

# RS64

TESTER  
MD-11-DZRSA-A

EP-DZRSA-A-DL-A

OCT 1976

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FICHE 1 OF 1

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This section of the document contains a grid of 150 small, illegible data tables or charts, arranged in 10 columns and 15 rows. Each cell in the grid appears to contain a small table with multiple columns and rows of text, but the text is too small and faded to be read. The overall appearance is that of a dense data matrix or a series of related test results.



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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZASA-A-D  
PRODUCT NAME: RS64 TESTER MONITOR AND DISK EXERCISER  
DATE CREATED: 1-AUG-72  
MAINTAINER: DIAGNOSTIC GROUP  
AUTHOR: KEN CHAFMAN

THIS PROGRAM IS FOR FACTORY CHECK-OUT AND PRODUCTION USE ONLY.

MAINDEC-11-DZASA-A  
DZASA.P11



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DIFFERENT INPUT STATES: MODE SELECTION AND PARAMETER SELECTION. THERE ARE ALSO SEVERAL CONTROL CHARACTERS DESIGNED TO AID THE OPERATOR IN MONITORING THE STATION.

5.1 MODE SELECTION STATE

UPON COMPLETION OF THE STARTING PROCEDURES, ALL STATIONS WILL AUTOMATICALLY RUN TEST 1 AND ENTER THE MODE SELECTION STATE. THE MONITOR WILL THEN WAIT FOR ONE OF TWO COMMANDS FROM THE TELETYPE:

- 1) TEST
- 2) ACCEPT

NOTE: TERMINATE COMMANDS WITH A "RETURN."

5.2 PARAMETER SELECTION STATE.

IF TEST MODE WAS SELECTED THE STATION WILL ENTER THE PARAMETER SELECTION STATE AND TYPE THE FOLLOWING HEADING:

TST PAT SEQ TRK SEC WORD

THE OPERATOR IS NOW ABLE TO ENTER WHATEVER TESTING PARAMETERS HE WISHES TO RUN (SEE SECTION 8 FOR PARAMETER DESCRIPTIONS). AFTER ENTERING EACH PARAMETER NUMBER THE OPERATOR MUST TERMINATE IT WITH A SPACE OR A TAB. WHEN ALL REQUIRED PARAMETERS ARE ENTERED THE MONITOR WILL RESPOND WITH "OK." THE OPERATOR THEN TYPES A "RETURN" TO START THE TEST RUNNING.

5.3 TEST MODE

IN TEST MODE THE MONITOR WILL AUTOMATICALLY PERFORM THE TEST SELECTED BY THE ABOVE PROCEDURE. IT WILL TYPE OUT ERROR MESSAGES WHEN ERRORS OCCUR (SEE SECTION 6 FOR ERROR MESSAGE DESCRIPTION) AND UPON COMPLETION IT WILL TYPE THE TIME, DATE AND NUMBER OF ERRORS IT DETECTED. IT WILL THEN ENTER THE PARAMETER SELECTION STATE AND WAIT FOR MORE PARAMETERS.

5.4 ACCEPT MODE

IF ACCEPT MODE WAS SELECTED (IN SECTION 5.1), THE MONITOR AUTOMATICALLY SELECTS THE PREDETERMINED PARAMETERS WHICH ARE INTENDED TO PROVIDE A DATA RELIABILITY INSPECTION OF THE RS64 DRIVE (SEE SECTION 8.7 FOR THESE PARAMETERS.) THE AUTOMATIC ACCEPTANCE TEST TAKES ABOUT 12 1/2 HOURS. EVERY HALF HOUR THE TIME, DATE AND NUMBER OF ERRORS IS TYPED, AND AT THE END, AN ACCEPTANCE MESSAGE IS TYPED. UPON COMPLETION OF AUTO ACCEPT THE MONITOR REENTERS THE MODE SELECTION STATE.

5.5 CONTROL C AND THE CONTINUE COMMAND.

5.5.1 IF THE OPERATOR WISHES TO STOP A TEST BEFORE IT HAS FINISHED, HE MAY TYPE "CONTROL C" (↑C). IF HE WAS IN TEST MODE, HE WOULD THEN RETURN TO THE PARAMETER SELECTION STATE AND IF HE WAS IN ACCEPT MODE HE WOULD RETURN TO THE MODE SELECTION STATES.

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- 5.5.2 IF, AFTER DOING A ↑C THE OPERATOR WISHES TO CONTINUE THE TEST HE WAS RUNNING FROM WHERE IT LEFT OFF, HE MAY DO SO BY TYPING "C" FOLLOWED BY A "RETURN". (CAUTION: THE MONITOR MAY SOMETIMES SKIP PART OF AN OPERATION WHEN "↑C" AND "C" ARE USED, THEREBY CAUSING ERRORS.)
- 5.5.3 IF THE STATION IS IN THE PARAMETER SELECTION STATE AND A ↑C IS TYPED, THE MONITOR WILL THEN GO INTO THE MODE SELECT STATE. WHEN THIS IS DONE C (CONTINUE) WILL NO LONGER WORK. LIKEWISE IF TWO SUCCESSIVE ↑C'S ARE TYPED, NO MATTER WHAT THE ORIGINAL STATE WAS, THE STATION WILL END UP IN THE MODE SELECTION STATE AND C (CONTINUE) WILL NOT WORK.
- 5.6 OTHER CONTROL CHARACTERS.
- 5.6.1 CONTROL L (↑L) - LOOP ON TEST
- IF THE OPERATOR WISHES TO REPEAT A PARTICULAR TEST OVER AND OVER AGAIN, I.E. LOOP ON THAT TEST, HE MAY DO SO BY TYPING A ↑L. THE MONITOR AUTOMATICLY RESTARTS THAT TEST WITH THE SAME PARAMETERS EVERY TIME IT HAS COMPLETED THE TEST. TO STOP THE LOOPING, THE OPERATOR SIMPLY TYPES ANOTHER ↑L. (CAUTION: THIS SWITCH IS DESIGNED FOR TEST MODE ONLY!)
- 5.6.2 CONTROL A (↑A) - ABORT 5 MINUTE READ.
- THE ↑A ONLY WORKS ON TEST 20 WHILE IT IS RUNNING. IT TERMINATES THE READING BEFORE THE 5 MINUTES IS UP. (SEE TEST 20 DESCRIPTION IN SEC 8 FOR MORE DETAIL)
- 5.6.3 CONTROL B (↑B) - BELL ON ERROR
- FOR CALIBRATING, THE OPERATOR MAY WANT TO KNOW IMMEDIATELY WHEN AN ERROR IS OCCURING AND WHEN IT GOES AWAY. BY TYPING ↑D (TO SUPPRESS THE ERROR MESSAGES) AND THEN ↑B, THE BELL ON THE TELETYPE WILL RING EVERY TIME AN ERROR OCCURS. A SECOND ↑B WILL SHUT THE BELL OFF.
- 5.6.4 CONTROL D (↑D) - DISCONTINUE ERROR MESSAGES
- SINCE THE ERROR MESSAGE IS RATHER LENGTHY AND TIME CONSUMMING, THE OPERATOR MAY SUPPRESS IT BY TYPING ↑D. A SECOND ↑D WILL RETURN THE ERROR MESSAGE, PROVIDED LESS THAN 64 ERRORS HAVE OCCURED. (NOTE: ERROR MESSAGES ARE AUTOMATICALLY SUPPRESSED AFTER 64 ERRORS HAVE OCCURED).
- 5.6.5 CONTROL E (↑E) - ERROR COUNT
- IF THE OPERATOR WANTS TO KNOW HOW MANY ERRORS HAVE OCCURRED ON THE TEST BEING RUN HE MAY FIND OUT BY TYPING ↑E

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5.6.6 CONTROL S (↑S) - STATUS REPORT

IF THE OPERATOR WISHES TO MONITOR THE PROGRESS OF THE TEST HE IS RUNNING, HE MAY DO SO BY TYPING ↑S. THE MONITOR WILL RESPOND WITH THE PARAMETERS THAT THE TESTER IS ON AT THAT MOMENT (SEE SECTION 8 FOR MORE DETAIL), FOLLOWED BY THE TIME AND DATE.

5.6.7 CONTROL T (↑T) - TIME AND DATE.

BY TYPING ↑T THE OPERATOR MAY FIND OUT WHAT TIME THE COMPUTER THINKS IT IS.

5.7 ILLEGAL INPUTS.

IF THE OPERATOR ACCIDENTLY STRIKES A WRONG KEY, THE MONITOR CAN USUALLY DETECT IT IMMEDIATELY AND WILL TYPE A "?" AND THEN WANT HIM TO START THE COMMAND STRING OVER. ALSO IF THE STATION IS IN A RUN MODE (TEST MODE OR ACCEPT MODE) IT WILL ONLY ACCEPT CONTROL CHARACTERS.

6. ERRORS

WHEN AN ERROR IS DETECTED BY THE TESTER, THE FOLLOWING MESSAGE IS NORMALLY TYPED (WHERE N REPRESENT AN OCTAL DIGIT):

TST	PAT	SEQ	TRK	SEC	WORD
NN	NN	NN	NN	NN	NNNNNN
ERR	OP	WCT	TRK	SEC	DB
NN	NN	NN	NN	NN	NNNNNN

THE FIRST SET OF PARAMETERS (FIRST TWO LINES) ARE THE MONITOR PARAMETERS AS DESCRIBED IN SECTION 8. THE SECOND SET OF PARAMETERS ARE THE TESTER PARAMETERS.

6.1 ERROR CODE (ERR)

01 ADDRESS SEEK ERROR (ASE):  
INDICATES THAT ON A READ SECTOR OR WRITE SECTOR OPERATION, THE SECTOR ADDRESS WAS NOT FOUND IN ONE FULL REVOLUTION OF OF THE DISK

02 ADDRESS PARITY ERROR (APE):  
INDICATES A SECTOR ADDRESS PARITY ERROR OCCURRED.

04 CD BIT ERROR:  
INDICATES ONE OF FOUR POSSIBLE ERRORS:  
A. NO GAP  
B. NO CLOCK STROBE  
C. NO DATA STROBE  
D. THE A.C. LOW SIGNAL WAS GENERATED WHILE RUNNING A TEST

10 DATA ERROR (DE):  
INDICATES THE DATA READ DID NOT COMPARE TO THE CONTENTS OF THE DATA REGISTER.

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MAINDEC-11-DZRSA-A  
DZRSAA.P11

RS64 TESTER MONITOR AND EXERCISER

MACY11 27(732) 10-SEP-76 11:07 PAGE 6

246  
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248

IF MORE THAN ONE ERROR OCCURES AT ONE TIME, THE SUM  
OF THE ERROR CODES WILL BE TYPED, I.E. 12 INDICATES  
BOTH A DATA ERROR AND AN ADDRESS PARITY ERROR OCCURRED.

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6.2 OPERATION CODE (OP)

THE FOLLOWING CODES INDICATE THE OPERATION WHICH THE TESTER WAS PERFORMING WHEN THE ERROR OCCURRED.

- 00 DISK CLEAR:  
CLEAR THE TEST SET AND DISK TO INITIAL CONDITIONS.
- 02 WRITE SECTOR:  
WRITE THE SECTOR INDICATED BY THE DISK ADDRESS REGISTER. ALL 32 WORDS OF THE SECTOR ARE WRITTEN WITH THE WORD CONTAINED IN THE DATA REGISTER. CHECKS FOR A "CD BIT" ERROR.
- 04 READ SECTOR:  
READ THE SECTOR INDICATED BY THE DISK ADDRESS REGISTER AND COMPARE EACH TO THE WORD CONTAINED IN THE DATA REGISTER. ALSO CHECKS "CD BIT" AND SECTOR ADDRESS PARITY.
- 12 WRITE TRACK:  
SAME AS WRITE SECTOR, EXCEPT THAT IT WRITES THE ENTIRE TRACK.
- 14 READ TRACK:  
SAME AS READ SECTOR EXCEPTS THAT IT READS AND COMPARES THE ENTIRE TRACK.

6.3 DISK ADDRESS REGISTER (DA)

THE DISK ADDRESS REGISTER CONTAINS THE ADDRESS AT WHICH THE ERROR OCCURRED. IT IS TYPED AS THREE SEPERATE PARAMETERS.  
WORD COUNT (WCT)  
TRACK ADDRESS (TRK)  
SECTOR ADDRESS (SEC)

6.4 DATA REGISTER (DB)

THE DATA BUFFER CONTAINS THE WORD READ IN ERROR. IF THE ERROR OCCURRED DURING A WRITE OPERATION, THIS IS MEANINGLESS.

7. RESTRICTIONS

BECAUSE THE SYSTEM IS DESIGNED FOR TIMESHARING THE PROGRAM SHOULD NEVER HALT. THEREFORE THE OPERATOR IS SOMEWHAT RESTRICTED IN WHAT HE CAN EXAMINE WHEN AN ERROR OCCURES. HOWEVER, BECAUSE OF THE VARIETY OF TESTS AVAILABLE HE SHOULD BE ABLE TO TRACE MOST PROBLEMS BY WORKING WITHIN THE SYSTEM.

8. PARAMETER DESCRIPTIONS

THE STATUS OF THE MONITOR IS DEPENDENT ON SIX PARAMETERS. WHEN THE STATUS IS TYPED IN ERROR MESSAGES, STATUS REPORTS, AND BY THE OPERATOR, THE FOLLOWING FORMAT IS USED (WHERE N REPRESENTS AN OCTAL DIGIT):

TST	PAT	SEQ	TRK	SEC	WORD
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B.1 TESTS (TST)

TEST 00

PERFORM ALL OF THE FOLLOWING TESTS IN SEQUENTIAL ORDER.

TEST 01

CLEAR THE DISK AND CHECK THE TESTER.

- A. CHECK THE CLR COMMAND TO MAKE SURE THE ATTENTION BIT WILL SET AND THE ERROR BITS ARE CLEARED
- B. WRITE THE DISK WITH ALL ZEROES, A TRACK AT A TIME.
- C. SELECT A RANDOM ADDRESS AND WRITE THAT SECTOR WITH A RANDOM DATA WORD.
- D. READ THE SAME SECTOR WITH A DIFFERENT DATA WORD IN THE DB. THIS SHOULD GENERATE A DATA ERROR, WHICH THE MONITOR CHECKS FOR AND, IF DATA READ BY THE TESTER CORRESPONDS TO THE DATA ORIGINALLY WRITTEN, THE ERROR IS IGNORED.
- E. REWRITE THE ABOVE SECTOR WITH ALL ZEROES.
- F. SELECT ANOTHER RANDOM ADDRESS AND WRITE THAT TRACK WITH A NEW RANDOM DATA WORD.
- G. READ THIS TRACK WITH A DIFFERENT DATA WORD IN THE DB AND MAKE THE SAME CHECKS AS IN STEP D.
- H. READ JUST ONE SECTOR ON THE ABOVE TRACK WITH A DIFFERENT DATA WORD IN THE DB AND AGAIN CHECK AS IN STEP D.
- I. REWRITE THE ABOVE TRACK WITH ALL ZEROES.

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- TEST 02 READ SECTORS.  
A. READ ONE SECTOR AT A TIME.
- TEST 03 READ TRACKS.  
A. READ ONE TRACK AT A TIME.
- TEST 04 WRITE SECTORS  
A. WRITE ONE SECTOR AT A TIME.
- TEST 05 WRITE TRACKS  
A. WRITE ONE TRACK AT A TIME.
- TEST 06 WRITE AND READ SECTORS  
A. WRITE A SECTOR  
B. READ THAT SECTOR
- TEST 07 WRITE AND READ TRACK  
A. WRITE A TRACK  
B. READ THAT TRACK
- TEST 10 CLEAR, READ, WRITE, READ SECTOR.  
A. WRITE A SECTOR WITH ZEROES.  
B. READ THAT SECTOR  
C. WRITE THAT SECTOR WITH A PATTERN WORD  
D. READ THAT SECTOR.
- TEST 11 CLEAR, READ, WRITE, READ TRACK  
A. WRITE A TRACK WITH ALL ZEROES  
B. READ THAT TRACK  
C. WRITE THAT TRACK WITH A PATTERN WORD.  
D. READ THAT TRACK.
- TEST 12 WRITE A SECTOR, CHANGE THE TRACKS AND REPEAT FOR REST OF DISK, THEN READ SECTORS WRITTEN.  
A. WRITE A SECTOR, THEN CHANGE TRACKS AND WRITE THE CORRESPONDING SECTOR ON THAT TRACK AND REPEAT FOR ALL TRACKS ON THE DISK.  
B. READ ALL THE SECTORS WRITTEN.



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TEST 13

CLEAR, WRITE A SECTOR, CHANGE TRACKS AND REPEAT,  
THEN READ ALL SECTORS.

- A. WRITE A TRACK WITH ALL ZEROES
- B. WRITE ONE SECTOR ON THAT TRACK WITH A PATTERN WORD. THEN CHANGE TRACKS AND REPEAT A AND B UNTIL ALL TRACKS HAVE BEEN WRITTEN.
- C. READ ALL SECTORS. THERE SHOULD BE ZEROES ON ALL SECTORS BUT ONE OF EACH TRACK.

TEST 14

WRITE A SECTOR COMPLEMENT PATTERN WORD, WRITE ALL OTHER SECTORS, THEN READ ALL SECTORS.

- A. WRITE ONE SECTOR WITH A PATTERN WORD, THEN WRITE THE REST OF THAT TRACK WITH THE COMPLEMENT PATTERN WORD.
- B. WRITE ALL OTHER TRACKS WITH THE COMPLEMENT PATTERN WORD.
- C. READ THE ORIGINAL SECTOR WITH THE ORIGINAL PATTERN WORD, THEN READ THE REST OF THE TRACK WITH THE COMPLEMENT PATTERN WORD.
- D. READ ALL THE OTHER TRACKS WITH THE COMPLEMENT PATTERN WORD.

TEST 15

WRITE ONE SECTOR, COMPLEMENT PATTERN WORD, WRITE REST OF TRACK, READ TRACK.

- A. WRITE ONE SECTOR WITH A PATTERN WORD, THEN WRITE THE REST OF THAT TRACK WITH THE COMPLEMENT PATTERN WORD.
- B. READ THE ORIGINAL SECTOR WITH THE ORIGINAL PATTERN WORD, THEN READ THE REST OF THE TRACK WITH THE COMPLEMENT PATTERN WORD.

TEST 16

WRITE A TRACK, COMPLEMENT PATTERN WORD, WRITE ALL OTHER TRACKS, THEN READ THE DISK.

- A. WRITE ONE TRACK WITH A PATTERN WORD, THEN WRITE ALL OF THE OTHER TRACKS WITH THE COMPLEMENT PATTERN WORD.
- B. READ THE ORIGINAL TRACK WITH THE ORIGINAL PATTERN WORD THEN READ THE REST OF THE DISK WITH THE COMPLEMENT PATTERN WORD.

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TEST 17

WRITE A TRACK, COMPLEMENT PATTERN WORD, WRITE THE TWO ADJACENT TRACKS, THEN READ ALL THREE TRACKS.

- A. WRITE A TRACK WITH PATTERN WORD
- B. WRITE ONE ADJACENT TRACK WITH THE COMPLEMENT PATTERN WORD.
- C. WRITE THE OTHER ADJACENT TRACK WITH THE COMPLEMENT PATTERN WORD.
- D. READ THE ORIGINAL TRACK WITH THE ORIGINAL PATTERN WORD.
- E. READ ONE ADJACENT TRACK WITH THE COMPLEMENT PATTERN WORD.
- F. READ THE OTHER ADJACENT TRACK WITH THE COMPLEMENT PATTERN WORD.

TEST 20

WRITE A TRACK, THEN READ IT FOR 5 MINUTES.

- A. WRITE TRACK
- B. READ THE TRACK CONTINUOUSLY FOR 5 MINUTES.
- C. REPEAT STEPS A AND B FOR REMAINING TRACKS.

TEST 21

DC POWER FAIL ON A WRITE TRACK

- A. WRITE ALL THE TRACKS WITH A PATTERN WORD, THEN WRITE PART OF THEM A SECOND TIME.
- B. DURING A WRITE, TURN DC POWER OFF (IGNORE ERRORS WHICH OCCUR WHILE POWER IS OFF)
- C. WAIT 20 SECONDS, THEN TURN POWER BACK ON AND CLEAR THE TESTER.
- D. WAIT ANOTHER 20 SECONDS FOR THE POWER TO STABILIZE.
- E. READ THE SECTOR WHICH WAS MOST LIKELY THE ONE BEING WRITTEN WHEN THE POWER FAIL OCCURED, THEN READ THE REST OF THE TRACK. (THE MONITOR IGNORES THE FIRST ERROR ON THAT TRACK.)
- F. AFTER THE FIRST ERROR IS ENCOUNTERED, ALL OTHER ERRORS ARE CONSIDERED AS VALID.
- G. READ THE REST OF THE DISK.

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TEST 22

DC POWER FAIL ON A REAL TRACK

- A. WRITE THE DISK WITH A PATTERN WORD.
- B. READ ALL OF THE TRACKS ONCE AND PART OF THEM A SECOND TIME.
- C. DURING A READ, TURN DC POWER OFF (IGNORE ERRORS WHICH OCCUR WHILE POWER IS OFF.)
- D. WAIT 20 SECONDS, THEN TURN POWER BACK ON AND CLEAR THE TESTER.
- E. WAIT ANOTHER 20 SECONDS FOR THE POWER TO STABILIZE.
- F. READ THE ENTIRE DISK.

TEST 23

AC POWER FAIL ON A WRITE TRACK

- A. WRITE ALL THE TRACKS WITH A PATTERN WORD, THEN WRITE PART OF THEM A SECOND TIME.
- B. DURING A WRITE, TURN AC POWER OFF (IGNORE ERRORS WHILE POWER IS OFF).
- C. WAIT 20 SECONDS, THEN TURN POWER BACK ON AND CLEAR THE TESTER.
- D. WAIT 20 SECONDS FOR THE POWER TO STABILIZE AND THE MOTOR TO GET BACK UP TO SPEED, THEN TURN AC POWER BACK OFF AGAIN.
- E. REPEAT OF C
- F. REPEAT OF D
- G. REPEAT OF C
- H. WAIT 20 SECONDS FOR THE POWER TO STABILIZE AND THE MOTOR TO GET BACK UP TO SPEED.
- I. READ THE SECTOR WHICH WAS MOST LIKELY THE ONE BEING WRITTEN WHEN THE POWER FAIL OCCURED, THEN READ THE REST OF THE TRACK. (THE MONITOR IGNORES THE FIRST ERROR ON THAT TRACK).
- J. AFTER THE FIRST ERROR IS ENCOUNTERED, ALL OTHER ERRORS ARE CONSIDERED AS VALID.
- K. READ THE REST OF THE DISK.

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TEST 24

AC POWER FAIL ON A READ.

- A. WRITE THE DISK WITH A PATTERN WORD
- B. READ ALL THE TRACKS ONCE AND PART OF THEM A SECOND TIME.
- C. DURING A READ, TURN AC POWER OFF. (IGNORE ERRORS WHILE POWER IS OFF.)
- D. WAIT 20 SECONDS, THEN TURN THE POWER BACK ON AND CLEAR THE TESTER.
- E. WAIT 20 SECONDS FOR THE POWER TO STABILIZE AND THE MOTOR TO GET BACK UP TO SPEED, THEN TURN AC POWER OFF AGAIN.
- F. REPEAT OF D
- G. REPEAT OF E
- H. REPEAT OF D
- I. WAIT 20 SECONDS FOR THE POWER TO STABILIZE AND THE MOTOR TO GET BACK UP TO SPEED.
- J. READ THE ENTIRE DISK.

8.2 PATTERNS (PAT)

- PATTERN 00 ALL OF THE FOLLOWING EXCEPT PATTERN 12.
- PATTERN 01 000000
- PATTERN 02 177777
- PATTERN 03 125252
- PATTERN 04 052525
- PATTERN 05 OCTAL CHECKERBOARD:  
107070, 070707,  
143434, 034343,  
161616, 016161,
- PATTERN 06 FLOATING ONE:  
000001, 000002, 000004,  
000010, 000020, 000040,  
000100, 000200, 000400,  
001000, 002000, 004000,  
010000, 020000, 040000,  
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PATTERN 07 FLOATING ZEROES:  
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177767, 177757, 177737,  
177677, 177577, 177377,  
176777, 175777, 173777,  
167777, 157777, 137777,  
077777

PATTERN 10 ONE'S TRANSFER:  
000000, 000001, 000003,  
000007, 000017, 000037,  
000077, 000177, 000377,  
000777, 001777, 003777,  
007777, 017777, 037777,  
077777, 177777

PATTERN 11 ZERO'S TRANSFER:  
177777, 177776, 177774,  
177770, 177760, 177740,  
177700, 177600, 177400,  
177000, 176000, 174000,  
170000, 160000, 140000,  
100000, 000000

PATTERN 12 RANDOM NUMBERS:  
4096 PROGRAM GENERATED RANDOM NUMBERS

PATTERN X ALLOWS THE OPERATOR TO CHOOSE ANY 16 BIT NUMBER.

8.3 SEQUENCES (SEQ).

THE SEQUENCE DETERMINES IN WHAT ORDER THE TRACK AND/OR SECTOR ADDRESSES ARE SELECTED.

- SEQUENCE 0 BOTH OF THE FOLLOWING SEQUENCES
- SEQUENCE 1 SEQUENTIAL ORDER
- SEQUENCE 2 RANDOM ORDER
- SEQUENCE X CHOOSE A SPECIFIC TRACK AND SECTOR.

8.4 TRACK ADDRESS (TRK)

A SPECIFIC TRACK CAN ONLY BE SELECTED WHEN SEQ=X. TRACK NUMBERS ARE 0 TO 37 OCTAL.

TRK=X SELECT ALL TRACKS, SEQUENCE 1

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8.5 SECTOR ADDRESS (SEC)

A SPECIFIC SECTOR CAN ONLY BE SELECTED WHEN SEQ=X. SECTOR NUMBERS ARE 0 TO 77 OCTAL.

SEC=X SELECT ALL SECTORS, SEQUENCE 1

8.6 DATA WORD (WORD)

ANY 16 BIT WORD CAN BE SELECTED WHEN PAT=X. IT CAN BE SPECIFIED AS A SIX OR LESS CHARACTER OCTAL WORD.

8.7 THE FOLLOWING PARAMETERS ARE AUTOMATICALLY SELECTED FOR THE AUTO ACCEPTANCE TEST.

TST	PAT	SEQ	TRK	SEC	(TIME)
1	1	1	-	-	
2	1	1	-	-	
7	1	1	-	-	
21	0	X	*	X	
22	0	X	*	X	
23	0	X	*	X	
24	0	X	*	X	
15	5	X	*	X	
16	5	1	-	-	
17	5	1	-	-	
20	12	1	-	-	(10:40)

\*= A SINGLE TRACK CHOSEN AT RANDOM

9. PROGRAM DESCRIPTION

THE RS64 DISK MONITOR IS DESIGNED TO MONITOR AND SERVICE THE THE RS64 TEST SETS WHICH CONTROL THE RS64 DISKS UNDER TEST. THE OPERATOR OF EACH TEST STATION HAS CONTROL OVER THE MONITOR THROUGH THE STATION'S TELETYPE WHICH OPERATES UNDER INTERRUPT MODE. THERE ARE THREE MAIN SECTIONS TO THIS PROGRAM: (1) THE MONITORING SECTION, (2) THE INTERRUPT ROUTINES, AND (3) THE MONITOR STATUS BUFFERS.

9.1 MONITORING SECTION

THE MONITORING SECTION IS THE BACKGROUND PROGRAM WHICH IS CONSTANTLY POLLING STATIONS ON LINE TO DETERMINE THEIR STATUS. IF A STATION IS "ACTIVE", MEANING IT IS RUNNING A TEST, THE MONITOR CHECKS TO SEE IF THE OPERATION IS DONE OR IF AN ERROR HAS OCCURRED. IF NEITHER CONDITION IS PRESENT, IT GOES AND POLLS THE NEXT STATION.

IF AN ERROR HAS OCCURED, THE MONITOR STORES A MESSAGE CODE FOR THE TELEPRINTER SERVICE ROUTINE, INCREMENTS THE ERROR COUNTER AND PROCEEDS TO THE NEXT OPERATION. AFTER 64 ERRORS, IT NO LONGER INITIATES THE ERROR PRINTOUT.



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IF THE OPERATION IS DONE THE MONITOR DETERMINES FROM THE STATUS BUFFERS WHICH TEST THAT STATION IS EXECUTING AND GOES TO THAT TEST ROUTINE. THE TEST ROUTINE UPDATES THE DATA IN THE MONITOR STATUS BUFFERS AND SENDS THE NECESSARY INFORMATION TO THE TESTER FOR EXECUTION OF THE NEXT OPERATION. IF THE TEST IS DONE THE MONITOR CHECKS IT TO SEE IF OTHER TESTS ARE TO BE PERFORMED AUTOMATICALLY. IF NOT, IT BUFFERS A MESSAGE INDICATING THE NUMBER OF ERRORS AND "DEACTIVATES" THE STATION, ALLOWING THE OPERATOR TO ENTER NEW COMMANDS AND/OR PARAMETERS.

9.2 TELETYPE INTERRUPT ROUTINES

THE TELETYPE INTERRUPT ROUTINES SERVE AS THE LINK BETWEEN THE STATION OPERATOR AND THE MONITOR. THE KEYBOARD INTERRUPT ROUTINE HANDLES THE OPERATOR'S INSTRUCTIONS TO THE MONITOR. INITIALLY THE OPERATOR CAN SELECT "ACCEPT" MODE OR "TEST" MODE. "ACCEPT" MODE AUTOMATICALLY SELECTS PREDETERMINED PARAMETERS FOR THE STATUS BUFFER AND ACTIVATES THE MONITORING SECTION. IN THE "TEST" MODE, THE ROUTINE WAITS FOR THE OPERATOR TO ENTER THE PARAMETERS HE WANTS FROM THE KEYBOARD. WHEN HE HAS ENTERED A SET OF PARAMETERS, THE MONITOR SECTION BEGINS EXECUTING THEM.

THE TELEPRINTER INTERRUPT ROUTINE BUFFERS MESSAGES REQUESTED BY THE MONITOR, ALLOWING THE MONITOR TO CONTINUE TIME SHARING WHILE THE TELEPRINTER IS TYPING.

9.3 MONITOR STATUS BUFFER

THE MONITOR STATUS BUFFERS SERVE AS A LINK BETWEEN THE MONITOR SECTION AND THE TELETYPE ROUTINES. INPUT FROM THE KEYBOARD ROUTINE IS STORED THERE FOR USE BY THE MONITOR SECTION. WHENEVER THE MONITOR HAS OUTPUT MESSAGES, THEY ARE STORED IN THE MONITOR STATUS BUFFER FOR THE TELEPRINTER INTERRUPT ROUTINE TO HANDLE. ALSO, THE MONITOR USES THE STATUS BUFFERS TO DETERMINE WHERE IT IS IN THE TESTING SEQUENCE AND WHAT IT IS SUPPOSED TO DO NEXT.

