

RK611

DUAL PORT LOGIC TEST
CZR6GB0

AH-E034B-MC

MAR 1978

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FICHE 1 OF 2

MADE IN USA

TEST 1	TEST 2	TEST 3	TEST 4	TEST 5	TEST 6	TEST 7	TEST 8	TEST 9	TEST 10	TEST 11	TEST 12	TEST 13	TEST 14	TEST 15	TEST 16	TEST 17	TEST 18	TEST 19	TEST 20	TEST 21	TEST 22	TEST 23	TEST 24	TEST 25	TEST 26	TEST 27	TEST 28	TEST 29	TEST 30	TEST 31	TEST 32	TEST 33	TEST 34	TEST 35	TEST 36	TEST 37	TEST 38	TEST 39	TEST 40	TEST 41	TEST 42	TEST 43	TEST 44	TEST 45	TEST 46	TEST 47	TEST 48	TEST 49	TEST 50	TEST 51	TEST 52	TEST 53	TEST 54	TEST 55	TEST 56	TEST 57	TEST 58	TEST 59	TEST 60	TEST 61	TEST 62	TEST 63	TEST 64	TEST 65	TEST 66	TEST 67	TEST 68	TEST 69	TEST 70	TEST 71	TEST 72	TEST 73	TEST 74	TEST 75	TEST 76	TEST 77	TEST 78	TEST 79	TEST 80	TEST 81	TEST 82	TEST 83	TEST 84	TEST 85	TEST 86	TEST 87	TEST 88	TEST 89	TEST 90	TEST 91	TEST 92	TEST 93	TEST 94	TEST 95	TEST 96	TEST 97	TEST 98	TEST 99	TEST 100
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IDENTIFICATION

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PRODUCT NAME: CZR6GB0 RK611 DU PORT LGC TEST
DATE: FEB 1978
MAINTAINER: DIAGNOSTIC ENGINEERING
AUTHOR: GARY PAPAZIAN

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1.0 ABSTRACT

THE RK06 DUAL PORT LOGIC PERFORMS A SERIES OF TESTS WHICH VERIFY THAT THE DUAL PORT OPTION IS FUNCTIONING PROPERLY.

BOTH PORTS OF THE RK06 ARE CABLED TO THE SAME RK611 BY A STANDARD CABLE & THE DUAL PORT TEST SWITCH IS ENABLED ON THE DUAL PORT MODULE. THIS ARRANGEMENT ALLOWS THE DUAL PORT LOGIC TO BE TESTED FROM ONE PDP-11/RK611 TO A MAXIMUM OF 4 DRIVES.

THIS PROGRAM WILL TEST RK06/RK07 DRIVES WITHOUT OPERATOR INPUTS

2.0 REQUIREMENTS

2.1 HARDWARE

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE DISK DIAGNOSTIC:

PDP-11
CONSOLE TELETYPE
16K MEMORY
KW11-L OR KW11-P CLOCK
RK06 UNIBUS CONTROLLER (RK611)
1 TO 4 RK06/RK07 DRIVES
FORMATTED DISKPACKS

2.2 PRELIMINARY TESTING & PROGRAMS

1. THE RK611 DISKLESS CONTROLLER DIAGNOSTICS (ALL PARTS) SHOULD FIRST RUN SUCCESSFULLY ON BOTH PORTS.
2. THE RK06 DRIVE DIAGNOSTICS (ALL PARTS) SHOULD FIRST RUN SUCCESSFULLY.
3. THE RK611 FUNCTIONAL CONTROLLER DIAGNOSTIC SHOULD FIRST RUN SUCCESSFULLY.

2.3 RESTRICTIONS & OPERATOR ACTION

TO TEST THE RK06 DUAL PORT OPTION WITH THIS PROGRAM, THE DUAL PORT TEST SWITCH MUST BE ENABLED ON THE DUAL PORT MODULE.

THE CABLE FROM THE RK611 IS DAISY CHAINED TO BOTH PORTS OF RK06 UNDER TEST. ENABLING THE SWITCH ON THE DUAL PORT MODULE, GROUNDS BIT 0 OF THE UNIT SELECT LINES GOING TO THE PORT B INTERFACE & TIMING MODULE (M7706).

THE EFFECT OF THIS IS THAT BIT 0 UNIT SELECT IS COMPLEMENTED

ON PORT B AND THE DRIVE APPEARS AS 2 SEPARATE UNITS TO THE RK611. EACH PORT OF THE RK06 WILL RESPOND TO A DIFFERENT DRIVE ADDRESS.

THE ADDRESS OF EACH PORT WILL DEPEND ON THE DRIVE ADDRESS. FOR THIS REASON, THE RESTRICTION IS MADE THAT ONLY EVEN NUMBERED UNIT SELECT PLUGS BE USED. IN THIS WAY PORT 'A' WILL RESPOND TO THE DRIVE ADDRESS, & PORT 'B' WILL RESPOND TO ADDRESS+1 (THE ADDRESS DEVELOPED BY THE SWITCH).

BECAUSE OF THE ABOVE CONSIDERATIONS, A MAXIMUM OF 4 DRIVES CAN BE TESTED BY THIS PROGRAM, WHICH WILL 'SEE' 8 DRIVES.

ANY OTHER DRIVES ON THE SYSTEM WHICH HAS ANY ADDRESS IN CONFLICT WITH EITHER OF THE TEST ADDRESSES MUST BE DESELECTED, BOTH PORTS SWITCHED OFF.

A FURTHER REQUIREMENT IS THE SYSTEM MUST HAVE EITHER A KW11-P OR KW11-L. IF NEITHER IS PRESENT AN ERROR MESSAGE WILL BE TYPED AND THE PROGRAM WILL JUMP TO THE END OF PASS.

3.0 PROGRAM CONSIDERATIONS

3.1 PDP-11 FAMILY COMPATIBILITY

THIS PROGRAM CAN BE USED BY THE PDP-11/04,05,10,20, 34,35,40,45,50,55 & 70.

IT IS COMPATABLE WITH THE LSI-11 INSTRUCTION SET AND CAN TEST THE RK06 ONLY IF THE DRIVE CONTROLLER FOR THE LSI-11 IS DESIGNED TO BE DIAGNOSTICALLY COMPATABLE WITH THE RK611.

3.2 XXDP

THIS PROGRAM SHOULD NOT BE CHAINED BY XXDP.

CHAIN MODE OPERATION (MONITOR)

BY DEFINITION, ANY PROGRAM THAT REQUIRES OPERATOR INTERVENTION SHOULD NOT BE CHAINED.

IN THIS CASE, OPERATOR INTERVENTION IS REQ'D TO ENABLE THE DUAL PORT TEST SWITCH & DAISY CHAINING BOTH PORTS TO THE SAME RK611.

DUMP MODE OPERATION (MANUAL)

1. INPUT DIALOGUE IF STARTED FROM 220.
2. IF THE LOADING MEDIUM ON DRIVE 0 IS AN RK06, IT WILL BE

TESTED. THE OPERATOR IS FIRST GIVEN A MESSAGE TO REPLACE
THE PACK ON DRIVE 0 WITH A SCRATCH PACK & TYPE <CR>
WHEN DONE.

3.3 ACT/APT

THIS PROGRAM IS ACT COMPATIBLE.

HOWEVER, IT SHOULD BE RUN ONLY IN DUMP MODE.

AUTOMATIC MODE (MONITOR)

BY DEFINITION ANY PROGRAM THAT REQUIRES OPERATOR INTERVENTION
SHOULD NOT BE RUN IN THE AUTO MODE.

DUMP MODE (MANUAL): INPUT DIALOGUE IF STARTED FROM 220.

3.3.1 APT ETABLE DEFINITIONS

THE FOLLOWING DEFINITIONS ARE VALID FOR SPECIFYING APT ENVIRONMENTAL
TABLE (ETABLE) ENTRIES. VIA RUNNING THE APT UTILITY PROGRAM "TSP":

1. SOFTWARE ENVIRONMENT:
=1 IF APT SCRIPT MODE
=0 IF STANDALONE MODE
2. ENVIRONMENT MODE: BYTE
BIT 7 = 1 ETABLE DOES SIZING
= 0 PROGRAM DOES SIZING
BIT 6 = 1 SPOOL MESSAGES TO APT IF SCRIPT MODE
= 0 DON'T SPOOL TO APT
BIT 5 = 1 SUPPRESS CONSOLE OUTPUT
= 0 ALLOW CONSOLE OUTPUT
BITS 4-0 NOT USED
3. SWITCH 1 (SOFTWARE SWITCH REGISTER)
IF ENVIRONMENT MODE BIT 7 (SIZING BIT) IS SET TO 1, THE SOFTWARE
SWITCH REGISTER WILL BE USED, INSTEAD OF THE HARDWARE CONSOLE
SWITCH REGISTER. REGARDLESS OF WHICH ONE IS USED, ALL BITS
DEFINED IN SECTIONS 4.3 & 4.4 (SWITCH REGISTER OPTIONS) MAY USED
WHEN RUNNING IN STANDALONE MODE.
IN APT SCRIPT MODE, HOWEVER, BIT 14 (LOOP ON TEST) MUST ALWAYS
BE SET TO 0.
4. SWITCH 2 (USER SWITCH REGISTER)
NOT USED
5. CPU OPTIONS:
NOT USED
6. MEMORY TYPES 1-4 AND MAX MEMORY ADDRESSES
NOT USED

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7. INTERRUPT VECTOR 1:
USED WHEN ENVIRONMENT MODE BIT 7=1. DEFAULT = 210
 8. BUS PRIORITY 1:
USED WHEN ENVIRONMENT MODE BIT 7=1. DEFAULT = 5
 9. INTERRUPT VECTOR 2:
NOT USED
 10. BUS PRIORITY 2:
NOT USED
 11. BASE ADDRESS:
USED WHEN ENVIRONMENT MODE BIT 7 = 1. DEFAULT = 177440
 12. DEVICE MAP:
USED WHEN ENVIRONMENT MODE BIT 7 = 1. EACH BIT SET TO
1 IN BITS 0-7 WILL SELECT THE CORRESPONDING DRIVE TO BE
TESTED. BITS 8-15 ARE NOT USED.
- NOTE: IN THIS PROGRAM, ONLY EVEN NUMBERED DRIVES CAN BE
TESTED (0,2,4,6)
13. CONTROLLER DESCRIPTORS:
NOT USED.
 14. DRIVE DESCRIPTOR CODES (IN WORDS):
NOT USED

3.4 MEMORY MANAGEMENT

MEMORY MANAGEMENT IS NOT USED.

3.5 PARITY CHECK ENABLED

IF THE MEMORY PARITY CHECK OPTION IS AVAILABLE ON THE SYSTEM,
THE PROGRAM WILL RUN WITH MEMORY CHECK ENABLED.

3.6 BAD SECTOR

THE PROGRAM WILL COMPARE DATA ERRORS WITH THE BAD SECTOR
INFORMATION CONTAINED ON CYLINDER 410, HEAD 2. PRINTOUTS
OF DATA ERRORS DUE TO BAD SECTORS/TRACKS WILL BE MASKED OUT.

3.7 EXECUTION TIME

THE EXECUTION TIME IS APPROX. 2.5 MIN. BASED ON THE PDP 11/50.

3.8 FAULT ISOLATION

TO BE DETERMINED.

3.9 ERROR CORRECTION AND FAILURE RATE ANALYSIS

THIS PROGRAM WILL NOT DO ERROR CORRECTION OR FAILURE RATE ANALYSIS.

3.10 DEFAULT UNIBUS ADDRESSES & VECTORS

THE FOLLOWING IS A LIST OF ALL DEFAULT ADDRESSES & VECTORS OF ALL HARDWARE TO BE USED & THEIR MEMORY ADDRESSES WHERE THEY CAN BE CHANGED.

	LOCATION	DEFAULT CONTENTS
RK06-RK07 BUSS ADDRESS	1264	177440
CONTROLLER INTERRUPT VECTOR	1314	210
CONTROLLER PRIORITY	1316	240
P-CLOCK STATUS REG	1320	172540
P-CLOCK SET BUFFER	1322	172542
P-CLOCK READ BUFFER	1324	172544
L-CLOCK STATUS REG	1326	177546
L-CLOCK INTERRUPT VECTOR	1330	100
P-CLOCK INTERRUPT VECTOR	1332	104
TTY KB STATUS REG	1144	177560
TTY KB BUFFER	1146	177562
TTY PRINTER STATUS REG	1150	177564
TTY PRINTER BUFFER	1152	177566

4.0 OPERATING PROCEDURE & CONTROL FUNCTIONS

4.1 PROGRAM LOADING

THE PROGRAM CAN BE LOADED FROM PAPER TAPE USING STANDARD PROCEDURE FOR ABSOLUTE LOADER TAPES; OR FROM ANY MEDIA SUPPORTED BY XXDP.

4.1.1 LOAD THE STARTING ADDRESS (SEE SEC 4.2).

4.1.2 SET SWITCH REGISTERS AS DESIRED (SEE SEC 4.3).

4.1.3 INSTALL CALBE(S) & SET DRIVES TO BE TESTED IN THE 'LOAD' CONDITION & WITH BOTH PORTS SELECTED & WRITE LOCK DISABLED. DRIVES NOT TO BE TESTED MUST HAVE BOTH PORTS DESELECTED. ALSO, THE DUAL PORT TEST SWITCH ON THE DUAL PORT MODULE MUST BE ENABLED.

NOTE: THE DRIVE WILL NOT RESPOND TO THE 'START SPINDLE' COMMAND IF THE RUN/STOP SWITCH IS IN THE 'STOP'

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POSITION.

4.1.4 PRESS 'START'

THE PROGRAM WILL IDENTIFY ITSELF AND WILL BEGIN A
DIALOGUE WITH THE OPERATOR TO DETERMINE DRIVES TO BE TESTED
(SEE SEC 4.5).

THE PROGRAM BEGINS TESTING ONLY THOSE DRIVES SPECIFIED BY
THE INPUT DIALOGUE. IF A SPECIFIED DRIVE CANNOT BE FOUND BY
THE PROGRAM IT WILL BE FLAGGED AS AN ERROR THAT THE DRIVE
WAS NOT AVAILABLE. THEN BEGINNING WITH THE LOWEST NUMERICAL
DRIVE AND PROCEEDING IN SEQUENTIAL ORDER, ALL VALID DRIVES
WILL BE TESTED. ONE PASS THROUGH THE TEST SEQUENCE WILL BE

PERFORMED ON EACH DRIVE BEFORE MOVING TO THE NEXT DRIVE
IN SEQUENCE. THE DRIVE TO BE TESTED WILL BE TYPED AT THE
BEGINNING OF EACH PASS. "END OF PASS" WILL BE TYPED AFTER
TESTING ALL DRIVES.

4.2 STARTING LOCATIONS

LOCATION 200 - STARTING ADDRESS TO DEFAULT THE BUSS
ADDRESS & THE CONTROLLER INTERRUPT VECTOR
& TEST ALL DRIVES IN THE 'DRIVE PRESENT'
CONDITION.

NOTE: THE DRIVE PRESENT CONDITION IS:

- A. HEADS MANUALLY LOADED
- B. BOTH PORTS SELECTED
- C. WRITE LOCK DISABLED
- D. DRIVE READY INDICATOR ON

LOCATION 220 - STARTING ADDRESS TO INPUT TESTING PARAMETERS
VIA THE INPUT DIALOGUE. BUSS ADDRESS &
CONT. INTERRUPT VECTOR INPUTTED ONLY ON
1ST PASS.

IMPORTANT: FOR VARIATIONS OF THE ABOVE, SEE XXDP, ACT/APT
CONSIDERATIONS IN SECTIONS 3.2 & 3.3.

THE PROGRAM WILL DETERMINE WHETHER THE DRIVE
IS AN RK06/RK07 WITHOUT OPERATOR INPUTS.

4.3 SWITCH REGISTER

THE SWITCHES ARE USED TO PROVIDE CONTROL FUNCTIONS.

SWITCH FUNCTION

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15 HALT ON ERROR
14 LOOP ON TEST
13 INHIBIT ERROR TYPEOUT
12 BYPASS DRIVE AFTER 20 ERRORS

11 INHIBIT ITERATION
10 BELL ON ERROR
9 LOOP ON ERROR
8 LOOP ON TEST IN SW<07:00>

4.3.1 SW<15>

THE PROGRAM HALTS ON ENCOUNTERING AN ERROR, AFTER TYPING OUT THE ERROR MESSAGE AND PERTINENT INFORMATION. PRESSING "CONTINUE" CONTINUES OPERATION OF THE PROGRAM.

4.3.2 SW<14>

THE PROGRAM LOOPS ON THE TEST THAT IS BEING EXECUTED WHEN THE SWITCH IS PUT ON. THIS SWITCH IS NORMALLY USED ALONG WITH SW15.

4.3.3 SW<13>

THIS SWITCH INHIBITS ALL ERROR MESSAGES. NORMALLY USED WHEN LOOPING ON TEST (SW14) OR LOOPING ON ERROR (SW9). WITH SW<13>SET, SW<15> SHOULD NOT BE SET

4.3.4 SW<12>

THIS SWITCH BYPASSES A GIVEN DRIVE AFTER 20 ERRORS HAVE BEEN DETECTED.

4.3.5 SW<11>

EACH TEST WILL BE EXECUTED ONLY ONCE. NORMALLY AFTER THE FIRST PASS, EACH SUBTEST IS ITERATED A NUMBER OF TIMES (USUALLY 50, 5 IN SOME CASES). SETTING THIS SWITCH INHIBITS ITERATIONS, SO THAT QUICK PASSES CAN BE MADE.

4.3.6 SW<10>

RINGS A BELL ON ERROR. USEFUL WHEN ERROR TYPEOUT IS INHIBITED.

4.3.7 SW<09>

THIS SWITCH PROVIDES THE TIGHTEST POSSIBLE SCOPE LOOP FOR

ERRORS. IF THE PROGRAM DETECTS AN ERROR, IT WILL LOOP BACK TO THE BEGINNING OF TEST.

4.3.8 SW<08>

THIS SWITCH IS USED TO SELECT A PARTICULAR TEST (AS PER SW<00-7>) FOR EXECUTION AND SUBSEQUENT LOOPING. THUS IF TEST 15 IS TO BE SELECTED THE SWITCH SETTING WOULD BE 000415. IT SHOULD BE NOTED THAT BEFORE SELECTING & LOOPING TEST 15, ALL THE PREVIOUS TESTS (1-14) WILL BE EXECUTED.

4.4 'SOFTWARE' SWITCH REGISTER

IF THE PROGRAM IS BEING RUN ON A SWITCHLESS PROCESSOR (I.E. AN 11/04 OR 11/34) THE PROGRAM WILL DETERMINE THAT THE HARDWARE SWITCH REGISTER IS NOT PRESENT AND WILL USE A 'SOFTWARE' SWITCH REGISTER. THE 'SOFTWARE' SWITCH REGISTER IS LOCATED AT LOCATION 176 (8). THE SETTINGS OF THE 'SOFTWARE' SWITCHES ARE CONTROLLED THROUGH A KEYBOARD ROUTINE WHICH IS CALLED BY TYPING A 'CONTROL G'. THE PROGRAM WILL RECOGNIZE THE 'CONTROL G' AT ANY TIME EXCEPT WHEN THE PROGRAM IS AT A HIGHER PRIORITY PROCESSING AN RK06 INTERRUPT. THE 'SOFTWARE' SWITCH VALUES ARE ENTERED AS AN OCTAL NUMBER IN RESPONSE TO THE PROMPT FROM THE SWITCH ENTRY ROUTINE:

SWR = NNNNNN NEW =

EACH TIME SWITCH SETTING ARE ENTERED, THE ENTIRE SWITCH REGISTER IMAGE MUST BE ENTERED. LEADING ZEROS ARE NOT REQUIRED. 'RUBOUT' AND 'CONTROL U' FUNCTIONS MAY BE USED TO CORRECT TYPING ERRORS DURING SWITCH ENTRY.

ON PROCESSORS WITH HARDWARE SWITCH REGISTERS, THE 'SOFTWARE' SWITCH REGISTER MAY BE USED. IF THE PROGRAM FINDS ALL 16 SWITCHES IN THE 'UP' POSITION, ALL SWITCH REGISTER REFERENCES WILL BE TO THE 'SOFTWARE' REGISTER AND THE PROCEDURES DESCRIBED ABOVE MUST BE FOLLOWED.

4.5 INPUT DIALOGUE

THE DIALOGUE WILL BE DONE INTERACTIVELY. THE PROGRAM WILL REQUEST A PARAMETER BY CONSOLE TYPEOUT. THE PARAMETER MAY THEN BE ENTERED AS SPECIFIED BELOW OR ALLOWED TO DEFAULT BY A CARRIAGE RETURN. UNRECOGNIZED OR ILLEGAL RESPONSES WILL BE ECHOED BACK FOLLOWED BY "?". THE PROPER RESPONSE MAY THEN BE ENTERED.

IMPORTANT: FOR VARIATIONS OF THE ABOVE, SEE XXDP, ACT/APT CONSIDERATIONS IN SECTIONS 3.2 & 3.4.

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4.5.1 DRIVE SELECTION

THE REQUEST WILL BE:

DRIVES TO BE TESTED:

THE DEFAULT RESPONSE IS CARRIAGE RETURN TO TEST ALL DRIVES
IN THE 'DRIVE PRESENT' CONDITION.

