          SCOPE
2656 012502 104007          G0ERRI  ERRORS          IDATA TRANSFERS CAUSED TRAP
2657 012504 104005          SCOPE
2658
2659
2660 012506 000105          |
2661 012510 012572          |.....|
2662 012512 000144          T1051  105          IRoutine NUMBER 105
2663 012514 012516          T106          IADDRESS OF NEXT ROUTINE
2664 000105          100.         ITEST ITERATION COUNT
2665          G9A          ISCOPE ENTRY POINT
2666          X=X+1          |
2667 012516 012777 012566 166472          |.....|
2668 012524 012767 000240 165244          ITEST THAT DEF SCAN ERROR TRAPS AT LEVEL 0
2669 012532 012777 000412 166452          I AND DOES NOT TRAP WITH IMM INT DISABLED
2670 012540 104010          G9A1  MOV      #G0ERR,OUTV          IPRIME FOR ERROR RETURN
2671 012542 000001          MOV      #PRTY5,PS          ISET PS=5
2672 012544 012777 012570 166444          MOV      #BITC1,UDCR          ISET MAIN,DEF INT+SCAN EN
2673 012546 000001          DELAY          1
2674 012548 052777 000004 166432          MOV      #G0OK,OUTV          IPRIME FOR GOOD RETURN
2675 012550 104010          BIS      #BIT2,UDCR          IENABLE IMM INT
2676 012552 000001          DELAY          1
2677 012554 104007          ERRORS
2678 012556 104007          G9ERRI  ERRORS          INO TRAP WITH IMM INT EN
2679 012558 104005          G9OKI  SCOPE          ITRAP OCCURRED WITH IMM INT DISABLED
2680
2681
2682 012572 000106          |
2683          T1061  106          IRoutine NUMBER 106
```

2683	012574	177777	TLAST	ADDRESS OF NEXT ROUTINE	•
2684	012576	000001	1	ITEST ITERATION COUNT	•
2685	012600	012602	EZA	ISCOPE ENTRY POINT	•
2686		000106	X=X+1	I	•
2687				
2688			JDUMMY END TEST		
2689	012602	104005	EZA1	SCOPE	
2690		000001	.END		

ADYENP	002370	A1A	004152	A1B	004106	A1FA	024524
A10B	004540	A11A	004556	A11B	004572	A2A	004224
A20	004220	A3A	004230	A3B	004252	A4A	004270
A40	004304	A5A	004322	A5B	004336	A6A	004354
A60	004370	A7A	004400	A7B	004422	A8A	004440
A80	004454	A9A	004472	A9B	004500	BDCNV	002224
BDCNVA	002256	BDCNVB	002310	BDCNVC	002312	BDCNVD	002314
B1YC1	000412	B1YC2	000402	B1YC3	000424	B1YC4	000404
B1YC5	001412	B1YC6	003412	B1YC7	001424	B1YCP	003424
B1YC9	007000	B1Y0	000001	B1Y1	000002	B1Y1P	002200
B1Y11	004000	B1Y12	010000	B1Y13	020000	B1Y14	040000
B1Y15	100000	B1Y2	000004	B1Y3	000010	B1Y4	000020
B1Y5	000040	B1Y6	000100	B1Y7	000200	B1Y8	000400
B1Y9	001000	BMOVE	002420	BMOVE	002410	B1A	004010
B2A	004714	B3A	004774	B4A	005054	B5A	005134
B6A	005214	B7A	005274	B8A	005354	B9A	005434
CHAINN	001424	CHALT	104003	CHLT	002714	CHNA	001500
CHNAA	001516	CHNAB	001472	CHNAC	001402	CHNB	001536
CNVCTR	002362	CURTST	004134	C1A	005514	C1FA	006110
C11A	006144	C12A	006200	C13A	006234	C14A	006270
C15A	006324	C16A	006360	C17A	006414	C2A	025550
C3A	005604	C4A	005640	C5A	005674	C6A	005730
C7A	005764	C8A	006020	C9A	006054	DECVL	002402
DELAY	104010	D:0IT	002364	DLY	002752	DLVA	002762
DLVB	002766	D1A	006440	D2A	006664	D3A	007120
EMALT	104017	EHLT	002074	EHLTA	002104	EMTA	002674
EMTINT	002650	EMTLM	004120	EMTAB	004000	EMTV	000030
EMTX	000020	ERR	001720	ERRA	001770	ERRB	002054