9.4 REAL TIME CLOCK INTERRUPT ROUTINE

THIS ROUTINE KEEPS TRACK OF WHAT TIME IT IS. IT IS USED TO DETERMINE WHEN A READ INSTRUCTION SHOULD BE TERMINATED AND IT CONTROLS WAIT ROUTINES, THUS LEAVING THE COMPUTER FREE FOR TIME SHARING.

9.5 POWER FAILURE INTERRUPT ROUTINE.

IF THE PROCESSOR EXPERIENCES A POWER FAILURE, THE MONITOR WILL WAIT 30 SECONDS AFTER POWER HAS BEEN RESTORED BEFORE DOING ANYTHING, THUS INSURING ALL DISK MOTORS ARE UP TO SPEED. IT THEN TRANSFERS BACK INTO THE TESTER THE PARAMETERS WHICH WERE BEING EXECUTED AT THE TIME OF THE POWER FAILURE.

10. LISTING  
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.TITLE MAINDEC-11-DZRSA-A      RS64 TESTER MONITOR AND EXERCISER
.ENABL ABS
;RS64 DISK TESTER AND DIAGNOSTIC MONITOR
;COPYRIGHT 1970, BY DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS. 01754
;PROGRAMMER: KEN CHAPMAN

;DEFINITIONS
PS=177776      ;ADDRESS OF PROCESSOR STATUS
RETIME=6       ;TIME ALLOWED FOR A READ>67MS
SP=240         ;ASCII FOR SPACE
CR=215         ;ASCII FOR CARRIAGE RETURN
LF=212         ;ASCII FOR LINE FEED
BELL=207       ;ASCII FOR BELL
CRLF=106612   ;ASCII FOR CARRIAGE RETURN, LINE FEED

.=0            ;INTERRUPT VECTORS
.REPT 100
  .+2
  HALT
.ENDR
.=24          ;NEXT LOCATION
          ;HALT ON INTERRUPT
          ;POWER FAILURE INTERUP VECTOR
          ;PRIORITY=7
.=60         ;KEYBOARD INTERRUPT
          ;PRIORITY=5
          ;TELEPRINTER INTERRUPT
          ;PRIORITY=5
.=100        ;LINE CLOCK INTERRUPT
          ;PRIORITY=7
.=200
LOAD: JMP BEGIN
      HALT
.=500
CYCLE: 7020
          ;AC LINE FREQUENCY IN CYCLES PER MINUTE
          ;7020 FOR 60 HERTZ
          ;5670 FOR 50 HERTZ
NUMBER: 10   ;NUMBER OF STATIONS ON SYSTEM * 10

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177776
000006
000240
000215
000212
000207
106612
000000
000024
022026
000340
000060
010412
000240
014046
000240
000100
017052
000340
000200
000167 000574
000000
000500
007020
000502 000010

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808
809
810
811
812 001000 012706 000500      . =1000
813 001004 000005      BEGIN:  MOV      #500,%6      ; INITIALIZE STACK POINTER
814 001006 012767 000340 176762  MOV      #340,PS      ; RESET ALL DEVICES ON THE UNIBUS
815 001014 004767 016420      JSR      7,DATIN      ; PRIORITY=7
816 001020 004767 020700      JSR      7,SETCYC     ; INPUT THE DATE AND TIME
817 001024 012777 000100 016404  MOV      #100,CLKS    ; ENABLE LINE FREQUENCY CLOCK
818 001032 012700 030000      MOV      #STAT0,%0   ; START OF STATUS BUFFERS
819 001036 012701 001100      MOV      #1100,%1    ; LENGTH OF BUFFERS
820 001042 005020      LOGIN: CLR      (0)+   ; CLEAR BUFFERS
821 001044 005301      DEC      %1          ; DONE?
822 001046 001375      BNE     LOGIN        ; LOOP BACK
823
824
825 001050 012767 001130 176726  ; ACTIVATE TELETYPES AND CLEAR TEST SETS
826 001056 012767 000340 176722  MOV      #NOSTAT,4   ; SKIP SET UP ON TIME OUT
827 001064 005000      MOV      #340,6     ; PRIORITY=7
828 001066 052770 000100 032400  LOOP:  CLR      %0
829 001074 004767 005706      BIS     #100,TKSO(0) ; SET TK INT ENB
830 001100 012760 100700 030000  JSR      7,CLACS     ; CLEAR TEST SET
831 001106 012760 020000 030002  MOV      #100700,STAT0(0) ; ACTIVE, TEST 1, TEST MODE
832 001114 052760 000020 030004  MOV      #020000,ASTAT(0) ; SEQ 1
833 001122 052760 100000 030200  BIS     #20,FLAGS(0) ; SET "STARTUP" FLAG
834 001130 062700 000010      BIS     #100000,CSBUF(0) ; SET WAIT FLAG
835 001134 020067 177342      NOSTAT: ADD     #10,%0 ; NEXT
836 001140 001352      CMP     %0,NUMBER   ; POLLED ALL STATIONS?
837 001142 012767 000006 176634  BNE     LOOP        ; NOT DONE POLLING
838 001150 005067 176632      MOV     #6,4        ; GO TO 6 ON TIME OUT
839 001154 012767 000140 176614  RESTAR: CLR      6   ; HALT ON TIME OUT
840 001162 012706 001000      MOV     #140,PS     ; PRIORITY=3
841      MOV     #1000,%6  ; RESET STACK POINTER
842
843
844
845
846
847
848 001166 005000      START: CLR      %0   ; CLEAR STATION COUNTER
849 001170 005760 030000      SCAN:  TST     STAT0(0) ; TEST STATION STATUS
850 001174 100406      BMI     ACTIVE     ; ACTIVE STATION
851 001176 062700 000010      NEXT:  ADD     #10,%0 ; INC TO NEXT STATION
852 001202 020067 177274      CMP     %0,NUMBER  ; POLLED ALL STATIONS?
853 001206 001370      BNE     SCAN       ; NOT DONE POLLING
854 001210 000766      BR     START       ; RESTART AFTER LAST STATION

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855
856 ;*****
857
858 001212 105770 032200 ACTIVE: TSTB @CSO(0) ;TEST SET CONTROL STATUS
859 001216 100425 BMI ATTN ;ATTN BIT SET
860 001220 032760 100004 030200 BIT #100004,CSBUF(0) ;WAIT FLAG OR READ?
861 001226 001763 BEQ NEXT ;NO
862 001230 100572 BMI WAIT
863 001232 016002 030600 READ: MOV RTIME(0),%2 ;GET READ START TIME
864 001236 166702 016164 SUB TIME,%2 ;COMPARE TO PRESENT TIME
865 001242 003402 BLE REDOVR ;TIME OVERFLOWED?
866 001244 166702 177230 SUB CYCLE,%2 ;YES, COMPENSATE
867 001250 062702 000006 REDOVR: ADD #RETIME,%2 ;READING TIME
868 001254 100350 BPL NEXT ;NOT DONE
869 001256 052760 000200 030200 BIS #200,CSBUF(0) ;SET ATTN TO STOP READING
870 001264 016070 030200 032200 MOV CSBUF(0),@CSO(0) ;DO IT
871 001272 032770 170000 032200 ATTN: BIT #170000,@CSO(0) ;TEST FOR ERRORS
872 001300 001045 BNE ERROR
873 001302 116001 030001 OPDONE: MOVB STATO+1(0),%1 ;GET TEST #
874 001306 042701 177700 BIC #177700,%1 ;MASK
875 001312 006301 ASL %1 ;*2
876 001314 105060 030606 CLRB READ3(0) ;CLR READ ERROR REPEAT COUNTER
877 001320 116003 030006 MOVB PHASE(0),%3 ;PHASE?
878 001324 100003 BPL TESTS
879 001326 004767 005536 JSR 7,TEDONE
880 001332 000721 BR NEXT
881
882 ;*****
883
884 001334 004771 001342 TESTS: JSR 7,@TEST(1) ;GO TEST
885 001340 000716 BR NEXT
886
887 TEST: TEST0
888 TEST1
889 TEST2
890 TEST3
891 TEST4
892 TEST5
893 TEST6
894 TEST7
895 TEST10
896 TEST11
897 TEST12
898 TEST13
899 TEST14
900 TEST15
901 TEST16
902 TEST17
903 TEST20
904 TEST21
905 TEST22
906 TEST23
907 TEST24

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Handwritten marks and scribbles on the right side of the page, including a large '4' and some illegible characters.

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908
909 ;*****
910
911 001414 032760 000001 030004 ERROR: BIT #1,FLAGS(0) ;"IGNORE ERRORS" FLAG UP?
912 001422 001327 BNE OPDONE ;YES
913 001424 032760 007400 030400 BIT #7400,PSTAT(0) ;LAST MESSAGE DONE?
914 001432 001032 BNE ERBUSY ;NO
915 001434 005260 030604 INC ERCONT(0) ;COUNT NUMBER OF ERRORS
916 001440 001432 BEQ ERCOVE ;OVERFLOW?
917 001442 032760 177700 030604 BIT #177700,ERCONT(0) ;WAISTING PAPER?
918 001450 001003 BNE ERROR1 ;YES, STOP ERROR MESSAGE
919 001452 005760 030004 TST FLAGS(0) ;SUPRESS ERROR TYPE-OUT FLAG UP?
920 001456 100012 BPL ERMES ;NO
921 001460 032760 000002 030004 ERROR1: BIT #2,FLAGS(0) ;BELL FLAG?
922 001466 001403 BEQ NOBELL
923 001470 112760 000241 030401 MOVB #241,PSTAT+1(0) ;MESS 12, LINE 1 - RING BELL
924 001476 004767 000044 NOBELL: JSR 7,ERREAD
925 001502 000635 BR NEXT
926
927 001504 042760 100000 030000 ERMES: BIC #100000,STAT0(0) ;DEACTIVATE
928 001512 112760 000007 030401 MOVB #007,PSTAT+1(0) ;MESSAGE 0, LINE 7
929 001520 004767 006636 ERBUSY: JSR 7,CRACT
930 001524 000624 BR NEXT
931
932 001526 032760 007400 030400 ERCOVE: BIT #7400,PSTAT(0)
933 001534 001371 BNE ERBUSY
934 001536 112760 000142 030401 MOVB #142,PSTAT+1(0) ;MESS 6, LINE 2 - ERROR COUNT OVERFLOW
935 001544 000765 BR ERBUSY
936
937 ;*****
938 ;SUBROUTINE TO REPEAT READS UP TO 3 TIMES WHEN ERRORS OCCUR.
939 ;*****
940
941 001546 032760 000004 030200 ERREAD: BIT #4,CSBUF(0) ;READ?
942 001554 001411 BEQ EREAD1 ;NO
943 001556 005770 032200 TST #CS0(0) ;DATA ERROR?
944 001562 100006 BPL EREAD1 ;NO
945 001564 105260 030606 INCB READ3(0) ;COUNT REPEATS
946 001570 126027 030606 000003 CMPB READ3(0),#3 ;DONE 3 REPEATS?
947 001576 103402 BLO EREAD2 ;NO
948 001600 000167 005202 EREAD1: JMP CLRCS ;CLR TESTER AND RTS
949
950 001604 012770 000200 032200 EREAD2: MOV #200,#CS0(0) ;CLEAR THE ERROR BITS
951 001612 000167 005136 JMP TRANS1 ;TRANSFER BUFFS TO TESTER AND RTS
952
953 ;*****
954 001616 026760 015604 030600 WAIT: CMP TIME,RTIME(0)
955 001624 001226 BNE OPDONE
956 001626 000167 177344 JMP NEXT
957
958 ;*****
959 001632 000000 TESTO: HALT

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971 001634 006303
972 001636 000173 001642
973 001642 001666
974 001644 001732
975 001646 002026
976 001650 002054
977 001652 002110
978 001654 002130
979 001656 002144
980 001660 002200
981 001662 002232
982 001664 002252
983
984 001666 005260 030006
985 001672 005070 032204
986 001676 005070 032202
987 001702 004767 005100
988 001706 052760 100000 030200
989 001714 012760 000074 030406
990 001722 016760 015500 030600
991 001730 000207
992
993 001732 105770 032200
994 001736 100416
995 001740 005360 030406
996 001744 001366
997 001746 005260 030604
998 001752 042760 100000 030000
999 001760 112760 000010 030401
1000 001766 004767 006370
1001 001772 000207
1002
1003 001774 032770 177577 032200
1004 002002 001361
1005 002004 005770 032204
1006 002010 001356
1007 002012 105260 030006
1008 002016 005060 030204
1009 002022 000167 004710
1010
1011 002026 004767 005132
1012 002032 102402
1013 002034 000167 004676
1014
1015 002040 105260 030006

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*****
TEST1-MAKE SURE THE TESTER WORKS AND THE DISK "FUNCTIONS."
FIRST, DO A CLEAR AND MAKE SURE ATTN BIT SETS.
THEN, WRITE THE DISK WITH ZEROES (TO REDUCE CHANGE OF PARITY ER)
THEN, WRITE A RANDOM SECTOR WITH A RANDOM PATTERN.
THEN, READ THAT SECTOR WITH A DIFFERENT RANDOM PATTERN,
THUS GENERATING AN ERROR. CHECK FOR THE CORRECT ERROR.
DO THE SAME FOR A TRACK.
*****

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TEST1: ASL      %3
        JMP      @T1(3)      ;JMP TO RIGHT PHASE OF TEST
T1:     T1Z
        T1A
        T1B
        T1C
        T1D
        T1E
        T1F
        T1G
        T1H
        T1I

T1Z:    INC      PHASE(0)
        CLR      @DAO(0)
        CLR      @DBO(0)
        JSR      7,CLRCS
        BIS      #100000,CSBUF(0) ;SET "WAIT" FLAG
        MOV      #74,WAITER(0) ;SET UP WAIT COUNTER
T1Z1:   MOV      TIME,RTIME(0) ;SET UP WAIT TIMER
        RTS      7

T1A:    TSTB    @CSO(0)      ;ATTEN BIT SET?
        BMI     T1A2        ;YES
        DEC     WAITER(0)   ;WAITED 1 SEC?
        BNE     T1Z1        ;NO
T1A1:   INC      ERCONT(0)  ;COUNT THE ERRORS
        BIC     #100000,STATO(0);DEACTIVATE
        MOVB    #010,PSTAT+1(0);MESSO,LINE10
        JSR     7,CRACT
        RTS      7

T1A2:   BIT     #177577,@CSO(0) ;STATUS BUFFER CLEAR?
        BNE     T1A1        ;FAILED TO CLEAR
        TST     @DAO(0)
        BNE     T1A1
        INCB   PHASE(0)
        CLR     @DBUF(0)
        JMP     WTRK

T1B:    JSR     7,NEXTAD
        BVS    T1B1
        JMP     WTRK

T1B1:   INCB   PHASE(0)

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1016	002044	004767	000256		JSR	7, T1PX		;GET RANDOM ADDR. AND RANDOM PAT.
1017	002050	000167	004642		JMP	W SCT		;WRITE A SECTOR
1018								
1019	002054	105260	030006		T1C:	INCB	PHASE(0)	
1020	002060	016060	030204	030206		MOV	DBBUF(0), OLDATA(0)	
1021	002066	004767	006150			JSR	7, RANDOM	
1022	002072	010160	030204			MOV	%1, DBBUF(0)	
1023	002076	052760	000001	030004		BIS	#1, FLAGS(0)	;SET "IGNORE ERRORS" FLAG
1024	002104	000167	004616			JMP	R SCT	;READ THE SECTOR
1025								
1026	002110	105260	030006		T1D:	INCB	PHASE(0)	
1027	002114	004767	000232			JSR	7, T1PY	;CHECK FOR ERRORS
1028	002120	005060	030204			CLR	DBBUF(0)	;CLEAR THAT SECTOR AGAIN
1029	002124	000167	004566			JMP	W SCT	
1030								
1031	002130	105260	030006		T1E:	INCB	PHASE(0)	
1032	002134	004767	000166			JSR	7, T1PX	;GET NEW RAN. ADDR. AND RAN. PAT.
1033	002140	000167	004572			JMP	W TRK	;WRITE A TRACK
1034								
1035	002144	105260	030006		T1F:	INCB	PHASE(0)	
1036	002150	016060	030204	030206		MOV	DBBUF(0), OLDATA(0)	
1037	002156	004767	006060			JSR	7, RANDOM	
1038	002162	010160	030204			MOV	%1, DBBUF(0)	
1039	002166	052760	000001	030004		BIS	#1, FLAGS(0)	;SET "IGNORE ERRORS" FLAG
1040	002174	000167	004546			JMP	R TRK	
1041								
1042	002200	105260	030006		T1G:	INCB	PHASE(0)	
1043	002204	004767	000142			JSR	7, T1PY	;CHECK FOR ERRORS
1044	002210	004767	006026			JSR	7, RANDOM	
1045	002214	010160	030204			MOV	%1, DBBUF(0)	
1046	002220	052760	000001	030004		BIS	#1, FLAGS(0)	;SET "IGNORE ERRORS" FLAG
1047	002226	000167	004474			JMP	R SCT	
1048								
1049	002232	105260	030006		T1H:	INCB	PHASE(0)	
1050	002236	004767	000110			JSR	7, T1PY	;CHECK FOR ERRORS
1051	002242	005060	030204			CLR	DBBUF(0)	
1052	002246	000167	004464			JMP	W TRK	
1053								
1054	002252	105060	030006		T1I:	CLRB	PHASE(0)	
1055	002256	005060	030200			CLR	CSBUF(0)	
1056	002262	005070	032200			CLR	@CS0(0)	
1057	002266	005070	032202			CLR	@DB0(0)	
1058	002272	005070	032204			CLR	@DA0(0)	
1059	002276	032760	000020	030004		BIT	#20, FLAGS(0)	; "START UP" FLAG SET?
1060	002304	001544				BEQ	T DONE	;NO
1061	002306	005060	030000			CLR	STAT0(0)	
1062	002312	005060	030002			CLR	ASTAT(0)	
1063	002316	005060	030004			CLR	FLAGS(0)	
1064	002322	000167	004600			JMP	T OUT1	

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1065
1066
1067 002326 004767 005710
1068 002332 016760 005130 030204
1069 002340 042701 174000
1070 002344 010160 030202
1071 002350 000207
1072
1073 002352 042760 000001 030004
1074 002360 032770 070000 032200
1075 002366 001033
1076 002370 005770 032200
1077 002374 100030
1078 002376 026070 030206 032202
1079 002404 001024
1080 002406 017001 032204
1081 002412 032760 000010 030200
1082 002420 001006
1083 002422 042701 174000
1084 002426 026001 030202
1085 002432 001011
1086 002434 000207
1087
1088 002436 042701 174077
1089 002442 016002 030202
1090 002446 042702 174077
1091 002452 020102
1092 002454 001767
1093 002456 005726
1094 002460 000167 177262

:*****
↑T1PX: JSR 7,RANDOM
      MOV LONUM,DBBUF(0)
      BIC #174000,%1
      MOV %1,DABUF(0)
      RTS 7
:*****
↑T1PY: BIC #1,FLAGS(0) ;CLR "IGNORE ERRORS" FLAG
      BIT #070000,@CSO(0) ;OTHER THAN DATA ERROR?
      BNE T1PYC ;YES, TESTER ERROR
      TST @CSO(0) ;DATA ERROR?
      BPL T1PYC ;NO, TESTER ERROR
      CMP OLDATA(0),@DBO(0) ;TESTER READ PROPER ERROR DATA?
      BNE T1PYC ;NO, TESTER OR DISK ERROR
      MOV @DAO(0),%1
      BIT #10,CSBUF(0)
      BNE T1PYB
      BIC #174000,%1
      CMP DABUF(0),%1
      BNE T1PYC
T1PYA: RTS 7
T1PYB: BIC #174077,%1
      MOV DABUF(0),%2
      BIC #174077,%2
      CMP %1,%2
      BEQ T1PYA
T1PYC: TST (6)+ ;INCREMENT STACK POINTER
      JMP T1A1
```



```
1095
1096
1097
1098
1099
1100 002464 003012 TEST2: BGT T2A
1101 002466 005260 030006 T2Z: INC PHASE(0)
1102 002472 032760 040000 030000 BIT #40000,STATO(0) ;ALL TESTS?
1103 002500 001002 BNE T2Z1
1104 002502 004767 004674 JSR 7,PATIN
1105 002506 000167 004214 T2Z1: JMP R5CT
1106
1107 002512 004767 004446 T2A: JSR 7,NEXTAD
1108 002516 102402 BVS T2A1
1109 002520 000167 004202 JMP R5CT
1110
1111 002524 005060 030006 T2A1: CLR PHASE(0) ;PHASE = 0
1112 002530 032760 000100 030000 BIT #100,STATO(0) ;ACCEPT MODE?
1113 002536 001027 BNE TDONE ;NO, SEE IF DONE
1114 002540 052760 003400 030000 BIS #3400,STATO(0) ;TEST 7
1115 002546 000167 000272 JMP T7Z
1116
1117
1118
1119
1120
1121
1122 002552 003012 TEST3: BGT T3A
1123 002554 005260 030006 T3Z: INC PHASE(0)
1124 002560 032760 040000 030000 BIT #40000,STATO(0) ;ALL TESTS?
1125 002566 001002 BNE T3Z1 ;YES
1126 002570 004767 004606 JSR 7,PATIN
1127 002574 000167 004146 T3Z1: JMP RTRK
1128
1129 002600 004767 004360 T3A: JSR 7,NEXTAD
1130 002604 102402 BVS T3A1
1131 002606 000167 004134 JMP RTRK
1132
1133 002612 005060 030006 T3A1: CLR PHASE(0)
1134 002616 000167 004200 TDONE: JMP TESDON
1135
1136
1137
1138
1139
1140 002622 003006 TEST4: BGT T4A
1141 002624 005260 030006 T4Z: INC PHASE(0)
1142 002630 004767 004546 JSR 7,PATIN
1143 002634 000167 004056 T4Z1: JMP W5CT
1144
1145 002640 004767 004320 T4A: JSR 7,NEXTAD
1146 002644 102373 BVC T4Z1
1147 002646 004767 004620 JSR 7,NEXPAT
1148 002652 102370 BVC T4Z1
1149 002654 005060 030006 CLR PHASE(0)
1150 002660 000167 004136 JMP TESDON
```

1151  
1152  
1153  
1154  
1155  
1156 002664 003006  
1157 002666 005260 030006  
1158 002672 004767 004504  
1159 002676 000167 004034  
1160  
1161 002702 004767 004256  
1162 002706 102402  
1163 002710 000167 004022  
1164  
1165 002714 004767 004552  
1166 002720 102402  
1167 002722 000167 004010  
1168  
1169 002726 005060 030006  
1170 002732 000167 004064  
1171  
1172  
1173  
1174  
1175  
1176 002736 001403  
1177 002740 005303  
1178 002742 001407  
1179 002744 000412  
1180  
1181 002746 005260 030006  
1182 002752 004767 004424  
1183 002756 000167 003734  
1184  
1185 002762 005260 030006  
1186 002766 000167 003734  
1187  
1188 002772 004767 004166  
1189 002776 102003  
1190 003000 004767 004466  
1191 003004 102404  
1192 003006 005360 030006  
1193 003012 000167 003700  
1194  
1195 003016 005060 030006  
1196 003022 000167 003774

\*\*\*\*\*  
;TEST5 - WRITE TRACK  
\*\*\*\*\*

TEST5: BGT TSA  
TSZ: INC PHASE(0)  
JSR 7,PATIN  
JMP WTRK

TSA: JSR 7,NEXTAD  
BVS TSA1  
JMP WTRK

TSA1: JSR 7,NEXPAT  
BVS TSA2  
JMP WTRK

TSA2: CLR PHASE(0)  
JMP TESDON

\*\*\*\*\*  
;TEST6 - WRITE AND READ SECTOR  
\*\*\*\*\*

TEST6: BEQ T6Z  
DEC %3  
BEQ T6A  
BR T6B

T6Z: INC PHASE(0)  
JSR 7,PATIN  
T6A1: JMP W SCT

T6A: INC PHASE(0)  
T6B1: JMP R SCT

T6B: JSR 7,NEXTAD  
BVC T6B2  
JSR 7,NEXPAT  
BVS T6B3

T6B2: DEC PHASE(0)  
JMP W SCT

T6B3: CLR PHASE(0)  
JMP TESDON

```

1197
1198
1199
1200
1201
1202 003026 006303
1203 003030 000173 003034
1204 003034 003044
1205 003036 003060
1206 003040 003070
1207 003042 003130
1208
1209 003044 005260 030006
1210 003050 004767 004326
1211 003054 000167 003656
1212
1213 003060 005260 030006
1214 003064 000167 003656
1215
1216 003070 004767 004070
1217 003074 102003
1218 003076 004767 004370
1219 003102 102404
1220 003104 005360 030006
1221 003110 000167 003622
1222
1223 003114 005060 030006
1224 003120 032760 000100 030000
1225 003126 001233
1226 003130 032770 000100 032404
1227 003136 001412
1228 003140 032760 007400 030400
1229 003146 001410
1230 003150 112760 000003 030006
1231 003156 005060 030200
1232 003162 000207
1233
1234 003164 004767 005172
1235 003170 112760 000122 030401
1236 003176 012760 150603 030000
1237 003204 004767 005032
1238 003210 042701 174077
1239 003214 010160 030202
1240 003220 052701 030000
1241 003224 010160 030002
1242 003230 000167 002056

;*****
;TEST7 - WRITE AND READ TRACK
;*****

TEST7:  ASL      %3
        JMP      @T7(3)          ;JMP TO RIGHT PHASE OF TEST
T7:     T7Z
        T7A
        T7B
        T7C

T7Z:    INC      PHASE(0)
        JSR      7,PATIN
T7A1:   JMP      WTRK

T7A:    INC      PHASE(0)
T7B1:   JMP      RTRK

T7B:    JSR      7,NEXTAD
        BVC      T7B2
        JSR      7,NEXPAT
        BVS      T7B3
T7B2:   DEC      PHASE(0)
        JMP      WTRK

T7B3:   CLR      PHASE(0)          ;PHASE=0
        BIT      #100,STAT0(0)    ;TEST MODE?
        BNE      TDONE           ;YES, CONTINUE TO NEXT TEST
T7C:    BIT      #100,@TPSO(0)    ;TP "BUSY"?
        BEQ      T7C1           ;NO
        BIT      #7400,PSTAT(0)  ;MESSAGE BUFFER EMPTY?
        BEQ      T7C2           ;YES
        MOVB    #3,PHASE(0)      ;PHASE=3, WAIT FOR TP TO FINISH
        CLR     CSBUF(0)         ;CLR CS BUFFER
        RTS      7

T7C1:   JSR      7,CRACK          ;ACTIVATE TP
T7C2:   MOVB    #122,PSTAT+1(0)  ;MESS 5,LINE 2
        MOV     #150603,STAT0(0) ;TEST 21, ACCEPT MODE, PATTERN 3
        JSR      7,RANDOM        ;GET A RANDOM NUMBER
        BIC     #174077,%1       ;RANDOM TRACK ADDR
        MOV     %1,DABUF(0)      ;INTO ADDR BUFF
        BIS     #030000,%1       ;SEQ 1, SINGLE TRACK
        MOV     %1,ASTAT(0)      ;INTO ADDR STATUS
        JMP     T21Z

```

```

1243
1244
1245
1246
1247
1248 003234 006303
1249 003236 000173 003242
1250 003242 003254
1251 003244 003274
1252 003246 003304
1253 003250 003322
1254 003252 003332
1255
1256 003254 004767 004122
1257 003260 005260 030006
1258 003264 005060 030204
1259 003270 000167 003422
1260
1261 003274 005260 030006
1262 003300 000167 003422
1263
1264 003304 005260 030006
1265 003310 016060 030204 030204
1266 003316 000167 003374
1267
1268 003322 005260 030006
1269 003326 000167 003374
1270
1271 003332 005060 030006
1272 003336 004767 003622
1273 003342 102346
1274 003344 004767 004122
1275 003350 102343
1276 003352 000167 003444

```

```

:*****
:TEST 10 - CLEAR, READ, WRITE, READ SECTOR
:*****

```

```

TEST10: ASL      %3
          JMP     @T10(3)      ;JMP TO RIGHT PHASE OF TEST
T10:     T10Z
          T10A
          T10B
          T10C
          T10D

T10Z:    JSR     7,PATIN
T10Z1:   INC     PHASE(0)
          CLR     DBBUF(0)
          JMP     WSCF

T10A:    INC     PHASE(0)
          JMP     RSCT

T10B:    INC     PHASE(0)
          MOV     OLDDATA(0),DBBUF(0) ;RESTOR THE DATA BUFFER
          JMP     WSCF

T10C:    INC     PHASE(0)
          JMP     RSCT

T10D:    CLR     PHASE(0)
          JSR     7,NEXTAD
          BVC    T10Z1
          JSR     7,NEXPAT
          BVC    T10Z1
          JMP     TESDON

```

```

1277
1278
1279
1290
1291
1282 003356 006303
1283 003360 000173 003364
1284 003364 003376
1285 003366 003416
1286 003370 003426
1287 003372 003444
1288 003374 003454
1289
1290 003376 004767 004000
1291 003402 005260 030006
1292 003406 005060 030204
1293 003412 000167 003320
1294
1295 003416 005260 030006
1296 003422 000167 003320
1297
1298 003426 005260 030006
1299 003432 016060 030206 030204
1300 003440 000167 003272
1301
1302 003444 005260 030006
1303 003450 000167 003272
1304
1305 003454 005060 030006
1306 003460 004767 003500
1307 003464 102346
1308 003466 004767 004000
1309 003472 102343
1310 003474 000167 003322

```

```

:*****
:TEST 11 - CLEAR, READ, WRITE, READ TRACK
:*****

```

```

TEST11: ASL      %3
          JMP     @T11(3)      ;JMP TO RIGHT PHASE OF TEST
T11:     T11Z
          T11A
          T11B
          T11C
          T11D

T11Z:    JSR     7,PATIN
T11Z1:   INC     PHASE(0)
          CLR     DBBUF(0)
          JMP     WTRK

T11A:    INC     PHASE(0)
          JMP     RTRK

T11B:    INC     PHASE(0)
          MOV     OLDATA(0),DBBUF(0) ;RESTOR THE DATA BUFFER
          JMP     WTRK

T11C:    INC     PHASE(0)
          JMP     RTRK

T11D:    CLR     PHASE(0)
          JSR     7,NEXTAD
          BVC    T11Z1
          JSR     7,NEXPAT
          BVC    T11Z1
          JMP     TESDON

```

```

1311
1312
1313
1314
1315
1316
1317 003500 006303
1318 003502 000173 003506
1319 003506 003514
1320 003510 003530
1321 003512 003552
1322
1323 003514 004767 003662
1324 003520 105260 030006
1325 003524 000167 003166
1326
1327 003530 004767 004210
1328 003534 001402
1329 003536 000167 003154
1330
1331 003542 105260 030006
1332 003546 000167 003154
1333
1334 003552 004767 004166
1335 003556 001402
1336 003560 000167 003142
1337
1338 003564 105060 030006
1339 003570 004767 003370
1340 003574 102351
1341 003576 004767 003670
1342 003602 102346
1343 003604 000167 003212

```