THE OPERATOR CAN ALSO TYPE IN THE SPECIFIC DRIVE NUMBERS
TO BE TESTED, SEPARATED BY COMMAS & TERMINATED BY A CARRIAGE
RETURN.

E.G. DRIVES TO BE TESTED (EVEN NOS. ONLY): 0,4

NOTES: 1. FOR VARIATIONS OF THE ABOVE, SEE XXDP, ACT/APT
CONSIDERATIONS IN SECTIONS 3.2 & 3.3.

2. SEE 'RESTRICTIONS & OPERATOR ACTION' IN SECTION 2.3.

4.5.2 BUS ADDRESS

THE REQUEST WILL BE:

TYPE IN BUSS ADDRESS IF NOT 177440

THE DEFAULT IS A CARRIAGE RETURN

4.5.3 CONTROLLER INTERRUPT VECTOR

THE REQUEST WILL BE:

TYPE IN CONTROLLER INTERRUPT VECTOR IF NOT 210

THE DEFAULT IS A CARRIAGE RETURN.

4.5.4 EXAMPLE OF PROGRAM DIALOGUE

THE EXAMPLE SHOWN IS FOR A PROGRAM STARTED AT ADDRESS 220.
ALL OPERATOR RESPONSES ARE UNDERLINED.

UNIBUS RK06-RK07 DUAL PORT DRIVE DIAGNOSTIC

CZR6GBJ

DRIVES TO BE TESTED: 0,4<CR>

TYPE IN BUSS ADDRESS IF NOT 177440 <CR>

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TYPE IN CONTROLLER INTERRUPT VECTOR IF NOT 210 <CR>

WILL TEST DRIVES:

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DRIVE 0

(THE REST IS IDENTICAL TO THE EXAMPLE SHOWN IN 4.6 BELOW)

4.6 PROGRAM EXAMPLE

THE FOLLOWING IS AN EXAMPLE OF A PROGRAM STARTED AT THE
DEFAULT ADDRESS (200) & WITH 2 DRIVES ON THE LINE.

UNIBUS RK06-RK07 DUAL PORT DRIVE DIAGNOSTIC

CZR6GB0

WILL TEST DRIVES:

0
4

DRIVE 0

DRIVE SERIAL NO. AAA
CARTRIDGE SERIAL NO. BBB

DRIVE 4

DRIVE SERIAL NO. CCC
CARTRIDGE SERIAL NO. DDD

END PASS #1

WILL TEST DRIVES:

0
4

DRIVE 0

DRIVE 4

END PASS # 2

(ETC)

THE ABOVE ASSUMES NO ERRORS DETECTED.
THE NUMBER OF PASSES IS DETERMINED BY ACT/APT/XXDPNOTES: 1. FOR VARIATIONS OF THE ABOVE, SEE XXDP, ACT/APT
CONSIDERATIONS IN SECTIONS 3.2 & 3.3.594
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2. SEE 'RESTRICTIONS & OPERATOR ACTION' IN SECTION 2.3.

4.7 HALTING THE PROGRAM

THE PROGRAM PROVIDES A METHOD OF HALTING ITSELF SUCH THAT THE CARTRIDGE AND/OR DRIVE IS NOT LEFT IN AN UNDETERMINED STATE; IE: HEADS UNLOADED OR INVALID FORMAT.

TO PROPERLY HALT, TYPE CONTROL-C (↑C) ON THE CONSOLE.

IF HEADS ARE LOADED, THE PROGRAM WILL:

1. ECHO ↑C
2. TYPE "CPU HALTED"
3. HALT THE PROGRAM

IF HEADS ARE NOT LOADED, THE PROGRAM WILL:

1. ECHO ↑C
2. TYPE 'HALT PENDING, PLEASE WAIT'
3. WILL LOAD HEADS
4. TYPE 'CPU HALTED'
5. HALT THE PROGRAM

NOTES:

1. OPERATING THE 'CONTINUE' SWITCH ON THE CPU CONSOLE WILL RETURN THE PROGRAM TO TEST 1 WHERE TESTING WILL BEGIN WITH THE 1'ST DRIVE AGAIN.

5.0 DUAL PORT DRIVE DIAGNOSTIC FUNCTIONAL DESCRIPTION

5.1 GENERAL

A. BASIC CONTROLLER TESTS, SIZING & SETUP

THESE TESTS DO BASIC CONTROLLER REGISTER REFERENCE TESTS, CHECKS OPERATOR INPUTS AGAINST DRIVES ON THE LINE OR DE-FAULTS TO TEST ALL DRIVES SEEN ON THE LINE WITHIN THE RESTRICTIONS DESCRIBED IN SECTION 2.3. CHECKS ARE MADE ON THE EXISTENCE OF EITHER AN L OR P CLOCK.

B. DUAL PORT TESTS

THESE TESTS VERIFY THE ABILITY OF THE DRIVE TO OPERATE IN THE DUAL PORT MODE. RELEASE, TIMEOUT & PROPER INTER-ACTION BETWEEN THE PORTS ARE VERIFIED.

C. METHOD TO DETERMINE THAT THE DRIVE IS IN NEUTRAL OR SEIZED.

THE PROGRAM DOES A 'SELECT DRIVE' COMMAND TO PORT 'A'. IF MESSAGE AO RETURNS WITH THE 'DRIVE AVAILABLE' BIT NOT SET, IT ASSUMES PORT 'B' HAS SEIZED THE DRIVE.

IF MESSAGE AD RETURNS WITH THE 'DRIVE AVAILABLE' BIT SET,
IT ASSUMES THE DRIVE WAS IN NEUTRAL OR ALREADY SEIZED BY
PORT 'A'.

AFTER A TIMEOUT OF 1 SECOND BY PORT 'A', ASSUMING NO FURTHER
COMMANDS, THE DRIVE SHOULD BECOME AVAILABLE TO PORT 'B'.

THERE IS NO SPECIFIC METHOD TO VERIFY THE DRIVE IS IN NEUTRAL
BECAUSE THE ACT OF DOING A SELECT DRIVE COMMAND TO CHECK FOR
NEUTRAL SEIZES THE DRIVE & TAKES IT OUT OF NEUTRAL.

'DSC' & 'ATTN' DO NOT ASSERT AT THE END OF A TIMEOUT IF THERE
IS NO PREVIOUS PORT REQUEST MADE.

THEY WILL ASSERT, HOWEVER, IF A PORT REQUESTED WHILE SEIZED
BY THE OTHER PORT & A TIMEOUT OR RELEASE OCCURS ON THE OTHER
PORT.

5.2 TEST DESCRIPTIONS

BASIC CONTROLLER TESTS, SIZING & SETUP

TEST 1 REFERENCE ALL CONTROLLER REGISTERS

THIS TEST VERIFIES THAT ALL THE CONTROLLER REGISTERS
CAN BE ACCESSED. THE INABILITY TO BE ACCESSED WILL
RESULT IN A TIMEOUT TRAP WITH AN ERROR MESSAGE. ANY
ERROR IN THIS TEST WILL RESULT IN ABORTING ALL OTHER
TESTS AND JUMPING TO 'END OF PASS'

TEST 2 SIZE THE BUSS

THIS TEST IS ENTERED ONLY IF 'DRIVE SELECTION' IS DEFAULTED
EITHER BY RUNNING IN THE AUTO MODE OR A 200 START IN THE
MANUAL MODE.
EVERY EVEN NUMBERED DRIVE (0,2,4,6) IS ADDRESSED.
CONTROLLER ERROR (CERR) IS EXAMINED AND IF NOT SET, THE
DRIVE WILL BE TESTED AS AN RK06. IF SET, THE PROGRAM WILL BYPASS
TESTING THAT DRIVE ONLY IF THE ERROR WAS A RESULT OF
MDS, UFE OR NED BEING SET. OR BOTH NED & DRA RESET IN-
DICATING THE OTHER PORT IS ACCESSED.
IF CERR DUE TO DTYE, DRIVE WILL BE TESTED AS RK07.

TEST 3 VERIFY OPERATOR DRIVE SELECTIONS

THIS TEST IS ENTERED ONLY IF DRIVE SELECTION IS NOT
DEFAULTED. EVERY EVEN NUMBERED DRIVE IS ADDRESSED &
CONTROLLER ERROR (CERR) IS EXAMINED. IF NOT SET, THE
PROGRAM WILL ASSUME THE DRIVE IS PRESENT AS AN RK06
IF CERR WAS SET, THAT DRIVE WILL BE BYPASSED
ONLY IF THE ERROR WAS A RESULT OF MDS OR UFE SET OR BOTH

NED & DRA RESET (WRONG PORT). IF CERR IS A RESULT OF
NED ONLY, IT IS CHECKED AGAINST THE INPUTTED INFORMATION TO
VERIFY IT WAS NOT SPECIFIED.
IF CERR DUE TO DTYE, DRIVE WILL BE TESTED AS RK07.

TEST 4 FIND NEXT DRIVE TO BE TESTED

THIS TEST FINDS THE NEXT DRIVE PRESENT & PUTS THAT
ADDRESS IN '\$UNIT' & \$TMP4 IS SET TO CDT IF DRIVE IS RK07.
THROUGHOUT THE FOLLOWING TESTS, THE DRIVE TESTED IS
THE DRIVE WHOSE ADDRESS IS IN '\$UNIT'.

DUAL PORT TESTS

TEST 5 TEST PORT 'A' SEIZE & TIMEOUT

VERIFY THAT THE DRIVE CAN BE SEIZED & THAT THE PORT
TIMEOUT RELEASES THE DRIVE.

- A. SET VOLUME VALID FOR BOTH PORTS & DO A RECAL COMMAND
- B. A SELECT DRIVE COMMAND IS ISSUED THRU PORT 'A'.
THE PROGRAM VERIFIES THE DRIVE HAS BEEN SEIZED BY 'DRIVE
AVAILABLE' SET.
- C. A SELECT DRIVE COMMAND IS ISSUED THRU PORT 'B' THE
PROGRAM VERIFIES THAT 'DRIVE AVAILABLE' IS NOT SET
FOR PORT 'B' & THAT CERR IS SET.
- D. VERIFY THAT FOR ALL MESSAGES REQUESTED THRU PORT 'B' (MSG
A0-A3, B0-B3) THAT MESSAGE 0 ALWAYS RETURNS FROM PORT B
WHILE PORT 'A' IS SEIZED.
- E. WAIT FOR THE PORT TIMEOUT TO OCCUR ON PORT 'A' BY
CONTINUOUSLY CHECKING FOR ATTN ON PORT B. AFTER
ATTN-B IS REC'D, A DRIVE SELECT COMMAND IS ISSUED
THRU PORT B & "DRIVE AVAILABLE" IS CHECKED TO
BE SET IN MESSAGE A0.

MEASURE THE DURATION OF THE TIMEOUT & TYPE THE VALUE
FOR THE FIRST PASS ONLY.
- F. VERIFY THAT ONLY PORT 'B' GETS 'DSC' & 'ATTN'.
- G. VERIFY THE DRIVE CLEAR COMMAND CLEARS 'DSC' & 'ATTN'
ON PORT 'B' BUT DOES NOT RELEASE THE DRIVE FROM PORT 'B'.

TEST 6 TEST PORT 'B' SEIZE & TIMEOUT

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

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TEST 7 PRINT DRIVE SERIAL NUMBER

THIS TEST READS & PRINTS THE DRIVE SERIAL # FROM MSG A3
IN BCD ON THE 1'ST PASS ONLY.
IT ALSO TESTS THAT THE SERIAL # READ THRU BOTH PORTS
ARE THE SAME.

TEST 10 TEST PORT 'A' COMMAND SEIZE & ATTENTION

VERIFY THE OPERATION OF 'DSC' & 'ATTN' BITS AFTER A COMMAND.

A. ISSUE A SEEK COMMAND TO CYLINDER 10 THRU PORT 'A'.

B. VERIFY SEIZURE & THAT 'DSC' & 'ATTN' SETS FOR PORT 'A'
ONLY AFTER THE SEEK HAS COMPLETED.

C. VERIFY 'ATTN' REMAINS SET BEYOND TIMEOUT

D. VERIFY A DRIVE CLEAR COMMAND RESETS 'DSC' & 'ATTN'
& DOES NOT RELEASE THE DRIVE FROM PORT 'A'.

TEST 11 TEST PORT 'B' COMMAND SEIZE & ATTENTION

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'
BUT THE SEEK IS TO CYLINDER 0.

TEST 12 TEST RESET PORT 'A' ATTENTION BY DRIVE CLEAR COMMAND

VERIFY THAT A DRIVE CLEAR COMMAND CLEARS ONLY THE ATTENTION BIT OF
THE SEIZING PORT

A. SET EACH PORT'S ATTENTION BIT BY PERFORMING SEEK
COMMANDS TO CYLINDER 0 & ALLOWING TIMEOUTS.

B. SEIZE THE DRIVE THRU PORT 'A' & ISSUE A DRIVE CLEAR COMMAND
VERIFY THAT 'DSC' & 'ATTN' FOR PORT 'A' HAVE BEEN CLEARED

C. SEIZE THE DRIVE THRU PORT 'B' & VERIFY 'DSC' & 'ATTN'
HAVE NOT CLEARED

TEST 13 TEST RESET PORT 'B' ATTENTION BY DRIVE CLEAR COMMAND

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

TEST 14 TEST RELEASE, DRIVE SEIZED BY PORT 'A'

A. SEIZE THE DRIVE THRU PORT 'A'

B. ISSUE A RELEASE USING RKCS2 THRU PORT 'A'

C. VERIFY PORT 'B' CAN ACCESS THE DRIVE IMMEDIATELY &
THAT NEITHER PORT SEES 'DSC' OR 'ATTN'

TEST 15 TEST RELEASE, DRIVE SEIZED BY PORT 'B'

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

TEST 16 TEST RELEASE FROM PORT 'A' WITH PORT 'B' REQUESTING

A. PORT 'A' SEIZES THE DRIVE & DOES A SEEK TO SELF COMMAND.
THE PROGRAM VERIFIES 'DSC' & 'ATTN' ON PORT 'A' ONLY
ON COMPLETION

B. PORT 'B' TRIES TO ACCESS THE DRIVE. THE PROGRAM VERIFIES
DRIVE NOT AVAILABLE

C. A RELEASE BY PORT 'A' IS ISSUED. VERIFY PORT 'B' CAN
ACCESS THE DRIVE IMMEDIATELY & THAT 'DSC' & 'ATTN'
ARE SEEN ON PORT 'B'.

D. VERIFY PORT 'A' 'DSC' & 'ATTN' REMAINS SET AFTER RELEASE

E. THE PROGRAM ISSUES A DRIVE CLEAR COMMAND TO PORT 'B'
& VERIFIES 'DSC' & 'ATTN' RESETS.

F. THE PROGRAM THEN VERIFIES THAT PORT 'B' DOES NOT SEE
FURTHER (MULTIPLE) ATTENTIONS FROM WHAT WOULD HAVE BEEN
NORMAL TIMEOUT FROM PORT 'A'.

TEST 17 TEST RELEASE FROM PORT 'B' WITH PORT 'A' REQUESTING

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

TEST 20 TEST RELEASE FROM REQUESTING PORT 'B' INHIBITS 'ATTN'

A. PORT 'A' SEIZES THE DRIVE

B. PORT 'B' ATTEMPTS TO SEIZE THE DRIVE

C. PORT 'B' & PORT 'A' RELEASE THE DRIVE, IN THAT ORDER

D. THE PROGRAM VERIFIES THAT NEITHER PORT 'A' OR 'B' ATTENTION
BITS SET

TEST 21 TEST RELEASE FROM REQUESTING PORT 'A' INHIBITS 'ATTN'

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

TEST 22 TEST RELEASE BY PORT 'B' WHEN SEIZED BY PORT 'A'

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VERIFY THAT A RELEASE ISSUED BY ONE PORT IS NOT RECOGNIZED IF
THE DRIVE IS SEIZED BY THE OTHER PORT

A. SEIZE THE DRIVE THRU PORT 'A'.

B. ISSUE A RELEASE THRU PORT 'B' & VERIFY DRIVE STILL SEIZED
BY PORT 'A'.

TEST 23 TEST RELEASE BY PORT 'A' WHEN SEIZED BY PORT 'B'

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

TEST 24 TEST COMMAND FOLLOWED BY IMMEDIATE RELEASE FROM PORT 'A'

A. ISSUE A SEEK COMMAND TO CYL 10 FROM PORT 'A' &
AN IMMEDIATE RELEASE TO PORT A.

B. VERIFY THE DRIVE IS AVAILABLE TO PORT 'B'
& PORT 'B' RECEIVES 'ATTN'

C. VERIFY PORT 'A' DOES NOT RAISE ATTN WHEN THE SEEK IS
COMPLETED.

TEST 25 COMMAND & IMMEDIATE RELEASE FROM PORT 'B'

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'
BUT THE SEEK IS TO CYLINDER 0.

TEST 26 TEST TIMEOUT RETRIGGER THRU PORT 'A'

VERIFY THAT THE PORT TIMEOUT ONE-SHOT CAN BE RETRIGGERED.

A. PORT 'A' SEIZES THE DRIVE

B. THE PROGRAM WAITS 500MS & RE-SEIZES THE DRIVE THRU PORT 'A'

C. PORT 'B' ATTEMPTS TO SEIZE THE DRIVE & THE
PROGRAM VERIFIES THAT FULL TIMEOUT TOOK PLACE
FROM STEP 'B' ABOVE.

TEST 27 TEST TIMEOUT RETRIGGER THRU PORT 'B'

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

TEST 30 TEST PORT 'A' TIMER INHIBIT

A. PORT 'A' SEIZES THE DRIVE

B. PORT 'B' ATTEMPTS TO SEIZE THE DRIVE

C. PORT 'A' RELEASES THE DRIVE
D. PORT 'A' ATTEMPTS TO GET THE DRIVE BACK.
THE PROGRAM VERIFIES THAT PORT 'A' CANNOT ACCESS
THE DRIVE FOR APPROX 1 SEC

TEST 31 TEST PORT 'B' TIMER INHIBIT

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

TEST 32 TEST UNLOAD COMMAND TIMER INHIBIT THRU PORT 'A'

VERIFY THAT THE UNLOAD COMMAND THRU A PORT, SEIZES THAT
PORT FOR AS LONG AS HEADS ARE UNLOADED & RELEASE IS NOT
ISSUED.

- A. ISSUE AN UNLOAD COMMAND THRU PORT 'A'.
VERIFY DRIVE UNLOADS & ATTENTION IS SET.
- B. DELAY FOR 5 SECONDS & VERIFY DRIVE
NOT AVAILABLE TO PORT 'B' TO INSURE TIMERS INHIBITED.
- C. ISSUE A RELEASE FROM PORT 'A'. VERIFY DRIVE BECOMES
AVAILABLE TO PORT 'B'
- D. LOAD HEADS FROM PORT 'B' & VERIFY 'ATTN-B' AT COMPLETION

TEST 33 TEST UNLOAD COMMAND TIMER INHIBIT THRU PORT 'B'

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

TEST 34 TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'A'

VERIFY THAT THE RECAL COMMAND THRU A PORT, SEIZES THAT
PORT FOR AS LONG AS THE RECAL IS IN PROGRESS & A
RELEASE IS NOT ISSUED.

- A. ISSUE A RECAL COMMAND FROM THE LAST CYL THRU PORT 'A'
- B. VERIFY PORT 'B' CANNOT SEIZE THE DRIVE UNTIL
PORT 'A' RECEIVES ATTN.
THIS INSURES THAT THE TIMERS WERE INHIBITED.

TEST 35 TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'B'

THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

TEST 36 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL

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H02

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SEQ 0020

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THIS TEST VERIFIES THAT CYL 632 (1456 FOR RK07), TRACK 2 CAN BE READ.

THIS AREA CONTAINS BAD SECTOR INFO WHICH IS WRITTEN BY THE
FACTORY DURING MANF. ALL BAD SECTOR INFO (BSE) WILL BE STORED
AT THIS TIME TO MASK FUTURE READ HEADER OR DATA ERROR PRINTOUTS.

SECTORS 0,2,4,6,8 CONTAIN IDENTICAL INFO FOR 22 SECTOR HARDWARE DETECTED
SECTORS 10,12,14,16,18,20 CONTAIN IDENTICAL INFO FOR 22 SECTOR SOFTWARE

IF BSE INFO CANNOT BE READ, OR IF AFTER READING THE BSE INFO
IT IS DETERMINED THAT AN ALIGNMENT CARTRIDGE IS USED,

A MESSAGE WILL BE TYPED INDICATING THAT ALL
FUTURE FORMAT AND READ-WRITE TESTS WILL BE BYPASSED.
THIS IS DONE SO AS NOT TO DESTROY BSE INFO OR AN ALIGNMENT PACK BY WRITI

THE PACK SERIAL # IS TYPED IN OCTAL & FOR THE FIRST PASS ONLY.

TEST 37 DATA TESTS

VERIFY UNIQUE DATA CAN BE WRITTEN THRU EITHER PORT & READ
BACK CORRECTLY THRU BOTH PORTS.

- A. ALL 1'S ARE WRITTEN THRU PORT 'A' ON CYL 0, SECTOR 0,
TRACK 0 & VERIFIED BY READING BACK THRU BOTH PORTS.
- B. ALL 1'S ARE WRITTEN THRU PORT 'B' ON CYL 10, SECTOR 0,
TRACK 0 & VERIFIED BY READING BACK THRU BOTH PORTS.
- C. THE PROGRAM CHECKS THAT CYL 0 WAS NOT OVERWRITTEN
BY READING & VERIFYING ALL 0'S THRU PORT 'B'.