ERRC	002060	ERRD	002070	ERRE	002072	ERROR	104002
ERRORS	104007	ERROR1	104006	ERRST	001644	ERR1	001742
E1A	007254	E2A	007344	E2BA	007452	E2CA	007526
E3A	007602	E4A	007656	E5A	007746	E6A	010074
E7A	010156	E8A	010240	E9A	010320	FORMD	001604
F1A	010376	F2A	010466	F2BA	010574	F3A	010650
F4A	010740	F5A	011060	F6A	011142	F7A	011224
F8A	011304	GETRDY	001300	GTRDYA	001342	GTRDYC	001362
GTRDYD	001404	GTRDYX	001300	G1A	011302	G2A	011474
G2AA	011576	G2AAER	011630	G3A	011644	G3ERRX	011750
G3OK	011716	G4A	011764	G4ERRX	012070	G4OK	012030
G5A	012104	G5ERR	012154	G5OK	012202	G6A	012214
G6ERR	012264	G6OK	012312	G7A	012324	G7ERR	012404
G8A	012420	G8ERR	012502	G9A	012516	G9ERR	012566
G9OK	012570	ICNT	004124	ICTR	004122	LOGIC	001572
MACHER	000004	MCLK	001222	MEO	003100	MICNT	003212
MINCRT	003356	MPC	003174	MPCEND	004051	MPUDC	003571
MPUDNG	003721	MPUDOK	003645	MPWRF	003532	MPWRT	003453
MSETSR	003264	MSTR	003223	MTIT	003376	MTNUM	003161
MUDCR	003233	MUDSR	003251	NOP	000240	NXIST	004132
OACNV	002136	OACNVA	002152	OACNVX	002222	OPEN	000000
PC	000007	POPSP	005726	POPSP2	002262	PRYP	000000
PRTY1	000040	PRTY2	000100	PRTY3	000140	PRTY4	000200
PRTY5	000240	PRTY6	000300	PRTY7	000340	PS	177776
PUSH	005746	PUSH2	024646	PWFDC	002620	PWFDCX	002640
PWRDN	002432	PWRDT	002566	PWRFL	000024	PWRST	002466

PWRUP	002442	PWRUT	002576	PWUDC	002520	PWUDCA	002540
RST04	0104012	RST05	0104016	RST05S	0104014	RSP4	003076
RS05	003130	RS05S	003124	RYNNO	004130	R0	0X000000
SAV04	0104011	SAV05	0104013	SAV05S	0104015	SCOPF	0104005
SCOPTR	004120	SP	0X000000	SR	0177570	RESEY	0104004
SRSETT	002730	START	001250	SUBTEN	002322	RUMTA	002326
SUBTNB	002342	SV04	003002	SV05	003032	SVPSA	003040
SV05B	003052	SV05C	003060	SV05S	003022	TENPWR	002360
TK0	001204	TK8	001202	TLAST	0177777	TP0	001210
TP8	001206	TRPV	000034	TYPE	0104000	TPES	0104001
TYP5	002106	TYP5A	002130	TYP5B	002132	T0	004142
T1	004174	T10	004462	T100	011754	T101	012074
T102	012204	T103	012314	T104	012410	T105	012500
T106	012572	T11	004514	T12	004546	T13	004600
T14	004704	T15	004764	T16	005044	T17	005124
T2	004226	T20	005204	T21	005264	T22	005344
T23	005424	T24	005504	T25	005540	T26	005574
T27	005630	T3	004260	T30	005604	T31	005720
T32	005754	T33	006010	T34	006044	T35	006100
T36	006134	T37	006170	T4	004312	T40	006224
T41	006260	T42	006314	T43	006350	T44	006404
T45	006430	T46	006654	T47	007110	T5	004344
T50	007244	T51	007334	T52	007442	T53	007510
T54	007572	T55	007646	T56	007736	T57	010064
T6	004376	T60	010146	T61	010230	T62	010310
T63	010366	T64	010450	T65	010504	T66	010640
T67	010730	T7	004430	T70	011050	T71	011132
T72	011214	T73	011274	T74	011352	T75	011404
T76	011566	T77	011634	UDCA1	001226	UDCA2	001230
UDCA3	001232	UDCA4	001234	UDCA5	001236	UDCA6	001240
UDCA7	001242	UDCA8	001244	UDCA9	001246	UDCR	001212
UDCRT	004136	UDBR	001214	UDSRT	004140	UMOD	001224
UPL	001220	UTV	001210	X	000106	ZZA	012602
SFILLS	001201	SNULL	001200	STYPE	001100	.	012604

ERRORS DETECTED: 0

DZUDB-B CONTROL TEST MACY11,623 14-FEB-73 20194 PAGE 36-12
UDC110.SRC

•,UDC110/N-SYSHAC.SML,UDC110.SRC
RUN-TIME: 15 20 0 SECONDS
CORE USED: 8K