```

:*****
:TEST 12 - WRITE ONE SECTOR, CHANGE TRACKS AND WRITE THAT SECTOR,
:      THEN GO BACK AND READ THOSE SECTORS WRITTEN.
:*****

```

```

TEST12: ASL      %3
        JMP      @T12(3)      ;JMP TO RIGHT PHASE OF TEST
T12:    T12Z
        T12A
        T12B

T12Z:   JSR      7,PATIN      ;START PAT
T12Z1:  INCB     PHASE(0)     ;PHASE = 1
        JMP      W SCT

T12A:   JSR      7,CHATAK     ;CHANGE TRACKS
        BEQ     T12A2
        JMP     W SCT

T12A2:  INCB     PHASE(0)     ;PHASE = 2
        JMP     R SCT        ;READ

T12B:   JSR      7,CHATAK     ;CHANGE TRACKS
        BEQ     T12B1
        JMP     R SCT

T12B1:  CLRB     PHASE(0)     ;PHASE = 0
        JSR     7,NEXTAD
        BVC     T12Z1
        JSR     7,NEXPAT
        BVC     T12Z1
        JMP     TESDON

```

# E03

MAINDEC-11-DZRSA-A  
DZRSAA.P11

RS64 TESTER MONITOR AND EXERCISER

MACY11 27(732) 10-SEP-76 11:07 PAGE 30

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1344
1345
1346
1347
1348
1349
1350 003610 006303
1351 003612 000173 003616
1352 003616 003626
1353 003620 003646
1354 003622 003664
1355 003624 003706
1356
1357 003626 004767 003550
1358 003632 105260 030006
1359 003636 005060 030204
1360 003642 000167 003070
1361
1362 003646 005260 030006 030204
1363 003652 016060 030206
1364 003660 000167 003032
1365
1366 003664 004767 004054
1367 003670 001403
1368 003672 105360 030006
1369 003676 000757
1370
1371 003700 105260 030006
1372 003704 000407
1373
1374 003706 004767 004064
1375 003712 001404
1376 003714 005060 030204
1377 003720 000167 003002
1378
1379 003724 004767 004014
1380 003730 001405
1381 003732 016060 030206 030204
1382 003740 000167 002762
1383
1384 003744 005060 030006
1385 003750 004767 003210
1386 003754 102326
1387 003756 004767 003510
1388 003762 102325
1389 003764 000167 003032

;*****
;TEST 13 - CLEAR TRACK, WRITE ONE SECTOR, CHANGE TRACKS AND REPEAT
;THEN READ ALL SECTORS
;*****

TEST13: ASL      %3
        JMP      @T13(3)      ;JMP TO RIGHT PHASE OF TEST
T13:    T13Z
        T13A
        T13B
        T13C

T13Z:   JSR      7,PATIN
T13Z1:  INCB     PHASE(0)      ;PHASE = 1
T13Z2:  CLR      DBBUF(0)
        JMP      WTRK

T13A:   INC      PHASE(0)      ;PHASE = 2
        MOV      OLDDATA(0),DBBUF(0)
        JMP      WSC

T13B:   JSR      7,CHATAK
        BEQ      T13B1
        DECB     PHASE(0)
        BR       T13Z2

T13B1:  INCB     PHASE(0)      ;PHASE = 3
        BR       T13C1

T13C:   JSR      7,CHASEC      ;CHANGE SECTORS
        BEQ      T13C1          ;Z=1, SAME SECTOR
        CLR      DBBUF(0)
        JMP      RSC

T13C1:  JSR      7,CHATAK      ;CHANGE TRACKS
        BEQ      T13C2          ;Z=1, DONE
        MOV      OLDDATA(0),DBBUF(0) ;RESTORE DATA BUFF
        JMP      RSC

T13C2:  CLR      PHASE(0)
        JSR      7,NEXTAD
        BVC     T13Z1
        JSR      7,NEXPAT
        BVC     T13Z2
        JMP      TESDON
```

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1390
1391
1392
1393
1394
1395
1396 003770 006303
1397 003772 000173 003776
1398 003776 004010
1399 004000 004024
1400 004002 004046
1401 004004 004102
1402 004006 004124
1403
1404 004010 004767 003366
1405 004014 105260 030006
1406 004020 000167 002672
1407
1408 004024 004767 003746
1409 004030 001404
1410 004032 004767 004000
1411 004036 000167 002654
1412
1413 004042 105260 030006
1414 004046 004767 003672
1415 004052 001404
1416 004054 004767 003756
1417 004060 000167 002652
1418
1419 004064 105260 030006
1420 004070 016060 030206 030204
1421 004076 000167 002624
1422
1423 004102 004767 003670
1424 004106 001404
1425 004110 004767 003722
1426 004114 000167 002606
1427
1428 004120 105260 030006
1429 004124 004767 003614
1430 004130 001404
1431 004132 004767 003700
1432 004136 000167 002604
1433
1434 004142 005060 030006
1435 004146 016060 030206 030204
1436 004154 042760 000010 030200
1437 004162 004767 002776
1438 004166 102312
1439 004170 004767 003276
1440 004174 102307
1441 004176 000167 002620

```

```

*****
;TEST14 - WRITE ONE SECTOR, COMPLEMENT THE PATTERN WORD,
;WRITE ALL OTHER SECTORS, THE READ ALL SECTORS
*****
TEST14: ASL      %3
        JMP      @T14(3)      ;JMP TO RIGHT PHASE OF TEST
T14:    T14Z
        T14A
        T14B
        T14C
        T14D
T14Z:   JSR      7,PATIN
T14Z1: INCB     PHASE(0)
        JMP      W3CT          ;WRITE ONE SECTOR
T14A:   JSR      7,CHASEC     ;CHANGE SECTOR
        BEQ      T14A1        ;ALL SECTORS THAT TRACK DONE?
        JSR      7,COMPAT     ;COMPLEMENT THE PATERN WORD
        JMP      W3CT        ;WRITE ALL OTHER SECTORS
T14A1:  INCB     PHASE(0)
T14B:   JSR      7,CHATAK
        BEQ      T14B2
        JSR      7,COMPAT
        JMP      WTRK
T14B2:  INCB     PHASE(0)
        MOV      OLDDATA(0),DBBUF(0) ;RESTOPE DATA BUFF
        JMP      RSCT
T14C:   JSR      7,CHASEC
        BEQ      T14C1
        JSR      7,COMPAT
        JMP      RSCT
T14C1:  INCB     PHASE(0)
T14D:   JSR      7,CHATAK
        BEQ      T14D1
        JSR      7,COMPAT
        JMP      RTRK
T14D1:  CLR      PHASE(0)      ;PHASE=0
        MOV      OLDDATA(0),DBBUF(0) ;RESTORE DATA BUFFER
        BIC      #10,CSBUF(0) ;CLR TRACK BIT TO GET NEXT SECTOR
        JSR      7,NEXTAD
        BVC     T14Z1
        JSR      7,NEXPAT
        BVC     T14Z1
        JMP     TESDON

```



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1442
1443
1444
1445
1446
1447 004202 006303
1448 004204 000173 004210
1449 004210 004216
1450 004212 004232
1451 004214 004266
1452
1453 004216 004767 003160
1454 004222 105260 030006
1455 004226 000167 002464
1456
1457 004232 004767 003540
1458 004236 001404
1459 004240 004767 003572
1460 004244 000167 002446
1461 004250 105260 030006
1462 004254 016060 030206 030204
1463 004262 000167 002440
1464
1465 004266 004767 003504
1466 004272 001404
1467 004274 004767 003536
1468 004300 000167 002422
1469
1470 004304 005060 030006
1471 004310 016060 030206 030204
1472 004316 004767 002642
1473 004322 102337
1474 004324 004767 003142
1475 004330 102334
1476 004332 032760 000100 030000
1477 004340 001402
1478 004342 000167 002454
1479
1480 004346 105260 030001
1481 004352 012760 020000 030002
1482 004360 005060 030202
1483 004364 000406

*****
:TEST 15 - WRITE ONE SECTOR, COMPLEMENT THE PATTERN WORD,
:WRITE THE REST OF THE TRACK, THEN READ THAT TRACK
*****
TEST15: ASL      %3
        JMP      @T15(3)      ;JMP TO RIGHT PHASE OF TEST
T15:    T15Z
        T15A
        T15B

T15Z:   JSR      7,PATIN
T15Z1:  INCB     PHASE(0)      ;PHASE = 1
        JMP      WSCT         ;WRITE ONE SECTOR

T15A:   JSR      7,CHASEC      ;CHANGE SECTORS
        BEQ      T15A1         ;Z=1 MEANS DONE TRACK
        JSR      7,COMPAT      ;COMPLEMENT THE PATTERN WORD
        JMP      WSCT         ;WRITE ALL OTHER SECTORS
T15A1:  INCB     PHASE(0)      ;PHASE = 2
        MOV      OLDDATA(0),DBBUF(0) ;RESTORE DAT BUFF
        JMP      RSCT         ;READ THE ORIGINAL SECTOR

T15B:   JSR      7,CHASEC      ;CHANGE SECTORS
        BEQ      T15B1         ;Z=1 MEANS DONE TRACK
        JSR      7,COMPAT      ;COMPLEMENT THE PATTERN WORD
        JMP      RSCT         ;READ THE OTHER SECTORS

T15B1:  CLR      PHASE(0)      ;PHASE = 0
        MOV      OLDDATA(0),DBBUF(0) ;RESTORE DATA BUFFER
        JSR      7,NEXTAD      ;NEW ADDRESS
        BVC     T15Z1         ;V=0, NOT DONE
        JSR      7,NEXPAT      ;GET NEXT PATTERN
        BVC     T15Z1
        BIT      #100,STATO(0) ;ACCEPT MODE?
        BEQ     T15B2         ;YES
        JMP     TESDON

T15B2:  INCB     STATO+1(0)    ;NEXT TEST (16)
        MOV     #020000,ASTAT(0) ;SEQUENCE 1
        CLR     DABUF(0)      ;CLR ADDR BUFF
        BR      T16Z         ;TEST16 NEXT

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004366 006303  
004370 000173 004374  
004374 004402  
004376 004416  
004400 004452  
004402 004767 002774  
004406 105260 030006  
004412 000167 002320  
004416 004767 003322  
004422 001404  
004424 004767 003406  
004430 000167 002302  
004434 105260 030006  
004440 016060 030206 030204  
004446 000167 002274  
004452 004767 003266  
004456 001404  
004460 004767 003352  
004464 000167 002256  
004470 005060 030006  
004474 016060 030206 030204  
004502 004767 002456  
004506 102337  
004510 004767 002756  
004514 102334  
004516 000167 002300

\*\*\*\*\*  
:TEST 16 - WRITE A TRACK, COMPLEMENT THE PATTERN WORD,  
:WRITE ALL OTHER TRACKS, THEN READ THE DISK.  
\*\*\*\*\*

TEST16: ASL %3  
JMP @T16(3) ;JMP TO RIGHT PHASE OF TEST  
T16: T16Z  
T16A  
T16B

T16Z: JSR 7,PATIN  
T16Z1: INCB PHASE(0) ;PHASE = 1  
JMP WTRK ;WRITE ONE TRACK

T16A: JSR 7,CHATAK ;CHANGE TRACKS  
BEQ T16A1 ;Z=1 MEANS DONE  
JSR 7,COMPAT ;COMPLEMENT THE PATTERN WORD  
JMP WTRK ;WRITE ALL OTHER TRACKS

T16A1: INCB PHASE(0) ;PHASE = 2  
MOV OLDDATA(0),DBBUF(0) ;RESTORE DATA BUFF  
JMP RTRK

T16B: JSR 7,CHATAK ;CHANGE TRACKS  
BEQ T16B1 ;Z=1 MEANS DONE  
JSR 7,COMPAT ;COMPLEMENT PAT WORD  
JMP RTRK ;READ THE OTHER TRACKS

T16B1: CLR PHASE(0) ;PHASE = 0  
MOV OLDDATA(0),DBBUF(0) ;RESTORE DATA BUFFER  
JSR 7,NEXTAD ;NEW ADDRESS  
BVC T16Z1 ;V=0, NOT DONE  
JSR 7,NEXPAT ;NEW PATTERN WORD.  
BVC T16Z1 ;V=0, NOT DONE  
JMP TESDON ;TEST DONE

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1527 004522 006303
1528 004524 000173 004530
1529 004530 004546
1530 004532 004562
1531 004534 004602
1532 004536 004622
1533 004540 004654
1534 004542 004674
1535 004544 004714
1536
1537 004546 004767 002630
1538 004552 105260 030006
1539 004556 000167 002154
1540
1541 004562 005260 030006
1542 004566 004767 003260
1543 004572 004767 003240
1544 004576 000167 002134
1545
1546 004602 005260 030006
1547 004606 004767 003302
1548 004612 004767 003220
1549 004616 000167 002114
1550
1551 004622 105260 030006
1552 004626 016060 030002 030202
1553 004634 042760 174000 030202
1554 004642 016060 030206 030204
1555 004650 000167 002072
1556
1557 004654 105260 030006
1558 004660 004767 003166
1559 004664 004767 003146
1560 004670 000167 002052
1561
1562 004674 105260 030006
1563 004700 004767 003210
1564 004704 004767 003126
1565 004710 000167 002032
1566
1567 004714 005060 030006
1568 004720 016060 030206 030204
1569 004726 004767 002232
1570 004732 102307
1571 004734 004767 002532
1572 004740 102304
1573 004742 032760 000100 030000
1574 004750 001402
1575 004752 000167 002044
1576

```

```

*****
:TEST17 - WRITE A TRACK, COMPLEMENT THE PATTERN WORD,
:WRITE THE TWO ADJACENT TRACKS, THEN READ ALL 3 TRACKS
*****
TEST17: ASL      %3
          JMP      @T17(3)          ;JMP TO RIGHT PHASE OF TEST
T17:     T17Z
          T17A
          T17B
          T17C
          T17D
          T17E
          T17F

T17Z:    JSR      7,PATIN
T17Z1:   INCB    PHASE(0)
          JMP     WTRK

T17A:    INC     PHASE(0)          ;PHASE=2
          JSR    7,ADJAC1          ;GET ADJACENT TRACK ADDR
          JSR    7,COMPAT
          JMP     WTRK

T17B:    INC     PHASE(0)          ;PHASE=3
          JSR    7,ADJAC2          ;GET OTHER ADJACENT TRACK ADDR
          JSR    7,COMPAT
          JMP     WTRK

T17C:    INCB    PHASE(0)          ;PHASE=4
          MOV    ASTAT(0),DABUF(0) ;RESTORE ADDR BUFF
          BIC    #17400,DABUF(0) ;MASK
          MOV    OLDATA(0),DBBUF(0) ;RESTORE DATA BUFF
          JMP     RTRK

T17D:    INCB    PHASE(0)          ;PHASE=5
          JSR    7,ADJAC1          ;GET ADJACENT TRACK ADDR
          JSR    7,COMPAT
          JMP     RTRK

T17E:    INCB    PHASE(0)          ;PHASE=6
          JSR    7,ADJAC2          ;GET OTHER ADJACENT TRACK ADDR
          JSR    7,COMPAT
          JMP     RTRK

T17F:    CLR     PHASE(0)
          MOV    OLDATA(0),DBBUF(0) ;RESTORE DATA BUFFER
          JSR    7,NEXTAD
          BVC    T17Z1
          JSR    7,NEXPAT
          BVC    T17Z1
          BIT    #100,STAT0(0)    ;ACCEPT MODE?
          BEQ    T17F1            ;YES
          JMP     TESDON

```

J03

MAINDEC-11-DZRSA-A  
DZRSAA.P11

RS64 TESTER MONITOR AND EXERCISER

MACY11 27(732) 10-SEP-76 11:07 PAGE 35

1577 004756 012760 150212 030000 T17F1: MOV #150212,STATO(0) ;TEST 20,RANDOM PATTERN  
1578 004764 000411 BR T202 ;TEST20 NEXT

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1585 004766 006303
1586 004770 000173 004774
1587 004774 005010
1588 004776 005032
1589 005000 005064
1590 005002 005130
1591 005004 005144
1592 005006 005174
1593
1594 005010 004767 002366
1595 005014 012760 000200 030402
1596 005022 005260 030006
1597 005026 000167 001704
1598
1599 005032 005260 030006
1600 005036 005060 030406
1601 005042 116760 012362 030406
1602 005050 004767 001672
1603 005054 052760 100000 030200
1604 005062 000207
1605
1606 005064 105770 032200
1607 005070 100005
1608 005072 032760 000100 030000
1609 005100 001363
1610 005102 000420
1611
1612 005104 116701 012320
1613 005110 166001 030406
1614 005114 100002
1615 005116 062701 000074
1616 005122 162701 000005
1617 005126 100405
1618 005130 105260 030006
1619 005134 042760 100000 030200
1620 005142 000207
1621
1622 005144 005060 030006
1623 005150 004767 002010
1624 005154 102404
1625 005156 032760 000100 030000
1626 005164 001316
1627 005166 004767 002300
1628 005172 102313
1629 005174 032760 000100 030000
1630 005202 001402
1631 005204 000167 001612
1632
1633 005210 004767 001572
1634 005214 032760 007400 030400

;*****
;TEST20-WRITE A TRACK, THEN READ IT FOR 5 MINUTES
;OR UNTIL INTERRUPTED BY "↑A"
;*****
TEST20: ASL      %3
          JMP      @T20(3)          ;JMP TO RIGHT PHASE OF TEST
T20:     T20Z
          T20A
          T20B
          T20C
          T20D
          T20E

T20Z:    JSR      7,PATIN
          MOV      #200,PRANK(0)    ;4 TIMES THROUGH ALL TRACKS
T20Z1:   INC      PHASE(0)
          JMP      WTRK

T20A:    INC      PHASE(0)
          CLR      WAITER(0)        ;MAKE SURE HIGH BYTE IS CLR
          MOV      #MINUTE,WAITER(0);START TIME FOR 5 MIN. READ
T20A1:   JSR      7,RTRK           ;START READING
          BIS      #100000,CSBUF(0);SET WAIT FLAG
          RTS      7

T20B:    TSTB    @CS0(0)           ;ATTEN BIT?
          BPL     T20B1            ;NO, CHECK TIME
          BIT     #100,STATO(0)    ;ACCEPT MODE?
          BNE     T20A1           ;NO, START READING AGAIN
          BR      T20D

T20B1:   MOV      #MINUTE,%1        ;GET PRESENT TIME
          SUB     WAITER(0),%1      ;LESS READ START TIME
          BPL     T20B2            ;NEXT HOUR?
          ADD     #74,%1           ;COMPENSATE FOR HR CHANGE
T20B2:   SUB     #5,%1             ;5 MINUTES UP?
          BMI     T20C1           ;NO, RTS

T20C:    INCB    PHASE(0)
          BIC     #100000,CSBUF(0);CLR WAIT FLAG
T20C1:   RTS      7

T20D:    CLR     PHASE(0)
          JSR     7,NEXTAD
          BVS    T20D1
          BIT     #100,STATO(0)
          BNE     T20Z1
T20D1:   JSR     7,NEXPAT
          BVC    T20Z1

T20E:    BIT     #100,STATO(0)    ;ACCEPT MODE?
          BEQ    T20E1            ;YES
          JMP    TESDON

T20E1:   JSR     7,CLRCS
          BIT     #7400,PSTAT(0)

```

1635	005222	001404				BEQ	T2OE2
1636	005224	112760	000005	030006		MOVB	#5,PHASE(0)
1637	005232	000207				RTS	7
1638							
1639	005234	112760	000226	030401	T2OE2:	MOVB	#226,PSTAT+1(0) ;MESS 11, LINE 6 - ACCEPT COMPLETED
1640	005242	004767	003114			JSR	7,CRACT
1641	005246	005060	030000			CLR	STATO(0)
1642	005252	005060	030002			CLR	ASTAT(0)
1643	005256	005060	030006			CLR	PHASE(0)
1644	005262	000207				RTS	7

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1650 005264 006303
1651 005266 000173 005272
1652 005272 005312
1653 005274 005326
1654 005276 005362
1655 005300 005406
1656 005302 005466
1657 005304 005510
1658 005306 005532
1659 005310 005556
1660
1661 005312 004767 002064
1662 005316 105260 030006
1663 005322 000167 001410
1664
1665 005326 004767 002412
1666 005332 001402
1667 005334 000167 001376
1668
1669 005340 016760 012062 030600
1670 005346 004767 001364
1671 005352 052760 100000 030200
1672 005360 000437
1673
1674 005362 052760 000001 030004
1675 005370 012770 000412 032200
1676 005376 016760 012024 030406
1677 005404 000425
1678
1679 005406 004767 002560
1680 005412 100404
1681 005414 016760 012006 030600
1682 005422 000207
1683
1684 005424 017001 032204
1685 005430 042701 177700
1686 005434 042760 000077 030202
1687 005442 050160 030202
1688 005446 004767 001334
1689 005452 016760 011750 030406
1690 005460 005260 030006
1691 005464 000207
1692
1693 005466 004767 002454
1694 005472 100402
1695 005474 000167 001306
1696
1697 005500 105260 030006
1698 005504 000167 001216
1699
1700 005510 032770 170000 032200

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:*****
:TEST21 - DC POWER FAIL ON A WRITE TRACK
:*****
TEST21: ASL      %3
          JMP      @T21(3)          ;JMP TO RIGHT PHASE OF TEST
T21:     T21Z
          T21A
          T21B
          T21C
          T21D
          T21E
          T21F
          T21G

T21Z:    JSR      7,PATIN
T21Z1:   INCB    PHASE(0)
          JMP      WTRK

T21A:    JSR      7,CHATAK          ;NEW TRACK
          BEQ     T21A1
          JMP     WTRK              ;WRITE TRACK

T21A1:   MOV     TIME,RTIME(0)     ;SAVE TIME FOR POWER FAIL
          JSR     7,WTRK            ;WRITE TRACK
          BIS     #100000,CSBUF(0) ;SET WAIT FLAG
          BR     T21C2

T21B:    BIS     #1,FLAGS(0)       ;SET "IGNORE ERRORS" FLAG
          MOV     #412,@CS0(0)     ;TURN DC POWER OFF (KEEP ON WRITING)
          MOV     TIME,WAITER(0)   ;SAVE TIME
          BR     T21C2

T21C:    JSR     7,W20S            ;WAIT 20 SEC. (POWER OFF)
          BMI     T21C1            ;DONE
          MOV     TIME,RTIME(0)
          RTS     7

T21C1:   MOV     @DAO(0),%1        ;GET DISK ADDR
          BIC     #177700,%1       ;MASK SECTOR ADDR
          BIC     #77,DABUF(0)
          BIS     %1,DABUF(0)
          JSR     7,CLRCS          ;TURN POWER BACK ON AND CLEAR
          MOV     TIME,WAITER(0)
          T21C2: INC     PHASE(0)
          RTS     7

T21D:    JSR     7,W2S            ;WAIT 2 SEC. (POWER ON)
          BMI     T21D1            ;20 SEC. UP
          JMP     CLRCS           ;DO ANOTHER CLEAR...TO BE SURE!

T21D1:   INCB    PHASE(0)         ;PHASE=E
          JMP     RSCT            ;READ PROBABLE BAD SECTOR

T21E:    BIT     #170000,@CS0(0)  ;ERROR?

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1701	005516	001405				BEQ	T21F		;NO
1702	005520	105260	030006			INCB	PHASE(0)		
1703	005524	042760	000001	030004		BIC	#1, FLAGS(0)		;NO LONGER IGNORE ERRORS
1704	005532	004767	002240		T21F:	JSR	7, CHASEC		
1705	005536	001402				BEQ	T21F1		
1706	005540	000167	001162			JMP	RSCT		
1707									
1708	005544	042760	000001	030004	T21F1:	BIC	#1, FLAGS(0)		;MAKE SURE "IGNORE ERRORS" FLAG IS CLR
1709	005552	005260	030006			INC	PHASE(0)		
1710	005556	004767	002162		T21G:	JSR	7, CHATAK		
1711	005562	001402				BEQ	T21G1		;Z=1, DONE
1712	005564	000167	001156			JMP	RTRK		;READ TRACK
1713									
1714	005570	005060	030006		T21G1:	CLR	PHASE(0)		
1715	005574	004767	001672			JSR	7, NEXPAT		
1716	005600	102246				BVC	T21Z1		;V=1 MEANS DONE
1717	005602	000167	001214			JMP	TESDON		



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1723 005606 006303
1724 005610 000173 005614
1725 005614 005632
1726 005616 005646
1727 005620 005660
1728 005622 005702
1729 005624 005726
1730 005626 005754
1731 005630 006010
1732
1733 005632 004767 001544
1734 005636 105260 030006
1735 005642 000167 001070
1736
1737 005646 004767 002072
1738 005652 001452
1739 005654 000167 001056
1740
1741 005660 004767 002060
1742 005664 001054
1743 005666 004767 001054
1744 005672 052760 100000 030200
1745 005700 000422
1746
1747 005702 052760 000001 030004
1748 005710 012770 000414 032200
1749 005716 016760 011504 030406
1750 005724 000410
1751 005726 004767 002240
1752 005732 100013
1753 005734 004767 001046
1754 005740 016760 011462 030406
1755 005746 005260 030006
1756 005752 000207
1757
1758 005754 004767 002166
1759 005760 100404
1760 005762 016760 011440 030600
1761 005770 000207
1762
1763 005772 042760 000001 030004
1764 006000 105260 030006
1765 006004 000167 000736
1766
1767 006010 004767 001730
1768 006014 001402
1769 006016 000167 000724
1770
1771 006022 005060 030006
1772 006026 004767 001440
1773 006032 102301

:*****
:TEST 22 - DC POWER FAIL ON A READ TRACK
:*****
TEST22: ASL      %3
          JMP      @T22(3)          ;JMP TO RIGHT PHASE OF TEST
T22:     T22Z
          T22A
          T22B
          T22C
          T22D
          T22E
          T22F
T22Z:    JSR      7,PATIN
T22Z1:   INCB    PHASE(0)
          JMP      WTRK
T22A:    JSR      7,CHATAK
          BEQ     T22E3
          JMP     WTRK
T22B:    JSR      7,CHATAK
          BNE    T22F1
          JSR    7,RTRK
          BIS    #100000,CSBUF(0) ;SET WAIT FLAG
          BR     T22D1
T22C:    BIS    #1,FLAGS(0)      ;SET "IGNORE ERRORS" FLAG
          MOV    #414,DCSO(0)    ;DC POWER OFF (KEEP ON READING)
          MOV    TIME,WAITER(0) ;SAVE TIME
          BR     T22D1
T22D:    JSR      7,W20S          ;WAIT 20 SEC. (POWER OFF)
          BPL    T22E1
          JSR    7,CLRCS
          MOV    TIME,WAITER(0) ;SAVE TIME
T22D1:   INC     PHASE(0)
          RTS     7
T22E:    JSR      7,W2S          ;WAIT 2 SEC. (POWER ON)
          BMI    T22E2
T22E1:   MOV     TIME,RTIME(0)
          RTS     7
T22E2:   BIC    #1,FLAGS(0)    ;CLEAR "IGNORE ERRORS" FLAG
T22E3:   INCB    PHASE(0)
          JMP     RTRK
T22F:    JSR      7,CHATAK
          BEQ    T22F2
T22F1:   JMP     RTRK
T22F2:   CLR     PHASE(0)
          JSR    7,NEXPAT
          BVC    T22Z1

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C04

MAINDEC-11-DZRSA-A  
DZRSAA.P11

RS64 TESTER MONITOR AND EXERCISER

MACY11 27(732) 10-SEP-76 11:07 PAGE 41

1774 006034 000167 000762  
1775

JMP TESDON

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1781 006040 006303
1782 006042 000173 006046
1783 006046 006076
1784 006050 006112
1785 006052 006146
1786 006054 006164
1787 006056 006234
1788 006060 006264
1789 006062 006234
1790 006064 006264
1791 006066 006302
1792 006070 006324
1793 006072 006346
1794 006074 006372
1795
1796 006076 004767 001300
1797 006102 105260 030006
1798 006106 000167 000624
1799
1800 006112 004767 001626
1801 006116 001402
1802 006120 000167 000612
1803
1804 006124 016760 011276 030600
1805 006132 004767 000600
1806 006136 052760 100000 030200
1807 006144 000430
1808
1809 006146 052760 000001 030004
1810 006154 012770 001012 032200
1811 006162 000416
1812
1813 006164 004767 002026
1814 006170 100040
1815 006172 017001 032204
1816 006176 042701 177700
1817 006202 042760 000077 030202
1818 006210 050160 030202
1819 006214 004767 000566
1820 006220 016760 011202 030406
1821 006226 005260 030006
1822 006232 000207
1823
1824 006234 004767 001732
1825 006240 100402
1826 006242 000167 000540
1827
1828 006246 052760 100000 030200
1829 006254 012770 001014 032200
1830 006262 000756
1831

;*****
;TEST23 - AC POWER FAIL ON A WRITE TRACK
;*****
TEST23: ASL      %3
          JMP      @T23(3)          ;JMP TO RIGHT PHASE OF TEST
T23:     T23Z
          T23A
          T23B
          T23C
          T23D
          T23E
          T23F
          T23G
          T23H
          T23I
          T23J
          T23K

T23Z:    JSR      7,PATIN
T23Z1:   INCB    PHASE(0)
          JMP      WTRK

T23A:    JSR      7,CHATAK          ;NEW TRACK
          BEQ     T23A1
          JMP     WTRK             ;WRITE TRACK

T23A1:   MOV     TIME,RTIME(0)    ;SAVE TIME FOR POWER FAIL
          JSR     7,WTRK           ;WRITE TRACK
          BIS     #100000,CSBUF(0);SET WAIT FLAG
          BR     T23C3

T23B:    BIS     #1,FLAGS(0)      ;SET "IGNORE ERRORS" FLAG
          MOV     #1012,@CSO(0)   ;TURN AC POWER OFF (KEEP ON WRITING)
          BR     T23C2

T23C:    JSR     7,W60S           ;WAIT 60 SEC. (POWER OFF)
          BPL     T23E1
          MOV     @DAO(0),%1
          BIC     #177700,%1      ;MASK SECTOR ADDR
          BIC     #77,DABUF(0)
          BIS     %1,DABUF(0)
T23C1:   JSR     7,CLRCS          ;TURN POWER BACK ON AND CLEAR
T23C2:   MOV     TIME,WAITER(0)
T23C3:   INC     PHASE(0)
          RTS     7

T23D:    JSR     7,W20S           ;WAIT 20 SEC. (POWER ON)
          BMI     T23D1           ;20 SEC. UP, DO ANOTHER POWER DOWN
          JMP     CLRCS          ;DO ANOTHER CLEAR...TO BE SURE!

T23D1:   BIS     #100000,CSBUF(0);SET WAIT FLAG
          MOV     #1014,@CSO(0)   ;TURN POWER OFF (WITH A READ)
          BR     T23C2
    
```