TEST 40 ALTERNATING SEEK INTERACTION TEST

THIS TEST VERIFIES THAT THERE ARE NO TIMING INTERACTION PROBLEMS
BETWEEN SEEKS FROM BOTH PORTS.

- A. PORT 'A' SEIZES THE DRIVE & SEEKS TO CYLINDER 0 & RELEASES
THE DRIVE AFTER 'ATTN' IS RECEIVED.
THE PROGRAM VERIFIES THAT UNTIL ATTN IS REC'D,
PORT 'B' SEES 'CONTROLLER ERROR' & 'DRIVE NOT AVAILABLE'.
- B. PORT 'B' SEIZES THE DRIVE & SEEKS TO THE LAST CYL
& RELEASES THE DRIVE AFTER 'ATTN' IS RECEIVED
THE PROGRAM VERIFIES THAT UNTIL ATTN IS REC'D,
PORT 'A' SEES 'CONTROLLER ERROR' & 'DRIVE NOT AVAILABLE'.
- C. THE ABOVE IS REPEATED FOR A PATTERN OF CONVERGING SEEKS
TOWARD THE CENTER OF THE CARTRIDGE.
- D. THE PROGRAM VERIFIES MULTIPLE ATTENTIONS OR ERRORS
DO NOT OCCUR AS A RESULT OF TIMING PROBLEMS.

6.0 ERROR REPORTING

6.1 ERROR INTERPRETATION

WHENEVER AN ERROR MESSAGE IS PRINTED OUT, ALL REGISTERS AND OTHER DATA PERTAINING TO THE ERROR ARE ALSO GIVEN. MSG A(00), MSG B(01), RKER, RKBA...ETC, INDICATE THE CONTENTS OF THE CORRESPONDING REGISTERS AT THE TIME OF ERROR.

EVERY ERROR MESSAGE CONTAINS A PC. THIS PC INDICATES THE POSITION IN PROGRAM WHERE THE ERROR CALL IS LOCATED. THE ERROR MESSAGE, BECAUSE OF PRACTICAL CONSIDERATIONS IS MADE SHORT AND MEANINGFUL. THE USER IS ADVISED TO LOOK UP THE PC IN THE PROGRAM LISTING, WHERE HE WILL FIND MORE INFORMATION ABOUT THE ERROR. IN MANY INSTANCES, A SINGLE FAULT WILL GIVE RISE TO MORE THAN ONE ERROR REPORT. A LITTLE DELIBERATION AND CAREFUL EXAMINATION OF THE DATA GIVEN WILL BE CERTAINLY

VERY HELPFUL IN PINPOINTING THE FAULT. A BRIEF EXPLANATION OF WHAT IS BEING CHECKED IN THE TEST IS GIVEN AT THE BEGINNING OF EVERY TEST. ALL THE NUMBERS GIVEN WITH ERROR MESSAGES ARE IN OCTAL.

NOTE

NO ERROR LOGGING OR OPERATION HISTORY IS PROVIDED.

6.2 ERROR PRINTOUT EXAMPLE:

MESSAGE AD ERROR
AFTER START SPINDLE CMD & FWD SET

	TEST NO.	PC				
	000014	016530				
	EXPECT					
AO	BO	A1	B1	A2	B2	B3
030144	100000	013704	000001			
	ACTUAL					
	140144	100000	101744	000001		
RKCS1	RKCS2	RKASOF	RKER	RKDS	RKDC	
040200	000100	010000	000000	000000	000000	

THE ABOVE EXAMPLE SHOWS EXPECTED & ACTUAL DATA FOR MESSAGE REGISTERS AO, BO, A1 & B1.

MESSAGES A2, B2 & B3 WILL BE TYPED OUT ONLY AS REQUIRED IF THE CYLINDER DIFFERENCE/OFFSET, CYLINDER ADDRESS & HEAD & SECTOR INFORMATION IS A VARIABLE PARAMETER OF THE TEST.

7.0 DUAL PROCESSOR-DUAL CONTROLLER TESTING

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K02

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SEQ 0023

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THIS PROGRAM AS DESCRIBED, TESTS THRU A SINGLE CPU & RK611
IN A SYNCHRONOUS MANNER.

TO RUN IN A DYNAMIC MANNER, I.E.: DUAL CPU/DUAL RK611
WITH BOTH PORTS CONTENDING FOR THE DRIVE ASYNCHRONOUSLY,
THE FOLLOWING PROGRAMS SHOULD BE USED:

CZR6M SUBSYSTEM VERIFICATION PART 1 TEST 22
CZR6P PERFORMANCE EXERCISER

EACH OF THE ABOVE PROGRAMS REQUIRES A SPECIAL STARTING ADDRESS
TO ENTER THE DUAL PORT TESTING MODE.

TEST 22 IN THE SUBSYSTEM VERIFICATION PROGRAM CAN BE SET UP
SO THAT ONE PORT BECOMES THE WRITER OF A SPECIFIED DATA PATTERN
OVER A SPECIFIED RANGE OF HEADS & CYLINDERS, WHILE THE
OTHER PORT BECOMES THE READER.
THE ROLES OF EACH PORT CAN THEN BE REVERSED THRU ANOTHER SETUP.

THERE ARE MANY POSSIBLE WAYS OF DYNAMICALLY TESTING DUAL
PORT BY THE ABOVE TEST.
THE OPERATOR IS URGED TO READ THE PROGRAM DOCUMENT.

THE PERFORMANCE EXERCISER SHOULD BE USED TO RANDOMLY
TEST ALL POSSIBLE DUAL PORT OPERATIONS.
THIS PROGRAM WILL MOST SIMULATE ACTUAL ON-LINE DUAL PORT OPERATION.
THE OPERATOR IS URGED TO READ THE PROGRAM DOCUMENT.
[END OF SPECIFICATION]

%

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SEQ 0024

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1185 ; *** PGM REV 030 ***
1186 ; 29-SEP-77 PATCH ALL ERROR LOGS
1187
1188 .NLIST CND,MC,MD
1189 .LIST ME
1190 .ENABL ABS,AMA
1191
1192 ;DEFINE SYSMAC MACROS
1193
1194 167400 $SWR= 167400 ;DEFINE SWITCHES 15,14,13,11,10,9,8
1195 000001 $TN= 1 ;SET FIRST TEST NO. TO 1
1196
1197
1198
1199 .TITLE CZR6GBU RK611 DU PORT LGC TST
1200 ;*COPYRIGHT (C) 1976,1977
1201 ;*DIGITAL EQUIPMENT CORP.
1202 ;*MAYNARD, MASS. 01754
1203 ;*
1204 ;*PROGRAM BY GARY PAPAIZIAN
1205 ;*
1206 ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
1207 ;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
1208 ;*
1209
1210 .SBTTL OPERATIONAL SWITCH SETTINGS
1211 ;*
1212 ;* SWITCH USE
1213 ;* -----
1214 ;* 15 HALT ON ERROR
1215 ;* 14 LOOP ON TEST
1216 ;* 13 INHIBIT ERROR TYPEOUTS
1217 ;* 12 ABORT DRIVE AFTER 20 ERRORS
1218 ;* 11 INHIBIT ITERATIONS
1219 ;* 10 BELL ON ERROR
1220 ;* 9 LOOP ON ERROR
1221 ;* 8 LOOP ON TEST IN SWR<7:0>
1222
1223
1224 .SBTTL SUMMARY OF STARTING LOCATIONS
1225 ;*
1226 ;*
1227 ;* 200 DEFAULT PARAMETERS
1228 ;* 220 INPUT PARAMETERS
1229 ;* 240 ODT11
1230 ;*
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1231      .SBTTL  BASIC DEFINITIONS
1232
1233      ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
1234      001100      STACK= 1100
1235      .EQUIV  EMT,ERROR      ;;BASIC DEFINITION OF ERROR CALL
1236      .EQUIV  TOT,SCOPE      ;;BASIC DEFINITION OF SCOPE CALL
1237
1238      ;*MISCELLANEOUS DEFINITIONS
1239      000011      HT= 11      ;;CODE FOR HORIZONTAL TAB
1240      000012      LF= 12      ;;CODE FOR LINE FEED
1241      000015      CR= 15      ;;CODE FOR CARRIAGE RETURN
1242      000200      CRLF= 200    ;;CODE FOR CARRIAGE RETURN-LINE FEED
1243      177776      PS= 177776  ;;PROCESSOR STATUS WORD
1244      .EQUIV  PS,PSW
1245      177774      STKLMT= 177774 ;;STACK LIMIT REGISTER
1246      177772      PIRQ= 177772 ;;PROGRAM INTERRUPT REQUEST REGISTER
1247      177570      DSWR= 177570 ;;HARDWARE SWITCH REGISTER
1248      177570      DDISP= 177570 ;;HARDWARE DISPLAY REGISTER
1249
1250      ;*GENERAL PURPOSE REGISTER DEFINITIONS
1251      000000      R0= %0      ;;GENERAL REGISTER
1252      000001      R1= %1      ;;GENERAL REGISTER
1253      000002      R2= %2      ;;GENERAL REGISTER
1254      000003      R3= %3      ;;GENERAL REGISTER
1255      000004      R4= %4      ;;GENERAL REGISTER
1256      000005      R5= %5      ;;GENERAL REGISTER
1257      000006      R6= %6      ;;GENERAL REGISTER
1258      000007      R7= %7      ;;GENERAL REGISTER
1259      000006      SP= %6      ;;STACK POINTER
1260      000007      PC= %7      ;;PROGRAM COUNTER
1261
1262      ;*PRIORITY LEVEL DEFINITIONS
1263      000000      PR0= 0      ;;PRIORITY LEVEL 0
1264      000040      PR1= 40     ;;PRIORITY LEVEL 1
1265      000100      PR2= 100    ;;PRIORITY LEVEL 2
1266      000140      PR3= 140    ;;PRIORITY LEVEL 3
1267      000200      PR4= 200    ;;PRIORITY LEVEL 4
1268      000240      PR5= 240    ;;PRIORITY LEVEL 5
1269      000300      PR6= 300    ;;PRIORITY LEVEL 6
1270      000340      PR7= 340    ;;PRIORITY LEVEL 7
1271
1272      ;*"SWITCH REGISTER" SWITCH DEFINITIONS
1273      100000      SW15= 100000
1274      040000      SW14= 40000
1275      020000      SW13= 20000
1276      010000      SW12= 10000
1277      004000      SW11= 4000
1278      002000      SW10= 2000
1279      001000      SW09= 1000
1280      000400      SW08= 400
1281      000200      SW07= 200
1282      000100      SW06= 100
1283      000040      SW05= 40
1284      000020      SW04= 20
1285      000010      SW03= 10
1286      000004      SW02= 4

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1287      000002      SW01= 2
1288      000001      SW00= 1
1289      .EQUIV      SW09,SW9
1290      .EQUIV      SW08,SW8
1291      .EQUIV      SW07,SW7
1292      .EQUIV      SW06,SW6
1293      .EQUIV      SW05,SW5
1294      .EQUIV      SW04,SW4
1295      .EQUIV      SW03,SW3
1296      .EQUIV      SW02,SW2
1297      .EQUIV      SW01,SW1
1298      .EQUIV      SW00,SW0
1299
1300      .*DATA BIT DEFINITIONS (BIT00 TO BIT15)
1301      100000      BIT15= 100000
1302      040000      BIT14= 40000
1303      020000      BIT13= 20000
1304      010000      BIT12= 10000
1305      004000      BIT11= 4000
1306      002000      BIT10= 2000
1307      001000      BIT09= 1000
1308      000400      BIT08= 400
1309      000200      BIT07= 200
1310      000100      BIT06= 100
1311      000040      BIT05= 40
1312      000020      BIT04= 20
1313      000010      BIT03= 10
1314      000004      BIT02= 4
1315      000002      BIT01= 2
1316      000001      BIT00= 1
1317      .EQUIV      BIT09,BIT9
1318      .EQUIV      BIT08,BIT8
1319      .EQUIV      BIT07,BIT7
1320      .EQUIV      BIT06,BIT6
1321      .EQUIV      BIT05,BIT5
1322      .EQUIV      BIT04,BIT4
1323      .EQUIV      BIT03,BIT3
1324      .EQUIV      BIT02,BIT2
1325      .EQUIV      BIT01,BIT1
1326      .EQUIV      BIT00,BIT0
1327
1328      .*BASIC "CPU" TRAP VECTOR ADDRESSES
1329      000004      ERRVEC= 4      ;; TIME OUT AND OTHER ERRORS
1330      000010      RESVEC= 10     ;; RESERVED AND ILLEGAL INSTRUCTIONS
1331      000014      TBITVEC= 14    ;; "T" BIT
1332      000014      TRTVEC= 14     ;; TRACE TRAP
1333      000014      BPTVEC= 14     ;; BREAKPOINT TRAP (BPT)
1334      000020      IOTVEC= 20     ;; INPUT/OUTPUT TRAP (IOT) **SCOPE**
1335      000024      PWRVEC= 24     ;; POWER FAIL
1336      000030      EMTVEC= 30     ;; EMULATOR TRAP (EMT) **ERROR**
1337      000034      TRAPVEC= 34    ;; "TRAP" TRAP
1338      000060      TKVEC= 60      ;; TTY KEYBOARD VECTOR
1339      000064      TPVEC= 64      ;; TTY PRINTER VECTOR
1340      000240      PIRQVEC= 240   ;; PROGRAM INTERRUPT REQUEST VECTOR
1341
1342      .SBTTL      RK06 CONTROLLER REGISTER DEFINITION

```

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1343
1344
1345
1346          000000      RKCS1= 0          ;CONTROL AND STATUS REGISTER 1
1347          000002      RKWC= 2          ;WORD COUNT REGISTER
1348          000004      RKBA= 4          ;BUS ADDRESS REGISTER
1349          000006      RKDA= 6          ;DESIRED TRACK SECTOR REGISTER
1350          000010      RKCS2= 10        ;CONTROL AND STATUS REGISTER 2
1351          000012      RKDS= 12        ;DRIVE STATUS REGISTER
1352          000014      RKER= 14        ;ERROR REGISTER
1353          000016      RKASOF= 16       ;ATTENTION SUMMARY AND OFFSET REGISTER
1354          000020      RKDC= 20        ;DESIRED CYLINDER REGISTER
1355          000024      RKDB= 24        ;DATA BUFFER
1356          000026      RKMR1= 26       ;MAINTENANCE REGISTER 1
1357          000034      RKMR2= 34       ;MAINTENANCE REGISTER 2 (MESSAGE LINE A)
1358          000036      RKMR3= 36       ;MAINTENANCE REGISTER 3 (MESSAGE LINE B)
1359          000030      RKECPS= 30      ;ECC POSITION INFORMATION
1360          000032      RKECPT= 32      ;ECC PATTERN INFORMATION
1361
1362          .SBTTL CONTROL AND STATUS REGISTER 1 BITS (RKCS1:0)
1363
1364          ;          DRIVE COMMANDS
1365
1366          000001      SELDRV= 1        ;SELECT DRIVE (GET STATUS)
1367          000003      PACK= 3         ;PACK ACKNOWLEDGE
1368          000005      CLEAR= 5        ;DRIVE CLEAR
1369          000007      UNLOAD= 7       ;UNLOAD
1370          000011      SRTSPL= 11      ;START SPINDLE
1371          000013      RECAL= 13       ;RECALIBRATE
1372          000015      OFFSET= 15     ;OFFSET
1373          000017      SEEK= 17        ;SEEK
1374          000021      RDDATA= 21      ;READ DATA
1375          000023      WRDATA= 23     ;WRITE DATA
1376          000025      RDHEAD= 25     ;READ HEADER
1377          000027      WRHEAD= 27     ;WRITE HEADER AND DATA
1378          000031      WRTCHK= 31     ;WRITE CHECK
1379
1380          000001      GO= BIT0         ;GO BIT
1381          000100      IE= BIT6        ;INTERRUPT ENABLE
1382          000200      RDY= BIT7       ;CONTROLLER READY
1383          000400      BA16= BIT8      ;BUS ADDRESS BIT 16
1384          001000      BA17= BIT9      ;BUS ADDRESS BIT 17
1385          002000      CDT= BIT10      ;CONTROLLER DRIVE TYPE (0=RK06,1=RK07)
1386          004000      CTO= BIT11     ;CONTROLLER TIMEOUT
1387          010000      CFMT= BIT12    ;CONTROLLER DRIVE FORMAT (0=22 SECTOR, 1=20 SECTOR)
1388          020000      DCPAR= BIT13   ;SERCON PARITY ERROR DETECTED BY CONTROLLER
1389          040000      DI= BIT14      ;DRIVE INTERRUPT
1390          100000      CERR= BIT15    ;CONTROLLER ERROR
1391          100000      CCLR= BIT15    ;CONTROLLER CLEAR
1392
1393          .SBTTL CONTROL AND STATUS REGISTER 2 BITS (RKCS2:10)
1394
1395          000007      DRVMSK= 7        ;MASK FOR DRIVE SELECTION CODE
1396          000010      RLS= BIT3       ;DESELECT OR RELEASE DRIVE IN BITS 0-2
1397          000020      BAI= BIT4      ;BUS ADDRESS INCREMENT INHIBIT
1398          000040      SCLR= BITS     ;SUBSYSTEM CLEAR CONTROLLER AND ALL DRIVES

```

1399	000100	IR=	BIT6	; INPUT READY
1400	000200	OR=	BIT7	; OUTPUT READY
1401	000400	UFE=	BIT8	; UNIT FIELD ERROR
1402	001000	MDS=	BIT9	; MULTIPLE DRIVE SELECT
1403	002000	PGE=	BIT10	; PROGRAMMING ERROR
1404	004000	NEM=	BIT11	; NON-EXISTENT MEMORY
1405	010000	NED=	BIT12	; NON-EXISTENT DRIVE
1406	020000	UPE=	BIT13	; UNIBUS PARITY ERROR
1407	040000	WCE=	BIT14	; WRITE CHECK ERROR
1408	100000	DLT=	BIT15	; DATA LATE ERROR
1409				
1410		.SBTTL	ERROR REGISTER BIT DEFINITION (RKER:14)	
1411				
1412	000001	ILF=	BIT0	; ILLEGAL FUNCTION CODE
1413	000002	SKI=	BIT1	; SEEK INCOMPLETE
1414	000004	NXF=	BIT2	; NON-EXECUTABLE FUNCTION
1415	000010	DRPAR=	BIT3	; DRIVE DETECTED SERCON PARITY ERROR
1416	000020	FMTE=	BIT4	; FORMAT ERROR
1417	000040	DTYE=	BIT5	; DRIVE TYPE ERROR
1418	000100	ECH=	BIT6	; ECC HARD
1419	000200	BSE=	BIT7	; BAD SECTOR ERROR
1420	000400	HVRC=	BIT8	; HEADER VRC ERROR
1421	001000	COE=	BIT9	; CYLINDER ADDRESS OVERFLOW ERROR
1422	002000	IDAE=	BIT10	; INVALID DISK ADDRESS ERROR: HEAD/CYL
1423	004000	WLE=	BIT11	; WRITE LOCK ERROR
1424	010000	DTE=	BIT12	; DRIVE TIMING ERROR
1425	020000	OPI=	BIT13	; OPERATION (SEARCH) INCOMPLETE
1426	040000	UNS=	BIT14	; DRIVE UNSAFE
1427	100000	DCK=	BIT15	; DATA CHECK
1428				
1429		.SBTTL	STATUS REGISTER BIT DEFINITION (RKDS:12)	
1430				
1431	000001	DRA=	BIT0	; DRIVE AVAILABLE (CONTROLLER IS SET IF THIS BIT IS RESET)
1432				
1433	000004	OFST=	BIT2	; DRIVE OFFSET
1434	000010	ACLO=	BIT3	; AC LOW
1435	000020	DCLO=	BIT4	; DC LOW
1436	000040	DROT=	BIT5	; DRIVE OFF TRACK
1437	000100	VV=	BIT6	; VOLUME VALID
1438	000200	DRDY=	BIT7	; DRIVE READY
1439	000400	DDT=	BIT8	; DRIVE TYPE (0=RK06, 1=RK07)
1440	004000	WRL=	BIT11	; WRITE LOCK
1441	020000	PIP=	BIT13	; POSITIONING IN PROGRESS
1442	040000	DSC=	BIT14	; DRIVE STATUS CHANGE
1443	100000	SVAL=	BIT15	; STATUS VALID
1444				
1445		.SBTTL	MAINTENANCE REGISTER 1 BIT DEFINITION (RKMR1:22)	
1446				
1447	000017	MESMSK=	17	; MESSAGE MASK
1448	000020	PAT=	BIT4	; FORCE EVEN PARITY ON SERCON MESSAGE LINES
1449	000040	DMD=	BIT5	; DIAGNOSTIC MODE
1450	000100	MSP=	BIT6	; MAINTENANCE SECTOR PULSE
1451	000200	MIND=	BIT7	; MAINTENANCE INDEX
1452	000400	MCLK=	BIT8	; MAINTENANCE CLOCK
1453	001000	MERD=	BIT9	; MAINTENANCE ENCODED READ DATA
1454	002000	MEWD=	BIT10	; MAINTENANCE ENCODED WRITE DATA