1832	006264	004767	001726		T23E:	JSR	7, W60S	;WAIT 60 SEC. (POWER OFF)
1833	006270	100751				BMI	T23C1	;DONE
1834	006272	016760	011130	030600	T23E1:	MOV	TIME, RTIME(0)	
1835	006300	000207				RTS	7	
1836								
1837		006234			T23F =	T23D		;ANOTHER POWER DOWN
1838								
1839		006264			T23G =	T23E		;ANOTHER POWER UP
1840								
1841	006302	004767	001664		T23H:	JSR	7, W20S	;WAIT 20 SEC. (POWER ON)
1842	006306	100402				BMI	T23H1	;20 SEC. UP
1843	006310	000167	000472			JMP	CLRCS	;DO ANOTHER CLEAR...TO BE SURE!
1844								
1845	006314	105260	030006		T23H1:	INCB	PHASE(0)	;PHASE=I
1846	006320	000167	000402			JMP	RSCT	;READ PROBABLE BAD SECTOR
1847								
1848	006324	032770	170000	032200	T23I:	BIT	#170000, ACSO(0)	;ERROR?
1849	006332	001405				BEQ	T23J	;NO
1850	006334	105260	030006			INCB	PHASE(0)	
1851	006340	042760	000001	030004		BIC	#1, FLAGS(0)	;NO LONGER IGNORE ERRORS
1852	006346	004767	001424		T23J:	JSR	7, CHASEC	
1853	006352	001402				BEQ	T23J1	
1854	006354	000167	000346			JMP	RSCT	
1855								
1856	006360	042760	000001	030004	T23J1:	BIC	#1, FLAGS(0)	;MAKE SURE "IGNORE ERRORS" FLAG IS CLR
1857	006366	005260	030006			INC	PHASE(0)	
1858	006372	004767	001346		T23K:	JSR	7, CHATAK	
1859	006376	001402				BEQ	T23K1	;Z=1, DONE
1860	006400	000167	000342			JMP	RTRK	;READ TRACK
1861								
1862	006404	005060	030006		T23K1:	CLR	PHASE(0)	
1863	006410	004767	001056			JSR	7, NEXPAT	
1864	006414	102232				BVC	T23Z1	;V=1 MEANS DONE
1865	006416	000167	000400			JMP	TESDON	

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1871 006422 006303
1872 006424 000173 006430
1873 006430 006456
1874 006432 006472
1875 006434 006504
1876 006436 006526
1877 006440 006560
1878 006442 006606
1879 006444 006560
1880 006446 006606
1881 006450 006560
1882 006452 006624
1883 006454 006650
1884
1885 006456 004767 000720
1886 006462 105260 030006
1887 006466 000167 000244
1888
1889 006472 004767 001246
1890 006476 001460
1891 006500 000167 000232
1892
1893 006504 004767 001234
1894 006510 001055
1895 006512 004767 000230
1896 006516 052760 100000 030200
1897 006524 000425
1898
1899 006526 052760 100000 030200
1900 006534 052760 000001 030004
1901 006542 012770 001014 032200
1902 006550 016760 010652 030406
1903 006556 000410
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1905 006560 004767 001432
1906 006564 100013
1907 006566 004767 000214
1908 006572 016760 010630 030406
1909 006600 005260 030006
1910 006604 000207
1911
1912 006606 004767 001360
1913 006612 100745
1914 006614 016760 010606 030600
1915 006622 000207
1916
1917 006560
1918 006606
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1920 006560
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*****
;TEST 24 - AC POWER FAIL ON A READ TRACK
*****
TEST24: ASL      %3
          JMP     @T24(3)      ;JMP TO RIGHT PHASE OF TEST
T24:     T24Z
          T24A
          T24B
          T24C
          T24D
          T24E
          T24F
          T24G
          T24H
          T24I
          T24J
T24Z:    JSR     7,PATIN
T24Z1:   INCB   PHASE(0)
          JMP     WTRK
T24A:    JSR     7,CHATAK
          BEQ    T24I1
          JMP     WTRK
T24B:    JSR     7,CHATAK
          BNE   T24I2
          JSR    7,RTRK
          BIS    #100000,CSBUF(0)
          BR    T24D1
T24C:    BIS    #100000,CSBUF(0) ;SET WAIT FLAG
          BIS    #1,FLAGS(0)    ;SET "IGNORE ERRORS" FLAG
          MOV    #1014,ACSO(0)  ;TURN AC POWER OFF (KEEP ON READING)
          MOV    TIME,WAITER(0) ;20 SEC
          BR    T24D1
T24D:    JSR     7,W60S          ;WAIT 60 SEC. (POWER OFF)
          BPL   T24E1
          JSR    7,CLRCS        ;TURN POWER BACK ON AND CLEAR
          MOV    TIME,WAITER(0) ;20 SEC
T24D1:   INC    PHASE(0)
          RTS    7
T24E:    JSR     7,W20S          ;WAIT 20 SEC. (POWER ON)
          BMI   T24C
T24E1:   MOV    TIME,RTIME(0)
          RTS    7
T24F = T24D ;WAIT 20 THEN POWER ON AGAIN
T24G = T24E ;WAIT 20 THEN POWER OFF AGAIN
T24H = T24D ;WAIT 20 THEN POWER ON AGAIN

```

1922									
1923	006624	004767	001342		T24I:	JSR	7, W20S		; WAIT 20 SEC. (POWER ON)
1924	006630	100371				BPL	T24E1		; NOT DONE
1925	006632	042760	000001	030004		BIC	#1, FLAGS(0)		; CLEAR "IGNORE ERRORS" FLAG
1926	006640	005260	030006		T24I1:	INC	PHASE(0)		
1927	006644	000167	000076		T24I2:	JMP	RTRK		
1928									
1929	006650	004767	001070		T24J:	JSR	7, CHATAK		; GET NEXT TRACK
1930	006654	001402				BEQ	T24J1		; Z=1, DONE
1931	006656	000167	000064			JMP	RTRK		
1932									
1933	006662	005060	030006		T24J1:	CLR	PHASE(0)		
1934	006666	004767	000600			JSR	7, NEXPAT		
1935	006672	102273				BVC	T24Z1		
1936	006674	032760	000100	030000		BIT	#100, STATO(0)		; ACCEPT MODE?
1937	006702	001072				BNE	TEDONE		; NO, DONE TESTS
1938	006704	012760	146605	030000		MOV	#146605, STATO(0)		; TEST 15, ACCEPT MODE, PATTERN 5
1939	006712	000167	175300			JMP	T15Z		; TEST 15 NEXT

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1940
1941
1942
1943
1944 006716 012760 000002 030200 WSCT:  MOV      #2,CSBUF(0)  ;OP CODE TO BUFFER
1945 006724 000416                BR      TRANS
1946
1947 006726 012760 000004 030200 RSCT:  MOV      #4,CSBUF(0)  ;OP CODE TO BUFFER
1948 006734 000407                BR      TRANS1
1949
1950 006736 012760 000012 030200 WTRK:  MOV      #12,CSBUF(0) ;OP CODE TO BUFFER
1951 006744 000406                BR      TRANS
1952
1953 006746 012760 000014 030200 RTRK:  MOV      #14,CSBUF(0) ;OP CODE TO BUFFER
1954 006754 016760 010446 030600 TRANS1: MOV     TIME,RTIME(0) ;READ START TIME
1955 006762 016070 030202 032204 TRANS:  MOV     DABUF(0),ADAO(0)
1956 006770 016070 030204 032202        MOV     DBBUF(0),ADBO(0)
1957 006776 016070 030200 032200        MOV     CSBUF(0),ACSO(0)
1958 007004 000207                RTS     7
1959
1960 007006 005070 032200                CLRCs: CLR     ACSO(0)      ;CLEAR THE STATION
1961 007012 042760 177767 030200        BIC     #177767,CSBUF(0) ;CLR ALL BUT TRK BIT OF CS BUFF
1962 007020 000207                RTS     7
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007164 016001 030002  
007170 042760 003777 030002  
007176 032701 040000  
007202 001046  
007204 032760 000010 030200  
007212 001010  
007214 032701 014000  
007220 001016  
007222 005201  
007224 032701 003777  
007230 001040  
007232 000422  
  
007234 032701 010000  
007240 001017  
007242 062701 000100  
007246 032701 003700  
007252 001027  
007254 000411  
  
007256 032701 004000  
007262 001364  
007264 005201  
007266 032701 000077  
007272 001017  
007274 162701 000100  
007300 005701  
007302 100027  
007304 012760 010000 030404  
007312 052760 040000 030002  
007320 005360 030404  
007324 001411  
007326 004767 000710  
007332 042701 174000  
007336 010160 030202  
007342 050160 030002  
007346 000207  
  
007350 005701  
007352 100003  
007354 042760 040000 030002  
007362 042701 174000  
007366 010160 030202  
007372 050160 030002  
007376 000262  
007400 000207

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*****
: SUBROUTINE TO SELECT ANOTHER ADDRESS
*****
NEXTAD: MOV      ASTAT(0),%1
        BIC      #3777,ASTAT(0) ;CLR ADDR FROM ASTAT
        BIT      #40000,%1 ;RANDOM SEQUENCE?
        BNE     NADRAN ;YES
        BIT      #10,CSBUF(0) ;TRACK OP CODE?
        BNE     NADTOP ;YES
        BIT      #14000,%1 ;SINGLE TRACK OR SECTOR?
        BNE     NADSIN ;YES
        INC     %1
        BIT      #3777,%1
        BNE     NADMOR
        BR      NASEQ

NADTOP: BIT      #10000,%1 ;SINGLE TRACK?
        BNE     NASEQ ;YES
        ADD     #100,%1 ;NEXT TRACK
        BIT      #3700,%1
        BNE     NADMOR
        BR      NASEQ

NADSIN: BIT      #4000,%1 ;SINGLE SECTOR?
        BNE     NADTOP ;YES
        INC     %1 ;NEXT SECTOR
        BIT      #77,%1 ;DONE?
        BNE     NADMOR ;NO
        SUB     #100,%1
NASEQ: TST      %1 ;BOTH SEQ?
        BPL     NADONE ;NO
        MOV     #10000,SRANK(0) ;RANDOM NUMBER COUNT
        BIS     #40000,ASTAT(0) ;SET RANDOM SEQ BIT
NADRAN: DEC     SRANK(0) ;COUNT DONE?
        BEQ     NADBOS ;YES
        JSR     7,RANDOM ;GET ADDR
NADMOR: BIC     #174000,%1 ;MASK
        MOV     %1,DABUF(0)
        BIS     %1,ASTAT(0) ;LOAD
        RTS     7

NADBOS: TST      %1 ;ALL SEQ?
        BPL     NADONE ;NO
        BIC     #40000,ASTAT(0) ;YES, CLR RAN SEQ BIT
NADONE: BIC     #174000,%1 ;MASK ADDR
        MOV     %1,DABUF(0) ;SAVE ADDR
        BIS     %1,ASTAT(0) ;SAVE ADDR
        SEV     ;V=1 MEANS DONE
        RTS     7

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007402 016001 030000  
007406 042701 177760  
007412 001410  
007414 006301  
007416 016160 007442 030204  
007424 012760 001000 030402  
007432 000514  
007434 032760 000020 030000  
007442 001110  
007444 000000  
007446 177777  
007450 125252  
007452 052525  
007454 107070  
007456 000001  
007460 177776  
007462 000000  
007464 177777  
007466 123456  
007470 176543  
  
016001 030000  
042701 177760  
006301  
007442 030204  
001000 030402  
  
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\*\*\*\*\*  
:SUBROUTINE TO INITIALIZE PATTERNS  
\*\*\*\*\*

PATIN: MOV STATO(0),%1  
BIC #177760,%1  
BEQ PATO  
ASL %1  
PATUR: MOV PATER-2(1),DBBUF(0)  
MOV #1000,PRANK(0)  
BR PARET  
  
PATO: BIT #20,STATO(0) ;PATX?  
BNE PARET ;YES  
  
PATER: 000000 ;PAT1  
177777 ;PAT2  
125252 ;PAT3  
052525 ;PAT4  
107070 ;PAT5-OCTAL CHECKERBOARD  
000001 ;PAT6-FLOATING ONE  
177776 ;PAT7-FLOATING ZERO  
000000 ;PAT10-ONES'S TRANSFER  
177777 ;PAT11-ZERO'S TRANSFER  
LONUM: 123456 ;PAT12-RANDOM NUMBERS  
HINUM: 176543

\*\*\*\*\*  
:SUBROUTINE TO GET NEXT PATTERN WORD  
\*\*\*\*\*

NEXPAT: MOV STATO(0),%1 ;GET STATUS  
BIC #177760,%1 ;MASK PATTERN #  
ASL %1 ;\*2  
JMP @PATER(1)  
  
PATER: PADONE ;PAT20=ONLY ONE PATTERN  
PANEX ;PAT1 = SINGLE PATTERN  
PANEX ;PAT2 = SINGLE PATTERN  
PANEX ;PAT3 = SINGLE PATTERN  
PANEX ;PAT4 = SINGLE PATTERN  
PATS ;OCTAL CHECKERBOARD  
PAT6  
PAT7  
PAT10  
PAT11  
PAT12

2092									
2093	007536	022760	016161	030204	PAT5:	CMP	#016161,DBBUF(0)		;LAST WORD?
2094	007544	001411				BEQ	PANEX		;YES
2095	007546	003002				BGT	PAT5A		
2096	007550	006260	030204			ASR	DBBUF(0)		
2097	007554	005160	030204		PAT5A:	COM	DBBUF(0)		
2098	007560	000441				BR	PARET		
2099									
2100	007562	005760	030204		PAT6:	TST	DBBUF(0)		
2101	007566	100034				BPL	PAT6A		
2102	007570	032760	000040	030000	PANEX:	BIT	#40,STATO(0)		;ALL PAT?
2103	007576	001455				BEQ	PADONE		;NO
2104	007600	020127	000022			CMP	%1,#22		;LAST PAT?
2105	007604	001443				BEQ	PADON		
2106	007606	005260	030000			INC	STATO(0)		
2107	007612	005721				TST	(1)+		;ADD 2 TO R1
2108	007614	000700				BR	PATUR		
2109									
2110	007616	005760	030204		PAT7:	TST	DBBUF(0)		
2111	007622	100362				BPL	PANEX		
2112	007624	000261				SEC			
2113	007626	006160	030204			ROL	DBBUF(0)		
2114	007632	000414				BR	PARET		
2115									
2116	007634	005760	030204		PAT10:	TST	DBBUF(0)		
2117	007640	100753				BMI	PANEX		
2118	007642	000261				SEC			
2119	007644	006160	030204			ROL	DBBUF(0)		
2120	007650	000405				BR	PARET		
2121									
2122	007652	005760	030204		PAT11:	TST	DBBUF(0)		
2123	007656	100344				BPL	PANEX		
2124	007660	006360	030204		PAT6A:	ASL	DBBUF(0)		
2125	007664	016060	030204	030206	PARET:	MOV	DBBUF(0),OLDDATA(0)		;V=0, NOT DONE
2126	007672	000207				RTS	7		
2127									
2128	007674	005360	030402		PAT12:	DEC	PRANK(0)		
2129	007700	001733				BEQ	PANEX		
2130	007702	004767	000334			JSR	7,RANDOM		
2131	007706	010160	030204			MOV	%1,DBBUF(0)		
2132	007712	000764				BR	PARET		
2133									
2134	007714	042760	000037	030000	PADON:	BIC	#37,STATO(0)		
2135	007722	005260	030000			INC	STATO(0)		
2136	007726	004767	177450			JSR	7,PATIN		
2137	007732	016060	030204	030206	PADONE:	MOV	DBBUF(0),OLDDATA(0)		
2138	007740	000262				SEV			;V=1 MEANS DONE
2139	007742	000207				RTS	7		

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007744 062760 000100 030202  
007752 042760 174000 030202  
007760 016002 030002  
007764 042702 174000  
007770 020260 030202  
007774 000207  
  
007776 005260 030202  
010002 016002 030202  
010006 042702 177700  
010012 001003  
010014 162760 000100 030202  
010022 016001 030002  
010026 042701 177700  
010032 020201  
010034 000207

\*\*\*\*\*  
:SUBROUTINE TO CHANGE TRACKS WITHOUT CHANGING ASTAT  
\*\*\*\*\*

CHATAK: ADD #100,DABUF(0)  
BIC #174000,DABUF(0)  
MOV ASTAT(0),%2  
BIC #174000,%2  
CMP %2,DABUF(0) ;Z=1 MEANS DONE  
RTS 7

\*\*\*\*\*  
:SUBROUTINE TO CHANGE SECTORS WITHOUT CHANGING ASTAT  
: ALSO CHECKS FOR SAME SECTOR (Z=1)  
\*\*\*\*\*

CHASEC: INC DABUF(0)  
MOV DABUF(0),%2  
BIC #177700,%2  
BNE CHASE1  
SUB #100,DABUF(0)  
CHASE1: MOV ASTAT(0),%1  
BIC #177700,%1  
CMP %2,%1  
RTS 7 ;V=0, Z=0

```
2167
2168
2169      ;*****
2170      ;SUBROUTINE TO LOAD COMPLEMENT PATTERN IN DATA BUFFER
2171      ;*****
2172 010036 016060 030206 030204 COMPAT: MOV   OLDDATA(0),DBBUF(0)
2173 010044 005160 030204          COM   DBBUF(0)
2174 010050 000207          RTS     7
2175
2176      ;*****
2177      ;SUBROUTINES TO GET ADJACENT TRACK ADDRESSES FOR TEST17.
2178      ;THIS IS NECESSARY BECAUSE THE TRACKS ARE PHYSICALLY STAGGERED.
2179      ;THE ORDER, FROM INSIDE TO OUTSIDE IS:
2180      ;30,20,31,21,32,22,33,23,34,24,35,25,36,26,37,27,
2181      ;00,10,01,11,02,12,03,13,04,14,05,15,06,16,07,17.
2182      ;*****
2183
2184
2185 010052 016001 030202          ADJAC1: MOV   DABUF(0),%1      ;GET THE ORIGINAL TRACK ADDR
2186 010056 032701 001000          BIT   #1000,%1      ;7<TRK<20,27<TRK?
2187 010062 001407          BEQ   ADJ1B      ;NO
2188 010064 032701 002000          BIT   #2000,%1      ;TRK>17?
2189 010070 001402          BEQ   ADJ1A      ;NO
2190 010072 162701 000200          SUB   #200,%1      ;COMPENSATE
2191 010076 162701 001700          ADJ1A: SUB   #1700,%1      ;COMPENSATE
2192 010102 062701 001000          ADJ1B: ADD   #1000,%1      ;NEW ADDR
2193 010106 010160 030202          MOV   %1,DABUF(0)    ;LOAD ADDR BUFFER
2194 010112 000207          RTS     7
2195
2196 010114 016001 030202          ADJAC2: MOV   DABUF(0),%1      ;GET THE FIRST ADJACENT TRACK ADDR
2197 010120 032760 002000 030002  BIT   #2000,ASTAT(0) ;WAS ORIGINAL TRK>17?
2198 010126 001402          BEQ   ADJ2A      ;NO
2199 010130 062701 000200          ADD   #200,%1      ;COMPENSATE
2200 010134 162701 000100          ADJ2A: SUB   #100,%1      ;NEW ADDR
2201 010140 010160 030202          MOV   %1,DABUF(0)    ;LOAD ADDR BUFFER
2202 010144 000207          RTS     7
2203
2204      ;*****
2205      ;SUBROUTINE TO SEE IF 2 SECONDS HAVE PASSED
2206      ;*****
2207
2208 010146 016002 030406          W2S:   MOV   WAITER(0),%2    ;GET WAIT START TIME
2209 010152 166702 007250          SUB   TIME,%2      ;SUBTRACT PRESENT TIME
2210 010156 003402          BLE   W2S1      ;BRANCH IF NO OVERFLOW
2211 010160 166702 170314          SUB   CYCLE,%2      ;SUBTRACT A MINUTE
2212 010164 066702 011634          W2S1: ADD   CYCLO2,%2      ;ADD 2 SECONDS
2213 010170 000207          RTS     7
2214
2215      ;*****
2216      ;SUBROUTINE TO SEE IF 20 SEC. HAVE PASSED.
2217      ;*****
2218
2219 010172 016002 030406          W20S:  MOV   WAITER(0),%2
2220 010176 166702 007224          SUB   TIME,%2
2221 010202 003402          BLE   W20S1
2222 010204 166702 170270          SUB   CYCLE,%2
```

2223	010210	066702	011606
2224	010214	000207	
2225			
2226			
2227			
2228			
2229			
2230	010216	016002	030406
2231	010222	166702	007200
2232	010226	003402	
2233	010230	166702	170014
2234	010234	066702	010000
2235	010240	000207	

```

W20S1:  ADD      CYCL20,%2
        RTS
        ;PLUS=NOT DONE, MINUS=DONE

;*****
;SUBROUTINE TO SEE IF 60 SECONDS HAVE PASSED
;*****

W60S:   MOV      WAITR(0),%2      ;GET WAIT START TIME
        SUB      TIME,%2          ;SUBTRACT PRESENT TIME
        BLE     W60S1             ;BRANCH IF NO OVERFLOW
        SUB      CYCLE,%2         ;SUBTRACT A MINUTE
W60S1:  ADD      CYCL60,%2        ;ADD 60 SECONDS
        RTS
  
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2241 010242 010046
2242 010244 010246
2243 010246 010346
2244 010250 016700 177212
2245 010254 016701 177210
2246 010260 012703 177771
2247 010264 005002
2248 010266 006300
2249 010270 006101
2250 010272 006102
2251 010274 005203
2252 010276 001373
2253 010300 066702 177162
2254 010304 005501
2255 010306 066701 177156
2256 010312 005502
2257 010314 062700 001057
2258 010320 005501
2259 010322 005502
2260 010324 062701 047401
2261 010330 005502
2262 010332 062702 000006
2263 010336 060200
2264 010340 005501
2265 010342 010067 177120
2266 010346 010167 177116
2267 010352 012603
2268 010354 012602
2269 010356 012600
2270 010360 000207
2271
2272
2273
2274
2275
2276 010362 032770 000100 032404
2277 010370 001007
2278 010372 105060 030400
2279 010376 012770 000100 032404
2280 010404 005070 032406
2281 010410 000207

```

```

:*****
:RANDOM NUMBER SUBROUTINE - R1 CONTAINS HINUM
:*****

```

```

RANDOM: MOV %0,-(6) ;SAVE R0
MOV %2,-(6) ;SAVE R2
MOV %3,-(6) ;SAVE R3
MOV LONUM,%0 ;SET R0 WITH LOW
MOV HINUM,%1 ;SET R1 WITH HIGH
MOV #7,%3 ;SET SHIFT COUNT
CLR %2
SHIFT: ASL %0 ;SHIFT R0 LEFT AND
ROL %1 ;ROTATE CARRY INTO R1 AND
ROL %2 ;ROTATE CARRY INTO R2.
INC %3 ;CHECK FOR DONE
BNE SHIFT ;CONTINUE SHIFT LOOP
ADD LONUM,%2 ;ADD NUMBER TO MAKE X 129
ADC %1 ;PROPOGATE CARRY
ADD HINUM,%1 ;ADD NUMBER TO MAKE X 129
ADC %2 ;PROPOGATE CARRY
ADD #1057,%0 ;ADD LOW CONSTANT
ADC %1 ;PROPOGATE CARRY
ADC %2 ;PROPOGATE CARRY
ADD #47401,%1 ;ADD HIGH CONSTANT
ADC %2 ;PROPOGATE CARRY
ADD #5,%2 ;ADD HIGHEST CONSTANT
ADD %2,%0 ;REPRIME R0 WITH HIGHEST DIGIT
ADC %1 ;PROPOGATE CARRY
MOV %0,LONUM ;SAVE R0
MOV %1,HINUM ;SAVE R1
MOV (6)+,%3 ;RESTORE R3
MOV (6)+,%2 ;RESTORE R2
MOV (6)+,%0 ;RESTORE R0
RTS 7 ;RETURN

```

```

:*****
:SUBROUTINE TO MAKE SURE THE TELEPRINTER IS ACTIVE
:*****

```

```

CRACT: BIT #100,@TPSO(0) ;TELEPRINTER BUSY?
BNE CRACT2 ;YES
CLRB PSTAT(0) ;CLEAR POINTER
CRACT1: MOV #100,@TPSO(0) ;INT ENB (MAKE BUSY)
CLR @TPBO(0) ;TYPE A NULL
CRACT2: RTS 7

```

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2287 010412 010046  
2288 010414 010146  
2289 010416 010246  
2290 010420 010346  
2291 010422 010446  
2292 010424 005000  
2293 010426 012767 000002 167352  
2294 010434 105770 032400  
2295 010440 100415  
2296 010442 062700 000010  
2297 010446 020067 170030  
2298 010452 001365  
2299 010454 005067 167326  
2300 010460 012604  
2301 010462 012603  
2302 010464 012602  
2303 010466 012601  
2304 010470 012600  
2305 010472 000002  
2306  
2307  
2308  
2309  
2310  
2311 010474 005067 167306  
2312 010500 010003  
2313 010502 006303  
2314 010504 006303  
2315 010506 062703 031200  
2316 010512 017001 032402  
2317 010516 042701 177600  
2318 010522 020127 000024  
2319 010526 003030  
2320 010530 006301  
2321 010532 000171 010536  
2322 010536 010670  
2323 010540 010770  
2324 010542 011054  
2325 010544 011132  
2326 010546 011264  
2327 010550 011304  
2328 010552 010670  
2329 010554 010670  
2330 010556 010670  
2331 010560 012210  
2332 010562 010670  
2333 010564 010670  
2334 010566 011320  
2335 010570 013404  
2336 010572 010670  
2337 010574 010670

\*\*\*\*\*  
:KEYBOARD INTERRUPT ROUTINE  
\*\*\*\*\*

```
KIN:  MOV    %0,-(6)      ;SAVE REGISTERS
      MOV    %1,-(6)
      MOV    %2,-(6)
      MOV    %3,-(6)
      MOV    %4,-(6)
      CLR    %0
      KLOOP: MOV    #2,6      ;RTI ON NONEXISTANT TTY
           TSTB  @TKSO(0)    ;TK DONE FLAG?
           BMI  TKSERV      ;SERVICE TTY
      KRETUR: ADD   #10,%0    ;INC TO NEXT STATION
           CMP   %0,NUMBER  ;POLLED ALL STATIONS?
           BNE  KLOOP      ;NOT DONE POLLING
           CLR   6          ;HALT ON TIME OUT
           MOV   (6)+,%4    ;RESTORE REGISTERS
           MOV   (6)+,%3
           MOV   (6)+,%2
           MOV   (6)+,%1
           MOV   (6)+,%0
           RTI
```

\*\*\*\*\*  
:KEYBOARD SERVICE ROUTINE  
\*\*\*\*\*

```
TKSERV: CLR    6          ;HALT ON TIME OUT
         MOV   %0,%3
         ASL   %3
         ASL   %3
         ADD   #PBUF,%3    ;R3=PBUF ADDR.
         MOV   @TKBO(0),%1 ;GET ASCII
         BIC   #177600,%1  ;MASK PARITY
         CMP   %1,#024
         BGT   TK0
         ASL   %1
         JMP   @TKCONT(1)  ;R1*2 FOR INDIRECT INDEXED ADDRESSING
TKCONT: ILLEG
        CONTA
        CONTB
        CONTC
        CONTD
        CONTE
        ILLEG
        ILLEG
        ILLEG
        SPACE      ;TAB=011
        ILLEG
        ILLEG
        CONTL
        ENDIN     ;CR=015
        ILLEG
        ILLEG
```

```

2338 010576 010670          ILLEG
2339 010600 010670          ILLEG
2340 010602 011402          CONTR
2341 010604 011460          CONTS
2342 010606 011476          CONTT
2343
2344 010610 105760 030000    TK0:  TSTB  STATO(0)      ;RUN MODE?
2345 010614 100425          BMI  ILLEG          ;YES, GO TYPE "?"
2346 010616 020127 000132    CMP  %1, #132      ;>"Z"?
2347 010622 003022          BGT  ILLEG
2348 010624 020127 000100    CMP  %1, #100      ;ALPHA?
2349 010630 003402          BLE  TK1
2350 010632 000167 000720    JMP  ALPHA
2351
2352 010636 020127 000072    TK1:  CMP  %1, #072  ;>"9"?
2353 010642 002012          BGE  ILLEG
2354 010644 020127 000060    CMP  %1, #060      ;NUMERIC?
2355 010650 002402          BLT  TK2
2356 010652 000167 001216    JMP  NUMB
2357
2358 010656 020127 000040    TK2:  CMP  %1, #040  ;SPACE?
2359 010662 001002          BNE  ILLEG
2360 010664 000167 001320    JMP  SPACE
2361
2362          ;*****
2363          ;ILLEGAL CHARACTER HANDLER
2364          ;*****
2365
2366 010670 005060 031000    ILLEG: CLR  KSTAT(0)      ;CLEAR INPUT BUFFER
2367 010674 032770 000100 032404 BIT  #100, JTPSO(0)
2368 010702 001014          BNE  ILBUSY
2369 010704 012713 106612    MOV  #CRLF, (3)    ;CRLF INTO PBUF
2370 010710 005060 030400    CLR  PSTAT(0)
2371 010714 052770 000100 032404 BIS  #100, JTPSO(0) ;MAKE BUSY
2372 010722 112770 000077 032406 MOVB #'? , JTPBO(0) ;TYPE "?"
2373 010730 000167 177506    JMP  KRETUR
2374
2375 010734 004767 002766    ILBUSY: JSR  7, BUSY
2376 010740 112715 000077    MOVB #'? , (5)
2377 010744 004767 002756    ILCRLF: JSR  7, BUSY
2378 010750 112715 000215    MOVB #CR, (5)
2379 010754 004767 002746    JSR  7, BUSY
2380 010760 112715 000212    MOVB #LF, (5)
2381 010764 000167 177452    JMP  KRETUR
2382

```



```

2383
2384
2385
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2388
2389 010770 105760 030000
2390 010774 100335
2391 010776 116001 030001
2392 011002 042701 177700
2393 011006 020127 000020
2394 011012 001326
2395 011014 012770 000214 032200
2396 011022 105260 030006
2397 011026 004767 002622
2398 011032 004767 002670
2399 011036 112715 000136
2400 011042 004767 002660
2401 011046 112715 000101
2402 011052 000734
2403
2404
2405
2406
2407
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2409
2410 011054 032760 000002 030004
2411 011062 001404
2412 011064 042760 000002 030004
2413 011072 000403
2414
2415 011074 052760 000002 030004
2416 011102 004767 002546
2417 011106 004767 002614
2418 011112 112715 000136
2419 011116 004767 002604
2420 011122 112715 000102
2421 011126 000167 177310
2422
2423
2424
2425
2426
2427
2428
2429 011132 004767 175650
2430 011136 105760 030000
2431 011142 100426
2432 011144 012702 000005
2433 011150 012701 030000
2434 011154 060001
2435 011156 005021
2436 011160 005021
2437 011162 005021
2438 011164 005011

```

```

*****
"CONTROL A" (↑A) HANDLER
↑A RAISES THE ATTEN BIT TO STOP READING IN TEST 22 ONLY
*****

```

```

CONTA: TSTB STATO(0) ;RUN MODE?
        BPL ILLEG ;NO
        MOVB STATO+1(0),%1 ;GET TEST #
        BIC #177700,%1
        CMP %1,%20 ;TEST 20?
        BNE ILLEG ;NO
        MOV #214,ACSO(0) ;ATTEN BIT UP, STOP READING
        INCB PHASE(0) ;NEXT PHASE
        JSR 7,ECHO ;MAKE SURE TP IS "BUSY"
        JSR 7,BUSY
        MOVB #'↑,(5)
        JSR 7,BUSY
        MOVB #'A,(5)
        BR ILCRLF

```

```

*****
"CONTROL B" (↑B) HANDLER
RINGS THE BELL ON ERRORS IF NO ERROR MESSAGE.
SECOND TIME STOPS THE BELL.
*****

```

```

CONTB: BIT #2,FLAGS(0)
        BEQ CONTBA
        BIC #2,FLAGS(0)
        BR CONTBB
CONTBA: BIS #2,FLAGS(0)
CONTBB: JSR 7,ECHO
        JSR 7,BUSY
        MOVB #'↑,(5)
        JSR 7,BUSY
        MOVB #'B,(5)
        JMP KRETUR

```

```

*****
"CONTROL C" (↑C) HANDLER
IF STATION IS ACITVE, CLEARS ONLY ACTIVE AND MODE BITS
IF NOT ACTIVE, CLEARS ALL BUFFERS
*****

```

```

CONTC: JSR 7,CLRCS ;CLR CS BUFFER
        TSTB STATO(0) ;RUN MODE?
        BMI CONTCC ;YES
        MOV #5,%2 ;THERE ARE FIVE FOUR WORD BUFFER AREAS!
        MOV #STATO,%1 ;FIRST BUFFER AREA ADDR
        ADD %0,%1 ;ADD STATION "↑"
CONTCA: CLR (1)+ ;CLR ALL BUFFERS
        CLR (1)+
        CLR (1)+
        CLR (1)

```

```

2439 011166 062701 000172      ADD    #172,%1      ;NEXT BUFFER AREA ADDR
2440 011172 005302      DEC    %2
2441 011174 001370      BNE   CONTCA
2442 011176 060001      ADD    %0,%1
2443 011200 060001      ADD    %0,%1
2444 011202 060001      ADD    %0,%1
2445 011204 012702 000020      MOV    #20,%2      ;THERE ARE 20 WORDS IN THE PBUF
2446 011210 005021      CONTCB: CLR    (1)+
2447 011212 005302      DEC    %2
2448 011214 001375      BNE   CONTCB
2449 011216 000410      BR    CONTCB
2450
2451 011220 042760 100200 030000  CONTC: BIC    #100200,STATO(0) ;CLEAR ACTIVE BIT AND RUN BIT
2452 011226 052760 000100 030004  BIS    #100,FLAGS(0) ;SET "CONTINUE" FLAG
2453 011234 005060 030400      CLR    PSTAT(0) ;RESET PBUF STATUS
2454 011240 012723 041536  CONTC: MOV    #'tC,(3)+ ;ASCII FOR "tC"
2455 011244 012723 106612      MOV    #CRLF,(3)+ ;ASCII FOR CRLF
2456 011250 005013      CLR    (3) ;END OF MESS MARK
2457 011252 032770 000100 032404  BIT    #100,ATPSO(0) ;TP "BUSY"?
2458 011260 001532      BEQ   EXCONA ;NO
2459 011262 000533      BR    KRET1
2460
2461 *****
2462 ;"CONTROL D" (tD) HANDLER
2463 *****
2464
2465 011264 062760 100000 030004  CONTD: ADD    #100000,FLAGS(0) ;SET "DON'T TYPE ERROR MESSAGE" FLAG
2466 011272 005060 030400      CLR    PSTAT(0) ;CLR PRINTER BUFF
2467 011276 012723 042136      MOV    #'tD,(3)+ ;ASCII FOR "tD"
2468 011302 000502      BR    EXCONT
2469
2470 *****
2471 ;"CONTROL E" (tE) HANDLER
2472 ;tE CAUSES TYPE OUT OF NUMBER OF ERRORS SO FAR
2473 *****
2474
2475 011304 012760 030400 030400  CONTE: MOV    #30400,PSTAT(0) ;MESS 3, LINE 1
2476 011312 012723 042536      MOV    #'tE,(3)+ ;ASCII FOR "tE"
2477 011316 000474      BR    EXCONT
2478
2479 *****
2480 ;"CONTROL L" (tL) HANDLER
2481 ;tL CAUSES A TEST TO LOOP ON ITSELF UNTIL RELEASED BY ANOTHER tL.
2482 *****
2483
2484 011320 032760 000040 030004  CONTL: BIT    #40,FLAGS(0)
2485 011326 001404      BEQ   CONTLA
2486 011330 042760 000040 030004  BIC    #40,FLAGS(0)
2487 011336 000405      BR    CONTLB
2488
2489 011340 005060 032206      CONTLA: CLR    LOOPC(0) ;CLR LOOP COUNTER
2490 011344 052760 000040 030004  BIS    #40,FLAGS(0) ;SET LOOP FLAG
2491 011352 004767 002276  CONTLB: JSR    7,ECHO
2492 011356 004767 002344      JSR    7,BUSY
2493 011362 112715 000136      MOVB  #'t,(5)
2494 011366 004767 002334      JSR    7,BUSY

```

2495 011372 112715 000114  
2496 011376 000167 177040

MOVB #'L,(5)  
JMP KRETUR

\*\*\*\*\*  
:"CONTROL R" (↑R) HANDLER  
↑R CAUSES COUNT TYPE OUT TO BE SUPRESSED ON LOOPING.  
SECOND ↑R RESUMES TYPE OUT  
\*\*\*\*\*

2504 011402 032760 002000 030004

CONTR: BIT #2000,FLAGS(0)

2505 011410 001404

BEQ CONTRA

2506 011412 042760 002000 030004

BIC #2000,FLAGS(0)

2507 011420 000403

BR CONTRB

2509 011422 052760 002000 030004

CONTRA: BIS #2000,FLAGS(0) ;SET THE "LOOP ON TEST" FLAG

2510 011430 004767 002220

CONTRB: JSR 7,ECHO

2511 011434 004767 002266

JSR 7,BUSY

2512 011440 112715 000136

MOVB #'↑,(5)

2513 011444 004767 002256

JSR 7,BUSY

2514 011450 112715 000122

MOVB #'R,(5)

2515 011454 000167 176762

JMP KRETUR

\*\*\*\*\*  
:"CONTROL S" (↑S) HANDLER  
\*\*\*\*\*

2521 011460 012760 012000 030400

CONTS: MOV #12000,PSTAT(0) ;MESS 1, LINE4

2522 011466 012723 051536

MOV #'↑S,(3)+ ;ASCII FOR "↑S"

2523 011472 005023

CLR (3)+ ;END OF MESS MARK

2524 011474 000405

BR EXCONT ;GO CHECK FOR BUSY TP

\*\*\*\*\*  
:"CONTROL T" (↑T) HANDLER  
↑T CAUSES THE PRESENT DATE AND TIME TO BE TYPED  
\*\*\*\*\*

2531 011476 012760 050400 030400

CONTT: MOV #50400,PSTAT(0) ;MESS 5, LINE 1

2532 011504 012723 052136

MOV #'↑T,(3)+ ;ASCII FOR "↑T"

2533 011510 012723 106612

EXCONT: MOV #CRLF,(3)+ ;ASCII FOR CRLF

2534 011514 005013

CLR (3) ;END OF MESS MARK

2535 011516 032770 000100 032404

BIT #100,ATPSO(0) ;TP "BUSY"?

2536 011524 001410

BEQ EXCONA ;NO

2537 011526 032770 170000 032200

BIT #170000,ACSO(0) ;ANY ERRORS?

2538 011534 001406

BEQ KRETI ;NO

2539 011536 052760 100000 030000

BIS #100000,STATO(0) ;SET ACTIVE BIT

2540 011544 000402

BR KRETI

2541

EXCONA: JSR 7,CRACT ;ACTIVATE TTY

2542 011546 004767 176610

KRETI: JMP KRETUR

2543 011552 000167 176664

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```

:*****
:ALPHA CHARACTER HANDLER
:*****
    
```

```

011556 032760 000100 030000 ALPHA: BIT #100,STAT0(0) ;TEST MODE?
011564 001106 BNE XNUM ;YES, GO CHECK FOR "X" OR "C"
011566 005760 031000 TST KSTAT(0)
011572 001452 BEQ NEWCOM
011574 126027 031001 000002 CMPB KSTAT+1(0),#2
011602 003144 BGT ILLO
011604 001426 BEQ KTEST
011606 126027 031000 000005 CMPB KSTAT(0),#5
011614 003137 BGT ILLO
011616 001416 BEQ AT
011620 126027 031000 000003 CMPB KSTAT(0),#3
011626 003007 BGT AP
011630 001403 BEQ AE
011632 020127 000103 CMP %1,#103 ;ASCII "C"?
011636 000424 BR AOK

011640 020127 000105 AE: CMP %1,#105 ;ASCII "E"?
011644 000421 BR AOK

011646 020127 000120 AP: CMP %1,#120 ;P?
011652 000416 BR AOK

011654 020127 000124 AT: CMP %1,#124 ;T?
011660 000413 BR AOK

011662 126027 031000 000003 KTEST: CMPB KSTAT(0),#3
011670 003111 BGT ILLO
011672 001770 BEQ AT
011674 126027 031000 000001 CMPB KSTAT(0),#1
011702 001756 BEQ AE
011704 020127 000123 CMP %1,#123 ;ASCII "S"?
011710 001101 AOK: BNE ILLO
011712 005260 031000 INC KSTAT(0)
011716 000462 BR NBACK

011720 020127 000124 NEWCOM: CMP %1,#124
011724 001416 BEQ NTEST
011726 020127 000101 CMP %1,#101
011732 001417 BEQ NACCEP
011734 020127 000103 CMP %1,#103
011740 001065 BNE ILLO
011742 032760 000100 030004 BIT #100,FLAGS(0) ;"CONTINUE" FLAG?
011750 001461 BEQ ILLO ;NO, ILLEGAL CHARACTER
011752 012760 001401 031000 MOV #1401,KSTAT(0)
011760 000441 BR NBACK

011762 012760 001001 031000 NTEST: MOV #1001,KSTAT(0)
011770 000435 BR NBACK

011772 012760 000401 031000 NACCEP: MOV #401,KSTAT(0)
012000 000431 BR NBACK
    
```

```

2600
2601 012002 105760 031000      XNUM:  TSTB  KSTAT(0)      ; POINTER AT 0?
2602 012006 001042              BNE  ILLO          ; NO
2603 012010 020127 000103      CMP  %1, #103     ; C?
2604 012014 001013              BNE  XNUMX
2605 012016 032760 000100 030004  BIT  #100, FLAGS(0) ; "CONTINUE" FLAG SET?
2606 012024 001433              BEQ  ILLO          ; NO, CAN'T CONTINUE!
2607 012026 042760 000100 030004  BIC  #100, FLAGS(0) ; CLR "CONTINUE" FLAG
2608 012034 112760 000006 031001  MOVB #06, KSTAT+1(0) ; ARG 06 = "OK"
2609 012042 000410              BR   NBACK
2610
2611 012044 020127 000130      XNUMX: CMP  %1, #130      ; X?
2612 012050 001021              BNE  ILLO
2613 012052 017060 032402 031002  MOV  @TKB0(0), KBUF(0)
2614 012060 005260 031000      INC  KSTAT(0)
2615 012064 004767 001564      NBACK: JSR  7, ECHO
2616 012070 000167 176346      JMP  KRETUR
2617
2618 ;*****
2619 ; NUMERIC HANDLER
2620 ;*****
2621
2622 012074 032760 000100 030000  NUMB:  BIT  #100, STATO(0) ; TEST MODE?
2623 012102 001006              BNE  TESNUM        ; YES
2624 012104 032760 001400 030004  BIT  #1400, FLAGS(0) ; SERIAL NUMBER FLAGS?
2625 012112 001364              BNE  NBACK         ; YES, ECHO IT
2626 012114 000167 176550      ILLO:  JMP  ILLEG   ; NO, ILLEGAL CHARACTER
2627
2628 012120 020127 000070      TESNUM: CMP  %1, #070    ; ">"?
2629 012124 002373              BGE  ILLO          ; NOT AN OCTAL NUMBER
2630 012126 126027 031000 000002  CMPB  KSTAT(0), #2
2631 012134 002013              BGE  WORIN
2632 012136 116005 031000      NUMBIN: MOVB  KSTAT(0), %5
2633 012142 060005              ADD  %0, %5
2634 012144 110165 031002      MOVB  %1, KBUF(5)
2635 012150 142765 000260 031002  BICB  #260, KBUF(5)
2636 012156 005260 031000      INC  KSTAT(0)
2637 012162 000740              BR   NBACK
2638
2639 012164 126027 031001 000005  WORIN: CMPB  KSTAT+1(0), #5
2640 012172 001350              BNE  ILLO
2641 012174 126027 031000 000006  CMPB  KSTAT(0), #6
2642 012202 002344              BGE  ILLO
2643 012204 000167 177726      JMP  NUMBIN
2644

```

```

2645
2646
2647
2648
2649
2650 012210 132760 000300 030000 SPACE: BITB #300,STATO(0) ;TEST MODE?
2651 012216 003736 BLE ILLO ;NO, ILLEGAL MODE
2652 012220 116001 031002 MOVB KBUF(0),%1 ;FIRST CHAR
2653 012224 116002 031001 MOVB KSTAT+1(0),%2 ;WHICH ARG?
2654 012230 006302 ASL %2
2655 012232 000172 012236 JMP @SPACE1(2) ;JMP TO INPUTING ROUTINES
2656 012236 012254 SPACE1: TSTIN
2657 012240 012400 INPAT
2658 012242 012540 SEQIN
2659 012244 012770 TRKIN
2660 012246 013104 SCTIN
2661 012250 013212 WRDIN
2662 012252 010670 ILLEG
2663
2664 012254 005060 030006 TSTIN: CLR PHASE(0)
2665 012260 005060 032206 CLR LOOPC(0) ;CLR LOOP COUNTER
2666 012264 042760 000004 030004 BIC #4,FLAGS(0) ;CLR "TEST 2 OR 3" FLAG
2667 012272 126027 031000 000001 CMPB KSTAT(0),#1 ;IN POINTER
2668 012300 003006 BGT HITST ;2 DIGITS
2669 012302 001416 BEQ LOTST ;1 DIGIT
2670 012304 112760 000101 030001 ALLTST: MOVB #101,STATO+1(0) ;ALL TESTS + TEST 1
2671 012312 000167 000766 JMP TAB
2672
2673 012316 006301 HITST: ASL %1
2674 012320 006301 ASL %1
2675 012322 006301 ASL %1
2676 012324 105060 031002 CLRB KBUF(0)
2677 012330 000360 031002 SWAB KBUF(0)
2678 012334 066001 031002 ADD KBUF(0),%1
2679 012340 020127 000024 LOTST: CMP %1,%24 ;>LAST TEST?
2680 012344 003263 BGT ILLO ;NO
2681 012346 110160 030001 MOVB %1,STATO+1(0)
2682 012352 001754 BEQ ALLTST
2683 012354 005301 DEC %1
2684 012356 001406 BEQ LOT2
2685 012360 162701 000002 SUB #2,%1
2686 012364 003003 BGT LOT2
2687 012366 052760 000004 030004 LOT2: BIS #4,FLAGS(0) ;"TEST 2 OR 3" FLAG
2688 012374 000167 000704 JMP TAB
2689
2690 012400 042760 000077 030000 INPAT: BIC #77,STATO(0) ;CLR PATTERN STATUS
2691 012406 120127 000330 CMPB %1,#330 ;PATTERN X?
2692 012412 001445 BEQ XPAT ;YES
2693 012414 126027 031000 000001 CMPB KSTAT(0),#1 ;INPUT POINTER
2694 012422 003006 BGT HIPAT ;2 DIGITS
2695 012424 001416 BEQ LOPAT ;1 DIGIT
2696 012426 052760 000041 030000 ALLPAT: BIS #41,STATO(0) ;ALL PATTERNS
2697 012434 000167 000644 JMP TAB
2698
2699 012440 006301 HIPAT: ASL %1
2700 012442 006301 ASL %1

```

2701	012444	006301			ASL	%1	
2702	012446	105060	031002		CLRB	KBUF(0)	
2703	012452	000360	031002		SWAB	KBUF(0)	
2704	012456	066001	031002		ADD	KBUF(0),%1	
2705	012462	020127	000012		LOPAT: CMP	%1,#12	
2706	012466	101212			BHI	ILLO	
2707	012470	032760	000004	030004	BIT	#4,FLAGS(0)	;"TEST 2 OR 3" FLAG?
2708	012476	001405			BEQ	LOPAT1	;NO
2709	012500	005301			DEC	%1	
2710	012502	032701	000014		BIT	#14,%1	;PAT 1,2,3,OR 4?
2711	012506	001007			BNE	XPAT	;NO
2712	012510	005201			INC	%1	
2713	012512	005701			LOPAT1: TST	%1	
2714	012514	001744			BEQ	ALLPAT	
2715	012516	060160	030000		ADD	%1,STATO(0)	
2716	012522	000167	000556		JMP	TAB	
2717							
2718	012526	052760	000020	030000	XPAT: BIS	#20,STATO(0)	;SPECIAL PATTERN
2719	012534	000167	000544		JMP	TAB	
2720							
2721	012540	042760	174000	030002	SEQIN: BIC	#174000,ASTAT(0)	;CLR SEQUENCE STATUS
2722	012546	012760	010000	030404	MOV	#10000,SRANK(0)	;SET UP RANDOM SEQ COUNTER
2723	012554	120127	000330		CMPB	%1,#330	;SEQUENCE X?
2724	012560	001413			BEQ	XSEQ	;YES
2725	012562	126027	031000	000001	CMPB	KSTAT(0),#1	;INPUT POINTER
2726	012570	003014			BGT	HISEQ	
2727	012572	001417			BEQ	LOSEQ	
2728	012574	012760	120000	030002	ALSEQ: MOV	#120000,ASTAT(0)	;ALL SEQ AND SEQ 1 BITS
2729	012602	005060	030202		CLR	DABUF(0)	
2730	012606	000437			BR	SEQTAB	
2731							
2732	012610	052760	034000	030002	XSEQ: BIS	#34000,ASTAT(0)	;SET SEQ=1, SING TRK + SCT
2733	012616	000167	000462		JMP	TAB	
2734							
2735	012622	105701			HISEQ: TSTB	%1	
2736	012624	001113			BNE	ILL1	
2737	012626	116001	031003		MOV	KBUF+1(0),%1	
2738	012632	020127	000002		LOSEQ: CMP	%1,#2	
2739	012636	003106			BGT	ILL1	
2740	012640	001410			BEQ	SEQ2	
2741	012642	005701			TST	%1	
2742	012644	001753			BEQ	ALSEQ	
2743	012646	012760	020000	030002	MOV	#20000,ASTAT(0)	
2744	012654	005060	030202		CLR	DABUF(0)	
2745	012660	000412			BR	SEQTAB	
2746							
2747	012662	004767	175354		SEQ2: JSR	7,RANDOM	
2748	012666	042701	174000		BIC	#174000,%1	;MASK ALL BUT ADDR
2749	012672	010160	030202		MOV	%1,DABUF(0)	
2750	012676	052701	040000		BIS	#40000,%1	;SET RAN SEQ BIT
2751	012702	010160	030002		MOV	%1,ASTAT(0)	
2752	012706	062760	001400	031000	SEQTAB: ADD	#1400,KSTAT(0)	
2753	012714	032760	000020	030000	BIT	#20,STATO(0)	
2754	012722	001570			BEQ	TAB	
2755	012724	126027	031000	000001	CMPB	KSTAT(0),#1	
2756	012732	003005			BGT	XWRDB	

2757	012734	001402			BEQ	XWRDA	
2758	012736	004767	000712		JSR	7,ECHO	
2759	012742	004767	000706		XWRDA: JSR	7,ECHO	
2760	012746	004767	000702		XWRDB: JSR	7,ECHO	
2761	012752	112760	000041	030401	MOV	#41,PSTAT+1(0)	;MESSAGE 2 - LINE 1
2762	012760	105060	031000		CLRB	KSTAT(0)	
2763	012764	000167	175452		JMP	KRETUR	
2764	012770	120127	000330		TRKIN: CMPB	%1,#330	;ALL TRKS?
2765	012774	001405			BEQ	ALLTRK	
2766	012776	126027	031000	000001	CMPB	KSTAT(0),#1	;INPUT POINTER
2767	013004	003007			BGT	HITRK	
2768	013006	001417			BEQ	LOTRK	
2769	013010	012760	024000	030002	ALLTRK: MOV	#24000,ASTAT(0)	
2770	013016	005060	030202		CLR	DABUF(0)	
2771	013022	000530			BR	TAB	
2772							
2773	013024	006301			HITRK: ASL	%1	
2774	013026	006301			ASL	%1	



2775	013030	006301			ASL	%1	
2776	013032	105060	031002		CLRB	KBUF(0)	
2777	013036	000360	031002		SWAB	KBUF(0)	
2778	013042	066001	031002		ADD	KBUF(0),%1	
2779	013046	020127	000040	LOTRK:	CMP	%1,#40	;OUT OF RANGE?
2780	013052	002402			BLT	LOK1	;NO
2781	013054	000167	175610	ILL1:	JMP	ILLEG	
2782	013060	000301		LOK1:	SWAB	%1	
2783	013062	006201			ASR	%1	
2784	013064	006201			ASR	%1	
2785	013066	010160	030202		MOV	%1,DABUF(0)	
2786	013072	052701	034000		BIS	#34000,%1	
2787	013076	010160	030002		MOV	%1,ASTAT(0)	
2788	013102	000500			BR	TAB	
2789							
2790							
2791	013104	120127	000330	SCTIN:	CMPB	%1,#330	;ALL SECTORS?
2792	013110	001405			BEQ	ALLSCT	
2793	013112	126027	031000 000001		CMPB	KSTAT(0),#1	
2794	013120	003005			BGT	HISCT	
2795	013122	001415			BEQ	LOSCT	
2796	013124	042760	004077 030002	ALLSCT:	BIC	#4077,ASTAT(0)	
2797	013132	000420			BR	SCTTAB	
2798							
2799	013134	006301		HISCT:	ASL	%1	
2800	013136	006301			ASL	%1	
2801	013140	006301			ASL	%1	
2802	013142	105060	031002		CLRB	KBUF(0)	
2803	013146	000360	031002		SWAB	KBUF(0)	
2804	013152	066001	031002		ADD	KBUF(0),%1	
2805	013156	020127	000077	LOSCT:	CMP	%1,#77	
2806	013162	101334			BHI	ILL1	
2807	013164	050160	030002		BIS	%1,ASTAT(0)	
2808	013170	050160	030202		BIS	%1,DABUF(0)	
2809	013174	032760	000020 030000	SCTTAB:	BIT	#20,STATO(0)	
2810	013202	001040			BNE	TAB	
2811	013204	105260	031001		INCB	KSTAT+1(0)	
2812	013210	000435			BR	TAB	
2813	013212	012704	031002	WRDIN:	MOV	#KBUF,%4	
2814	013216	060004			ADD	%0,%4	
2815	013220	121427	000055		CMPB	(4),#055	
2816	013224	001012			BNE	NOTNEG	
2817	013226	005001			CLR	%1	
2818	013230	105360	031000		DECB	KSTAT(0)	
2819	013234	001417			BEQ	POS	
2820	013236	005204			INC	%4	
2821	013240	006301		WLOOP:	ASL	%1	
2822	013242	006301			ASL	%1	
2823	013244	006301			ASL	%1	
2824	013246	111402			MOVB	(4),%2	
2825	013250	060201			ADD	%2,%1	
2826	013252	005204		NOTNEG:	INC	%4	
2827	013254	105360	031000		DECB	KSTAT(0)	
2828	013260	003367			BGT	WLOOP	
2829	013262	122760	000055 031002		CMPB	#055,KBUF(0)	
2830	013270	001001			BNE	POS	

2831	013272	005401				NEG	%1
2832	013274	010160	030204		POS:	MOV	%1, DBBUF(0)
2833	013300	010160	030206			MOV	%1, OLDDATA(0)
2834	013304	004767	000344		TAB:	JSR	7, ECHO
2835	013210	116001	031000			MOVB	KSTAT(0), %1
2836	013314	162701	000005			SUB	#5, %1
2837	013320	100004			TABLOP:	BPL	OKOUT
2838	013322	004767	000366			JSR	7, SPACES
2839	013326	005201				INC	%1
2840	013330	000773				BR	TABLOP
2841							
2842	013332	062760	000400	031000	OKOUT:	ADD	#400, KSTAT(0)
2843	013340	105060	031000			CLRB	KSTAT(0)
2844	013344	126027	031001	000006		CMPB	KSTAT+1(0), #6
2845	013352	001012				BNE	KRET2
2846	013354	005060	030604			CLR	ERCONT(0)
2847	013360	004767	000342			JSR	7, BUSY
2848	013364	112715	000317			MOVB	#317, (5)
2849	013370	004767	000332			JSR	7, BUSY
2850	013374	112715	000313			MOVB	#313, (5)
2851	013400	000167	175036		KRET2:	JMP	KRETUR

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2852
2853
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2856
2857 013404 132760 000300 030000 ENDIN: BITB #300,STATO(0) ;WHICH MODE?
2858 013412 100421 BMI ILL2 ;RUN MODE IS ILLEGAL
2859 013414 001410 BEQ MONDON ;NOT TEST MODE
2860 013416 126027 031001 000006 CMPB KSTAT+1(0),#6
2861 013424 001014 BNE ILL2
2862 013426 052760 100200 030000 MONACT: BIS #100200,STATO(0) ;ACTIVATE MONITOR
2863 013434 000457 BR ECCR
2864
2865 013436 116001 031001 MONDON: MOVB KSTAT+1(0),%1 ;GET ARGUMENT
2866 013442 005301 DEC %1 ;ARG=1=ACCEPT?
2867 013444 001415 BEQ ACMODE ;YES
2868 013446 005301 DEC %1 ;ARG=2=TEST?
2869 013450 001404 BEQ ENTEST ;YES
2870 013452 005301 DEC %1 ;ARG=3=CONTINUE?
2871 013454 001764 BEQ MONACT ;YES
2872 013456 000167 175206 ILL2: JMP ILLEG ;NO, ILLEGAL CHARACTER
2873
2874 013462 052760 000100 030000 ENTEST: BIS #100,STATO(0)
2875 013470 112760 000102 030401 MOVB #102,PSTAT+1(0) ;MESS4, LINE2
2876 013476 000426 BR ECCRO
2877
2878 013500 032760 000400 030004 ACMODE: BIT #400,FLAGS(0) ;M SER. NO. FLAG?
2879 013506 001050 BNE PSERNO ;YES
2880 013510 032760 001000 030004 BIT #1000,FLAGS(0) ;P SER. NO. FLAG?
2881 013516 001440 BEQ MSERNO ;NO
2882 013520 042760 001000 030004 BIC #1000,FLAGS(0) ;CLEAR M SER.NO. FLAG
2883 013526 012760 140641 030000 MOV #140641,STATO(0) ;ACCEPT STARTING STATUS
2884 013534 005060 030002 CLR ASTAT(0)
2885 013540 016760 003664 030602 MOV MINUTE,STIME(0) ;SAVE STARTING TIME
2886 013546 112760 000162 030401 MOVB #162,PSTAT+1(0) ;MESS 7,LINE 2 - AUTO ACCEPT START MESS
2887 013554 005060 030604 ECCRO: CLR ERCONT(0)
2888 013560 005060 032206 CLR LOOPC(0) ;CLR LOOP COUNTER
2889 013564 105060 030006 CLAB PHASE(0)
2890 013570 004767 173212 JSR 7,CLRCS
2891 013574 004767 000054 ECCR: JSR 7,ECHO ;CR
2892 013600 004767 000122 JSR 7,BUSY
2893 013604 112715 000212 MOVB #212,(5) ;LF
2894 013610 005060 031000 CLR KSTAT(0)
2895 013614 000167 174622 JMP KRETUR
2896
2897 013620 112760 000261 030401 MSERNO: MOVB #261,PSTAT+1(0) ;MESS13, LINE1-M SERIAL NUMBER
2898 013626 000403 BR PSER1
2899
2900 013630 112760 000301 030401 PSERNO: MOVB #301,PSTAT+1(0) ;MESS14, LINE1-P SERIAL NUMBER
2901 013636 062760 000400 030004 PSER1: ADD #400,FLAGS(0) ;SET FLAG
2902 013644 004767 000004 JSR 7,ECHO
2903 013650 000167 174566 JMP KRETUR

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2904
2905
2906
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2909 013654 032770 000100 032404 ECHO: BIT #100,@TPSO(0) ;"BUSY"?
2910 013662 001007 SNE ECBUSY
2911 013664 052770 000100 032404 BIS #100,@TPSO(0) ;MAKE BUSY
2912 013672 017070 032402 032406 MOV @TKBO(0),@TPBO(0);ECHO
2913 013700 000207 RTS 7
2914 013702 004767 000020 ECBUSY: JSR 7,BUSY
2915 013706 117015 032402 MOVB @TKBO(0),(5)
2916 013712 000207 RTS 7
2917
2918
2919
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2923
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2926
2927
2928
2929
2930 013726 010146 BUSY: MOV %1,-(6) ;SAVE R1
2931 013730 010246 MOV %2,-(6) ;SAVE R2
2932 013732 116005 030400 MOVB PSTAT(0),%5 ;GET POINTER
2933 013736 060305 ADD %3,%5 ;SET UP POINTER
2934 013740 010502 MOV %5,%2 ;SAVE POINTER IN R2
2935 013742 010301 MOV %3,%1 ;GET PBUF ADDR.
2936 013744 062701 000040 ADD #40,%1 ;END OF BUFFER IN R1
2937 013750 105725 BLOOP: TSTB (5)+ ;END OF MESS?
2938 013752 001420 BEQ POINT ;YES
2939 013754 020501 CMP %5,%1 ;END OF BUFFER?
2940 013756 001001 BNE ENDAR ;NO
2941 013760 010305 MOV %3,%5 ;YES, GO TO BEG OF BUF
2942 013762 020502 ENDAR: CMP %5,%2 ;FULL BUFFER?
2943 013764 001371 BNE BLOOP ;NO
2944 013766 020503 CMP %5,%3 ;BEGINNING OF BUFFER?
2945 013770 001001 BNE BUFUL1 ;NO
2946 013772 010105 MOV %1,%5 ;YES, GO TO END OF BUFFER
2947 013774 105045 BUFUL1: CLRB -(5) ;CLEAR LAST SLOT
2948 013776 020503 CMP %5,%3 ;BEGINNING OF BUFFER?
2949 014000 001001 BNE BUFUL2 ;NO
2950 014002 010105 MOV %1,%5 ;YES, GO TO END OF BUFFER
2951 014004 112745 000207 BUFUL2: MOVB #BELL,-(5) ;BELL IN NEXT TO LAST SLOT
2952 014010 005205 INC %5 ;R5 POINTS TO LAST SLOT
2953 014012 000412 BR BUSIES ;EXIT
2954
2955 014014 020501 POINT: CMP %5,%1 ;END OF BUFFER?
2956 014016 001404 BEQ ENDAR1 ;YES
2957 014020 020502 CMP %5,%2 ;FULL BUFFER?
2958 014022 001764 BEQ BUFUL1 ;YES
2959 014024 105015 CLRB (5) ;NO, CLR 2ND FREE SLOT