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MAINTENANCE REGISTER 1 BIT DEFINITION (RKMR1:22)

SEQ 0029

1455	004000	PCA= BIT11	; PRECOMPENSATION ADVANCE
1456	010000	PCD= BIT12	; PRECOMPENSATION DELAY
1457	020000	ECCW= BIT13	; ECC WORD IS BEING READ OR WRITTEN
1458	040000	WRTGAT= BIT14	; WRITE GATE
1459	100000	RDGATE= BIT15	; READ GATE
1460			
1461		.SBTTL	DEFINITION OF DRIVE STATUS BYTE 00 MESSAGE A (RKMR2:34)
1462			
1463	000040	D.DRA= BIT5	; DRIVE AVAILABLE
1464	000100	D.VV= BIT6	; VOLUME VALID
1465	000200	D.DRDY= BIT7	; DRIVE READY
1466	000400	D.DOT= BIT8	; DRIVE TYPE (0=RK06,1=RK07)
1467	001000	C.FORM= BIT9	; DRIVE FORMAT
1468	002000	D.OFF= BIT10	; OFFSET ON
1469	004000	D.WRL= BIT11	; WRITE LOCK
1470	010000	D.SPIN= BIT12	; SPINDLE ON
1471	020000	D.PIP= BIT13	; POSITIONING IN PROGRESS
1472	040000	D.DSC= BIT14	; DRIVE STATUS CHANGE
1473			
1474		.SBTTL	DEFINITION OF DRIVE STATUS BYTE 01 MESSAGE A (RKMR2:34)
1475			
1476	000020	D.SSP= BIT4	; SERVO SIG PRESENT
1477	000040	D.HOHM= BIT5	; HEADS HOME
1478	000100	D.BRHM= BIT6	; BRUSHES HOME
1479	000200	D.DOOR= BIT7	; DOOR INTERLOCKED
1480	000400	D.CART= BIT8	; CARTRIDGE INTERLOCK
1481	001000	D.SPOK= BIT9	; SPEED OK
1482	002000	D.FWD= BIT10	; FORWARD
1483	004000	D.REV= BIT11	; REVERSE
1484	010000	D.LOAD= BIT12	; HEADS LOADING
1485	020000	D.RTZ= BIT13	; RETURN TO ZERO
1486	040000	D.UNLD= BIT14	; HEADS UNLOADING
1487			
1488		.SBTTL	DEFINITION OF DRIVE STATUS BYTE 00 MESSAGE B (RKMR3:36)
1489			
1490	000040	D.IDAE= BIT5	; INVALID DISK ADDRESS ERROR:HEAD/CYL
1491	000100	D.ACLO= BIT6	; AC LOW
1492	000200	D.FLT= BIT7	; DRIVE FAULT
1493	000400	D.ILF= BIT8	; ILLEGAL FUNCTION CODE
1494	001000	D.PAR= BIT9	; DRIVE DETECTED SERCON PARITY ERROR
1495	002000	D.SKI= BIT10	; SEEK INCOMPLETE
1496	004000	D.WLE= BIT11	; WRITE LOCK ERROR
1497	010000	D.SPLS= BIT12	; SPEED LOSS
1498	020000	D.DROT= BIT13	; DRIVE OFF TRACK
1499	040000	D.UNS= BIT14	; R/W UNSAFE
1500			
1501		.SBTTL	DEFINITION OF DRIVE STATUS BYTE 01 MESSAGE B (RKMR3:36)
1502			
1503	000020	D.SECT= BIT4	; SECTOR ERROR
1504	000040	D.WCUR= BIT5	; WRITE CURRENT AND NO WRITE GATE
1505	000100	D.WGAT= BIT6	; WRITE GATE AND NO TRANSISTIONS
1506	000200	D.HOFL= BIT7	; HEAD FAULT
1507	000400	D.MHD= BIT8	; MULTIPLE HEAD SELECT
1508	001000	D.XERR= BIT9	; INDEX ERROR
1509	002000	D.TIB= BIT10	; TRIBIT ERROR
1510	004000	D.PLO= BIT11	; PLO ERROR

E03

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DEFINITION OF DRIVE STATUS BYTE 01 MESSAGE B (RKMR3:36)

SEQ 0030

1511	010000	D.NMOV= BIT12	;SEEK AND NO MOTION
1512	020000	D.LIMD= BIT13	;LIMIT DETECT ON SEEK
1513	040000	D.SUNS= BIT14	;SERVO UNSAFE
1514		.SBTTL COMMON MASKS AND OTHER BITS: MESSAGE A (RKMR2:34)	
1515			
1516			
1517	000007	M.DRV= 7	;DRIVE CODE, ALL BYTES
1518	077770	M.SER= 77770	;DRIVE SERIAL #, BYTE 11
1519			
1520		.SBTTL COMMON MASKS AND OTHER BITS: MESSAGE B (RKMR3:36)	
1521			
1522	000003	M.ID= 3	;BYTE ID, ALL BYTES
1523	040000	M.ALGN= BIT14	;ALIGN SIGN, BYTE 10
1524	000760	M.SECT= 760	;SECTOR COUNT, BYTE 11
1525	007000	M.HEAD= 7000	;HEAD DECODE, BYTE 11
1526	100000	M.PAR= BIT15	;PARITY, MESS A/B, ALL BYTES

```

1527
1528      .SBTTL  TRAP CATCHER
1529
1530      000000      ;=0
1531      ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
1532      ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
1533      ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
1534      000174      ;=174
1535      000174      000000      DISPREG: .WORD 0      ;; SOFTWARE DISPLAY REGISTER
1536      000176      000000      SWREG: .WORD 0      ;; SOFTWARE SWITCH REGISTER
1537      .SBTTL  STARTING ADDRESS(ES)
1538      000200      000137      010050      JMP 2*START ;; JUMP TO STARTING ADDRESS OF PROGRAM
1539      000220      000220
1540      000220      000137      010040      JMP 220      PARSRT      ; INPUT PARAMETERS
1541
1542      000240      000240      ;=240
1543      000240      000137      067264      JMP 0.0DT      ; ENTER ODT11
1544
1545      .SBTTL  ACT11 HOOKS
1546
1547      ;*****
1548      ;HOOKS REQUIRED BY ACT11
1549      000244      $SVPC=.      ;SAVE PC
1550      000046      000046      ;=46
1551      000046      042772      $ENDAD      ;; 1)SET LOC.46 TO ADDRESS OF $ENDAD IN .SEOP
1552      000052      000052      ;=52
1553      000052      100000      .WORD 100000      ;; 2)SET LOC.52 TO 100000
1554      000244      ;=$SVPC      ;; RESTORE PC
1555      001000      ;=1000
1556      .SBTTL  APT PARAMETER BLOCK
1557
1558      ;*****
1559      ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
1560      ;*****
1561      001000      .SX=.      ;; SAVE CURRENT LOCATION
1562      000024      000024      ;=24      ;; SET POWER FAIL TO POINT TO START OF PROGRAM
1563      000024      000200      200      ;; FOR APT START UP
1564      000044      000044      ;=44      ;; POINT TO APT INDIRECT ADDRESS PNTR.
1565      000044      001000      $APTHDR      ;; POINT TO APT HEADER BLOCK
1566      001000      ;=.SX      ;; RESET LOCATION COUNTER
1567      ;*****
1568      ;SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
1569      ;INTERFACE SPEC.
1570
1571      001000      $APTHD:
1572      001000      000000      $HIBTS: .WORD 0      ;; TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
1573      001002      001210      $MBAOR: .WORD $MAIL      ;; ADDRESS OF APT MAILBOX (BITS 0-15)
1574      001004      000430      $TSTM: .WORD 280.      ;; RUN TIM OF LONGEST TEST
1575      001006      001130      $PASTM: .WORD 600.      ;; RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
1576      001010      001130      $UNITM: .WORD 600.      ;; ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
1577      001012      000042      .WORD $ETEND-$MAIL/2 ;; LENGTH MAILBOX-ETABLE(WORDS)
1578
1579
1580      .LIST  MD
1581
1582

```

```

;USE LOOP X TO OMIT SUBCLR
;

```

```

.MACRO LOOP A
  SCOP1
  MOV #STACK,SP ;RESTORE STK PTR

  IF B A
    JSR PC,SUBCLR
    ERROR 24 ;CERR AFTER SCLR
  .ENDC
.ENDM LOOP

```

```

; THIS MACRO FILLS EXPECTED MSG A0, B0, A1, B1, A2, B2 & B3 WITH STANDARD BITS
; A=D.DSC AFTER ATTN OR 0 AFTER DRIVE CLEAR OR ANY IMPLIED SEEKS
; NOTE: A CAN BE ANY BIT COMBINATION DESIRED & INCLUDES D.DRA

```

```

.MACRO F.EAB A
  MOV #<A!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
  CLR E.B0 ;EXPECTED MSG B0
  MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
  MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
  CLR E.A2 ;EXPECTED MSG A2
  MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
  MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
.ENDM F.EAB

```

```

; THIS MACRO ASSUMES DRIVE MSG A0, B0, A1, B1 WILL ALWAYS BE TESTED
; USE A,C,D,E FOR MSG A0, B0, A1, B1 ERROR NUMBERS RESP.
; USE G=T.A2 TO READ MSG A2 & PUT INFO INTO 'CYLDIF'
; H=T.B2 TO READ MSG B2 & PUT INFO INTO 'CYLADD'
; I=T.B3 TO READ MSG B3 & PUT INFO INTO 'SECTOR' & 'HEADR'

```

```

;USE F=<ERROR DESCRIPTION>

```

```

.MACRO CHECK A,C,D,E,F,G,H,I
  JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
  .WORD G!H!I ;& MSGS SPECIFIED HERE
  ERROR A ;MSG A0 ERROR F
  ERROR C ;MSG B0 ERROR
  ERROR D ;MSG A1 ERROR
  ERROR E ;MSG B1 ERROR
.ENDM CHECK

```

```

;A=CYL DIFF/OFFSET ERROR #
;B=CYL ADDR ERROR #
;C=<ERROR DESCRIPTION>

```

```

.MACRO CWD2 A,B,C,?D,?E
  MOV #2,RKMR1(R5)

```

H03

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APT PARAMETER BLOCK

SEQ 0033

```

1639      JSB      PC,GSTAT
1640      TST      CYLOIF      ;SEE IF MSG A2=0
1641      BEQ      D          ;BR IF YES
1642      ERROR    A          ;MSG A2 NOT CLEARED C
1643      TST      CYLADD      ;SEE IF MSG B2=0
1644      BEQ      E          ;BR IF YES
1645      ERROR    B          ;MSG B2 NOT CLEARED C
1646
1647      E:
1648      .ENDM     CWD2
1649
1650      .MACRO    STDER1      B
1651      F.EAB     <D,DRA!B>
1652      CHECK     165,166,167,170,<AFTER TIMEOUT>,0,0,0
1653      .ENDM     STDER1
1654
1655      .MACRO    STDER2      B
1656      F.EAB     <D,DRA!B>
1657      CHECK     211,212,213,214,<AFTER RELEASE ISSUED>,0,0,0
1658      .ENDM     STDER2
1659
1660      .MACRO    DRCLR      C,?A
1661
1662      MOV      #CCLR,RKCS1(R5)
1663      MOV      $UNIT,RKCS2(R5) ;DRIVE#
1664      ADD      UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
1665      MOV      #CLEAR,HCS1
1666      JSR      PC,DOCMD      ;DO DRIVE CLEAR CMD & GET CONTR RDY
1667      ERROR    151          ;NO RDY AFTER DRIVE CLEAR CMD
1668      JSR      PC,TSTATN    ;TEST FOR ATTN
1669      BR       A
1670      ERROR    154          ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
1671
1672      A:
1673      .IF      B            C
1674      F.EAB     D.DRA
1675      CHECK     33,34,35,36,<AFTER DRV CLEAR CMD>,1.A2,T.B2.0
1676      .ENDC
1677      .ENDM     DRCLR
1678
1679
1680      :USE CALIB      X      TO OMIT CHECKING MSGS AD, BD, A1, B1, A2 & B2
1681
1682      .MACRO    CALIB      A,?C
1683
1684      MOV      #CCLR,RKCS1(R5)
1685      MOV      $UNIT,RKCS2(R5)
1686      ADD      UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
1687      MOV      #RECAL,HCS1
1688      JSR      PC,DOCMD      ;DO RECAL CMD & GET CONTR RDY
1689      ERROR    124          ;RDY NOT SET AFTER RECAL CMD
1690
1691      MOV      #1,RKMR1(R5) ;SELECT WORD 1
1692      JSR      PC,GSTAT
1693      BIT      #D.RTZ,HMR2
1694

```

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APT PARAMETER BLOCK

SEQ 0034

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```

C:      BNE      C
        ERROR    70          ;RTZ NOT SET DURING RECAL CMD
        MOV      T10,TEMP2    ;SETUP TIMEOUT
        JSR      PC,FATT1      ;FIND ATTN
        ERROR    55          ;NO ATTN AFTER RECAL CMD
      .IF B
        A
        F.EAB    <D.DSC!D.DRA>
        CHECK    221,66,222,67,<AFTER RECAL CMD>,T.A2,T.B2,T.B3
        CWD2     47,50,<AFTER RECAL CMD>
      .ENDC
        DRCLR
      .ENDM    CALIB

; QUICK START SPINDLE
; MACRO QKSRT
      JSR      PC,SUBCLR
      ERROR    24          ;CERR AFTER SCLR
      MOV      #SRTSPL,HCS1
      JSR      PC,DOCMD      ;DO START SPINDLE CMD & GET CONTR RDY
      ERROR    121          ;RDY NOT SET AFTER ST SPIN CMD.
      MOV      T100,TEMP2    ;SETUP TIMEOUT
      JSR      PC,FATT1      ;FIND ATTN
      ERROR    74          ;NO ATTN AFTER ST SPIN CMD.
      CLR      UNLD
      .ENDM    QKSRT

; A=WRHEAD/<CFMT!WRHEAD>
; USE WRHDR <A>,X TO OMIT CHECKING A0, B0, A1 & B1
; MACRO WRHDR A,C,?D
      MOV      #<A>,HCS1
      JSR      PC,DATCMD      ;DO DATA X FOR CMD & GET CONTR RDY
      ERROR    200          ;NO RDY AFTER WRITE HEADER CMD
      JSR      PC,GSTAT      ;GET FRESH STATUS
      BIT      #CERR,HCS1
      BEQ      D
      ERROR    201          ;CERR AFTER WRITE HEADER CMD
      TYPE     MSG21          ;ABORTING BALANCE OF TESTS
      JMP      $EOP
D:
      .IF B
        C
        F.EAB    D.DRA
        CHECK    37,40,41,42,<AFTER WRITE HEADER CMD>,.0,.0,.0
      .ENDC
      .ENDM    WRHDR

```

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1751
1752
1753 ; A=RDHEAD/(CFMT!RDHEAD)
1754 ; USE RDHDR <A>,X TO OMIT CHECKING A0, B0, A1, B1
1755
1756 .MACRO RDHDR A,C,?D,?E
1757
1758     MOV     #RHTAB,RO
1759     MOV     #<A>,HCS1
1760     JSR     PC,DATCMD           ;DO DATA X FOR CMD & GET CONTR RDY
1761     ERROR   171                ;NO RDY AFTER READ HEADER CMD
1762     BIT     #CERR,HCS1
1763     BEQ     D
1764     ERROR   174                ;CERR AFTER READ HEADER CMD
1765
1766 D:     MOV     RKDB(R5),(RO)+    ;1'ST WORD FROM SILO TO RHTAB
1767     MOV     RKDB(R5),(RO)+    ;2'ND WORD
1768     MOV     RKDB(R5),(RO)+    ;3'RD WORD
1769
1770
1771     BIT     #DLT,RKCS2(R5)
1772     BEQ     E
1773     JSR     PC,GSTAT
1774     ERROR   173                ;DLT AFTER READ HEADER CMD
1775
1776 E:     .IF     B C
1777     F.EAB   D.DRA
1778     CHECK   301,271,302,272,<AFTER READ HEADER CMD>,T.A2.T.B2,0
1779
1780 .ENDC
1781
1782 .ENDM RDHDR
1783
1784 .MACRO HDCHK3 ?A
1785
1786     RDHDR   RDHEAD
1787     CMP     RHTAB,TOCYL        ;CHECK WORD 0 ONLY, CYL#
1788     BEQ     A                  ;BR IF SAME
1789     ERROR   S1                ;WRONG CYL# ON HEADER
1790
1791 A:
1792
1793 .ENDM HDCHK3
1794
1795 ; A=TOCYL/FRCYL , B=HEAD#, C = 0 FOR 22 SECTOR, 1 FOR 20 SECTOR
1796
1797 .MACRO HDTBL A,B,C
1798
1799     MOV     A,CALADD           ;SETUP
1800     MOV     #B,HEAD           ;TO FILL
1801     MOV     #C,FORMAT         ;HEADER
1802     JSR     PC,FHDTAB         ;TABLE
1803
1804 .ENDM HDTBL
1805
1806 ;

```

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APT PARAMETER BLOCK

K03

SEQ 0036

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```
; QUICK SEEK. ENTER WITH CYL# IN RKDC
;
; MACRO QKSEEK ?A
;
; MOV #SEEK, HCS1
; JSR PC, DOCMD ; DO SEEK CMD & GET CONTR READY
; ERROR 131 ; NO RDY AFTER SEEK CMD
;
; MOV T50000, TEMP1 ; SETUP TIMEOUT
; JSR PC, FATT2 ; FIND ATTN
; ERROR 132 ; NO ATTN AFTER SEEK CMD
;
; BIT #CERR, HCS1
; BEQ A
; ERROR 210 ; CERR AFTER SEEK CMD
;
A: F.EAB <D.DSC!D.DRA>
CHECK 161,162,163,164,<AFTER SEEK CMD>,0,0,0
;
; ENDM QKSEEK
;
; A=WRDATA/<CFMT!WRDATA>
; C=ADDR TO JMP TO ATTEMPT TO WRITE ON ANOTHER SECTOR
; D=ADDR TO JMP TO BYPASS TEST
; E: IF BLANK WILL CHECK A0, B0, A1 & B1 AT THE END OF WRITING
; E: IF NON BLANK WILL OMIT CHECKING A0 THRU B1
;
; MACRO WDATA A,C,D,E,?F,?G,?H,?I
;
; MOV #<A>, HCS1
; JSR PC, DATCMD ; DO DATA X FOR CMD & GET CONTR RDY
; ERROR 11 ; NO RDY AFTER WRITE DATA CMD
; JSR PC, GSTAT ; GET FRESH STATUS
; BIT #CERR, HCS1
; BEQ I ; BR IF NO ERRORS
;
; BIT #BSE, HER ; SEE IF BAD SECTOR FLAG
; BEQ G ; BR IF NO
; JSR PC, TRUEERR ; ELSE SEE IF SECTOR LISTED IN BSE TABLE
; BR H ; RETURN HERE IF NO
;
; INC SECTOR ; RETURN HERE IF YES
; CMP SECTOR, #10. ; ARE 10 CONSEC. SECTORS BAD
; BNE F ; BR IF NO
; ERROR 46 ; ABORTING TEST DETECTED 10 BAD SECTORS
; JMP D ; BYPASS TEST
;
F: MOV #CCLR, RKCS1(R5) ; TRY ANOTHER SECTOR
; JMP C
;
G: ERROR 12 ; CERR WITH WRITE DATA CMD
; F.EAB D.DRA
; CHECK 52,23,53,25,<AFTER WRITE DATA CMD>,T.A2,T.B2,0
; TYPE MSG21 ; ABORTING BALANCE OF TESTS
; JMP $EOP
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H:      ERROR      43              ;BAD SECTOR NOT LISTED IN TABLE
I:
.IF      B          E
        F.EAB      D.DRA
        CHECK      52,23,53,25,<AFTER WRITE DATA CMD>,T.A2,T.B2,0
.ENDC
.ENDM    WDATA

;A=RDDATA/<CFMT!RDDATA>
;USE RDATA      <A>,X TO OMIT CHECKING AD, BO, A1 & B1
;
.MACRO   RDATA      A,C,?D,?E,?F,?G,?H
        MOV        #<A>,HCS1
        JSR        PC,DATCMD      ;DO DATA X FOR CMD & GET CONTR RDY
        ERROR      13              ;NO RDY AFTER READ DATA CMD
        JSR        PC,GSTAT      ;GET FRESH STATUS
        BIT        #CERR,HCS1
        BEQ        G
        BIT        #BSE,HER      ;SEE IF BAD SECTOR
        BEQ        E
        ERROR      65              ;DETECTED BSE IN READ BUT NOT IN WRITE CMD.
        BR         H
E:      BIT        #DCK,HER      ;SEE IF DATA CHECK ERROR
        BEQ        F
        ERROR      21              ;DATA CHECK ERROR AFTER READ CMD (ECC)
        BR         H
F:      ERROR      14              ;CERR AFTER READ DATA CMD.
H:      F.EAB      D.DRA
        CHECK      54,26,56,30,<AFTER READ DATA CMD>,T.A2,T.B2,0
        TYPE      MSG21          ;ABORTING BAL OF TESTS
        JMP        $EOP
G:
.IF      B          C
        F.EAB      D.DRA
        CHECK      54,26,56,30,<AFTER READ DATA CMD>,T.A2,T.B2,0
.ENDC
.ENDM    RDATA