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2960 014026 000403  
2961  
2962 014030 020302  
2963 014032 001760  
2964 014034 105013  
2965 014036 005305  
2966 014040 012602  
2967 014042 012601  
2968 014044 000207

BR BUSIER  
ENDAR1: CMP %3,%2  
BEQ BUFUL1  
CLRB (3)  
BUSIER: DEC %5  
BUSIES: MOV (6)+,%2  
MOV (6)+,%1  
RTS 7

:FULL BUFFER?  
:YES  
:NO, CLR 2ND FREE SLOT  
:R5 POINTS TO 1ST FREE SLOT  
:RESTORE R2  
:RESTORE R1

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2969
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2974 014046 010046
2975 014050 010146
2976 014052 010246
2977 014054 010346
2978 014056 010446
2979 014060 005000
2980 014062 012767 000002 163716
2981 014070 022770 000300 032404
2982 014076 001415
2983 014100 062700 000010
2984 014104 020067 164372
2985 014110 001364
2986 014112 005067 163670
2987 014116 012604
2988 014120 012603
2989 014122 012602
2990 014124 012601
2991 014126 012600
2992 014130 000002
2993
2994
2995
2996
2997
2998 014132 005067 163650
2999 014136 010003
3000 014140 006303
3001 014142 006303
3002 014144 062703 031200
3003 014150 010004
3004 014152 062704 030400
3005 014156 111401
3006 014160 060301
3007 014162 105711
3008 014164 001412
3009 014166 111170 032406
3010 014172 105011
3011 014174 005214
3012 014176 032714 000340
3013 014202 001736
3014 014204 142714 000040
3015 014210 001733
3016 014212 105024
3017 014214 132714 000017
3018 014220 001460
3019 014222 105314
3020 014224 001567
3021 014226 121427 000020
3022 014232 103460
3023 014234 001563
3024 014236 121427 000040

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;*****
;TELEPRINTER INTERRUPT ROUTINE
;*****

```

```

PIN:  MOV    %0,-(6)
      MOV    %1,-(6)
      MOV    %2,-(6)
      MOV    %3,-(6)
      MOV    %4,-(6)
      CLR    %0
PLOOP: MOV    #2,%0
      CMP    #300,%TPSO(0)
      BEQ    TPSEV
PRETUR: ADD    #10,%0
      CMP    %0,NUMBER      ;POLLED ALL STATIONS?
      BNE    PLOOP          ;NOT DONE POLLING
      CLR    %0
      MOV    (6)+,%4
      MOV    (6)+,%3
      MOV    (6)+,%2
      MOV    (6)+,%1
      MOV    (6)+,%0
      RTI

```

```

;*****
;TELEPRINTER SERVICE ROUTINE
;*****

```

```

TPSEV: CLR    %0
      MOV    %0,%3
      ASL    %3
      ASL    %3
      ADD    #PBUF,%3      ;PBUF ADDR IN R3
      MOV    %0,%4        ;STATION # TO R4
      ADD    #PSTAT,%4    ;PSTAT ADDR IN R4
      MOV    (4),%1       ;POINTER IN R1
      ADD    %3,%1        ;CHAR. ADDR. IN R1
      TSTB   (1)          ;END OF OUTPUT?
      BEQ    PUFEM        ;YES, GET NEXT MESS
      MOV    (1),%TPBO(0) ;NO, PRINT CHAR.
      CLR    (1)          ;CLR BUFFER
      INC    (4)          ;MOVE POINTER
      BIT    #340,(4)     ;END OF BUFF?
      BEQ    PRETUR      ;NO
      BIC    #40,(4)
      BEQ    PRETUR
PUFEM: CLR    (4)+        ;CLR TP POINTER
      BIT    #17,(4)     ;LINE=0?
      BEQ    PRIDON      ;YES, MESSAGE DONE
      DECB  (4)
      BEQ    LINE00
      CMP    (4),#20
      BLO   MESS0
      BEQ    LINE00      ;MESS1 LINE0 = LINE00
      CMP    (4),#40

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3025	014242	103471	
3026	014244	001525	
3027	014246	121427	000060
3028	014252	103472	
3029	014254	001523	
3030	014256	121427	000100
3031	014262	103550	
3032	014264	001521	
3033	014266	121427	000120
3034	014272	103506	
3035	014274	001543	
3036	014276	121427	000140
3037	014302	103514	
3038	014304	001537	
3039	014306	121427	000160
3040	014312	103512	
3041	014314	001533	
3042	014316	121427	000200
3043	014322	103510	
3044	014324	001527	
3045	014326	121427	000220
3046	014332	103506	
3047	014334	001507	
3048	014336	121427	000240
3049	014342	103437	
3050	014344	001511	
3051	014346	121427	000300
3052	014352	103510	
3053	014354	001511	
3054	014356	000167	002206
3055			
3056	014362	005070	032404
3057	014366	005304	
3058	014370	005014	
3059	014372	000642	
3060			
3061			
3062			
3063			
3064			
3065	014374	121427	000002
3066	014400	103431	
3067	014402	001432	
3068	014404	121427	000004
3069	014410	103431	
3070	014412	001432	
3071	014414	121427	000006
3072	014420	103431	
3073	014422	001432	
3074	014424	000433	
3075			
3076	014426	121427	000022
3077	014432	101026	
3078	014434	001423	
3079	014436	000420	
3080			

BLO	MESS1
BEQ	L20
CMPB	(4), #60
BLO	MESS2
BEQ	L30
CMPB	(4), #100
BLO	LINE00
BEQ	L40
CMPB	(4), #120
BLO	L06
BEQ	LINE00
CMPB	(4), #140
BLO	L51
BEQ	LINE00
CMPB	(4), #160
BLO	L61
BEQ	LINE00
CMPB	(4), #200
BLO	L71
BEQ	LINE00
CMPB	(4), #220
BLO	L101
BEQ	L110
CMPB	(4), #240
BLO	MESS11
BEQ	L120
CMPB	(4), #300
BLO	L130
BEQ	L140
JMP	LIN150

;MESS4 LINE1 = LINE06

;MESS6 LINE0 = LINE00

;MESS7 LINE0 = LINE00

;MESS10 LINE0 = LINE00

PRIDON: CLR @TPSO(0)  
 DEC %4  
 CLR (4)  
 BR PRETUR

\*\*\*\*\*  
 ;MESSAGES  
 \*\*\*\*\*

MESS0: CMPB (4), #002  
 BLO L01  
 BEQ L02  
 CMPB (4), #004  
 BLO L03  
 BEQ L04  
 CMPB (4), #006  
 BLO L05  
 BEQ L06  
 BR L07

MESS1: CMPB (4), #022  
 BHI L06  
 BEQ L05  
 BR L04

```

3081 014440 000000
3082
3083 014442 121427 000222
3084 014446 103426
3085 014450 001455
3086 014452 121427 000224
3087 014456 103440
3088 014460 001441
3089 014462 000430
3090
3091 014464 000167 000324
3092 014470 000167 000500
3093 014474 000167 000604
3094 014500 000167 000636
3095 014504 000167 001026
3096 014510 000167 001156
3097 014514 000167 001212
3098 014520 000167 001250
3099 014524 000167 001270
3100 014530 000167 001354
3101 014534 000167 001372
3102 014540 000167 001424
3103 014544 000167 001460
3104 014550 000167 001520
3105 014554 000167 001544
3106 014560 000167 001606
3107 014564 000167 001624
3108 014570 000167 001666
3109 014574 000167 001674
3110 014600 000167 001726

```

MESS2: HALT

```

MESS11: CMPB (4), #222
        BLO L30
        BEQ LINE00
        CMPB (4), #224
        BLO L113
        BEQ L114
        BR L71

```

;MESS11, LINE1 = LINE30

```

L01:   JMP   LINE01
L02:   JMP   LINE02
L03:   JMP   LINE03
L04:   JMP   LINE04
L05:   JMP   LINE05
L06:   JMP   LINE06
L07:   JMP   LINE07
L20:   JMP   LINE20
L30:   JMP   LINE30
L40:   JMP   LINE40
L51:   JMP   LINE51
L61:   JMP   LINE61
L71:   JMP   LINE71
L101:  JMP   LINE101
L110:  JMP   LINE110
L113:  JMP   LINE113
L114:  JMP   LINE114
L120:  JMP   LINE120
L130:  JMP   LINE130
L140:  JMP   LINE140

```



```

3111
3112
3113 014604 116701 002621
3114 014610 004767 002172
3115 014614 112723 000072
3116 014620 116701 002604
3117 014624 004767 002156
3118 014630 116701 002576
3119 014634 012702 000240
3120 014640 110223
3121 014642 110223
3122 014644 110223
3123 014646 004767 002134
3124 014652 116701 002555
3125 014656 006301
3126 014660 006301
3127 014662 016123 014730
3128 014666 016123 014732
3129 014672 112723 000055
3130 014676 116701 002532
3131 014702 004767 002100
3132 014706 112723 000215
3133 014712 112723 000212
3134 014716 105013
3135 014720 005070 032406
3136 014724 000167 177150
3137 014730 030055 030060
3138 014734 045055 047101 043055
3139 014742 041105 046455 051101
3140 014750 040455 051120 046455
3141 014756 054501 045055 047125
3142 014764 045055 046125 040455
3143 014772 043525 051455 050105
3144 015000 047455 052103 047055
3145 015006 053117 042055 041505
3146
3147 015014 012704 015146
3148 015020 017001 032204
3149 015024 042701 174077
3150 015030 006301
3151 015032 006301
3152 015034 000301
3153 015036 004767 001704
3154 015042 012704 015154
3155 015046 017001 032204
3156 015052 004767 001670
3157 015056 012704 015140
3158 015062 017001 032204
3159 015066 042701 003777
3160 015072 006201
3161 015074 006201
3162 015076 006201
3163 015100 000301
3164 015102 004767 001640
3165 015106 012704 015162
3166 015112 017001 032202

```

```

;*****
LINE00: MOV      HOUR,%1          ;GET HOUR
        JSR      7,DECIM2
        MOV      #'',(3)+        ;ASCII FOR ":" IN TP BUFFER
        MOV      MINUTE,%1
        JSR      7,DECIM2
        MOV      DATE,%1         ;GET DATE
LOOA:   MOV      #SP,%2
        MOV      %2,(3)+
        MOV      %2,(3)+
        MOV      %2,(3)+
        JSR      7,DECIM2        ;PUT DECIMAL DATE IN PBUF
        MOV      MONTH,%1       ;GET MONTH
        ASL      %1              ;*2
        ASL      %1              ;*2
        MOV      LOOTAB(1),(3)+  ;MONTH INTO PBUF
        MOV      LOOTAB+2(1),(3)+
        MOV      #'-',(3)+      ;ASCII FOR "-" IN TP BUFFER
        MOV      YEAR,%1        ;GET YEAR
        JSR      7,DECIM2        ;PUT DECIMAL YEAR IN PBUF
        MOV      #CR,(3)+
        MOV      #LF,(3)+      ;ASCII FOR A LINE FEED
        CLRB     (3)            ;END OF MESS MARK
        CLR      @TPBO(0)       ;TYPE A NULL TO ACTIVATE TP
        JMP      PRETUR
LOOTAB: .ASCII  /-000/
        .ASCII  /-JAN-FEB-MAR-APR-MAY-JUN-JUL-AUG-SEP-OCT-NOV-DEC/

```

```

;*****
LINE01: MOV      #L01B,%4
        MOV      @DAO(0),%1     ;GET TESTER TRACK ADDR.
        BIC      #174077,%1
        ASL      %1
        ASL      %1
        SWAB     %1
        JSR      7,OCTAL2
        MOV      #L01C,%4
        MOV      @DAO(0),%1     ;GET TESTER SECTOR ADDR.
        JSR      7,OCTAL2
        MOV      #L01A,%4
        MOV      @DAO(0),%1     ;GET TESTER WORD COUNT
        BIC      #3777,%1      ;MASK
        ASR      %1
        ASR      %1
        ASR      %1
        SWAB     %1
        JSR      7,OCTAL2
        MOV      #L01D,%4
        MOV      @DBO(0),%1     ;GET TESTER DATA BUFFER

```

3167	015116	004767	001474			JSR	7,OCTAL6	
3168	015122	052760	100000	030000		BIS	#100000,STATO(0)	;ACTIVATE MONITOR
3169	015130	004767	164412			JSR	7,ERREAD	;REPEAT READ ERRORS
3170	015134	004567	001674			JSR	5,PRINT	
3171	015140	000	000			.BYTE	0,0	
3172	015142	240	240	240	LO1A:	.BYTE	SP,SP,SP,SP	
3173	015145	240						
3174	015146	000	000			.BYTE	0,0	
3175	015150	240	240	240	LO1B:	.BYTE	SP,SP,SP,SP	
3176	015153	240						
3177	015154	000	000			.BYTE	0,0	
3178	015156	240	240	240	LO1C:	.BYTE	SP,SP,SP,SP	
3179	015161	240						
3180	015162	000	000	000	LO1D:	.BYTE	0,0,0,0,0,0	
3181	015165	000	000	000				
3182	015170	215	212	000		.BYTE	CR,LF,0	
3183		015174				.EVEN		
3184								
3185								
3186	015174	017001	032200			LINE02: MOV	#CSO(0),%1	;GET ERROR CODE
3187	015200	042701	007777			BIC	#7777,%1	;MASK
3188	015204	006001				ROR	%1	
3189	015206	006201				ASR	%1	
3190	015210	006201				ASR	%1	
3191	015212	006201				ASR	%1	
3192	015214	000301				SWAB	%1	
3193	015216	012704	015266			MOV	#LO2A,%4	
3194	015222	004767	001520			JSR	7,OCTAL2	
3195	015226	016001	030200			MOV	#CSBUF(0),%1	;GET OP CODE
3196	015232	042701	177760			BIC	#177760,%1	
3197	015236	012704	015274			MOV	#LO2B,%4	
3198	015242	004767	001500			JSR	7,OCTAL2	
3199	015246	004567	001562			JSR	5,PRINT	
3200	015252	042523	020103	020040		.ASCII	/SEC DB/	
3201	015260	020040	041104					
3202	015264	215	212			.BYTE	CR,LF	
3203	015266	000	000		LO2A:	.BYTE	0,0	
3204	015270	240	240	240		.BYTE	SP,SP,SP,SP	
3205	015273	240						
3206	015274	000	000			.BYTE	0,0	
3207	015276	240	240	240	LO2B:	.BYTE	SP,SP,SP,SP,0	
3208	015301	240	000					
3209		015304				.EVEN		
3210								
3211								
3212	015304	004567	001524			LINE03: JSR	5,PRINT	
3213	015310	051105	020122	020040		.ASCII	/ERR OP WCT TRK /	
3214	015316	050117	020040	020040				
3215	015324	041527	020124	020040				
3216	015332	051124	020113	020040				
3217	015340	000				.BYTE	0	
3218		015342				.EVEN		
3219								
3220	015342	032760	014000	030002		LINE04: BIT	#14000,ASTAT(0)	;SEQ X?
3221	015350	001015				BNE	LO4X	;YES
3222	015352	112767	000260	000123		MOVB	#260,LO4A	;ASCII "0"

```

3223 015360 112767 000261 000116      MOVB   #261,LO4A+1      ;ASCII "1"
3224 015366 032760 040000 030002      BIT    #40000,ASTAT(0) ;SEQ 2?
3225 015374 001411                BEQ    LO4Y              ;NO
3226 015376 105267 000102      INCB   LO4A+1           ;YES, ASCII "2"
3227 015402 000406                BR     LO4Y
3228
3229 015404 112767 000330 000071  LO4X:  MOVB   #330,LO4A
3230 015412 112767 000240 000064  LO4Y:  MOVB   #240,LO4A+1
3231 015420 016001 030202                MOV    DABUF(0),%1      ;GET TRACK ADDR
3232 015424 042701 174077                BIC    #174077,%1      ;MASK
3233 015430 006101                ROL    %1
3234 015432 006101                ROL    %1
3235 015434 000301                SWAB   %1
3236 015436 012704 015511                MOV    #LO4B,%4
3237 015442 004767 001300                JSR    7,OCTAL2
3238 015446 016001 030202                MOV    DABUF(0),%1      ;GET BUFFERED SECTOR ADDR
3239 015452 012704 015517                MOV    #LO4C,%4
3240 015456 004767 001264                JSR    7,OCTAL2
3241 015462 016001 030204                MOV    DBBUF(0),%1      ;GET BUFFERED DATA
3242 015466 012704 015525                MOV    #LO4D,%4
3243 015472 004767 001120                JSR    7,OCTAL6
3244 015476 004567 001332                JSR    5,PRINT
3245 015502                240                .BYTE   SP
3246 015503                000                .BYTE   0,0
3247 015505                240                .BYTE   SP,SP,SP,SP
3248 015510                240
3249 015511                000                .BYTE   0,0
3250 015513                240                .BYTE   SP,SP,SP,SP
3251 015516                240
3252 015517                000                .BYTE   0,0
3253 015521                240                .BYTE   SP,SP,SP,SP
3254 015524                240
3255 015525                000                .BYTE   0,0,0,0,0,0
3256 015530                000                .BYTE   0,0,0,0,0,0
3257 015533                215                .BYTE   CR,LF,0
3258
3259
3260 ;*****
3261 015536 116001 030001  LINE05: MOVB   STAT0+1(0),%1 ;GET TEST NO.
3262 015542 012704 015655                MOV    #LO5B,%4
3263 015546 004767 001174                JSR    7,OCTAL2
3264 015552 116001 030006                MOVB   PHASE(0),%1      ;GET PHASE
3265 015556 001002                BNE    LOSA              ;NOT PHASE 0
3266 015560 162701 000040                SUB    #40,%1            ;FOR SPACE
3267 015564 062701 000300  LOSA:  ADD    #300,%1          ;LETTER ASCII
3268 015570 110167 000063                MOVB   %1,LO5C
3269 015574 116001 030000                MOVB   STAT0(0),%1      ;GET PATTERN NO.
3270 015600 012704 015663                MOV    #LO5D,%4
3271 015604 032701 000020                BIT    #20,%1            ;PAT X?
3272 015610 001005                BNE    LOSX              ;YES
3273 015612 042701 177760                BIC    #177760,%1
3274 015616 004767 001124                JSR    7,OCTAL2
3275 015622 000404                BR     LOSY
3276
3277 015624 112724 000240  LOSX:  MOVB   #240,(4)+
3278 015630 112714 000330                MOVB   #330,(4)         ;ASCII "X"

```

3279	015634	004567	001174		LOS Y:	JSR	5, PRINT			
3280	015640	042523	020103	020040		.ASCII	/SEC	WORD/		
3281	015646	053440	051117	104						
3282	015653	215	212			.BYTE	CR, LF			
3283	015655	000	000		LOS B:	.BYTE	0, 0			
3284	015657	000	240	240	LOS C:	.BYTE	0, SP, SP, SP			
3285	015662	240								
3286	015663	000	000		LOS D:	.BYTE	0, 0			
3287	015665	240	240	240		.BYTE	SP, SP, SP, 0			
3288	015670	000								
3289		015672				.EVEN				
3290										
3291					;*****					
3292	015672	004567	001136		LINE06:	JSR	5, PRINT			
3293	015676	215	212			.BYTE	CR, LF			
3294	015700	051524	020124	020040		.ASCII	/TST	PAT	SEQ	TRK /
3295	015706	040520	020124	020040						
3296	015714	042523	020121	020040						
3297	015722	051124	020113	020040						
3298	015730	000				.BYTE	0			
3299		015732				.EVEN				
3300					;*****					
3301					LINE07:	JSR	5, PRINT			
3302	015732	004567	001076			.BYTE	CR, LF			
3303	015736	215	212			.ASCII	/POSSIBLE TESTER MALFUNCTION/			
3304	015740	047520	051523	041111						
3305	015746	042514	052040	051505						
3306	015754	042524	020122	040515						
3307	015762	043114	047125	052103						
3308	015770	047511	116							

L06

MAINDEC-11-DZRSA-A  
DZRSAA.P11

RS64 TESTER MONITOR AND EXERCISER

MACY11 27(732) 10-SEP-76 11:07 PAGE 76

3309 015773 000  
3310

.BYTE 0  
.EVEN

```

3311
3312
3313 015774 004567 001034
3314 016000 020040 054040 020130
3315 016006 020040 054040 020130
3316 016014 020040 040
3317 016017 000
3318
3319
3320
3321 016020 032760 000010 030004
3322 016026 001405
3323 016030 112760 000102 030401
3324 016036 005060 030004
3325 016042 016001 030604
3326 016046 012704 016076
3327 016052 004767 000540
3328 016056 004567 000752
3329 016062 051105 047522 051522
3330 016070 020072 020040 020040
3331 016076 000 000 000
3332 016101 000 000 000
3333 016104 215 212 000
3334
3335
3336
3337 016110 004567 000720
3338 016114 042523 020103 020040
3339 016122 053440 051117 104
3340 016127 215 212 000
3341
3342
3343
3344 016132 004567 000676
3345 016136 215 212
3346 016140 052521 041511 020113
3347 016146 042526 044522 054506
3348 016154 041440 046517 046120
3349 016162 052105 042105
3350 016166 240 000
3351
3352
3353
3354 016170 004567 000640
3355 016174 215 212
3356 016176 051105 047522 020122
3357 016204 047503 047125 020124
3358 016212 053117 051105 046106
3359 016220 053517 040440 124
3360 016225 240 000
3361
3362
3363
3364 016230 004567 000600
3365 016234 051522 032066 040440
3366 016242 052125 020117 041501

```

:\*\*\*\*\*  
LINE20: JSR 5,PRINT  
.ASCII / XX XX /  
.BYTE 0  
.EVEN  
:\*\*\*\*\*  
LINE30: BIT #10,FLAGS(0) ;"MESSAGE 4" FLAG?  
BEQ L30A ;NO  
MCVB #102,PSTAT+1(0) ;MESSAGE 4, LINE 2  
CLR FLAGS(0) ;CLR "MESSAGE 4" FLAG  
L30A: MOV ERCONT(0),%1  
MOV #L30B,%4  
JSR 7,OCTAL6  
JSR 5,PRINT  
.ASCII /ERRORS: /  
L30B: .BYTE 0,0,0,0,0,0,CR,LF,0  
.EVEN  
:\*\*\*\*\*  
LINE40: JSR 5,PRINT  
.ASCII /SEC WORD/  
.BYTE CR,LF,0  
.EVEN  
:\*\*\*\*\*  
LINE51: JSR 5,PRINT  
.BYTE CR,LF  
.ASCII /QUICK VERIFY COMPLETED/  
.BYTE SP,0  
.EVEN  
:\*\*\*\*\*  
LINE61: JSR 5,PRINT  
.BYTE CR,LF  
.ASCII /ERROR COUNT OVERFLOW AT/  
.BYTE SP,0  
.EVEN  
:\*\*\*\*\*  
LINE71: JSR 5,PRINT  
.ASCII /RS64 AUTO ACCEPT/

```

3367 016250 042503 052120
3368 016254      215 212
3369 016256 052123 051101 042524 .BYTE CR,LF
3370 016264 035104 .ASCII /STARTED:/
3371 016266      240 240 240 .BYTE SP,SP,SP,SP,0
3372 016271      240 000
3373      016274 .EVEN
3374
3375 *****
3376 016274 004567 000534 LIN101: JSR 5,PRINT
3377 016300      215 212 .BYTE CR,LF
3378 016302 047520 042527 020122 .ASCII /POWER FAILED AT/
3379 016310 040506 046111 042105
3380 016316 040440      124
3381 016321      240 000 .BYTE SP,0
3382      016324 .EVEN
3383
3384 *****
3385 016324 010001 LIN110: MOV %0,%1
3386 016326 006201 ASR %1
3387 016330 006201 ASR %1
3388 016332 006201 ASR %1
3389 016334 012704 016364 MOV #L110A,%4
3390 016340 004767 000402 JSR 7,OCTAL2
3391 016344 004567 000464 JSR 5,PRINT
3392 016350 052123 052101 047511 .ASCII /STATION #: /
3393 016356 020116 035043 020040
3394 016364      000 000 215 L110A: .BYTE 0,0,CR,LF,0
3395 016367      212 000
3396      016372 .EVEN
3397
3398 *****
3399 016372 004567 000436 LIN113: JSR 5,PRINT
3400 016376 047503 050115 042514 .ASCII /COMPLETED:/
3401 016404 042524 035104
3402 016410      240 240 000 .BYTE SP,SP,0
3403      016414 .EVEN
3404
3405 *****
3406 016414 116001 030603 LIN114: MOVB STIME+1(0),%1
3407 016420 004767 000362 JSR 7,DECIM2
3408 016424 112723 000072 MOVB #'',(3)+ ;ASCII FOR ":" IN TP BUFFER
3409 016430 116001 030602 MOVB STIME(0),%1
3410 016434 004767 000346 JSR 7,DECIM2
3411 016440 116701 000766 MOVB DATE,%1 ;GET PRESENT DATE
3412 016444 126760 000761 030603 CMPB HOUR,STIME+1(0) ;NEXT DAY?
3413 016452 002001 BGE L114A
3414 016454 005301 DEC %1
3415 016456 000167 176152 L114A: JMP LOOA
3416
3417 *****
3418 016462 112770 000007 032406 LIN120: MOVB #007,@TPBO(0)
3419 016470 000167 175404 JMP PRETUR
3420
3421 *****
3422 016474 004567 000334 LIN130: JSR 5,PRINT

```

3423	016500	215	212	
3424	016502	051522	032066	020115
3425	016510	042523	044522	046101
3426	016516	047040	046525	042502
3427	016524	035122	020040	
3428	016530	000		
3429		016532		
3430				
3431				
3432	016532	004567	000276	
3433	016536	215	212	
3434	016540	051522	032066	020120
3435	016546	042523	044522	046101
3436	016554	047040	046525	042502
3437	016562	035122	020040	
3438	016566	000		
3439		016570		
3440				
3441				
3442	016570	016001	032206	
3443	016574	012704	016610	
3444	016600	004767	000142	
3445	016604	004567	000224	
3446	016610	000	000	215
3447	016613	212	000	
3448		016616		

.BYTE CR,LF  
.ASCII /RS64M SERIAL NUMBER: /

.BYTE 0  
.EVEN

\*\*\*\*\*

LIN140: JSR 5,PRINT  
.BYTE CR,LF  
.ASCII /RS64P SERIAL NUMBER: /

.BYTE 0  
.EVEN

\*\*\*\*\*

LIN150: MOV LOOPC(0),%1  
MOV #L150A,%4  
JSR 7,OCTAL2  
JSR 5,PRINT  
215 L150A: .BYTE 0,0,CR,LF,0

.EVEN



3449  
3450  
3451  
3452  
3453  
3454 016616 112714 000260  
3455 016622 010102  
3456 016624 100001  
3457 016626 105214  
3458 016630 042702 170370  
3459 016634 052702 060260  
3460 016640 110264 000005  
3461 016644 105002  
3462 016646 000302  
3463 016650 000261  
3464 016652 106002  
3465 016654 110264 000002  
3466 016660 010102  
3467 016662 006202  
3468 016664 006202  
3469 016666 006202  
3470 016670 042702 170370  
3471 016674 052702 060260  
3472 016700 110264 000004  
3473 016704 105002  
3474 016706 000302  
3475 016710 000261  
3476 016712 106002  
3477 016714 110264 000001  
3478 016720 010102  
3479 016722 006102  
3480 016724 006102  
3481 016726 000302  
3482 016730 042702 000370  
3483 016734 052702 000260  
3484 016740 110264 000003  
3485 016744 000207  
3486  
3487  
3488  
3489  
3490  
3491 016746 042701 177700  
3492 016752 010102  
3493 016754 042702 000370  
3494 016760 052702 000260  
3495 016764 110264 000001  
3496 016770 006201  
3497 016772 006201  
3498 016774 006201  
3499 016776 052701 000260  
3500 017002 110114  
3501 017004 000207

\*\*\*\*\*  
:SUBROUTINE TO CONVERT OCTAL NUMBER TO ASCII  
\*\*\*\*\*

OCTAL6: MOVB #260,(4)  
MOV %1,%2  
BPL OC6A  
INCB (4)  
OC6A: BIC #170370,%2  
BIS #060260,%2  
MOVB %2,5(4)  
CLRB %2  
SWAB %2  
SEC  
RORB %2  
MOVB %2,2(4)  
MOV %1,%2  
ASR %2  
ASR %2  
ASR %2  
BIC #170370,%2  
BIS #060260,%2  
MOVB %2,4(4)  
CLRB %2  
SWAB %2  
SEC  
RORB %2  
MOVB %2,1(4)  
MOV %1,%2  
ROL %2  
ROL %2  
SWAB %2  
BIC #370,%2  
BIS #260,%2  
MOVB %2,3(4)  
RTS 7

\*\*\*\*\*  
:SUBROUTINE TO CONVERT 2 BIT OCTAL NUMBER TO ASCII  
\*\*\*\*\*

OCTAL2: BIC #177700,%1  
MOV %1,%2  
BIC #370,%2  
BIS #260,%2  
MOVB %2,1(4)  
ASR %1  
ASR %1  
ASR %1  
BIS #260,%1  
MOVB %1,(4)  
RTS 7