;A=WRTCHK/<CFMT!WRTCHK>
;C=EXPECTED DATA FOR TYPEOUT
;USE WRCHK      <A>,DATA0,X TO OMIT CHECKING AD, BO, A1 & B1
;
.MACRO   WRCHK      A,C,D,?E,?F
        MOV        #<A>,HCS1
        JSR        PC,DATCMD      ;DO DATA X FOR CMD & GET CONTR RDY

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APT PARAMETER BLOCK

MO3

SEQ 0038

```
1919          ERROR 15          ;NO RDY AFTER WRITE CHECK CMD
1920          JSR   PC,GSTAT    ;GET FRESH STATUS
1921          BIT   #CERR,HCS1
1922          BEQ   F
1923          BIT   #WCE,HCS2    ;SEE IF WRITE CHECK ERROR
1924          BEQ   E
1925          MOV   RKDS(R5),WD1  ;ACTUAL WORD FOR PRINTOUT
1926          MOV   C,WD2        ;EXPECTED WORD FOR TYPEOUT
1927          ERROR 16          ;WCE AFTER WRITE CMD
1928          BR    F
1929
1930 E:          ERROR 22          ;CERR AFTER WRITE CHECK CMD
1931          F.EAB D.DRA
1932          CHECK 57,31,60,32,<AFTER WRITE CHECK CMD>,T.A2,T.B2,0
1933          TYPE  MSG21        ;ABORTING BALANCE OF TESTS
1934          JMP   $EOP
1935
1936 F:
1937 .IF        B            D
1938          F.EAB D.DRA
1939          CHECK 57,31,60,32,<AFTER WRITE CHECK CMD>,T.A2,T.B2,0
1940
1941 .ENDC
1942 .ENDM      WRCHK
1943
1944
1945 .MACRO     EOPGM
1946
1947          SCOPE
1948          CLR   $ESCAPE
1949          MOV   #1,$TIMES
1950          MOV   #STACK,SP
1951          INC   $DEVCT        ;INCR COUNT FOR # DRIVES CHECKED
1952          CMP   DRVS,$DEVCT  ;ARE ALL DRIVES PRESENT TESTED?
1953          BEQ   $EOP1+2      ;BR IF YES
1954          JMP   NUORV        ;ELSE TEST NEXT DRIVE PRESENT
1955
1956 $EOP1:     SCOPE
1957 .ENDM      EOPGM
1958
1959 .MACRO     QKPACK  ?A
1960          MOV   #CCLR,RKCS1(R5)
1961          MOV   $UNIT,RKCS2(R5)
1962          ADD   UNITB,RKCS2(R5)
1963          MOV   #PACK,HCS1
1964          JSR   PC,DOCMD      ;DO PACK CMD & GET CONTR RDY
1965          ERROR 116          ;CONTR NOT RDY AFT PACK CMD
1966
1967          BIT   #D.VV,HMR2
1968          BNE   A
1969          ERROR 27          ;VV NOT SET AFTER PACK CMD
1970
1971 A:          .ENDM      QKPACK
1972
1973
1974 ;
```

N03

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APT PARAMETER BLOCK

SEQ 0039

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;MACRO TO RELEASE PORT A OR B
;RLS PORT A:  RELEAS 0,1,A,B  (A,B,C,D IF USED WITH MACROS BELOW)
;RLS PORT B:  RELEAS 1,C,B,A  (B,A,D,C IF USED WITH MACROS BELOW)
;
.MACRO  RELEAS  W,X,Y,Z,?J
          MOV    $UNIT,RKCS2(R5) ;SETUP FOR PORT Y
          MOV    #W,UNITB
          ADD    UNITB,RKCS2(R5)
          MOVB   #'Y,MSG19A
          ADD    #RLS,RKCS2(R5) ;RELEASE PORT Y
          MOV    #SELDV,HCS1
          JSR    PC,DOCMD        ;DO SELDRV (STATUS) CMD & GET CONTR RDY
          ERROR  1,?             ;NO RDY AFTER SEL DRV CMD

          MOV    $UNIT,RKCS2(R5) ;SETUP FOR PORT Z
          MOV    #X,UNITB
          ADD    UNITB,RKCS2(R5)
          MOVB   #'Z,MSG19A
          MOV    #SELDV,HCS1
          JSR    PC,DOCMD        ;DO SELDRV (STATUS) CMD & GET CONTR RDY
          ERROR  1,?             ;NO RKY AFTER SEL DRV CMD

          BIT    #D.DRA,HMR2     ;SEE IF DRIVE AVAIL ON PORT Z
          BNE    J              ;BR IF YES
          ERROR  7,1             ;PORT Z NOT AVAIL AFTER PORT Y RLS

J:
.ENDM  RELEAS

.MACRO  SETP  A,C
          MOV    #A,UNITB        ;SETUP PORT C
          MOVB   #'C,MSG19A
          MOV    TIMER,COUNT
          JSR    PC,TMO          ;DO TIMEOUT

          JSR    PC,SUBCLR
          ERROR  24              ;CERR AFTER SCLR

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2014      JSR      PC,DRAV      ;SEE IF DRIVE AVAIL
2015      ERROR    45           ;PORT C NOT AVAIL AFTER TMO
2016
2017      .ENDM     SETP
2018
2019      .MACRO    REPTST
2020      ;*
2021      ;*      THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.
2022      ;*
2023      .ENDM     REPTST
2024
2025      .MACRO    REPTA
2026      ;*
2027      ;*      THE PREVIOUS TEST IS REPEATED FOR PORT 'B',
2028      ;*      BUT THE SEEK IS TO CYLINDER 0
2029      ;*
2030      .ENDM     REPTA
2031
2032      .MACRO    HEADER
2033      ;*
2034      ;*      A & B=0 FOR PORT A OR 1 FOR PORT B
2035      ;*      C & D=A FOR PORT A OR B FOR PORT B
2036      ;*
2037      .ENDM     HEADER
2038
2039      .MACRO    SUNIT
2040      MOV        $UNIT,RKCS2(R5)
2041      ADD        UNITB,RKCS2(R5)
2042      .ENDM     SUNIT
2043
2044      ;*
2045      ;*      A & B=0 FOR PORT A OR 1 FOR PORT B
2046      ;*      C & D=A FOR PORT A OR B FOR PORT B
2047      ;*
2048      .MACRO    TSTS      A,B,C,D,E
2049      SETP      A,C
2050      MOV        #$$,$ESCAPE
2051      F.EAB     D,DRA
2052      CHECK     77,100,101,102,<AFTER TIMEOUT>,0,0,0
2053      MOV        #B,UNITB      ;SELECT PORT D BEFORE TIMEOUT OR RELEASE
2054      MOV        #'D,MSG19A    ;SETUP ERROR MSG FOR PORT D
2055      CLC        $ESCAPE
2056      JSR        PC,DRAV      ;SEE IF DRIVE AVAIL
2057      BR         1$           ;BR IF NOT AVAIL
2058      ERROR     103          ;PORT D AVAIL BEFORE TMO OR RELEASE
2059
2060      1$:      BIT        #CERR,HCS1
2061      BNE        6$
2062      ERROR     130          ;CERR NOT SET AFTER SEL DRIVE & DRIVE NOT AVAIL
2063      6$:      MOV        #<D.SPIN!D.VV>,E.A0
2064      MOV        E.A0,E.A1      ;MSG A & B SHOULD ALWAYS RETURN SAME
2065      BIS        E.DOT,E.A1
2066      CLR        E.B0          ;WORD 0 FOR PORT D
2067      CLR        E.B1
2068      MOV        #$$,$ESCAPE
2069      CHECK     104,105,106,107,<WHILE PORT D UNAVAILABLE>,0,0,0

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2070
2071      TST      $PASS
2072      BEQ      8$      ;BR IF FIRST PASS
2073      JMP      5$      ;ELSE EXIT TEST
2074      CLR      $ESCAPE
2075      MOV      #CCLR,RKCS1(R5)
2076      MOV      #A,UNITB      ;SETUP FOR PORT C AGAIN
2077      MOVB     #'C,MSG19A
2078      MOV      #360,COUNT      ;SETUP 4 SEC TIMEOUT
2079      JSR      PC,CLKON      ;TURN ON CLOCK
2080
2081      JSR      PC,DRAV
2082      ERROR    45      ;PORT C NOT AVAIL AFTER TIMEOUT
2083
2084      MOV      #B,UNITB      ;SELECT PORT D BEFORE TIMEOUT OR RELEASE
2085      MOVB     #'D,MSG19A
2086      JSR      PC,DRAV      ;SEE IF PORT D DRIVE AVAIL
2087      BR       3$      ;BR IF NOT AVAIL
2088      ERROR    103      ;PORT D AVAIL BEFORE TMO OR RELEASE
2089
2090      3$:      MOV      #CCLR,RKCS1(R5)
2091      MOV      $UNIT,R4
2092      ADD      UNITB,R4
2093      JSR      PC,FATT3
2094      ERROR    110      ;NO ATTN ON PORT D TO ALLOW SEIZE
2095
2096      JSR      PC,CLKOF
2097      JSR      PC,DRAV      ;SEE IF PORT D DRIVE AVAIL
2098      ERROR    45      ;PORT D NOT AVAIL
2099
2100      MOV      #5$, $ESCAPE
2101      F.EAB     <D.OSC!D.DRA>
2102      CHECK     77,100,101,102,<AFTER TIMEOUT>,0,0,0
2103      CLR      $ESCAPE
2104      MOV      #A,UNITB      ;SETUP FOR PORT C
2105      MOVB     #'C,MSG19A
2106      JSR      PC,TSTATN      ;TEST FOR ATTN ON PORT C
2107      BR       4$      4$
2108      ERROR    111      ;PORT C ATTN SET W/O REQUEST PENDING
2109
2110      4$:      MOV      #5$, $ESCAPE
2111      MOV      #B,UNITB      ;SETUP FOR PORT D
2112      MOVB     #'D,MSG19A
2113      DRCLR
2114
2115      MOV      #360,R1
2116      SUB      COUNT,R1      ;R1-COUNT=R1
2117      MULT     #17.,R1      ;MULT BY 16.66 MS
2118      TYPE     E      ;PORT TIMEOUT
2119      MOV      R1,-(SP)      ;PUSH BINARY ONTO STACK
2120      JSR      PC,$$B2D      ;CONVERT TO ASCII
2121      JSR      PC,$$UPRS      ;TYPE IT
2122      TYPE     ,MSG22      ;MS
2123
2124      5$:      CLR      $ESCAPE
2125      JSR      PC,CLKOF

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.ENDM TST5

; A & B=0 FOR PORT A OR 1 FOR PORT B
; C & D=A FOR PORT A OR B FOR PORT B

```

MACRO TST10 A,B,C,D,E,F,'G
  SETP A,C
  MOV #F,RKDC(R5) ;SEEK TO CYL F
  QKSEEK
  JSR PC,RDCYLA ;READ CYL ADDR
  CMP CYLADD,#F ;SEE IF CYL F
  BEQ G ;BR IF YES
  MOV #E,FRCYL
  MOV #F,TOCYL
  MOV #F,CALDIF
  MOV #F,RKDC(R5) ;REFRESH RKDC
  ERROR 224 ;DID NOT SEEK TO CYL F

G: MOV #150,COUNT
  JSR PC,TMO ;DO 2.5 SEC TIMEOUT
  JSR PC,FATT2
  ERROR 112 ;ATTN CLEARED AFTER TMO
  DRCLR
  JSR PC,DRAV
  ERROR 113 ;PORT C NOT AVAIL AFTER DRIVE CLEAR CMD

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.ENDM TST10

; A & B=0 FOR PORT A OR 1 FOR PORT B
; C & D=A FOR PORT A OR B FOR PORT B

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MACRO TST12 A,B,C,D
  SETP A,C
  QKSEEK
  MOV TIMER,COUNT
  JSR PC,TMO ;DO 1.5 SEC TIMEOUT
  MOV #B,UNITB ;SETUP PORT D
  MOVB #'D,MSG19A
  JSR PC,DRAV
  ERROR 45 ;PORT D NOT AVAIL AFTER TMO

  STDER1 0
  QKSEEK
  MOV TIMER,COUNT
  JSR PC,TMO
  MOV #A,UNITB ;SETUP PORT C
  MOVB #'C,MSG19A
  JSR PC,DRAV
  ERROR 45 ;PORT C NOT AVAIL AFTER TMO

  STDER1 D.DSC
  DRCLR
  MOV TIMER,COUNT
  JSR PC,TMO ;DO 1.5 SEC TIMEOUT
  MOV #B,UNITB ;SETUP PORT D

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SEQ 0043

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2182          MOVB      #'D,MSG19A
2183          JSR        PC,TSTATN
2184          ERROR      114          ;ATTN RESET ON PORT D AFTER DR CLR CMD
2185                                     ;ON PORT C
2186
2187          STDER1     D.DSC
2188          .ENDM      TST12
2189
2190          ; A & B=0 FOR PORT A OR 1 FOR PORT B
2191          ; C & D=A FOR PORT A OR B FOR PORT B
2192
2193          .MACRO      TST14      A,B,C,D
2194          SETP      A,C
2195          RELEAS     A,B,C,D
2196          JSR        PC,TSTATN
2197          BR         1$
2198          ERROR      115          ;ATTN SET IN PORT D AFTER RLS OF PORT C
2199          1$:        F.EAB      D.DRA
2200          CHECK      133,134,135,136,<AFTER RELEASED TO PORT D>,0,0,0
2201
2202          MOV        #A,UNITB      ;ADDRESS PORT C
2203          MOVB      #'C,MSG19A
2204          JSR        PC,TSTATN
2205          SKIP      R,<GOTO NEXT TST>
2206          ERROR      115          ;ATTN SET AFTER RLS ISSUED
2207          STDER2     D.DRA
2208          .ENDM      TST14
2209
2210          ; A & B=0 FOR PORT A OR 1 FOR PORT B
2211          ; C & D=A FOR PORT A OR B FOR PORT B
2212
2213          .MACRO      TST16      A,B,C,D
2214          RELEAS     B,A,D,C
2215          STDER2     D.DRA
2216          JSR        PC,SUBCLR
2217          ERROR      24          ;CERR AFTER SCLR
2218          QKSEEK
2219
2220          MOV        #B,UNITB      ;SETUP PORT D
2221          MOVB      #'D,MSG19A
2222          JSR        PC,DRAV      ;SEE IF DRIVE AVAIL
2223          BR         1$
2224          ERROR      103          ;PORT D AVAIL BEFORE TMO OR RELEASE
2225
2226          1$:        BIT        #CERR,HCS1
2227          BNE        2$
2228          ERROR      130          ;CERR NOT SET AFTER SEL DRIVE CMD
2229                                     ;& NO DRA
2230
2231          2$:        JSR        PC,TSTATN
2232          BR         3$
2233          ERROR      115          ;ATTN SET IN PORT D AFTER RLS FROM PORT C
2234
2235          3$:        MOV        #CCLR,RKCS1(R5)
2236          RELEAS     A,B,C,D
2237

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F04

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SEQ 0044

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2238      JSR      PC,TSTATN
2239      ERROR    122          ;NO ATTN IN PORT D AFTER RLS FROM PORT C
2240
2241      STDER2   <D,DSC!D.DRA>
2242      RELEAS   B,A,D,C
2243      JSR      PC,TSTATN
2244      ERROR    123          ;ATTN CLEARED IN PORT C AFT RLS FROM PORT D
2245
2246      STDER2   <D,DSC!D.DRA>
2247      RELEAS   A,B,C,D
2248      DRCLR
2249      MOV      TIMER,COUNT
2250      JSR      PC,TMO          ;DO 1.5 SEC TIMEOUT ON PORT D
2251      JSR      PC,TSTATN
2252      SKIP     R,<GOTO NEXT TST>
2253      ERROR    144          ;MULT ATTN ON PORT D
2254      .ENDM      TST16
2255
2256
2257      ; A & B=0 FOR PORT A OR 1 FOR PORT B
2258      ; C & D=A FOR PORT A OR B FOR PORT B
2259
2260      .MACRO    TST20   A,B,C,D
2261      RELEAS   B,A,D,C
2262      STDER2   D,DRA
2263      JSR      PC,SUBCLR
2264      ERROR    24          ;CERR AFTER SCLR
2265
2266      MOV      #B,UNITB          ;SETUP PORT D
2267      MOV      #'D,MSG19A
2268      JSR      PC,DRAV          ;SEE IF DRIVE AVAIL
2269      BR       1$
2270      ERROR    103          ;PORT D AVAIL BEFORE TMO OR RELEASE
2271
2272      1$:      BIT      #CERR,HCS1
2273      BNE      2$
2274      ERROR    130          ;CERR NOT SET BY NO DRA
2275
2276      2$:      JSR      PC,TSTATN
2277      BR       3$
2278      ERROR    115          ;ATTN SET IN PORT D AFTER RLS FROM PORT C
2279
2280      3$:      MOV      #CCLR,RKCS1(R5)
2281      RELEAS   B,A,D,C
2282      RELEAS   A,B,C,D
2283      MOV      TIMER,COUNT
2284      JSR      PC,TMO          ;DO 1.5 SEC TIMEOUT ON PORT D
2285      JSR      PC,TSTATN
2286      BR       4$
2287      ERROR    115          ;ATTN SET ON PORT D AFTER RLS FROM PORT D
2288
2289      4$:      STDER2   0
2290      MOV      #A,UNITB          ;SETUP PORT C
2291      MOV      #'C,MSG19A
2292      JSR      PC,TSTATN
2293

```

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G04

SEQ 0045

```
                SKIP R,<GOTO NEXT TST>
                ERROR 115 ;ATTN SET ON PORT C, AFTER RLS FROM PORT C
.ENDM TST20

; A & B=0 FOR PORT A OR 1 FOR PORT B
; C & D=A FOR PORT A OR B FOR PORT B
;
;MACRO TST22 A,B,C,D
;      SETP A,C
;      RELEAS B,A,D,C
;      STDER2 D,DRA
;ENDM TST22

; A & B=0 FOR PORT A OR 1 FOR PORT B
; C & D=A FOR PORT A OR B FOR PORT B
;
;MACRO TST24 A,B,C,D,E
;      RELEAS B,A,D,C
;      JSR PC,SUBCLR
;      ERROR 24 ;CERR AFTER SCLR

;      MOV #E,RKDC(R5)
;      MOV #SEEK,HCS1
;      JSR PC,DOCMD ;DO SEEK CMD & GET CONTR READY
;      ERROR 131 ;NO RDY AFTER SEEK CMD
;      RELEAS A,B,C,D
;      MOV T50000,TEMP1
;      JSR PC,FATT2
;      ERROR 152 ;NO ATTN ON PORT D AFTER SEEK & RLS FROM PORT C

;      F.EAB <D,DRA!D,DSC>
;      CHECK 145,146,147,150,<AFTER SEEK & RLS FROM PORT C>,0,0,0
;      RELEAS B,A,D,C
;      JSR PC,STATN
;      BR 15
;      ERROR 160 ;ATTN ON PORT C AFTER SEEK & RLS FROM PORT C

1$: F.EAB D,DRA
;      CHECK 145,146,147,150,<AFTER SEEK & RLS FROM PORT C>,0,0,0
;ENDM TST24

; A & B=0 FOR PORT A OR 1 FOR PORT B
; C & D=A FOR PORT A OR B FOR PORT B
;
;MACRO TST26 A,B,C,D
;      JSR PC,SUBCLR
;      ERROR 24 ;CERR AFTER SCLR
;      RELEAS B,A,D,C
;      JSR PC,SUBCLR
;      ERROR 24 ;CERR AFTER SCLR

;      MOV #30.,COUNT
```

```

2350      JSR      PC,TMO          ;DO 500MS TIMEOUT
2351      JSR      PC,DRAV         ;RE-SEIZE DRIVE THRU PORT C
2352      ERROR    45              ;PORT C NOT AVAIL AFTER TIMEOUT
2353      STDER1    0
2354      MOV      #-1,COUNT
2355      JSR      PC,CLKON         ;TURN ON CLOCK
2356      MOV      #B,UNITB        ;SETUP PORT D
2357      JSR      PC,DRAV         ;SEE IF DRV AVAIL
2358      BR        1$             ;BR IF NO
2359      ERROR    103              ;PORT C AVAIL BEFORE TMO OR RLS
2360      1$:      MOV      #'D,MSG19A
2361      MOV      $UNIT,R4
2362      ADD      UNITB,R4
2363      JSR      PC,FAIT3
2364      ERROR    110              ;NO ATTN ON PORT D TO ALLOW SEIZE
2365
2366      JSR      PC,CLKOF         ;TURN CLOCK OFF
2367      COM      COUNT           ;GET ACTUAL COUNT OF TIMEOUT
2368      CMP      COUNT,#35.       ;COMPARE COUNT AGAINST APPROX 1 SEC
2369      SKIP     GE,<GO TO NEXT TEST>
2370      ERROR    153              ;TIMEOUT DID NOT RE-TRIGGER
2371      .ENDM    TST26
2372
2373      ;A & B=0 FOR PORT A OR 1 FOR PORT B
2374      ;C & D=A FOR PORT A OR B FOR PORT B
2375
2376      .MACRO    TST30    A,B,C,D
2377      JSR      PC,SUBCLR
2378      ERROR    24              ;CERR AFTER SCLR
2379      RELEAS    B,A,D,C
2380      JSR      PC,SUBCLR
2381      ERROR    24              ;CERR AFTER SCLR
2382
2383      MOV      #B,UNITB        ;SETUP FOR PORT D
2384      MOV      #'D,MSG19A
2385      JSR      PC,DRAV         ;PORT D TRIES TO SEIZE THE DRIVE
2386      BR        1$             ;BR IF NOT AVAIL
2387      ERROR    103              ;PORT D AVAIL BEFORE TMO OR RELEASE
2388
2389      1$:      MOV      #CCLR,RKCS1(R5)
2390      RELEAS    A,B,C,D
2391      MOV      #A,UNITB        ;SETUP FOR PORT C
2392      MOV      #'C,MSG19A
2393      JSR      PC,DRAV
2394      BR        2$             ;PORT C AVAIL BEFORE TMO OR RELEASE
2395      ERROR    103
2396
2397      2$:      MOV      #CCLR,RKCS1(R5)
2398      MOV      #-1,COUNT
2399      JSR      PC,CLKON
2400      MOV      $UNIT,R4
2401      ADD      UNITB,R4
2402      JSR      PC,FAIT3
2403      ERROR    110              ;NO ATTN ON PORT C TO ALLOW SEIZE
2404
2405