3502  
3503  
3504  
3505  
3506  
3507 017006 112713 000257  
3508 017012 105213  
3509 017014 162701 000012  
3510 017020 002374  
3511 017022 005203  
3512 017024 062701 000272  
3513 017030 110123  
3514 017032 000207  
3515  
3516  
3517  
3518  
3519 017034 112570 032406  
3520 017040 112523  
3521 017042 001376  
3522 017044 005726  
3523 017046 000167 175026

```
*****  
:SUBROUTINE TO CHANGE TWO OCTAL DIGITS TO DECIMAL AND  
:STORE IN PBUF  
*****  
DECIM2: MOVB #257,(3) ;ASCII "0"-1  
DEC2A: INCB (3) ;FIRST DIGIT  
SUB #12,%1 ;IS 1ST DIG THERE YET?  
BGE DEC2A ;NO  
INC %3  
ADD #272,%1 ;ASCII FOR SECOND DIGIT  
MOVB %1,(3)+ ;PUT IT IN PBUF  
RTS 7 ;RETURN  
*****  
:SUBROUTINE TO PUT MESSAGE IN PBUF FOR TYPING  
*****  
PRINT: MOVB (5)+,ATPBO(0) ;TYPE FIRST CHAR  
PRINTA: MOVB (5)+,(3)+  
BNE PRINTA  
TST (6)+ ;ADD 2 TO R6  
JMP PRETUR
```

```

3524
3525
3526
3527
3528
3529 017052 042777 000200 000356 CLOCK: BIC #200,ALKS
3530 017060 005267 000342 INC TIME
3531 017064 001401 BEQ TIMIN
3532 017066 000002 RTI
3533
3534 017070 010046 TIMIN: MOV %0,-(6)
3535 017072 010146 MOV %1,-(6)
3536 017074 010246 MOV %2,-(6)
3537 017076 166767 161376 000322 SUB CYCLE,TIME
3538 017104 126727 000320 000073 CMPB MINUTE,#73 ;HOUR UP?
3539 017112 001403 BEQ TIMOUR
3540 017114 105267 000310 INCB MINUTE
3541 017120 000474 BR TIMEOUT
3542
3543 017122 105067 000302 TIMOUR: CLRB MINUTE
3544 017126 126727 000277 000027 CMPB HOUR,#27 ;MIDNIGHT?
3545 017134 001403 BEQ TIMDAY ;YES, NEW DAY.
3546 017136 105267 000267 INCB HOUR
3547 017142 000463 BR TIMEOUT
3548
3549 017144 105067 000261 000034 TIMDAY: CLRB HOUR ;CLEAR HOURS
3550 017150 126727 000256 000034 CMPB DATE,#34 ;DAY=28TH?
3551 017156 001411 BEQ FEB ;YES, CHECK FOR FEB.
3552 017160 003003 BGT TIMDAT ;DAY>28TH.
3553 017162 105267 000244 TIDA: INCB DATE ;NEXT DAY
3554 017166 000451 BR TIMEOUT
3555
3556 017170 126727 000236 000036 TIMDAT: CMPB DATE,#36 ;WHAT DAY?
3557 017176 101027 BHI TIMONT ;31ST
3558 017200 001415 BEQ SNAJ ;30TH
3559 017202 126727 000225 000002 FEB: CMPB MONTH,#2 ;FEBRUARY?
3560 017210 001364 BNE TIDA ;NO
3561 017212 132767 000003 000214 BITB #3, YEAR ;LEAP YEAR?
3562 017220 001016 BNE TIMONT ;NO, END OF MONTH
3563 017222 126727 000204 000034 CMPB DATE,#34 ;DAY=28TH?
3564 017230 001754 BEQ TIDA ;YES, GO TO 29TH.
3565 017232 000411 BR TIMONT ;29TH, END OF MONTH
3566
3567 017234 116701 000173 SNAJ: MOVB MONTH,%1 ;GET MONTH IN R1
3568 017240 032701 000010 BIT #10,%1 ;FIRST SEVEN MONTHS?
3569 017244 001401 BEQ AJ ;YES-MONTH # EVEN IF APR OR JUN
3570 017246 005101 COM %1 ;NO-MONTH # ODD IF SEP OR NOV
3571 017250 032701 000001 AJ: BIT #1,%1 ;IF EVEN THEN 30 DAY MONTH
3572 017254 001342 BNE TIDA ;31 DAY MONTH
3573 017256 112767 000001 000146 TIMONT: MOVB #1,DATE ;1ST, OHR, OMIN
3574 017264 105267 000143 INCB MONTH ;NEXT MONTH
3575 017270 126727 000137 000014 CMPB MONTH,#14 ;DECEMBER?
3576 017276 101405 BLOS TIMEOUT
3577 017300 112767 000001 000125 MOVB #1,MONTH ;JANUARY
3578 017306 105267 000122 INCB YEAR ;NEXT YEAR
3579

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3580 ;ROUTINE TO SEE IF IT IS TIME TO TYPE ANOTHER TIME MESSAGE.
3581 ; DATE, TIME AND NUMBER OF ERRORS (MESSAGE 6) ARE TYPED OUT
3582 ; EVERY HALF HOUR ON STATIONS RUNNING AUTO ACCEPT.
3583 ;*****
3584 017312 005000 TIMEOUT: CLR %0 ;SET RO UP FOR POLLING
3585 017314 105760 030000 TILOOP: TSTB STATO(0) ;ACTIVE STATION?
3586 017320 100031 BPL TIMOT2 ;NO
3587 017322 032760 000100 030000 BIT #100,STATO(0) ;ACCEPT MODE?
3588 017330 001025 BNE TIMOT2 ;NO
3589 017332 116001 030602 MOV8 STIME(0),%1 ;GET STARTING TIME (MIN ONLY)
3590 017336 116702 000066 MOV8 MINUTE,%2 ;GET PRESENT TIME
3591 017342 160102 SUB %1,%2 ;SAME?
3592 017344 001406 BEQ TIMTYP ;YES!
3593 017346 100002 BPL TIMOT1 ;R2>R1
3594 017350 062702 000074 ADD #74,%2 ;ADD 60 MIN TO R2
3595 017354 162702 000036 TIMOT1: SUB #36,%2 ;HALF HOUR?
3596 017360 001011 BNE TIMOT2 ;NO, DON'T TYPE
3597 017362 032770 000100 032404 TIMTYP: BIT #100,TPSO(0) ;TP BUSY?
3598 017370 001005 BNE TIMOT2 ;YES, FORGET THE MESSAGE!
3599 017372 112760 000062 030401 MOV8 #062,PSTAT+1(0) ;MESS 3, LINE 2 - # ERRORS AND TIME
3600 017400 004767 170756 JSR 7,CRACT ;ACTIVATE TP
3601 017404 062700 000010 TIMOT2: ADD #10,%0 ;NEXT STATION
3602 017410 020067 161066 CMP %0,NUMBER ;DONE POLLING?
3603 017414 001337 BNE TILOOP ;NO
3604 017416 012602 MOV (6)+,%2
3605 017420 012601 MOV (6)+,%1
3606 017422 012600 MOV (6)+,%0
3607 017424 000002 RTI
3608
3609 017426 174370 TIME: -3410 ;HALF A MINUTE
3610 017430 000 MINUTE: .BYTE 0
3611 017431 000 HOUR: .BYTE 00
3612 017432 000 DATE: .BYTE 000
3613 017433 000 MONTH: .BYTE 000
3614 017434 000 YEAR: .BYTE 0
3615 017436 017436 .EVEN
3616
3617 017436 177546 LKS: 177546

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```

3618
3619
3620
3621
3622
3623 017440 012700 021522
3624 017444 004767 001540
3625 017450 004767 001506
3626 017454 010102
3627 017456 020227 000260
3628 017462 103441
3629 017464 020227 000270
3630 017470 103036
3631 017472 042702 000260
3632 017476 006302
3633 017500 006302
3634 017502 006302
3635 017504 010267 160772
3636 017510 004767 001446
3637 017514 020127 000215
3638 017520 001427
3639 017522 020127 000260
3640 017526 103417
3641 017530 020127 000270
3642 017534 103014
3643 017536 042701 000260
3644 017542 060201
3645 017544 006301
3646 017546 006301
3647 017550 006301
3648 017552 020127 000200
3649 017556 101003
3650 017560 010167 160716
3651 017564 001005
3652 017566 012700 021362
3653 017572 004767 001412
3654 017576 000724
3655
3656 017600 020127 000215
3657 017604 001370
3658 017606 012700 021226
3659 017612 004767 001372
3660 017616 005067 177606
3661 017622 005067 177604
3662 017626 105067 177602
3663 017632 004767 001324
3664 017636 010102
3665 017640 020227 000260
3666 017644 103477
3667 017646 020227 000272
3668 017652 103074
3669 017654 042702 000260
3670 017660 001471
3671 017662 110267 177544
3672 017666 004767 001270
3673 017672 020127 000255

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;*****
;ROUTINE TO INPUT THE DATE AND TIME
;*****

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```

DATIN:  MOV    #MESS24,%0
        JSR    7,TYPE
KEYA:   JSR    7,KEIN
        MOV    %1,%2
        CMP    %2,#260
        BLO   TRYAGN
        CMP    %2,#270
        BHIS  TRYAGN
        BIC    #260,%2
        ASL    %2
        ASL    %2
        ASL    %2
        MOV    %2,NUMBER
KEYB:   JSR    7,KEIN
        CMP    %1,#215      ;CR?
        BEQ   KEYC
        CMP    %1,#260
        BLO   TRYAGN
        CMP    %1,#270
        BHIS  TRYAGN
        BIC    #260,%1
        ADD    %2,%1
        ASL    %1
        ASL    %1
        ASL    %1
        CMP    %1,#200      ;LIMIT OF 20 OCTAL STATIONS
        BHI   TRYAGN
        MOV    %1,NUMBER
        BNE   KEYC
TRYAGN: MOV    #MESS22,%0
        JSR    7,TYPE
        BR    KEYA
KEYC:   CMP    %1,#215      ;CR?
        BNE   TRYAGN
        MOV    #MESS20,%0
KEYD:   JSR    7,TYPE
        CLR   MINUTE      ;CLR MINUTE AND HOUR BYTES
        CLR   DATE        ;CLR DATE AND MONTH BYTES
        CLR  YEAR         ;CLR YEAR BYTE
KEY1:   JSR    7,KEIN
        MOV    %1,%2
        CMP    %2,#260
        BLO   TRYAG
        CMP    %2,#272
        BHIS  TRYAG
        BIC    #260,%2
        BEQ   TRYAG
        MOVB  %2,DATE
KEY2:   JSR    7,KEIN
        CMP    %1,#255      ;"-"?

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3674	017676	001430	
3675	017700	020127	000260
3676	017704	103457	
3677	017706	020127	000272
3678	017712	103054	
3679	017714	042701	000260
3680	017720	006302	
3681	017722	060201	
3682	017724	006302	
3683	017726	006302	
3684	017730	060201	
3685	017732	001444	
3686	017734	032701	177740
3687	017740	001041	
3688	017742	110167	177464
3689	017746	004767	001210
3690	017752	020127	000255
3691	017756	001032	
3692			
3693	017760	004767	001176
3694	017764	020127	000301
3695	017770	001457	
3696	017772	020127	000304
3697	017776	001507	
3698	020000	020127	000306
3699	020004	001435	
3700	020006	020127	000312
3701	020012	001421	
3702	020014	020127	000315
3703	020020	001435	
3704	020022	020127	000316
3705	020026	001465	
3706	020030	020127	000317
3707	020034	001454	
3708	020036	020127	000323
3709	020042	001443	
3710	020044	012700	021362
3711	020050	004767	001134
3712	020054	000660	
3713	020056	004767	001100
3714	020062	020127	000301
3715	020066	001461	
3716	020070	020127	000325
3717	020074	001531	
3718	020076	000762	
3719	020100	004767	001056
3720	020104	020127	000305
3721	020110	001461	
3722	020112	000754	
3723	020114	004767	001042
3724	020120	020127	000301
3725	020124	001464	
3726	020126	000746	
3727	020130	004767	001026
3728	020134	020127	000320
3729	020140	001472	

	BEQ	KEY4		;YES, ONE DIGIT DATE
	CMP	%1, #260		
	BLO	TRYAG		
	CMP	%1, #272		
	BHIS	TRYAG		
	BIC	#260, %1		
	ASL	%2		
	ADD	%2, %1		
	ASL	%2		
	ASL	%2		
	ADD	%2, %1		
	BEQ	TRYAG		
	BIT	#177740, %1		
	BNE	TRYAG		
KEY3:	MOVB	%1, DATE		
	JSR	7, KEIN		
	CMP	%1, #255		
	BNE	TRYAG		
KEY4:	JSR	7, KEIN		
	CMP	%1, #301		;A?
	BEQ	K5A		
	CMP	%1, #304		;D?
	BEQ	K5D		
	CMP	%1, #306		;F?
	BEQ	K5F		
	CMP	%1, #312		;J?
	BEQ	K5J		
	CMP	%1, #315		;M?
	BEQ	K5M		
	CMP	%1, #316		;N?
	BEQ	K5N		
	CMP	%1, #317		;O?
	BEQ	K5O		
	CMP	%1, #323		;S?
	BEQ	K5S		
TRYAG:	MOV	#MESS22, %0		
	JSR	7, TYPE		
	BR	KEY0		
K5J:	JSR	7, KEIN		
	CMP	%1, #301		;JA?
	BEQ	K6JAN		
	CMP	%1, #325		;JU?
	BEQ	K6JU		
	BR	TRYAG		
K5F:	JSR	7, KEIN		
	CMP	%1, #305		;FE?
	BEQ	K6FEB		
	BR	TRYAG		
K5M:	JSR	7, KEIN		
	CMP	%1, #301		;MA?
	BEQ	K6MA		
	BR	TRYAG		
K5A:	JSR	7, KEIN		
	CMP	%1, #320		;AP?
	BEQ	K6APR		

3730	020142	020127	000325		CMP	%1, #325	;AU?
3731	020146	001524			BEQ	K6AUG	
3732	020150	000735			BR	TRYAG	
3733	020152	004767	001004	K5S:	JSR	7 KEIN	
3734	020156	020127	000305		CMP	%1, #305	;SE?
3735	020162	001527			BEQ	K6SEP	
3736	020164	000727			BR	TRYAG	
3737	020166	004767	000770	K50:	JSR	7 KEIN	
3738	020172	020127	000303		CMP	%1, #303	;OC?
3739	020176	001532			BEQ	K6OCT	
3740	020200	000721			BR	TRYAG	
3741	020202	004767	000754	K5N:	JSR	7 KEIN	
3742	020206	020127	000317		CMP	%1, #317	;NO?
3743	020212	001535			BEQ	K6NOV	
3744	020214	000713			BR	TRYAG	
3745	020216	004767	000740	K5D:	JSR	7 KEIN	
3746	020222	020127	000305		CMP	%1, #305	;DE?
3747	020226	001542			BEQ	K6DEC	
3748	020230	000705			BR	TRYAG	
3749	020232	004767	000724	K6JAN:	JSR	7 KEIN	
3750	020236	020127	000316		CMP	%1, #316	;N?
3751	020242	001300			BNE	TRYAG	
3752	020244	112767	000001 177161		MOVB	#1, MONTH	;JANUARY
3753	020252	000540			BR	KEY7	
3754							
3755	020254	004767	000702	K6FEB:	JSR	7 KEIN	
3756	020260	020127	000302		CMP	%1, #302	;B?
3757	020264	001267			BNE	TRYAG	
3758	020266	112767	000002 177137		MOVB	#2, MONTH	;FEBRUARY
3759	020274	000527			BR	KEY7	
3760							
3761	020276	004767	000660	K6MA:	JSR	7 KEIN	
3762	020302	020127	000331		CMP	%1, #331	;Y?
3763	020306	001420			BEQ	K6MAY	
3764	020310	020127	000322		CMP	%1, #322	;R?
3765	020314	001253			BNE	TRYAG	
3766	020316	112767	000003 177107		MOVB	#3, MONTH	;MARCH
3767	020324	000513			BR	KEY7	
3768							
3769	020326	004767	000630	K6APR:	JSR	7 KEIN	
3770	020332	020127	000322		CMP	%1, #322	;R?
3771	020336	001242			BNE	TRYAG	
3772	020340	112767	000004 177065		MOVB	#4, MONTH	;APRIL
3773	020346	000502			BR	KEY7	
3774							
3775	020350	112767	000005 177055	K6MAY:	MOVB	#5, MONTH	;MAY
3776	020356	000476			BR	KEY7	
3777							
3778	020360	004767	000576	K6JU:	JSR	7 KEIN	
3779	020364	020127	000314		CMP	%1, #314	;L?
3780	020370	001407			BEQ	K6JUL	
3781	020372	020127	000316		CMP	%1, #316	;N?
3782	020376	001222			BNE	TRYAG	
3783	020400	112767	000006 177025		MOVB	#6, MONTH	;JUNE
3784	020406	000462			BR	KEY7	
3785							

3786	020410	112767	000007	177015	K6JUL:	MOV BR	#7, MONTH KEY7	; JULY
3787	020416	000456						
3788								
3789	020420	004767	000536		K6AUG:	JSR	7, KEIN	
3790	020424	020127	000307			CMP	%1, #307	; G?
3791	020430	001205				BNE	TRYAG	
3792	020432	112767	000010	176773		MOV BR	#10, MONTH KEY7	; AUGUST
3793	020440	000445						
3794								
3795	020442	004767	000514		K6SEP:	JSR	7, KEIN	
3796	020446	020127	000320			CMP	%1, #320	; P?
3797	020452	001026				BNE	TRYAGA	
3798	020454	112767	000011	176751		MOV BR	#11, MONTH KEY7	; SEPTEMBER
3799	020462	000434						
3800								
3801	020464	004767	000472		K6OCT:	JSR	7, KEIN	
3802	020470	020127	000324			CMP	%1, #324	; T?
3803	020474	001015				BNE	TRYAGA	
3804	020476	112767	000012	176727		MOV BR	#12, MONTH KEY7	; OCTOBER
3805	020504	000423						
3806								
3807	020506	004767	000450		K6NOV:	JSR	7, KEIN	
3808	020512	020127	000326			CMP	%1, #326	; V?
3809	020516	001004				BNE	TRYAGA	
3810	020520	112767	000013	176705		MOV BR	#13, MONTH KEY7	; NOVEMBER
3811	020526	000412						
3812								
3813	020530	000167	177310		TRYAGA:	JMP	TRYAG	
3814								
3815	020534	004767	000422		K6DEC:	JSR	7, KEIN	
3816	020540	020127	000303			CMP	%1, #303	; C?
3817	020544	001371				BNE	TRYAGA	
3818	020546	112767	000014	176657		MOV BR	#14, MONTH KEY7	; DECEMBER
3819	020554	004767	000402		KEY7:	JSR	7, KEIN	
3820	020560	020127	000255			CMP	%1, #255	; -?
3821	020564	001361				BNE	TRYAGA	
3822								
3823	020566	004767	000370		KEY8:	JSR	7, KEIN	
3824	020572	020127	000260			CMP	%1, #260	
3825	020576	103754				BLO	TRYAGA	
3826	020600	020127	000272			CMP	%1, #272	
3827	020604	103351				BHIS	TRYAGA	
3828	020606	042701	000260			BIC	#260, %1	
3829	020612	006301				ASL	%1	
3830	020614	010102				MOV	%1, %2	
3831	020616	006301				ASL	%1	
3832	020620	006301				ASL	%1	
3833	020622	060102				ADD	%1, %2	
3834								
3835	020624	004767	000332		KEY9:	JSR	7, KEIN	
3836	020630	020127	000260			CMP	%1, #260	
3837	020634	103735				BLO	TRYAGA	
3838	020636	020127	000272			CMP	%1, #272	
3839	020642	103332				BHIS	TRYAGA	
3840	020644	042701	000260			BIC	#260, %1	
3841	020650	060102				ADD	%1, %2	



3842	020652	110267	176556		MOVB	%2, YEAR	
3843							
3844	020656	004767	000300	KEY10:	JSR	7, KEIN	
3845	020662	020127	000215		CMP	%1, #215	;CR?
3846	020666	001320			BNE	TRYAGA	
3847	020670	012700	021402		MOV	#MESS23,%0	
3848	020674	004767	000310		JSR	7, TYPE	
3849							
3850	020700	004767	000256	KEY11:	JSR	7, KEIN	
3851	020704	010102			MOV	%1,%2	
3852	020706	020227	000260		CMP	%2, #260	
3853	020712	103516			BLO	TRYAN	
3854	020714	020227	000272		CMP	%2, #272	
3855	020720	103113			BHIS	TRYAN	
3856	020722	042702	000260		BIC	#260,%2	
3857							
3858	020726	004767	000230	KEY12:	JSR	7, KEIN	
3859	020732	020127	000272		CMP	%1, #272	
3860	020736	001420			BEQ	KEY13A	
3861	020740	101103			BHI	TRYAN	
3862	020742	020127	000260		CMP	%1, #260	
3863	020746	103500			BLO	TRYAN	
3864	020750	042701	000260		BIC	#260,%1	
3865	020754	006302			ASL	%2	
3866	020756	060201			ADD	%2,%1	
3867	020760	006302			ASL	%2	
3868	020762	006302			ASL	%2	
3869	020764	060102			ADD	%1,%2	
3870							
3871	020766	004767	000170	KEY13:	JSR	7, KEIN	
3872	020772	020127	000272		CMP	%1, #272	::?
3873	020776	001064			BNE	TRYAN	
3874							
3875	021000	020227	000027	KEY13A:	CMP	%2, #27	
3876	021004	003061			BGT	TRYAN	
3877	021006	110267	176417		MOVB	%2, HOUR	
3878	021012	004767	000144	KEY14:	JSR	7, KEIN	
3879	021016	010102			MOV	%1,%2	
3880	021020	020227	000260		CMP	%2, #260	
3881	021024	103451			BLO	TRYAN	
3882	021026	020227	000272		CMP	%2, #272	
3883	021032	103046			BHIS	TRYAN	
3884	021034	042702	000260		BIC	#260,%2	
3885							
3886	021040	004767	000116	KEY15:	JSR	7, KEIN	
3887	021044	020127	000215		CMP	%1, #215	;CR?
3888	021050	001422			BEQ	KEY16A	
3889	021052	020127	000260		CMP	%1, #260	
3890	021056	103434			BLO	TRYAN	
3891	021060	020127	000272		CMP	%1, #272	
3892	021064	103031			BHIS	TRYAN	
3893	021066	042701	000260		BIC	#260,%1	
3894	021072	006302			ASL	%2	
3895	021074	060201			ADD	%2,%1	
3896	021076	006302			ASL	%2	
3897	021100	006302			ASL	%2	

3898	021102	060102		
3899				
3900	021104	004767	000052	
3901	021110	020127	000215	
3902	021114	001015		
3903				
3904	021116	020227	000073	
3905	021122	003012		
3906	021124	110267	176300	
3907	021130	012700	021357	
3908	021134	004767	000050	
3909	021140	105777	011240	
3910	021144	100375		
3911	021146	000207		
3912				
3913	021150	012700	021362	
3914	021154	004767	000030	
3915	021160	000647		
3916				
3917	021162	105777	011212	
3918	021166	100375		
3919	021170	017701	011206	
3920				
3921	021174	105777	011204	
3922	021200	100375		
3923	021202	010177	011200	
3924	021206	000207		
3925				
3926	021210	105777	011170	
3927	021214	100375		
3928	021216	112077	011164	
3929	021222	001372		
3930	021224	000207		
3931				
3932	021226	212	212	
3933	021230	054524	042520	044440
3934	021236	020116	040504	026531
3935	021244	047515	052116	026510
3936	021252	042531	051101	043040
3937	021260	047522	020115	042513
3938	021266	041131	040517	042122
3939	021274	056		
3940	021275	215	212	
3941	021277	123	050105	051105
3942	021304	052101	020105	040505
3943	021312	044103	053440	052111
3944	021320	020110	020101	054510
3945	021326	044120	047105	020054
3946	021334	052523	044103	040440
3947	021342	026123	031040	026460
3948	021350	040512	026516	030467
3949	021356	056		
3950	021357	215	212	000
3951				
3952				
3953	021362	077		

	ADD	%1,%2
KEY16:	JSR	7 KEIN
	CMP	%1,#215
	BNE	TRYAN
KEY16A:	CMP	%2,#73
	BGT	TRYAN
	MOVB	%2,MINUTE
	MOV	#MESS21,%0
KEY16B:	JSR	7,TYPE
	TSTB	@TPSO
	BPL	KEY16B
	RTS	7
TRYAN:	MOV	#MESS22,%0
	JSR	7,TYPE
	BR	KEY11
KEYIN:	TSTB	@TKSO
	BPL	KEYIN
	MOV	@TKBO,%1
KOUT:	TSTB	@TPSO
	BPL	KOUT
	MOV	%1,@TPBO
	RTS	7
TYPE:	TSTB	@TPSO
	BPL	TYPE
	MOVB	(0)+,@TPBO
	BNE	TYPE
	RTS	7
MESS20:	.BYTE	LF,LF
	.ASCII	/TYPE IN DAY-MONTH-YEAR FROM KEYBOARD./
	.BYTE	CR,LF
	.ASCII	/SEPERATE EACH WITH A HYPHEN, SUCH AS, 20-JAN-71./
MESS21:	.BYTE	CR,LF,0
	.EVEN	
MESS22:	.ASCII	/?/

3954	021363	215	212	
3955	021365	124	054522	040440
3956	021372	040507	047111	041
3957	021377	215	212	000
3958				
3959				
3960	021402	212	212	
3961	021404	054524	042520	044440
3962	021412	020116	047510	051125
3963	021420	046472	047111	052125
3964	021426	020105	051106	046517
3965	021434	045440	054505	047502
3966	021442	051101	027104	
3967	021446	215	212	
3968	021450	042523	042520	040522
3969	021456	042524	053440	052111
3970	021464	020110	020101	047503
3971	021472	047514	026116	051440
3972	021500	041525	020110	051501
3973	021506	020054	032461	031472
3974	021514	027065		
3975	021516	215	212	000
3976		021522		
3977				
3978	021522	215	212	
3979	021524	051522	032066	052040
3980	021532	051505	042524	020122
3981	021540	047515	044516	047524
3982	021546	020122	047101	020104
3983	021554	044504	045523	042440
3984	021562	042530	041522	051511
3985	021570	051105	056	
3986	021573	215	212	
3987	021575	124	050131	020105
3988	021602	044124	020105	041517
3989	021610	040524	020114	052516
3990	021616	041115	051105	047440
3991	021624	020106	052123	052101
3992	021632	047511	051516	047440
3993	021640	020116	044124	020105
3994	021646	054523	052123	046505
3995	021654	056		
3996	021655	215	212	
3997	021657	124	051105	044515
3998	021664	040516	042524	053440
3999	021672	052111	020110	020101
4000	021700	040503	051122	040511
4001	021706	042507	051040	052105
4002	021714	051125	027116	
4003	021720	215	212	000
4004		021724		
4005				
4006				
4007				
4008				
4009				

```

.BYTE CR,LF
.ASCII /TRY AGAIN!/

.BYTE CR,LF,0
.EVEN

MESS23: .BYTE LF,LF
.ASCII /TYPE IN HOUR:MINUTE FROM KEYBOARD./

.BYTE CR,LF
.ASCII /SEPERATE WITH A COLON, SUCH AS, 15:35./

.BYTE CR,LF,0
.EVEN

MESS24: .BYTE CR,LF
.ASCII /RS64 TESTER MONITOR AND DISK EXERCISER./

.BYTE CR,LF
.ASCII /TYPE THE OCTAL NUMBER OF STATIONS ON THE SYSTEM./

.BYTE CR,LF
.ASCII /TERMINATE WITH A CARRIAGE RETURN./

.BYTE CR,LF,0
.EVEN

```

```

*****
:SUBROUTINE TO SET UP THE 2 SEC., 20 SEC., AND 60 SEC WAIT ROUTINE
*****

```

4010	021724	026727	156550	007020	SETCYC:	CMP	CYCLE, #7020	:CHECK FOR 60 CYCLE CONSTANT
4011	021732	001406				BEQ	.60CYC	:BRANCH IF 60 CYCLE
4012	021734	026727	156540	005670		CMP	CYCLE, #5670	:CHECK FOR 50 CYCLE CONSTANT
4013	021742	001414				BEQ	.50CYC	:BRANCH IF 50 CYCLE
4014	021744	000000				HALT		:NEITHER 50 OR 60?
4015	021746	000766				BR	SETCYC	:TRY AGAIN.
4016								
4017	021750	012767	007016	000042	.60CYC:	MOV	#7016, CYCL60	
4018	021756	012767	002260	000036		MOV	#2260, CYCL20	
4019	021764	012767	000170	000032		MOV	#0170, CYCL02	
4020	021772	000207				RTS	%7	
4021								
4022	021774	012767	005670	000016	.50CYC:	MOV	#5670, CYCL60	
4023	022002	012767	001750	000012		MOV	#1750, CYCL20	
4024	022010	012767	000144	000006		MOV	#0144, CYCL02	
4025	022016	000207				RTS	%7	
4026								
4027	022020	000000				CYCL60:	0	
4028	022022	000000				CYCL20:	0	
4029	022024	000000				CYCL02:	0	

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022026 012767 022036 155770  
022034 000000  
  
022036 012767 022026 155760  
022044 012706 001000  
022050 000005  
022052 012777 000100 175356  
022060 012702 000140  
022064 005001  
022066 005301  
022070 001376  
022072 005302  
022074 001374  
  
022076 012767 000002 155702  
022104 005000  
022106 012770 000100 032400  
022114 004767 166256  
022120 105760 030000  
022124 100015  
022126 052760 100000 030000  
022134 012760 101000 030400  
022142 004767 166214  
022146 012770 000200 032200  
022154 004767 164602  
022160 062700 000010  
022164 020067 156312  
022170 001346  
022172 000167 156752

```
*****
:POWER FAILURE INTERRUPT ROUTINE.
: ALL STATIONS GET CLEARED AFTER 30 SECONDS, AND THE MONITOR
: PICKS UP WHERE IT LEFT OFF.
: A POWER FAIL MESSAGE IS TYPED ON ALL STATIONS RUNNING TESTS.
*****

POWER:  MOV  #POWON,24
        HALT

POWON:  MOV  #POWER,24
        MOV  #1000,%6
        RESET ;CLEAR OUT ALL DEVICES
        MOV  #100,%LKS
        MOV  #140,%2 ;30 SEC. WAIT LOOP
W30S:   CLR  %1
        DEC  %1
        BNE  W30S
        DEC  %2
        BNE  W30S
;POLL STATIONS; TYPE MESSAGE AND CLEAR ACTIVE STATIONS.