```

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2406      JSR      PC,CLKOF      ;TURN CLOCK OFF
2407      COM      COUNT        ;GET ACTUAL COUNT OF TIMEOUT
2408      CMP      COUNT,#35.    ;COMPARE AGAINST APPROX 1 SEC
2409      SKIP     GE,<GO TO NEXT TST>
2410      ERROR    153           ;TIMEOUT DID NOT RE-TRIGGER
2411      .ENDM    TST30
2412
2413      ;A & B=0 FOR PORT A OR 1 FOR PORT B
2414      ;C & D=A FOR PORT A OR B FOR PORT B
2415
2416      .MACRO    TST32      A,B,C,D
2417      RELEAS   B,A,D,C
2418      JSR      PC,SUBCLR
2419      ERROR    24           ;CERR AFTER SCLR
2420
2421      INC      UNLD          ;USED FOR VALID HALT
2422      MOV      #25,$ESCAPE
2423      MOV      #UNLOAD,HCS1 ;UNLOAD CMD
2424      BIS      STMP4,HCS1
2425      MOV      HCS1,RKCS1(R5)
2426      MOV      T10,TEMP1    ;SETUP TIMEOUT
2427      JSR      PC,FATT2      ;FIND ATTN
2428      ERROR    73           ;NO ATTN AFTER UNLD CMD
2429
2430      MOV      #300,COUNT
2431      JSR      PC,TMO        ;DO 5 SEC DELAY
2432      MOV      #B,UNITB     ;SETUP FOR PORT D
2433      MOV      #D,MSG19A
2434      JSR      PC,DRAW
2435      BR       15
2436      ERROR    155          ;PORT D AVAIL BEFORE RLS WHEN UNLOADED
2437                               ;UNLOAD DID NOT INHIBIT TIMERS
2438
2439      1$:      MOV      #CCLR,RKCS1(R5)
2440      RELEAS   A,B,C,D
2441      2$:      CLR      $ESCAPE
2442      QKSRT
2443      CLR      UNLD
2444      .ENDM    TST32
2445
2446      ;A & B=0 FOR PORT A OR 1 FOR PORT B
2447      ;C & D=A FOR PORT A OR B FOR PORT B
2448
2449      .MACRO    TST32A     A,B,C,D
2450      RELEAS   B,A,D,C
2451      JSR      PC,SUBCLR
2452      ERROR    24           ;CERR AFTER SCLR
2453
2454      MOV      #55,$ESCAPE
2455      MOV      LC,RKDC(R5)   ;SEEK TO LAST CYL
2456      QKSEEK
2457      DRCLR
2458
2459      2460
2461

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J04

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SEQ 0048

```

2462      MOV      #RECAL,HCS1      ;RECAL COMMAND
2463      BIS      $TMP4,HCS1
2464      MOV      HCS1,RKCS1(R5)
2465      MOV      $UNIT,R4
2466      ADD      UNITB,R4
2467      1$:      BITB     ATTN(R4),RKASOF+1(R5)      ;SEE IF ATTN SET
2468      BNE      3$      ;BR IF YES
2469
2470      MOV      #B,UNITB      ;SETUP FOR PORT D
2471      MOVB     #'D,MSG19A
2472      JSR      PC,DRVAV      ;SEE IF DRV AVAIL
2473      BR       2$      ;RETURN HERE IF NO
2474      ERROR    177      ;PORT D AVAIL
2475      ;RECAL DID NOT INHIBIT TIMEPS
2476      2$:      MOV      #CLR,RKCS1(R5)
2477      MOV      #A,UNITB
2478      MOVB     #'C,MSG19A      ;SETUP PORT C
2479      JSR      PC,DRVAV      ;SEE IF DRV AVAIL
2480      ERROR    203      ;PORT C NOT REMAIN AVAIL DURING RECAL
2481      BR       1$
2482
2483      3$:      JSR      PC,GSTAT
2484      BIT      #D.PIP,HMR2      ;SEE IF ANY MOTION
2485      BEQ      4$      ;BR IF NO
2486      ERROR    72      ;PIP SET AFTER ATTN REC'D FROM RECAL
2487      4$:      MOV      #120,COUNT
2488      JSR      PC,TMO      ;DO 2 SEC DLY
2489      MOV      #B,UNITB      ;SETUP FOR PORT D
2490      MOVB     #'D,MSG19A
2491      JSR      PC,DRVAV      ;SEE IF DRV NOW AVAIL
2492      ERROR    45      ;PORT D NOT AVAIL AFTER TMO
2493
2494      5$:      CLR      $ESCAPE
2495      .ENDM     TST32A
2496
2497      .NLIST    MD
2498
2499

```

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COMMON TAGS

SEQ 0049

```

2500      .SBTTL  COMMON TAGS
2501
2502      ;*****
2503      ;THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
2504      ;USED IN THE PROGRAM.
2505
2506      001100      .=1100
2507      001100      $CMTAG:      ;;START OF COMMON TAGS
2508      001100      000000      $TSTNM: .BYTE 0      ;;CONTAINS THE TEST NUMBER
2509      001102      000      $ERFLG: .BYTE 0      ;;CONTAINS ERROR FLAG
2510      001103      000      $ICNT: .WORD 0      ;;CONTAINS SUBTEST ITERATION COUNT
2511      001104      000000      $LPADR: .WORD 0      ;;CONTAINS SCOPE LOOP ADDRESS
2512      001106      000000      $LPERR: .WORD 0      ;;CONTAINS SCOPE RETURN FOR ERRORS
2513      001110      000000      $ERTTL: .WORD 0      ;;CONTAINS TOTAL ERRORS DETECTED
2514      001112      000000      $ITEMB: .BYTE 0      ;;CONTAINS ITEM CONTROL BYTE
2515      001114      000      $ERMAX: .BYTE 1      ;;CONTAINS MAX. ERRORS PER TEST
2516      001115      001      $ERRPC: .WORD 0      ;;CONTAINS PC OF LAST ERROR INSTRUCTION
2517      001116      000000      $GDADR: .WORD 0      ;;CONTAINS ADDRESS OF 'GOOD' DATA
2518      001120      000000      $BDADR: .WORD 0      ;;CONTAINS ADDRESS OF 'BAD' DATA
2519      001122      000000      $GDAT: .WORD 0      ;;CONTAINS 'GOOD' DATA
2520      001124      000000      $BDAT: .WORD 0      ;;CONTAINS 'BAD' DATA
2521      001126      000000      .WORD 0      ;;RESERVED--NOT TO BE USED
2522      001130      000000      .WORD 0
2523      001132      000000      .WORD 0
2524      001134      000      $AUTOB: .BYTE 0      ;;AUTOMATIC MODE INDICATOR
2525      001135      000      $INTAG: .BYTE 0      ;;INTERRUPT MODE INDICATOR
2526      001136      000000      .WORD 0
2527      001140      177570      SWR: .WORD DSWR      ;;ADDRESS OF SWITCH REGISTER
2528      001142      177570      DISPLAY: .WORD DDISP      ;;ADDRESS OF DISPLAY REGISTER
2529      001144      177560      $TKS: 177560      ;;TTY KBD STATUS
2530      001146      177562      $TKB: 177562      ;;TTY KBD BUFFER
2531      001150      177564      $TPS: 177564      ;;TTY PRINTER STATUS REG. ADDRESS
2532      001152      177566      $TPB: 177566      ;;TTY PRINTER BUFFER REG. ADDRESS
2533      001154      000      $NULL: .BYTE 0      ;;CONTAINS NULL CHARACTER FOR FILLS
2534      001155      002      $FILLS: .BYTE 2      ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
2535      001156      012      $FILLC: .BYTE 12      ;;INSERT FILL CHARS. AFTER A "LINE FEED"
2536      001157      000      $TPFLG: .BYTE 0      ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
2537      001160      000000      $TMP0: .WORD 0      ;;USER DEFINED
2538      001162      000000      $TMP1: .WORD 0      ;;USER DEFINED
2539      001164      000000      $TMP2: .WORD 0      ;;USER DEFINED
2540      001166      000000      $TMP3: .WORD 0      ;;USER DEFINED
2541      001170      000000      $TMP4: .WORD 0      ;;USER DEFINED
2542      001172      000000      $TMP5: .WORD 0      ;;USER DEFINED
2543      001174      000000      $TIMES: 0      ;;MAX. NUMBER OF ITERATIONS
2544      001176      000000      $ESCAPE: 0      ;;ESCAPE ON ERROR ADDRESS
2545      001200      177607      $BELL: .ASCIZ <207><377><377>      ;;CODE FOR BELL
2546      001204      077      $QUES: .ASCII ??      ;;QUESTION MARK
2547      001205      015      $CRLF: .ASCII <15>      ;;CARRIAGE RETURN
2548      001206      000012      $LF: .ASCIZ <12>      ;;LINE FEED
2549      ;*****
2550      .SBTTL  APT MAILBOX-ETABLE
2551
2552      ;*****
2553      .EVEN
2554      001210      $MAIL:      ;;APT MAILBOX
2555      001210      000000      $MSGTY: .WORD  AMSGTY      ;;MESSAGE TYPE CODE

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SEQ 0050

2556	001212	000000	\$FATAL:	.WORD	AFATAL	;; FATAL ERROR NUMBER
2557	001214	000000	\$TESTN:	.WORD	ATESTN	;; TEST NUMBER
2558	001216	000000	\$PASS:	.WORD	APASS	;; PASS COUNT
2559	001220	000000	\$DEVCT:	.WORD	ADEVCT	;; DEVICE COUNT
2560	001222	000000	\$UNIT:	.WORD	AUNIT	;; I/O UNIT NUMBER
2561	001224	000000	\$MSGAD:	.WORD	AMSGAD	;; MESSAGE ADDRESS
2562	001226	000000	\$MSGLG:	.WORD	AMSGLG	;; MESSAGE LENGTH
2563	001230		\$ETABLE:			;; APT ENVIRONMENT TABLE
2564	001230	000	\$ENV:	.BYTE	AENV	;; ENVIRONMENT BYTE
2565	001231	000	\$ENVM:	.BYTE	AENVM	;; ENVIRONMENT MODE BITS
2566	001232	000000	\$SWREG:	.WORD	ASWREG	;; APT SWITCH REGISTER
2567	001234	000000	\$USWR:	.WORD	AUSWR	;; USER SWITCHES
2568	001236	000000	\$CPUOP:	.WORD	ACPUOP	;; CPU TYPE, OPTIONS
2569			;;			BITS 15-11=CPU TYPE
2570			;;			11/04=01, 11/05=02, 11/20=03, 11/40=04, 11/45=05
2571			;;			11/70=06, PDQ=07, Q=10
2572			;;			BIT 10=REAL TIME CLOCK
2573			;;			BIT 9=FLOATING POINT PROCESSOR
2574			;;			BIT 8=MEMORY MANAGEMENT
2575	001240	000	\$MAMS1:	.BYTE	AMAMS1	;; HIGH ADDRESS, M.S. BYTE
2576	001241	000	\$MTYP1:	.BYTE	AMTYP1	;; MEM. TYPE, BLK#1
2577			;;			MEM. TYPE BYTE -- (HIGH BYTE)
2578			;;			900 NSEC CORE=001
2579			;;			300 NSEC BIPOLAR=002
2580			;;			500 NSEC MOS=003
2581	001242	000000	\$MADR1:	.WORD	AMADR1	;; HIGH ADDRESS, BLK#1
2582			;;			MEM. LAST ADDR.=3 BYTES, THIS WORD AND LOW OF "TYPE" ABOVE
2583	001244	000	\$MAMS2:	.BYTE	AMAMS2	;; HIGH ADDRESS, M.S. BYTE
2584	001245	000	\$MTYP2:	.BYTE	AMTYP2	;; MEM. TYPE, BLK#2
2585	001246	000000	\$MADR2:	.WORD	AMADR2	;; MEM. LAST ADDRESS, BLK#2
2586	001250	000	\$MAMS3:	.BYTE	AMAMS3	;; HIGH ADDRESS, M.S. BYTE
2587	001251	000	\$MTYP3:	.BYTE	AMTYP3	;; MEM. TYPE, BLK#3
2588	001252	000000	\$MADR3:	.WORD	AMADR3	;; MEM. LAST ADDRESS, BLK#3
2589	001254	000	\$MAMS4:	.BYTE	AMAMS4	;; HIGH ADDRESS, M.S. BYTE
2590	001255	000	\$MTYP4:	.BYTE	AMTYP4	;; MEM. TYPE, BLK#4
2591	001256	000000	\$MADR4:	.WORD	AMADR4	;; MEM. LAST ADDRESS, BLK#4
2592	001260	000000	\$VECT1:	.WORD	AVECT1	;; INTERRUPT VECTOR#1, BUS PRIORITY#1
2593	001262	000000	\$VECT2:	.WORD	AVECT2	;; INTERRUPT VECTOR#2, BUS PRIORITY#2
2594	001264	177440	\$BASE:	.WORD	ABASE	;; BASE ADDRESS OF EQUIPMENT UNDER TEST
2595	001266	000000	\$DEVN:	.WORD	ADEVN	;; DEVICE MAP
2596	001270	000000	\$CDW1:	.WORD	ACDW1	;; CONTROLLER DESCRIPTION WORD#1
2597	001272	000000	\$CDW2:	.WORD	ACDW2	;; CONTROLLER DESCRIPTION WORD#2
2598	001274	000000	\$DDW0:	.WORD	ADDW0	;; DEVICE DESCRIPTOR WORD#0
2599	001276	000000	\$DDW1:	.WORD	ADDW1	;; DEVICE DESCRIPTOR WORD#1
2600	001300	000000	\$DDW2:	.WORD	ADDW2	;; DEVICE DESCRIPTOR WORD#2
2601	001302	000000	\$DDW3:	.WORD	ADDW3	;; DEVICE DESCRIPTOR WORD#3
2602	001304	000000	\$DDW4:	.WORD	ADDW4	;; DEVICE DESCRIPTOR WORD#4
2603	001306	000000	\$DDW5:	.WORD	ADDW5	;; DEVICE DESCRIPTOR WORD#5
2604	001310	000000	\$DDW6:	.WORD	ADDW6	;; DEVICE DESCRIPTOR WORD#6
2605	001312	000000	\$DDW7:	.WORD	ADDW7	;; DEVICE DESCRIPTOR WORD#7
2606	001314		\$ETEND:			
2607			.MEXIT			
2608		177440	ABASE=	177440		;; DEFAULT BUSS ADDRESS
2609	001314	000210	RKVEC:	210		;; DEFAULT CONTROLLER INTERRUPT VECTOR
2610	001316	000240	RKPRI:	PR5		;; PRIORITY
2611	001320	172540	PKS:	172540		;; P-CLOCK STATUS REG

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SEQ 0051

2612	001322	172542	PKSB:	172542	;P-CLOCK SET BUFFER
2613	001324	172544	PKRB:	172544	;P-CLOCK READ BUFFER
2614	001326	177546	LKS:	177546	;L-CLOCK STATUS REG.
2615					
2616	001330	000100	LCVEC:	100	;L-CLOCK INTERRUPT VECTOR
2617	001332	000104	PCVEC:	104	;P-CLOCK INTERRUPT VECTOR.
2618					
2619		000114	MEMVEC=	114	;MEMORY PARITY VECTOR
2620		172100	MEMBAS=	172100	;MEMORY PARITY OPTION CSR START ADDR
2621	001334	000000	TRAPPC:	0	;PC FOR MEM CHECK ENABLE TRAP
2622					
2623	001336	000000	PARAM:	0	;1 FOR 220 START, NO DEFAULT
2624	001340	000000	FTITLE:	0	;FLAG FOR PRINTING OUT 1ST PROGRAM TITLE
2625					
2626	001342	000000	DRVPTR:	0	;CONTAINS THE POINTER TO THE DRIVE FLAG
2627					; (DRIVO-DRIV?) OF THE DRIVE TO BE CHECKED NEXT.
2628		000040	SPBAR=	40	;SPACEBAR
2629	001344	000000	FRCYL:	0	;FROM CYLINDER
2630	001346	000000	TOCYL:	0	;TO CYLINDER
2631	001350	000000	CCYL:	0	;CURRENT CYL, USED IN N SQUARE TEST
2632	001352	000000	PCYL:	0	;PREV CYL, USED IN N SQUARE TEST
2633	001354	000000	CALDIF:	0	;CALC CYL DIFF USED IN N SQUARE TEST
2634	001356	000000	CYLDIF:	0	;CYL DIFF, RIGHT JUSTIFIED FROM RKMR3
2635	001360	000000	CYLADD:	0	;CYL ADDR, RIGHT JUSTIFIED FROM RKMR3
2636	001362	000000	CALADD:	0	;CYL ADDR USED IN FHDTAB ROUTINE
2637					
2638	001364	000074	HZ:	60.	;60 FOR 60 CPS
2639					;50 FOR 50 CPS
2640	001366	000000	COUNT:	0	;LOADED TO 50 OR 60 TO COUNT TO 1 SEC
2641					;OR ANY OTHER NUMBER TO COUNT OFF FRACTIONAL SECOND
2642	001370	000000	SEC:	0	;SECOND COUNTER
2643	001372	000000	TIMUP:	0	;FLAG TO INDICATE TIME IS UP
2644	001374	000000	SECTOR:	0	;SECTOR COUNT, RIGHT JUSTIFIED FROM RKMR3
2645					
2646	001376	000001	T1:	1	;TIMEOUT CONSTANTS
2647	001400	000012	T10:	10.	
2648	001402	000062	T50:	50.	
2649	001404	000764	T500:	500.	
2650	001406	010000	T100:	10000	
2651	001410	011610	T5000:	5000.	
2652	001412	141520	T50000:	50000.	
2653					
2654					
2655	001414	000000	WD1:	0	;ACTUAL HEADER/DATA WORD
2656	001416	000000	WD2:	0	;EXPECTED DATA WORD
2657	001420	000000	HEAD:	0	;HEAD NUMBER
2658	001422	000000	HEAD:	0	;HEAD # FROM H.B3, RT. JUSTIFIED
2659	001424	000000	HD1:	0	;SHIFTED HEAD# FOR FORMATTER ROUTINE
2660	001426	000000	FORMAT:	0	;FORMAT TYPE
2661	001430	000000	FMT1:	0	;SHIFTED FORMAT FOR FORMATTER ROUTINE
2662	001432	000000	WDCNT:	0	;WORD COUNT
2663					
2664	001434	000000	DATA0:	0	;ALL 0'S
2665	001436	052525	DATA01:	52525	;0101 PATT
2666	001440	177777	DATA1:	177777	;ALL 1'S
2667	001442	133467	DPAT1:	133467	

NO4

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SEQ 0052

2668	001444	070627			DPAT2:	70627	
2669					WORD:	0	;HEADER/DATA WORD
2670	001446	000000			HDWD:	0	;HEADER WORD FROM RKDB
2671	001450	000000					
2672					BSERR:	0	;CANNOT READ BSE INFO WHEN SET
2673	001452	000000			LIMERR:	0	;LIMIT DETECT ERROR FLAG
2674	001454	000000			BYPERR:	0	;SET TO 1 TO BYPASS CKERR IN 'GSTAT1'
2675	001456	000000			CHKFLG:	0	;WORDS TO BE TESTED
2676	001460	000000					
2677							
2678	001462	000102			HDTAB:	.BLKW 66.	;CALCULATED HEADER WORD TABLE
2679	001666	000102			RHTAB:	.BLKW 66.	;FILLED AFTER READ HEADER CMD
2680	002072	000102			SRTTAB:	.BLKW 66.	;ABOVE RHTAB SORTED STARTING FORM
2681							;SECTOR 0 BY SORT ROUTINE
2682	002276	000400			BSE22H:	.BLKW 256.	;22 SECTOR HARDWARE BSE INFO.
2683	003276	000400			BSE22S:	.BLKW 256.	;22 SECTOR SOFTWARE BSE INFO.
2684	004276	000400			RDTAB:	.BLKW 256.	;FILLED AFTER READ DATA CMD
2685							
2686	005276	000000			UNLD:	0	;SET TO 0 IF HEADS ARE LOADED
2687							;SET TO 1 IF HEADS UNLOADED
2688	005300	000000			BADHDR:	0	;SET TO 0 IF FORMATTING OK
2689							;SET TO 1 IF FORMATTING ALTERED
2690	005302	000000			HPEND:	0	;SET TO 0 IF HALT NOT PENDING
2691							;SET TO 1 IF HALT PENDING
2692							
2693							;THE ABOVE 3 FLAGS ARE USED
2694							;BY 'STOP' ROUTINE TO BRING
2695							;THE CPU TO A VALID HALT.
2696							
2697							
2698	005304	001	002	004	ATTN:	.BYTE 1,2,4,10,20,40,100,200	;ATN 0-7 RESP.
2699	005307	010	020	040			
2700	005312	100	200				
2701						.EVEN	
2702							
2703							
2704							;THE FOLLOWING ARE HOLDING REGISTERS FOR THE RK611 REGISTERS
2705							;THEY ARE LOADED AFTER RDY IS REC'D FROM WRDY ROUTINE.
2706							
2707							
2708	005314	000000			HCS1:	0	;HOLD RKCS1
2709	005316	000000			HCS2:	0	;HOLD RKCS2
2710	005320	000000			HWC:	0	;HOLD RKWC
2711	005322	000000			HBA:	0	;ETC.
2712	005324	000000			HDA:	0	
2713	005326	000000			HDS:	0	
2714	005330	000000			HER:	0	
2715	005332	000000			HASOF:	0	
2716	005334	000000			HOC:	0	
2717	005336	000000			HOB:	0	
2718	005340	000000			HMR1:	0	
2719	005342	000000			HMR2:	0	
2720	005344	000000			HMR3:	0	
2721	005346	000000			HPOS:	0	
2722	005350	000000			HPAT:	0	
2723							

```

2724
2725 005352 000000      TEMP1: 0          ;TEMPORARY STORAGE.
2726 005354 000000      TEMP2: 0
2727 005356 000000      TEMP3: 0
2728 005360 000000      TEMP4: 0
2729 005362 000000      TEMP5: 0
2730
2731      ;THE FOLLOWING ARE HOLDING REGISTERS FOR MSGA(0-3) & MSGB(0-3).
2732
2733 005364 000000      H.A0: 0
2734 005366 000000      H.B0: 0
2735 005370 000000      H.A1: 0
2736 005372 000000      H.B1: 0
2737 005374 000000      H.A2: 0
2738 005376 000000      H.B2: 0
2739 005400 000000      H.A3: 0
2740 005402 000000      H.B3: 0
2741
2742      ;THE FOLLOWING ARE 'EXPECTED' REGISTER FOR THE ABOVE.
2743
2744 005404 000000      E.A0: 0
2745 005406 000000      E.B0: 0
2746 005410 000000      E.A1: 0
2747 005412 000000      E.B1: 0
2748 005414 000000      E.A2: 0
2749 005416 000000      E.B2: 0
2750 005420 000000      E.A3: 0
2751 005422 000000      E.B3: 0
2752
2753      ;THE FOLLOWING ARE IDENTIFIERS FOR DRIVE MSG WORDS TO BE TESTED.
2754
2755      T.A2=BIT0          ;TEST MSG A2 IF SET
2756      T.B2=BIT1
2757      T.B3=BIT2
2758
2759      ;ALL THE FLAGS BELOW ARE CLEARED INITIALLY BY THE CLRFLG ROUTINE.
2760
2761 005424 000000      DDUMP: 0          ;FLAG - SET WHEN IN DDP DUMP MODE
2762 005426 000000      DDPCH: 0        ;FLAG - SET WHEN IN DDP CHAIN MODE
2763 005430 000000      ACT11: 0       ;FLAG - SET WHEN IN ACT11 MODE OF OPERATION
2764 005432 000000      PPTP: 0        ;FLAG - SET WHEN PROGRAM LOADED BY PAPER TAPE
2765 005434 000000      DRIVS: 0       ;CONTAINS THE NUMBER OF DRIVES PRESENT
2766
2767      ;THE FLAGS BELOW ARE SET TO 1 TO INDICATE THAT A PARTICULAR DRIVE
2768      ;IS PRESENT AND IS TO BE TESTED.
2769      ;ONLY DRIVES 0,2,4,6 CAN BE TESTED.
2770
2771 005436 000000      DRIV0: 0          ;FLAG SET TO 1 WHEN DRIVE 0 PRESENT
2772 005440 000000      DRIV1: 0        ;FOR DRIVE 1
2773 005442 000000      DRIV2: 0        ;FOR DRIVE 2
2774 005444 000000      DRIV3: 0        ;FOR DRIVE 3
2775 005446 000000      DRIV4: 0        ;FOR DRIVE 4
2776 005450 000000      DRIV5: 0        ;FOR DRIVE 5
2777 005452 000000      DRIV6: 0        ;FOR DRIVE 6
2778 005454 000000      DRIV7: 0        ;FOR DRIVE 7
2779

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APT MAILBOX-ETABLE

SEQ 0054

2780 005456 000000
2781 005460 000000
2782 005462 000000
2783 005464 000000
2784
2785 005466 000132

LCLKF: 0
PCLKF: 0
SIZFLG: 0
UNITB: 0

TIMER: 90.

;L-CLOCK FLAG PRESENT FLAG
;P-CLOCK FLAG PRESENT FLAG
;SET IF DEFAULT DO SIZING IN TEST 1
;0 FOR PORT A: DRIVES 0,2,4,6
;1 FOR PORT B: DRIVES 1,3,5,7
;TIMER FOR 1.5 SEC

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ERROR POINTER TABLE

SEQ 0055

.SBTTL ERROR POINTER TABLE

;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
;*LOCATION \$ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
;*NOTE1: IF \$ITEMB IS 0 THE ONLY PERTINENT DATA IS (\$ERRPC).
;*NOTE2: EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

;* EM ;POINTS TO THE ERROR MESSAGE
;* DH ;POINTS TO THE DATA HEADER
;* DT ;POINTS TO THE DATA
;* DF ;POINTS TO THE DATA FORMAT

\$ERRTB:

;ERROR 1			
	EM2		;DR # IN RKCS2 CANNOT BE READ BACK CORRECTLY IN RKMR2
	DH1		
	DT1		
	DF1		
;ERROR 2			
	EM5		;DETECTED MDS
	DH1		
	DT1		
	DF1		
;ERROR 3			
	EM6		;DETECTED UFE
	DH1		
	DT1		
	DF1		
;ERROR 4			
	EM7		;DETECTED DRA & NED RESET (WRONG PORT SELECTED?)
	DH1		
	DT1		
	DF1		
;ERROR 5			
	0		
	0		
	0		
	0		
;ERROR 6			
	EM9		;DR NOT PRESENT BUT SPECIFIED BY OPERATOR
	DH1		
	DT1		
	DF1		
;ERROR 7			
	EM10		;ABORT TEST, COULD NOT REFERENCE CONTROLLER REGISTER
	DH1		
	DT1		
	DF1		

2786
2787
2788
2789
2790
2791
2792
2793
2794
2795
2796
2797
2798
2799
2800 005470
2801
2802
2803 005470 057111
2804 005472 062540
2805 005474 065512
2806 005476 066314
2807
2808
2809 005500 057330
2810 005502 062540
2811 005504 065512
2812 005506 066314
2813
2814
2815 005510 057351
2816 005512 062540
2817 005514 065512
2818 005516 066314
2819
2820
2821 005520 057372
2822 005522 062540
2823 005524 065512
2824 005526 066314
2825
2826 005530 000000
2827 005532 000000
2828 005534 000000
2829 005536 000000
2830
2831
2832 005540 057636
2833 005542 062540
2834 005544 065512
2835 005546 066314
2836
2837
2838 005550 057712
2839 005552 062540
2840 005554 065512
2841 005556 066314

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ERROR POINTER TABLE

SEQ 0056

2842			;ERROR 10	
2843	005560	057775	EM11	;DRA & NED BOTH SET
2844	005562	062540	DH1	
2845	005564	065512	DT1	
2846	005566	066314	DF1	
2847			;ERR 11	
2848	005570	060041	EM12	;NO RDY
2849	005572	064302	DH27	;AFTER WRITE DATA CMD
2850	005574	065512	DT1	
2851	005576	066444	DF10	
2852			;ERR 12	
2853	005600	060435	EM21	;CERR SET
2854	005602	064302	DH27	
2855	005604	065512	DT1	
2856	005606	066444	DF10	
2857			;ERR 13	
2858	005610	060041	EM12	;NO RDY
2859	005612	064252	DH26	;AFTER READ DATA CMD
2860	005614	065512	DT1	
2861	005616	066444	DF10	
2862			;ERR 14	
2863	005620	060435	EM21	;CERR SET
2864	005622	064252	DH26	
2865	005624	065512	DT1	
2866	005626	066444	DF10	
2867			;ERR 15	
2868	005630	060041	EM12	;NO RDY
2869	005632	064432	DH32	;AFTER WRITE CHECK CMD
2870	005634	065512	DT1	
2871	005636	066444	DF10	
2872			;ERR 16	
2873	005640	062220	EM80	;WRITE CHECK ERROR SET
2874	005642	064432	DH32	;AFTER WRITE CHECK CMD
2875	005644	065624	DT6	
2876	005646	066334	DF3	
2877			;ERR 17	
2878	005650	060121	EM14	;UNEXP MEM PARITY TRAP
2879	005652	063176	DH8	;TEST #, TRAP PC
2880	005654	065552	DT3	
2881	005656	066330	DF2	
2882			;ERR 20	
2883	005660	062257	EM82	;READ DATA NOT COMPARE WITH WRITE DATA
2884	005662	064252	DH26	;AFTER READ DATA CMD
2885	005664	065624	DT6	
2886				
2887	005666	066334	DF3	
2888			;ERR 21	
2889	005670	062331	EM83	;DATA CHECK ERROR
2890	005672	064252	DH26	
2891	005674	065512	DT1	
2892				
2893	005676	066444	DF10	
2894			;ERR 22	
2895	005700	060435	EM21	;CERR SET
2896	005702	064432	DH32	;AFTER WRITE CHECK CMD
2897	005704	065512	DT1	

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ERROR POINTER TABLE

SEQ 0057

2898	005706	066444	DF10	
2899			;ERR 23	
2900	005710	060352	EM18	;MSG B0 ERROR
2901	005712	064302	DH27	;AFTER WRITE DATA CMD
2902	005714	066050	DT13	
2903	005716	066574	DF21	
2904			;ERROR 24	
2905	005720	060435	EM21	;CERR SET
2906	005722	064052	DH21	;AFTER SCLR
2907	005724	065512	DT1	
2908	005726	066444	DF10	
2909			;ERR 25	
2910	005730	060414	EM20	;MSG B1 ERROR
2911	005732	064302	DH27	
2912	005734	066050	DT13	
2913	005736	066574	DF21	
2914			;ERR 26	
2915	005740	060352	EM18	
2916	005742	064252	DH26	;AFTER READ DATA CMD
2917	005744	066050	DT13	
2918	005746	066574	DF21	
2919			;ERROR 27	
2920			EM24	;VOL VALID NOT SET
2921	005750	060664	DH19	;AFTER PACK CMD
2922	005752	063774	DT1	
2923	005754	065512	DF10	
2924	005756	066444		
2925			;ERR 30	
2926	005760	060414	EM20	;MSG B1 ERROR
2927	005762	064252	DH26	;AFTER READ DATA CMD.
2928	005764	066050	DT13	
2929	005766	066574	DF21	
2930			;ERR 31	
2931	005770	060352	EM18	;MSG B0 ERROR
2932	005772	064432	DH32	;AFTER WRITE CHECK CMD
2933	005774	066050	DT13	
2934	005776	066574	DF21	
2935			;ERR 32	
2936	006000	060414	EM20	;MSG B1 ERROR
2937	006002	064432	DH32	
2938	006004	066050	DT13	
2939	006006	066574	DF21	
2940			;ERR 33	
2941	006010	060331	EM17	;AO ERROR
2942	006012	064100	DH22	;AFTER DRIVE CLR CMD
2943	006014	066050	DT13	
2944	006016	066574	DF21	
2945			;ERR 34	
2946	006020	060352	EM18	;B0 ERROR
2947	006022	064100	DH22	
2948	006024	066050	DT13	
2949	006026	066574	DF21	
2950			;ERR 35	
2951	006030	060373	EM19	
2952	006032	064100	DH22	
2953	006034	066050	DT13	

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ERROR POINTER TABLE

SEQ 0058

2954	006036	066574	DF21	
2955			;ERR 36	
2956	006040	060414	EM20	
2957	006042	064100	DH22	
2958	006044	066050	DT13	
2959	006046	066574	DF21	
2960			;ERR 37	
2961	006050	060331	EM17	;AD ERROR
2962	006052	064720	DH39	;AFTER WRITE HEADER CMD
2963	006054	066050	DT13	
2964	006056	066574	DF21	
2965			;ERR 40	
2966	006060	060352	EM18	
2967	006062	064720	DH39	
2968	006064	066050	DT13	
2969	006066	066574	DF21	
2970			;ERR 41	
2971	006070	060373	EM19	
2972	006072	064720	DH39	
2973	006074	066050	DT13	
2974	006076	066574	DF21	
2975			;ERR 42	
2976	006100	060414	EM20	
2977	006102	064720	DH39	
2978	006104	066050	DT13	
2979	006106	066574	DF21	
2980			;ERR 43	
2981	006110	060771	EM26	;BSE ERROR IN WRITE CMD NOT ON BSE TABLE
2982	006112	064302	DH27	;AFTER WRITE DATA CMD
2983	006114	065512	DT1	
2984	006116	066444	DF10	
2985			;ERR 44	
2986	006120	060157	EM15	;WCE AT CYL 411, TRK 2, SEC 21
2987	006122	062540	DH1	
2988	006124	065512	DT1	
2989	006126	066360	DF4	
2990			;ERR 45	
2991	006130	061364	EM31	;PORT NOT AVAIL
2992	006132	062742	DH5	;AFTER TIMEOUT
2993	006134	065512	DT1	
2994	006136	066444	DF10	
2995			;ERR 46	
2996	006140	060717	EM25	;DETECTED 10 BAD SECTORS
2997	006142	064302	DH27	;AFTER WRITE DATA CMD.
2998	006144	065512	DT1	
2999	006146	066444	DF10	
3000			;ERROR 47	
3001	006150	061675	EM39	;CYL DIFF/OFFSET IN RKMR2 NOT CLEARED
3002	006152	063723	DH17	;AFTER RECAL CMD
3003	006154	066130	DT14	
3004	006156	066630	DF22	
3005			;ERROR 50	
3006	006160	061744	EM40	;CYL ADDR IN RKMR3 NOT CLEARED
3007	006162	063723	DH17	;AFTER RECAL COMD
3008	006164	066130	DT14	
3009	006166	066630	DF22	

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ERROR POINTER TABLE

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SEQ 0059

3010			;ERR 51	EM93	;WRONG CYL# IN HEADER WORD (MISPOSITION)
3011	006170	062457		DH25	;AFTER SEEK CMD
3012	006172	064227		DT9	
3013	006174	066004		DF20	
3014	006176	066550			
3015			;ERR 52	EM17	;MSG AO ERROR
3016	006200	060331		DH27	;AFTER WRITE DATA CMD
3017	006202	064302		DT13	
3018	006204	066050		DF21	
3019	006206	066574			
3020			;ERR 53	EM19	;MSG A1 ERROR
3021	006210	060373		DH27	
3022	006212	064302		DT13	
3023	006214	066050		DF21	
3024	006216	066574			
3025			;ERR 54	EM17	;MSG AO ERROR
3026	006220	060331		DH26	;AFTER READ DATA CMD
3027	006222	064252		DT13	
3028	006224	066050		DF21	
3029	006226	066574			
3030			;ERROR 55	EM13	;NO ATTN
3031	006230	060077		DH17	;AFTER RECAL CMD
3032	006232	063723		DT1	
3033	006234	065512		DF10	
3034	006236	066444			
3035			;ERR 56	EM19	;MSG A1 ERROR
3036	006240	060373		DH26	
3037	006242	064252		DT13	
3038	006244	066050		DF21	
3039	006246	066574			
3040			;ERR 57	EM17	;MSG AO ERROR
3041	006250	060331		DH32	;AFTER WRITE CHECK CMD
3042	006252	064432		DT13	
3043	006254	066050		DF21	
3044	006256	066574			
3045			;ERR 60	EM19	;MSG A1 ERROR
3046	006260	060373		DH32	
3047	006262	064432		DT13	
3048	006264	066050		DF21	
3049	006266	066574			
3050			;ERR 61	EM17	;AO ERROR
3051	006270	060331		DH30	;AFTER READ HEADER CMD
3052	006272	064353		DT13	
3053	006274	066050		DF21	
3054	006276	066574			
3055			;ERR 62	EM18	
3056	006300	060352		DH30	
3057	006302	064353		DT13	
3058	006304	066050		DF21	
3059	006306	066574			
3060			;ERR 63	EM19	
3061	006310	060373		DH30	
3062	006312	064353		DT13	
3063	006314	066050		DF21	
3064	006316	066574			
3065			;ERR 64		

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ERROR POINTER TABLE

SEQ 0060

3066	006320	060414	EM20	
3067	006322	064353	DH30	
3068	006324	066050	DT13	
3069	006326	066574	DF21	
3070			;ERR 65	
3071	006330	061050	EM27	;DETECTED BSE IN READ BUT NOT IN WRITE CMD.
3072	006332	062540	DH1	
3073	006334	065512	DT1	
3074	006336	066314	DF1	
3075			;ERR 66	
3076	006340	060352	EM18	;BD ERROR
3077	006342	063723	DH17	;AFTER RECAL CMD
3078	006344	066050	DT13	
3079	006346	066574	DF21	
3080			;ERR 67	
3081	006350	060414	EM20	
3082	006352	063723	DH17	
3083	006354	066050	DT13	
3084	006356	066574	DF21	
3085			;ERR 70	
3086	006360	062152	EM74	;RTZ NOT SET
3087	006362	065007	DH41	;DURING RECAL CMD
3088	006364	065512	DT1	
3089	006366	066444	DF10	
3090			;ERR 71	
3091	006370	061364	EM31	;PORT NOT AVAIL
3092	006372	064464	DH35	;AFTER RLS
3093	006374	065512	DT1	
3094	006376	066444	DF10	
3095			;ERR 72	
3096	006400	061343	EM30	;PIP SET
3097	006402	062676	DH4	;AFTER ATTN REC'D FROM RECAL
3098	006404	065512	DT1	
3099	006406	066444	DF10	
3100			;ERR 73	
3101	006410	060077	EM13	;NO ATTN
3102	006412	063747	DH18	;AFTER UNLOAD CMD
3103	006414	065512	DT1	
3104	006416	066444	DF10	
3105			;ERR 74	
3106	006420	060077	EM13	;NO ATTN
3107	006422	063272	DH10	;AT END OF HEAD LOADING
3108	006424	065512	DT1	
3109	006426	066444	DF10	
3110			;ERR 75	
3111	006430	060457	EM22	;NO DRIVS IN \$DEVN
3112	006432	062540	DH1	
3113	006434	065512	DT1	
3114	006436	066314	DF1	
3115			;ERR 76	
3116	006440	060564	EM23	;NO DRIVS ON BUSS
3117	006442	062540	DH1	
3118	006444	065512	DT1	
3119	006446	066314	DF1	
3120			;ERR 77	
3121	006450	060331	EM17	;AD ERROR

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ERROR POINTER TABLE

SEQ 0061

3122	006452	062742	DH5		
3123	006454	066050	DT13		
3124	006456	066574	DF21		
3125				;ERR 100	
3126	006460	060352	EM18		
3127	006462	062742	DH5		
3128	006464	066050	DT13		
3129	006466	066574	DF21		
3130				;ERR 101	
3131	006470	060373	EM19		
3132	006472	062742	DH5		
3133	006474	066050	DT13		
3134	006476	066574	DF21		
3135				;ERR 102	
3136	006500	060414	EM20		
3137	006502	062742	DH5		
3138	006504	066050	DT13		
3139	006506	066574	DF21		
3140				;ERR 103	
3141	006510	061407	EM32		
3142	006512	063513	DH14		
3143	006514	065512	DT1		
3144	006516	066444	DF10		
3145				;ERR 104	
3146	006520	060331	EM17		
3147	006522	063545	DH15		
3148	006524	066050	DT13		
3149	006526	066574	DF21		
3150				;ERR 105	
3151	006530	060352	EM18		
3152	006532	063545	DH15		
3153	006534	066050	DT13		
3154	006536	066574	DF21		
3155				;ERR 106	
3156	006540	060373	EM19		
3157	006542	063545	DH15		
3158	006544	066050	DT13		
3159	006546	066574	DF21		
3160				;ERR 107	
3161	006550	060414	EM20		
3162	006552	063545	DH15		
3163	006554	066050	DT13		
3164	006556	066574	DF21		
3165				;ERR 110	
3166	006560	060077	EM13		
3167	006562	063574	DH16		
3168	006564	065512	DT1		
3169	006566	066444	DF10		
3170				;ERR 111	
3171	006570	061426	EM33		
3172	006572	064132	DH23		
3173	006574	065512	DT1		
3174	006576	066444	DF10		
3175				;ERR 112	
3176	006600	060077	EM13		
3177	006602	062742	DH5		

;AFTER TMO

;PORT AVAIL
;BEFORE TMO OR RLS;AO ERROR
;WHILE PORT UNAVAIL;NO ATTN
;TO ALLOW PORT TO SEIZE;ATTN SET
;W/O REQUEST PENDING;NO ATTN
;AFT TMO