MOV  #2,6 ;RTI ON TIME OUT
CLR  %0
LOOPOW: MOV  #100,%TKSO(0) ;INTERUPT ENABLE
        JSR  7,CRACT1 ;INITIALIZE TELEPRINTER
        TSTB STAT0(0) ;STATION IN RUN MODE?
        BPL  NOTACT
        BIS  #100000,STAT0(0) ;MAKE SURE IT IS ACTIVE
        MOV  #101000,PSTAT(0) ;MESS10, LINE 2
        JSR  7,CRACT
        MOV  #200,%CSO(0) ;CLEAR ANY ERRORS
        JSR  7,TRANS ;REDO LAST OPERATION
NOTACT: ADD  #10,%0
        CMP  %0,NUMBER
        BNE  LOOPOW
        JMP  RESTAR
```

4068			STATO	=	30000
4069		030000	ASTAT	=	STATO+2
4070		030002	FLAGS	=	STATO+4
4071		030004	PHASE	=	STATO+6
4072		030006	CSBUF	=	STATO+200
4073		030200	DABUF	=	STATO+202
4074		030202	DBBUF	=	STATO+204
4075		030204	OLDATA	=	STATO+206
4076		030206	PSTAT	=	STATO+400
4077		030400	PRANK	=	STATO+402
4078		030402	SRANK	=	STATO+404
4079		030404	WAITER	=	STATO+406
4080		030406	RTIME	=	STATO+600
4081		030600	STIME	=	STATO+602
4082		030602	ERCONT	=	STATO+604
4083		030604	READ3	=	STATO+606
4084		030606	KSTAT	=	STATO+1000
4085		031000	KBUF	=	STATO+1002
4086		031002	PBUF	=	STATO+1200
4087		031200	.	=	STATO+2200
4088		032200			
4089					
4090	032200	170100	CS0:		170100
4091	032202	170102	DB0:		170102
4092	032204	170104	DA0:		170104
4093	032206	000000	LOOPC:		0
4094	032210	170110	CS1:		170110
4095	032212	170112	DB1:		170112
4096	032214	170114	DA1:		170114
4097	032216	000000			0
4098	032220	170120	CS2:		170120
4099	032222	170122	DB2:		170122
4100	032224	170124	DA2:		170124
4101	032226	000000			0
4102	032230	170130	CS3:		170130
4103	032232	170132	DB3:		170132
4104	032234	170134	DA3:		170134
4105	032236	000000			0
4106	032240	170140	CS4:		170140
4107	032242	170142	DB4:		170142
4108	032244	170144	DA4:		170144
4109	032246	000000			0
4110	032250	170150	CS5:		170150
4111	032252	170152	DB5:		170152
4112	032254	170154	DA5:		170154
4113	032256	000000			0
4114	032260	170160	CS6:		170160
4115	032262	170162	DB6:		170162
4116	032264	170164	DA6:		170164
4117	032266	000000			0
4118	032270	170170	CS7:		170170
4119	032272	170172	DB7:		170172
4120	032274	170174	DA7:		170174
4121	032276	000000			0
4122	032300	170200	CS10:		170200
4123	032302	170202	DB10:		170202

4124	032304	170204	DA10:	170204
4125	032306	000000		0
4126	032310	170210	CS11:	170210
4127	032312	170212	DB11:	170212
4128	032314	170214	DA11:	170214
4129	032316	000000		0
4130	032320	170220	CS12:	170220
4131	032322	170222	DB12:	170222
4132	032324	170224	DA12:	170224
4133	032326	000000		0
4134	032330	170230	CS13:	170230
4135	032332	170232	DB13:	170232
4136	032334	170234	DA13:	170234
4137	032336	000000		0
4138	032340	170240	CS14:	170240
4139	032342	170242	DB14:	170242
4140	032344	170244	DA14:	170244
4141	032346	000000		0
4142	032350	170250	CS15:	170250
4143	032352	170252	DB15:	170252
4144	032354	170254	DA15:	170254
4145	032356	000000		0
4146	032360	170260	CS16:	170260
4147	032362	170262	DB16:	170262
4148	032364	170264	DA16:	170264
4149	032366	000000		0
4150	032370	170270	CS17:	170270
4151	032372	170272	DB17:	170272
4152	032374	170274	DA17:	170274
4153	032376	000000		0

4154				
4155	032400	177560	TKS0:	177560
4156	032402	177562	TKB0:	177562
4157	032404	177564	TPS0:	177564
4158	032406	177566	TPB0:	177566
4159	032410	176500	TKS1:	176500
4160	032412	176502	TKB1:	176502
4161	032414	176504	TPS1:	176504
4162	032416	176506	TPB1:	176506
4163	032420	176510	TKS2:	176510
4164	032422	176512	TKB2:	176512
4165	032424	176514	TPS2:	176514
4166	032426	176516	TPB2:	176516
4167	032430	176520	TKS3:	176520
4168	032432	176522	TKB3:	176522
4169	032434	176524	TPS3:	176524
4170	032436	176526	TPB3:	176526
4171	032440	176530	TKS4:	176530
4172	032442	176532	TKB4:	176532
4173	032444	176534	TPS4:	176534
4174	032446	176536	TPB4:	176536
4175	032450	176540	TKS5:	176540
4176	032452	176542	TKB5:	176542
4177	032454	176544	TPS5:	176544
4178	032456	176546	TPB5:	176546
4179	032460	176550	TKS6:	176550
4180	032462	176552	TKB6:	176552
4181	032464	176554	TPS6:	176554
4182	032466	176556	TPB6:	176556
4183	032470	176560	TKS7:	176560
4184	032472	176562	TKB7:	176562
4185	032474	176564	TPS7:	176564
4186	032476	176566	TPB7:	176566
4187	032500	176570	TKS10:	176570
4188	032502	176572	TKB10:	176572
4189	032504	176574	TPS10:	176574
4190	032506	176576	TPB10:	176576
4191	032510	176600	TKS11:	176600
4192	032512	176602	TKB11:	176602
4193	032514	176604	TPS11:	176604
4194	032516	176606	TPB11:	176606
4195	032520	176610	TKS12:	176610
4196	032522	176612	TKB12:	176612
4197	032524	176614	TPS12:	176614
4198	032526	176616	TPB12:	176616
4199	032530	176620	TKS13:	176620
4200	032532	176622	TKB13:	176622
4201	032534	176624	TPS13:	176624
4202	032536	176626	TPB13:	176626
4203	032540	176630	TKS14:	176630
4204	032542	176632	TKB14:	176632
4205	032544	176634	TPS14:	176634
4206	032546	176636	TPB14:	176636
4207	032550	176640	TKS15:	176640
4208	032552	176642	TKB15:	176642
4209	032554	176644	TPS15:	176644



4210.	032556	176646	TPB15:	176646
4211	032560	176650	TKS16:	176650
4212	032562	176652	TKB16:	176652
4213	032564	176654	TPS16:	176654
4214	032566	176656	TPB16:	176656
4215	032570	176660	TKS17:	176660
4216	032572	176662	TKB17:	176662
4217	032574	176664	TPS17:	176664
4218	032576	176666	TPB17:	176666
4219				
4220	032600	000200	END:	.END LOAD



CONTS	011460	2341	2521#															
CONTT	011476	2342	2531#															
CR	= 000215	778#	2378	3132	3182	3202	3257	3282	3293	3303	3331	3340	3345	3355				
		3368	3377	3394	3423	3433	3446	3940	3950	3954	3957	3967	3975	3978				
		3986	3996	4003														
CRACT	010362	929	1000	1234	1640	1987	1991	2276#	2542	3600	4061							
CRACT1	010376	2279#	4056															
CRACT2	010410	2277	2281#															
CRLF	= 106612	781#	2369	2455	2533													
CSBUF	= 030200	833*	860	869*	870	941	988*	1055*	1081	1231*	1436*	1603*	1619*	1671*				
		1744*	1806*	1828*	1896*	1899*	1944*	1947*	1950*	1953*	1957	1961*	2002	3195				
		4073#																
CS0	032200	858	870*	871	943	950*	993	1003	1056*	1074	1076	1606	1675*	1700				
		1748*	1810*	1829*	1848	1901*	1957*	1960*	2395*	2537	3186	4062*	4090#					
CS1	032210	4094#																
CS10	032300	4122#																
CS11	032310	4126#																
CS12	032320	4130#																
CS13	032330	4134#																
CS14	032340	4138#																
CS15	032350	4142#																
CS16	032360	4146#																
CS17	032370	4150#																
CS2	032220	4098#																
CS3	032230	4102#																
CS4	032240	4106#																
CS5	032250	4110#																
CS6	032260	4114#																
CS7	032270	4118#																
CYCLE	000500	804#	866	2211	2222	2233	3537	4010	4012									
CYCL02	022024	2212	4019*	4024*	4029#													
CYCL20	022022	2223	4018*	4023*	4028#													
CYCL60	022020	2234	4017*	4022*	4027#													
DABUF	= 030202	1070*	1084	1089	1239*	1482*	1552*	1553*	1686*	1687*	1817*	1818*	1955	2032*				
		2040*	2145*	2146*	2149	2157*	2158	2161*	2185	2193*	2196	2201*	2729*	2744*				
		2749*	2770*	2785*	2808*	3231	3238	4074#										
		3118	3411	3550	3553*	3556	3563	3573*	3612#	3661*	3671*	3688*						
		815	3623#															
DATE	017432																	
DATIN	017440																	
DA0	032204	985*	1005	1058*	1080	1684	1815	1955*	3148	3155	3158	4092#						
DA1	032214	4096#																
DA10	032304	4124#																
DA11	032314	4128#																
DA12	032324	4132#																
DA13	032334	4136#																
DA14	032344	4140#																
DA15	032354	4144#																
DA16	032364	4148#																
DA17	032374	4152#																
DA2	032224	4100#																
DA3	032234	4104#																
DA4	032244	4108#																
DA5	032254	4112#																
DA6	032264	4116#																
DA7	032274	4120#																
DBBUF	= 030204	1008*	1020	1022*	1028*	1036	1038*	1045*	1051*	1068*	1258*	1265*	1292*	1299*				
		1359*	1363*	1376*	1381*	1420*	1435*	1462*	1471*	1506*	1515*	1554*	1568*	1956				

		2053*	2093	2096*	2097*	2100	2110	2113*	2116	2119*	2122	2124*	2125	2131*
DB0	032202	2137	2172*	2173*	2832*	3241	4075#							
DB1	032212	986*	1057*	1078	1956*	3166	4091#							
DB10	032302	4095#												
DB11	032312	4123#												
DB12	032322	4127#												
DB13	032332	4131#												
DB14	032342	4135#												
DB15	032352	4139#												
DB16	032362	4143#												
DB17	032372	4147#												
DB2	032222	4151#												
DB3	032232	4099#												
DB4	032242	4103#												
DB5	032252	4107#												
DB6	032262	4111#												
DB7	032272	4115#												
DECIM2	017006	4119#												
DEC2A	017012	3114	3117	3123	3131	3407	3410	3507#						
ECBUSY	013702	3508#	3510											
ECCR	013574	2910	2914#											
ECCRO	013554	2863	2891#											
ECHO	013654	2876	2887#											
END	032600	2397	2416	2491	2510	2615	2758	2759	2760	2834	2891	2902	2909#	
ENDAR	013762	4220#												
ENDAR1	014030	2940	2942#											
ENDIN	013404	2955	2962#											
ENTEST	013462	2335	2857#											
ERBUSY	001520	2869	2874#											
ERCONT=	030604	914	929#	933	935									
ERCOVE	001526	915*	917	997*	2846*	2887*	3325	4083#						
ERREAD1	001600	916	932#											
ERREAD2	001604	942	944	948#										
ERMES	001504	947	950#											
ERREAD	001546	920	927#											
ERROR	001414	924	941#	3169										
ERROR1	001460	872	911#											
EXCONA	011546	918	921#											
EXCONT	011510	2458	2536	2542#										
FEB	017202	2468	2477	2524	2533#									
FLAGS =	030004	3551	3559#											
		832*	911	919	921	1023*	1039*	1046*	1059	1063*	1073*	1674*	1703*	1708*
		1747*	1763*	1809*	1851*	1856*	1900*	1925*	1967	1976	1983	1985*	2410	2412*
		2415*	2452*	2465*	2484	2486*	2490*	2504	2506*	2509*	2590	2605	2607*	2624
		2666*	2687*	2707	2878	2880	2882*	2901*	3321	3324*	4071#			
HINUM	007470	2070#	2245	2255	2266*									
HIPAT	012440	2694	2699#											
HISCT	013134	2794	2799#											
HISEQ	012622	2726	2735#											
HITRK	013024	2767	2773#											
HITST	012316	2668	2673#											
HOUR	017431	3113	3412	3544	3546*	3549*	3611#	3877*						
ILBUSY	010734	2368	2375#											
ILCRLF	010744	2377#	2402											
ILLEG	010670	2322	2328	2329	2330	2332	2333	2336	2337	2338	2339	2345	2347	2353
		2359	2366#	2390	2394	2626	2662	2781	2872					













MAINDEC-11-DZRSA-A RS64 TESTER MONITOR AND EXERCISER  
 DZRSAA.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

TEST	001342	884	887#																	
TESTS	001334	878	884#																	
TESTO	001632	887	959#																	
TEST1	001634	888	971#																	
TEST10	003234	895	1248#																	
TEST11	003356	896	1282#																	
TEST12	003500	897	1317#																	
TEST13	003610	898	1350#																	
TEST14	003770	899	1396#																	
TEST15	004202	900	1447#																	
TEST16	004366	901	1490#																	
TEST17	004522	902	1527#																	
TEST2	002464	889	1100#																	
TEST20	004766	903	1585#																	
TEST21	005264	904	1650#																	
TEST22	005606	905	1723#																	
TEST23	006040	906	1781#																	
TEST24	006422	907	1871#																	
TEST3	002552	890	1122#																	
TEST4	002622	891	1140#																	
TEST5	002664	892	1156#																	
TEST6	002736	893	1176#																	
TEST7	003026	894	1202#																	
TIDA	017162	3553#	3560	3564	3572															
TILoop	017314	3585#	3603																	
TIMDAT	017170	3552	3556#																	
TIMDAY	017144	3545	3549#																	
TIME	017426	864	954	990	1669	1676	1681	1689	1749	1754	1760	1804	1820	1834						
		1902	1908	1914	1954	2209	2220	2231	3530*	3537*	3609#									
TIMIN	017070	3531	3534#																	
TIMONT	017256	3557	3562	3565	3573#															
TIMOT1	017354	3593	3595#																	
TIMOT2	017404	3586	3588	3596	3598	3601#														
TIMOUR	017122	3539	3543#																	
TIMOUT	017312	3541	3547	3554	3576	3584#														
TIMTYP	017362	3592	3597#																	
TKB0	032402	2316	2613	2912	2915	3919	4156#													
TKB1	032412	4160#																		
TKB10	032502	4188#																		
TKB11	032512	4192#																		
TKB12	032522	4196#																		
TKB13	032532	4200#																		
TKB14	032542	4204#																		
TKB15	032552	4208#																		
TKB16	032562	4212#																		
TKB17	032572	4216#																		
TKB2	032422	4164#																		
TKB3	032432	4168#																		
TKB4	032442	4172#																		
TKB5	032452	4176#																		
TKB6	032462	4180#																		
TKB7	032472	4184#																		
TKCONT	010536	2321	2322#																	
TKSERV	010474	2295	2311#																	
TKSO	032400	828*	2294	3917	4055*	4155#														
TKS1	032410	4159#																		





MAINDEC-11-DZRSA-A RS64 TESTER MONITOR AND EXERCISER  
 DZRSAA.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

T13C2	003744	1380	1384#	
T13Z	003626	1352	1357#	
T13Z1	003632	1358#	1386	
T13Z2	003636	1359#	1369	1388
T14	003776	1397	1398#	
T14A	004024	1399	1408#	
T14A1	004042	1409	1413#	
T14B	004046	1400	1414#	
T14B2	004064	1415	1419#	
T14C	004102	1401	1423#	
T14C1	004120	1424	1428#	
T14D	004124	1402	1429#	
T14D1	004142	1430	1434#	
T14Z	004010	1398	1404#	
T14Z1	004014	1405#	1438	1440
T15	004210	1448	1449#	
T15A	004232	1450	1457#	
T15A1	004250	1458	1461#	
T15B	004266	1451	1465#	
T15B1	004304	1466	1470#	
T15B2	004346	1477	1480#	
T15Z	004216	1449	1453#	1939
T15Z1	004222	1454#	1473	1475
T16	004374	1491	1492#	
T16A	004416	1493	1500#	
T16A1	004434	1501	1505#	
T16B	004452	1494	1509#	
T16B1	004470	1510	1514#	
T16Z	004402	1483	1492	1496#
T16Z1	004406	1497#	1517	1519
T17	004530	1528	1529#	
T17A	004562	1530	1541#	
T17B	004602	1531	1546#	
T17C	004622	1532	1551#	
T17D	004654	1533	1557#	
T17E	004674	1534	1562#	
T17F	004714	1535	1567#	
T17F1	004756	1574	1577#	
T17Z	004546	1529	1537#	
T17Z1	004552	1538#	1570	1572
T2A	002512	1100	1107#	
T2A1	002524	1108	1111#	
T2Z	002466	1101#		
T2Z1	002506	1103	1105#	
T20	004774	1586	1587#	
T20A	005032	1588	1599#	
T20A1	005050	1602#	1609	
T20B	005064	1589	1606#	
T20B1	005104	1607	1612#	
T20B2	005122	1614	1616#	
T20C	005130	1590	1618#	
T20C1	005142	1617	1620#	
T20D	005144	1591	1610	1622#
T20D1	005166	1624	1627#	
T20E	005174	1592	1629#	
T20E1	005210	1630	1633#	

T20E2	005234	1635	1639#	
T20Z	005010	1578	1587	1594#
T20Z1	005022	1596#	1626	1628
T21	005272	1651	1652#	
T21A	005326	1653	1665#	
T21A1	005340	1666	1669#	
T21B	005362	1654	1674#	
T21C	005406	1655	1679#	
T21C1	005424	1680	1684#	
T21C2	005460	1672	1677	1690#
T21D	005466	1656	1693#	
T21D1	005500	1694	1697#	
T21E	005510	1657	1700#	
T21F	005532	1658	1701	1704#
T21F1	005544	1705	1708#	
T21G	005556	1659	1710#	
T21G1	005570	1711	1714#	
T21Z	005312	1242	1652	1661#
T21Z1	005316	1662#	1716	
T22	005614	1724	1725#	
T22A	005646	1726	1737#	
T22B	005660	1727	1741#	
T22C	005702	1728	1747#	
T22D	005726	1729	1751#	
T22D1	005746	1745	1750	1755#
T22E	005754	1730	1758#	
T22E1	005762	1752	1760#	
T22E2	005772	1759	1763#	
T22E3	006000	1738	1764#	
T22F	006010	1731	1767#	
T22F1	006016	1742	1769#	
T22F2	006022	1768	1771#	
T22Z	005632	1725	1733#	
T22Z1	005636	1734#	1773	
T23	006046	1782	1783#	
T23A	006112	1784	1800#	
T23A1	006124	1801	1804#	
T23B	006146	1785	1809#	
T23C	006164	1786	1813#	
T23C1	006214	1819#	1833	
T23C2	006220	1811	1820#	1830
T23C3	006226	1807	1821#	
T23D	006234	1787	1824#	1837
T23D1	006246	1825	1828#	
T23E	006264	1788	1832#	1839
T23E1	006272	1814	1834#	
T23F	= 006234	1789	1837#	
T23G	= 006264	1790	1839#	
T23H	006302	1791	1841#	
T23H1	006314	1842	1845#	
T23I	006324	1792	1848#	
T23J	006346	1793	1849	1852#
T23J1	006360	1853	1856#	
T23K	006372	1794	1858#	
T23K1	006404	1859	1862#	
T23Z	006076	1783	1796#	







MAINDEC-11-DZRSA-A  
DZRSAA.P11

RS64 TESTER MONITOR AND EXERCISER  
CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

ADC	2254	2256	2258	2259	2261	2264									
ADD	834	851	867	1615	2013	2145	2192	2199	2212	2223	2234	2253	2255	2257	2260
	2262	2263	2296	2315	2434	2439	2442	2443	2444	2465	2633	2678	2704	2715	2752
	2778	2804	2814	2825	2842	2901	2933	2936	2983	3002	3004	3006	3267	3512	3594
ASL	3601	3644	3681	3684	3833	3841	3866	3869	3895	3898	4064				
	875	971	1202	1248	1282	1317	1350	1396	1447	1490	1527	1585	1650	1723	1781
	1871	2052	2078	2124	2248	2313	2314	2320	2654	2673	2674	2675	2699	2700	2701
	2773	2774	2775	2799	2800	2801	2821	2822	2823	3000	3001	3125	3126	3150	3151
	3632	3633	3634	3645	3646	3647	3680	3682	3683	3829	3831	3832	3865	3867	3868
ASR	3894	3896	3897												
	2096	2783	2784	3160	3161	3162	3189	3190	3191	3386	3387	3388	3467	3468	3469
	3496	3497	3498												
BEQ	861	916	922	942	1060	1092	1176	1178	1227	1229	1328	1335	1367	1375	1380
	1409	1415	1424	1430	1458	1466	1477	1501	1510	1574	1630	1635	1666	1701	1705
	1711	1738	1768	1801	1849	1853	1859	1890	1930	1970	1979	2029	2051	2094	2103
	2105	2129	2187	2189	2198	2411	2458	2485	2505	2536	2538	2552	2555	2558	2561
	2576	2578	2585	2587	2591	2606	2669	2682	2684	2692	2695	2708	2714	2724	2727
	2740	2742	2754	2757	2765	2768	2792	2795	2819	2859	2867	2869	2871	2881	2938
	2956	2958	2963	2982	3008	3013	3015	3018	3020	3023	3026	3029	3032	3035	3038
	3041	3044	3047	3050	3053	3067	3070	3073	3078	3085	3088	3225	3322	3531	3539
	3545	3551	3558	3564	3569	3592	3638	3670	3674	3685	3695	3697	3699	3701	3703
	3705	3707	3709	3715	3717	3721	3725	3729	3731	3735	3739	3743	3747	3763	3780
	3860	3888	4011	4013											
BGE	2353	2629	2631	2642	3413	3510									
BGT	1100	1122	1140	1156	2095	2319	2347	2554	2557	2560	2575	2668	2680	2686	2694
	2726	2739	2756	2767	2794	2828	3552	3876	3905						
BHI	2706	2806	3077	3557	3649	3861									
BHIS	3630	3642	3668	3678	3827	3839	3855	3883	3892						
BIC	874	927	998	1069	1073	1083	1088	1090	1238	1436	1553	1619	1685	1686	1703
	1708	1763	1816	1817	1851	1856	1925	1961	1988	1999	2031	2038	2039	2050	2077
	2134	2146	2148	2159	2163	2317	2392	2412	2451	2486	2506	2607	2666	2690	2721
	2748	2796	2882	3149	3159	3187	3196	3232	3273	3458	3470	3482	3491	3493	3529
	3631	3643	3669	3679	3828	3840	3856	3864	3884	3893					
BICB	2635	3014													
BIS	828	832	833	869	988	1023	1039	1046	1114	1240	1603	1671	1674	1687	1744
	1747	1806	1809	1818	1828	1896	1899	1900	2027	2033	2041	2371	2415	2452	2490
	2509	2539	2687	2696	2718	2732	2750	2786	2807	2808	2862	2874	2911	3168	3459
	3471	3483	3494	3499	4059										
BIT	860	871	911	913	917	921	932	941	1003	1059	1074	1081	1102	1112	1124
	1224	1226	1228	1476	1573	1608	1625	1629	1634	1700	1848	1936	1967	1969	1976
	1978	1983	2000	2002	2004	2007	2011	2014	2018	2021	2057	2102	2186	2188	2197
	2276	2367	2410	2457	2484	2504	2535	2537	2549	2590	2605	2622	2624	2707	2710
	2753	2809	2878	2880	2909	3012	3220	3224	3271	3321	3568	3571	3587	3597	3686
BITB	2650	2857	3017	3561											
BLE	865	2210	2221	2232	2349	2651									
BLO	947	3022	3025	3028	3031	3034	3037	3040	3043	3046	3049	3052	3066	3069	3072
	3084	3087	3628	3640	3666	3676	3825	3837	3853	3863	3881	3890			
BLOS	3576														
BLT	2355	2780													
BMI	850	859	862	994	1617	1680	1694	1759	1825	1833	1842	1913	2117	2295	2345
	2431	2858													
BNE	822	836	853	872	912	914	918	933	955	996	1004	1006	1075	1079	1082
	1085	1103	1113	1125	1225	1609	1626	1742	1894	1937	1968	1977	1984	2001	2003
	2005	2008	2012	2015	2019	2022	2058	2160	2252	2277	2298	2359	2368	2394	2441
	2448	2550	2580	2589	2602	2604	2612	2623	2625	2640	2711	2736	2810	2816	2830
	2845	2861	2879	2910	2940	2943	2945	2949	2985	3221	3265	3272	3521	3560	3562

	3572	3588	3596	3598	3603	3651	3657	3687	3691	3751	3757	3765	3771	3782	3791
BPL	3797	3803	3809	3817	3821	3846	3873	3902	3929	4048	4050	4066			
	868	878	920	944	1077	1607	1614	1752	1814	1906	1924	2025	2037	2101	2111
BR	2123	2390	2837	3456	3586	3593	3910	3918	3922	3927	4058				
	854	880	885	925	930	935	1179	1369	1372	1483	1578	1610	1672	1677	1745
	1750	1807	1811	1830	1897	1903	1945	1948	1951	1989	1992	2009	2016	2055	2098
	2108	2114	2120	2132	2402	2413	2449	2459	2468	2477	2487	2507	2524	2540	2563
	2566	2569	2572	2582	2593	2596	2599	2609	2637	2730	2745	2771	2788	2797	2812
	2840	2863	2876	2898	2953	2960	3059	3074	3079	3089	3227	3275	3541	3547	3554
	3565	3654	3712	3718	3722	3726	3732	3736	3740	3744	3748	3753	3759	3767	3773
BVC	3776	3784	3787	3793	3799	3805	3811	3915	4015						
	1146	1148	1189	1217	1273	1275	1307	1309	1340	1342	1386	1388	1438	1440	1473
BVS	1475	1517	1519	1570	1572	1628	1716	1773	1864						
CLR	1012	1108	1130	1162	1166	1191	1219	1624							
	820	827	838	848	985	986	1008	1028	1051	1055	1056	1057	1058	1061	1062
	1063	1111	1133	1149	1169	1195	1223	1231	1258	1271	1292	1305	1359	1376	1384
	1434	1470	1482	1514	1567	1600	1622	1641	1642	1643	1714	1771	1862	1933	1960
	2247	2280	2292	2299	2311	2366	2370	2435	2436	2437	2438	2446	2453	2456	2466
	2489	2523	2534	2664	2665	2729	2744	2770	2817	2846	2884	2887	2888	2894	2979
CLRB	2986	2998	3056	3058	3135	3324	3584	3660	3661	4046	4054				
	876	1054	1338	1972	2278	2676	2702	2762	2776	2802	2843	2889	2947	2959	2964
CMP	3010	3016	3134	3461	3473	3543	3549	3662							
	835	852	954	1078	1084	1091	2093	2104	2149	2164	2297	2318	2346	2348	2352
	2354	2358	2393	2562	2565	2568	2571	2579	2584	2586	2588	2603	2611	2628	2679
	2705	2738	2779	2805	2939	2942	2944	2948	2955	2957	2962	2981	2984	3602	3627
	3629	3637	3639	3641	3648	3656	3665	3667	3673	3675	3677	3690	3694	3696	3698
	3700	3702	3704	3706	3708	3714	3716	3720	3724	3728	3730	3734	3738	3742	3746
	3750	3756	3762	3764	3770	3779	3781	3790	3796	3802	3808	3816	3820	3824	3826
	3836	3838	3845	3852	3854	3859	3862	3872	3875	3880	3882	3887	3889	3891	3901
CMPB	3904	4010	4012	4065											
	946	2553	2556	2559	2574	2577	2630	2639	2641	2667	2691	2693	2723	2725	2755
	2764	2766	2791	2793	2815	2829	2844	2860	3021	3024	3027	3030	3033	3036	3039
	3042	3045	3048	3051	3065	3068	3071	3076	3083	3086	3412	3538	3544	3550	3556
COM	3559	3563	3575												
DEC	2097	2173	3570												
	821	995	1177	1192	1220	2028	2128	2440	2447	2683	2709	2866	2868	2870	2965
DECB	3057	3414	4047	4049											
HALT	1368	2818	2827	3019											
INC	788	801	959	3081	4014	4039									
	915	984	997	1101	1123	1141	1157	1181	1185	1209	1213	1257	1261	1264	1268
	1291	1295	1298	1302	1362	1541	1546	1596	1599	1690	1709	1755	1821	1857	1909
	1926	1975	2006	2020	2106	2135	2157	2251	2581	2614	2636	2712	2820	2826	2839
INCB	2952	3011	3511	3530											
	945	1007	1015	1019	1026	1031	1035	1042	1049	1324	1331	1358	1371	1405	1413
	1419	1428	1454	1461	1480	1497	1505	1538	1551	1557	1562	1618	1662	1697	1702
	1734	1764	1797	1845	1850	1886	1971	2396	2811	3226	3457	3508	3540	3546	3553
JMP	3574	3578													
	800	948	951	956	972	1009	1013	1017	1024	1029	1033	1040	1047	1052	1064
	1094	1105	1109	1115	1127	1131	1134	1143	1150	1159	1163	1167	1170	1183	1186
	1193	1196	1203	1211	1214	1221	1242	1249	1259	1262	1266	1269	1276	1283	1293
	1296	1300	1303	1310	1318	1325	1329	1332	1336	1343	1351	1360	1364	1377	1382
	1389	1397	1406	1411	1417	1421	1426	1432	1441	1448	1455	1460	1463	1468	1478
	1491	1498	1503	1507	1512	1520	1528	1539	1544	1549	1555	1560	1565	1575	1586
	1597	1631	1651	1663	1667	1695	1698	1706	1712	1717	1724	1735	1739	1765	1769
	1774	1782	1798	1802	1826	1843	1846	1854	1860	1865	1872	1887	1891	1927	1931
	1939	2079	2321	2350	2356	2360	2373	2381	2421	2496	2515	2543	2616	2626	2643



MAINDEC-11-DZRSA-A RS64 TESTER MONITOR AND EXERCISER  
 DZRSAA.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

SEC	2112	2118	3463	3475											
SEV	2042	2138													
SUB	864	866	1613	1616	2023	2161	2190	2191	2200	2209	2211	2220	2222	2231	2233
SWAB	2685	2836	3266	3509	3537	3591	3595								
TST	2677	2703	2777	2782	2803	3152	3163	3192	3235	3462	3474	3481			
TSTB	849	919	943	1005	1076	1093	2024	2036	2100	2107	2110	2116	2122	2551	2713
	2741	3522													
	858	993	1606	2294	2344	2389	2430	2601	2735	2937	3007	3585	3909	3917	3921
.ASCII	3926	4057													
	3137	3138	3200	3213	3280	3294	3304	3314	3329	3338	3346	3356	3365	3369	3378
.BYTE	3392	3400	3424	3434	3933	3941	3953	3955	3961	3968	3979	3987	3997		
	3171	3172	3174	3175	3177	3178	3180	3182	3202	3203	3204	3206	3207	3217	3245
	3246	3247	3249	3250	3252	3253	3255	3257	3282	3283	3284	3286	3287	3293	3298
	3303	3309	3317	3331	3340	3345	3350	3355	3360	3368	3371	3377	3381	3394	3402
	3423	3428	3433	3438	3446	3610	3611	3612	3613	3614	3932	3940	3950	3954	3957
	3960	3967	3975	3978	3986	3996	4003								
.ENABL	769														
.END	4220														
.EVEN	3183	3209	3218	3258	3289	3299	3310	3318	3334	3341	3351	3361	3373	3382	3396
	3403	3429	3439	3448	3615	3951	3958	3976	4004						
.REM	1														
.REPT	784														
.TITLE	768														

ERRORS DETECTED: 0  
 DEFAULT GLOBALS GENERATED: 0

\*DZRSAA, DZRSAA, SEQ/SOL/CRF/DS:ERFZ/EN:ABS=DSKM:DZRSAA.P11  
 RUN-TIME: 11 24 6 SECONDS  
 RUN-TIME RATIO: 76/42=1.7  
 CORE USED: 14K (28 PAGES)