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ERROR POINTER TABLE

SEQ 0062

3178	006604	065512	DT1	
3179	006606	066444	DF10	
3180			;ERR 113	
3181	006610	061364	EM31	;PORT NO AVAIL
3182	006612	064100	DH22	;AFTER DRIVE CLEAR CMD
3183	006614	065512	DT1	
3184	006616	066444	DF10	
3185			;ERR 114	
3186	006620	061451	EM34	;ATTN CLEARED
3187	006622	064162	DH24	;BY DR CLR TO OTHER PORT.
3188	006624	065512	DT1	
3189	006626	066444	DF10	
3190			;ERR 115	
3191	006630	061426	EM33	;ATTN SET
3192	006632	064464	DH35	;AFT RELEASE ISSUED
3193	006634	065512	DT1	
3194	006636	066444	DF10	
3195			;ERROR 116	
3196	006640	060041	EM12	;CONT NOT RDY
3197	006642	063774	DH19	;AFTER PACK CMD
3198	006644	065512	DT1	
3199	006646	066444	DF10	
3200			;ERROR 117	
3201	006650	060041	EM12	;CONT NOT RDY
3202	006652	064017	DH20	;AFTER SEL DR CMD
3203	006654	065512	DT1	
3204	006656	066444	DF10	
3205			;ERROR 120	
3206	006660	060041	EM12	
3207	006662	064052	DH21	;AFTER SUBSYS CLEAR
3208	006664	065512	DT1	
3209	006666	066444	DF10	
3210			;ERROR 121	
3211	006670	060041	EM12	
3212	006672	063217	DH9	;AFTER START SPINDLE CMD
3213	006674	065512	DT1	
3214	006676	066444	DF10	
3215			;ERR 122	
3216	006700	060077	EM13	;NO ATTN
3217	006702	064572	DH37	;AFT RLS & REQUEST PENDING
3218	006704	065512	DT1	
3219	006706	066444	DF10	
3220			;ERR 123	
3221	006710	061451	EM34	;ATTN CLEARED
3222	006712	064464	DH35	;AFTER RELEASE
3223	006714	065512	DT1	
3224	006716	066444	DF10	
3225			;ERROR 124	
3226	006720	060041	EM12	
3227	006722	063723	DH17	;AFTER RECAL CMD
3228	006724	065512	DT1	
3229	006726	066444	DF10	
3230			;ERR 125	
3231	006730	062131	EM73	;CTO SET
3232	006732	062366	EM84	;WHILE WAITING FOR OR REC'D CONTR RDY. MSG A&B BAD
3233	006734	065512	DT1	

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ERROR POINTER TABLE

SEQ 0063

3234	006736	066374	DF5	
3235			;ERR 126	
3236	006740	062177	EM79	;NED SET
3237	006742	062366	EM84	
3238	006744	065512	DT1	
3239	006746	066374	DF5	
3240			;ERR 127	
3241	006750	057330	EM5	;MDS SET
3242	006752	062366	EM84	
3243	006754	065512	DT1	
3244	006756	066374	DF5	
3245			;ERROR 130	
3246	006760	061500	EM35	;CERR NOT SET
3247	006762	064511	DH36	;AFT SEL DRV CMD & NO DRA
3248	006764	065512	DT1	
3249	006766	066444	DF10	
3250			;ERROR 131	
3251	006770	060041	EM12	;NO RDY
3252	006772	064227	DH25	;AFTER SEEK CMD
3253	006774	065512	DT1	
3254	006776	066444	DF10	
3255			;ERROR 132	
3256	007000	060077	EM13	;NO ATTN
3257	007002	064227	DH25	
3258	007004	065512	DT1	
3259	007006	066444	DF10	
3260			;ERR 133	
3261	007010	060331	EM17	;AO ERROR
3262	007012	064464	DH35	;AFTER RLS ISSUED
3263	007014	066050	DT13	
3264	007016	066574	DF21	
3265			;ERR 134	
3266	007020	060352	EM18	
3267	007022	064464	DH35	
3268	007024	066050	DT13	
3269	007026	066574	DF21	
3270			;ERR 135	
3271	007030	060373	EM19	
3272	007032	064464	DH35	
3273	007034	066050	DT13	
3274	007036	066574	DF21	
3275			;ERR 136	
3276	007040	060414	EM20	
3277	007042	064464	DH35	
3278	007044	066050	DT13	
3279	007046	066574	DF21	
3280			;ERROR 137	
3281	007050	061675	EM39	;CYL DIFF/OFFSET IN RKMR2 NOT CLEARED
3282	007052	064227	DH25	
3283	007054	065512	DT1	
3284	007056	066444	DF10	
3285			;ERR 140	
3286	007060	060331	EM17	;MSG AO ERROR
3287	007062	065433	DH51	;AFTER SEEK TO SELF
3288	007064	066050	DT13	
3289	007066	066574	DF21	

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ERROR POINTER TABLE

SEQ 0064

3290			;ERR 141	
3291	007070	060352	EM18	
3292	007072	065433	DH51	
3293	007074	066050	DT13	
3294	007076	066574	DF21	
3295			;ERR 142	
3296	007100	060373	EM19	
3297	007102	065433	DH51	
3298	007104	066050	DT13	
3299	007106	066574	DF21	
3300			;ERR 143	
3301	007110	060414	EM20	
3302	007112	065433	DH51	
3303	007114	066050	DT13	
3304	007116	066574	DF21	
3305			;ERR 144	
3306	007120	061571	EM37	;MULT ATTN
3307	007122	062742	DH5	;AFTER TMO
3308	007124	065512	DT1	
3309	007126	066444	DF10	
3310			;ERR 145	
3311	007130	060331	EM17	;AO ERROR
3312	007132	064646	DH38	;AFTER SEEK & IMMED RELEASE
3313	007134	066050	DT13	
3314	007136	066574	DF21	
3315			;ERR 146	
3316	007140	060352	EM18	
3317	007142	064646	DH38	
3318	007144	066050	DT13	
3319	007146	066574	DF21	
3320			;ERR 147	
3321	007150	060373	EM19	
3322	007152	064646	DH38	
3323	007154	066050	DT13	
3324	007156	066574	DF21	
3325			;ERR 150	
3326	007160	060414	EM20	
3327	007162	064646	DH38	
3328	007164	066050	DT13	
3329	007166	066574	DF21	
3330			;ERROR 151	
3331	007170	060041	EM12	;NO RDY
3332	007172	064100	DH22	;AFTER CLEAR CMD
3333	007174	065512	DT1	
3334	007176	066444	DF10	
3335			;ERR 152	
3336	007200	060077	EM13	;NO ATTN
3337	007202	064646	DH38	;AFTER SEEK & IMMED RLS
3338	007204	065512	DT1	
3339	007206	066444	DF10	
3340			;ERR 153	
3341	007210	061622	EM38	;RE-TRIGGER NO GOOD
3342	007212	065154	DH43	;AFTER RE-SEIZE MIDWAY THRU TMO
3343	007214	065512	DT1	
3344	007216	066444	DF10	
3345			;ERROR 154	

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ERROR POINTER TABLE

SEQ 0065

3346 007220 062002
3347 007222 064100
3348 007224 065512
3349 007226 066444
3350

EM55
DH22
DT1
DF10

:ATTN NOT CLEARED

:ERR 155

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ERROR POINTER TABLE

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SEQ 0066

3351 007230 061275
3352 007232 065312
3353 007234 065512

EM29
DH45
DT1

;PORT AVAIL-TIMERS NOT INHIB.
;BEFORE RLS WHEN UNLOADED

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ERROR POINTER TABLE

SEQ 0067

3354	007236	066444	DF10	
3355			;ERR 156	
3356	007240	060077	EM13	;NO ATTN
3357	007242	064227	DH25	;AFTER SEEK CMD
3358	007244	065512	DT1	
3359	007246	066444	DF10	
3360			;ERR 157	
3361	007250	061364	EM31	;PORT NOT AVAIL
3362	007252	064227	DH25	;AFTER SEEK CMD
3363	007254	065512	DT1	
3364	007256	066444	DF10	
3365			;ERROR 160	
3366	007260	061426	EM33	;ATTN SET
3367	007262	064646	DH38	;AFTER SEEK & IMMED RLS
3368	007264	065512	DT1	
3369	007266	066444	DF10	
3370			;ERR 161	
3371	007270	060331	EM17	;MSG AD ERROR
3372	007272	064227	DH25	;AFTER SEEK CMD
3373	007274	066050	DT13	
3374	007276	066574	DF21	
3375			;ERR 162	
3376	007300	060352	EM18	
3377	007302	064227	DH25	
3378	007304	066050	DT13	
3379	007306	066574	DF21	
3380			;ERR 163	
3381	007310	060373	EM19	
3382	007312	064227	DH25	
3383	007314	066050	DT13	
3384	007316	066574	DF21	
3385			;ERR 164	
3386	007320	060414	EM20	
3387	007322	064227	DH25	
3388	007324	066050	DT13	
3389	007326	066574	DF21	
3390			;ERR 165	
3391	007330	060331	EM17	;MSG AD ERROR
3392	007332	062742	DH5	;AFTER TMO
3393	007334	066050	DT13	
3394	007336	066574	DF21	
3395			;ERR 166	
3396	007340	060352	EM18	
3397	007342	062742	DH5	
3398	007344	066050	DT13	
3399	007346	066574	DF21	
3400			;ERR 167	
3401	007350	060373	EM19	
3402	007352	062742	DH5	
3403	007354	066050	DT13	
3404	007356	066574	DF21	
3405			;ERR 170	
3406	007360	060414	EM20	
3407	007362	062742	DH5	
3408	007364	066050	DT13	
3409	007366	066574	DF21	

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ERROR POINTER TABLE

SEQ 0068

3410			; ERROR 171	
3411	007370	060041	EM12	; NO RDY
3412	007372	064353	DH30	; AFTER READ HEADER CMD
3413	007374	065512	DT1	
3414	007376	066444	DF10	
3415			; ERROR 172	
3416	007400	061364	EM31	; PORT NOT AVAIL
3417	007402	064464	DH35	; AFT RELEASE
3418	007404	065512	DT1	
3419	007406	066444	DF10	
3420			; ERROR 173	
3421	007410	062035	EM63	; DLT SET
3422	007412	064353	DH30	
3423	007414	065512	DT1	
3424	007416	066504	DF15	
3425			; ERROR 174	
3426	007420	060435	EM21	; CERR SET
3427	007422	064353	DH30	
3428	007424	065512	DT1	
3429	007426	066504	DF15	
3430			; ERROR 175	
3431	007430	061675	EM39	; CYL DIFF NOT CLEARED
3432	007432	063272	DH10	; AT END OF HEAD LOADING
3433	007434	065512	DT1	
3434	007436	066444	DF10	
3435			; ERROR 176	
3436	007440	061744	EM40	; CYL ADDR NOT CLEARED.
3437	007442	063272	DH10	
3438	007444	065512	DT1	
3439	007446	066444	DF10	
3440			; ERROR 177	
3441	007450	061275	EM29	; PORT AVAIL-TIMERS NOT INHIB
3442	007452	065007	DH41	; DURING RECAL CMD
3443	007454	065512	DT1	
3444	007456	066444	DF10	
3445			; ERROR 200	
3446	007460	060041	EM12	; NO RDY
3447	007462	064720	DH39	; AFTER WRITE HEADER CMD
3448	007464	065512	DT1	
3449	007466	066504	DF15	
3450			; ERROR 201	
3451	007470	060435	EM21	; CERR SET
3452	007472	064720	DH39	
3453	007474	065512	DT1	
3454	007476	066504	DF15	
3455			; ERROR 202	
3456	007500	062056	EM65	; READ HEADER ERROR
3457	007502	062540	DH1	
3458	007504	065670	DT7	
3459	007506	066464	DF14	
3460			; ERROR 203	
3461	007510	061364	EM31	; PORT NOT AVAIL
3462	007512	065007	DH41	; DURING RECAL CMD
3463	007514	065512	DT1	
3464	007516	066444	DF10	
3465			; ERROR 204	

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ERROR POINTER TABLE

SEQ 0069

3466	007520	000000	0	
3467	007522	000000	0	
3468	007524	000000	0	
3469	007526	000000	0	
3470			; ERROR 205	
3471	007530	000000	0	
3472	007532	000000	0	
3473	007534	000000	0	
3474	007536	000000	0	
3475			; ERROR 206	
3476	007540	061526	EM36	; CYL ADDR IN RKMR3 INCORRECT
3477	007542	064227	DH25	; AFTER SEEK CMD
3478	007544	065736	DT8	
3479	007546	066420	DF6	
3480			; ERROR 207	
3481	007550	061526	EM36	; CYL ADDR IN RKMR3 INCORRECT
3482	007552	064227	DH25	; AFTER SEEK CMD
3483	007554	065556	DT4	
3484	007556	066420	DF6	
3485			; ERROR 210	
3486	007560	060435	EM21	; CERR SET
3487	007562	064227	DH25	
3488	007564	065512	DT1	
3489	007566	066444	DF10	
3490			; ERR 211	
3491	007570	060331	EM17	; MSG AD ERROR
3492	007572	064464	DH35	; AFTER RLS ISSUED
3493	007574	066050	DT13	
3494	007576	066574	DF21	
3495			; ERR 212	
3496	007600	060352	EM18	
3497	007602	064464	DH35	
3498	007604	066050	DT13	
3499	007606	066574	DF21	
3500			; ERR 213	
3501	007610	060373	EM19	
3502	007612	064464	DH35	
3503	007614	066050	DT13	
3504	007616	066574	DF21	
3505			; ERR 214	
3506	007620	060414	EM20	
3507	007622	064464	DH35	
3508	007624	066050	DT13	
3509	007626	066574	DF21	
3510			; ERROR 215	
3511	007630	000000	0	
3512	007632	000000	0	
3513	007634	000000	0	
3514	007636	000000	0	
3515			; ERROR 216	
3516	007640	000000	0	
3517	007642	000000	0	
3518	007644	000000	0	
3519	007646	000000	0	
3520			; ERROR 217	
3521	007650	000000	0	

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SEQ 0070

3522	007652	000000	0	
3523	007654	000000	0	
3524	007656	000000	0	
3525			; ERROR 220	
3526	007660	000000	0	
3527	007662	000000	0	
3528	007664	000000	0	
3529	007666	000000	0	
3530			; ERROR 221	
3531	007670	060331	EM17	; MSG A0 ERROR
3532	007672	063723	DH17	
3533	007674	066050	DT13	
3534	007676	066574	DF21	
3535			; ERROR 222	
3536	007700	060373	EM19	; MSG A1 ERROR
3537	007702	063723	DH17	
3538	007704	066050	DT13	
3539	007706	066574	DF21	
3540			; ERROR 223	
3541	007710	060435	EM21	; CERR SET
3542	007712	063024	DH7	; AFT SCLR
3543	007714	065512	DT1	
3544	007716	066444	DF10	
3545			; ERR 224	
3546	007720	061526	EM36	; CYL ADDR IN RKMR3 BAD
3547	007722	063336	DH12	; AFT SEEK CMD
3548	007724	065556	DT4	
3549	007726	066420	DF6	
3550			; ERROR 225	
3551	007730	000000	0	
3552	007732	000000	0	
3553	007734	000000	0	
3554	007736	000000	0	
3555			; ERROR 226	
3556	007740	060041	EM12	; NO RDY
3557	007742	064252	DH26	; AFTER READ DATA CMD
3558	007744	065512	DT1	
3559	007746	066444	DF10	
3560			; ERROR 227	
3561	007750	060435	EM21	; CERR SET
3562	007752	064252	DH26	
3563	007754	065512	DT1	
3564	007756	066504	DF15	
3565			; ERROR 230	
3566	007760	060266	EM16	; CANNOT READ BSE INFO
3567	007762	063427	DH13	; ON SEC 10, 12, 14, 16, 18, 20
3568	007764	065512	DT1	
3569	007766	066524	DF17	
3570			; ERROR 231	
3571	007770	000000	0	
3572	007772	000000	0	
3573	007774	000000	0	
3574	007776	000000	0	
3575			; ERROR 232	
3576	010000	000000	0	
3577	010002	000000	0	

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3578 010004 000000      0
3579 010006 000000      0
3580      ;ERROR 233      EM16      ;CANNOT READ BSE INFO
3581 010010 060266      DH42      ;ON SECT 0,2,4,6,8
3582 010012 065103      DT1
3583 010014 065512      DF17
3584 010016 066524
3585      ;ERROR 234      0
3586 010020 000000      0
3587 010022 000000      0
3588 010024 000000      0
3589 010026 000000      0
3590      ;ERROR 235      EM69      ;ALIGN CARTRIDGE USED
3591 010030 062100      DH44      ;WILL BYPASS FORMAT & ALL R/W TESTS
3592 010032 065233      DT1
3593 010034 065512      DF10
3594 010036 066444
3595
3596      .SBTTL PROGRAM SETUP
3597
3598 010040 012737 000001 001336 PARSRT: MOV      #1,PARAM      ;SET FLAG FOR 220 START: INPUT PARAMETERS
3599 010046 000402      BR      PRGSRT      ;START PROGRAM
3600
3601 010050 005037 001336      START: CLR      PARAM      ;200 START, DEFAULT
3602 010054 000005      PRGSRT: RESET      ;CLEAR ALL INT ENABLE & INIT
3603 010056 012706 001100      MOV      #STACK,SP      ;SETUP STACK POINTER
3604 010062 012746 000000      MOV      #PRO,-(SP)      ;PSW LOADED TO BE
3605 010066 012746 010074      MOV      #1$,-(SP)      ;LSI-11 COMPATABLE
3606 010072 000002      RTI      ;ENABLE ALL INTERRUPTS
3607
3608 010074 004737 052260      1$: JSR      PC,$TKINT      ;SETUP KB VECTOR ADDR, PRIORITY 4
3609      ;& TURN ON KB INTERRUPT
3610
3611      ;*** CPU PRIORITY LEVEL NOW AT 0 ***
3612      ;*** ANY DEVICE WHICH SETS ITS ***
3613      ;*** INTERRUPT ENABLE BIT WILL ***
3614      ;*** SERVICED. ***
3615
3616      ;CLOCK INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 6 (IN 'STS')
3617      ;RK06 CONTROLLER INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 5 IN 'SETINT')
3618      ;KEYBOARD INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 4 (SEE ABOVE)
3619
3620      ;ALL 'SYSMAC' TRAPS WILL CHANGE CPU PRIORITY TO LEVEL 7 (SEE BELOW)
3621
3622      ;SYSMAC 'SETUP'
3623      .SBTTL INITIALIZE THE COMMON TAGS
3624      ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
3625      MOV      #CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
3626 010100 012706 001100      CLR      (R6)+      ;;CLEAR MEMORY LOCATION
3627 010104 005026      CMP      #SWR,R6 ;;DONE?
3628 010106 022706 001140      BNE      -6      ;;LOOP BACK IF NO
3629 010112 001374      MOV      #STACK,SP      ;;SETUP THE STACK POINTER
3630 010114 012706 001100      ;;INITIALIZE A FEW VECTORS
3631      MOV      #SCOPE,2#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
3632 010120 012737 050366 000020      MOV      #340,2#IOTVEC+2 ;;LEVEL 7
3633 010126 012737 000340 000022

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INITIALIZE THE COMMON TAGS

SEQ 0072

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3634 010134 012737 050646 000030      MOV      #ERROR, #EMTVEC      ;; EMT VECTOR FOR ERROR ROUTINE
3635 010142 012737 000340 000032      MOV      #340, #EMTVEC+2      ;; LEVEL 7
3636 010150 012737 054476 000034      MOV      #STRAP, #TRAPVEC      ;; TRAP VECTOR FOR TRAP CALLS
3637 010156 012737 000340 000036      MOV      #340, #TRAPVEC+2      ;; LEVEL 7
3638 010164 012737 050122 000024      MOV      #SPWRON, #PWRVEC      ;; POWER FAILURE VECTOR
3639 010172 012737 000340 000026      MOV      #340, #PWRVEC+2      ;; LEVEL 7
3640 010200 013737 042740 042732      MOV      SENDCT, SEOPCT      ;; SETUP END-OF-PROGRAM COUNTER
3641 010206 005037 001174      CLR      $TIMES      ;; INITIALIZE NUMBER OF ITERATIONS
3642 010212 005037 001176      CLR      $ESCAPE      ;; CLEAR THE ESCAPE ON ERROR ADDRESS
3643 010216 112737 000001 001115      MOV      #1, $ERMAX      ;; ALLOW ONE ERROR PER TEST
3644 010224 012737 010224 001106      MOV      #., $LPADR      ;; INITIALIZE THE LOOP ADDRESS FOR SCOPE
3645 010232 012737 010232 001110      MOV      #., $LPERR      ;; SETUP THE ERROR LOOP ADDRESS
3646                                     ;; SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
3647                                     ;; EQUAL TO A "-1" SETUP FOR A SOFTWARE SWITCH REGISTER.
3648 010240 013746 000004      MOV      #ERRVEC, -(SP)      ;; SAVE ERROR VECTOR
3649 010244 012737 010300 000004      MOV      #64$, #ERRVEC      ;; SET UP ERROR VECTOR
3650 010252 012737 177570 001140      MOV      #DSWR, SWR      ;; SETUP FOR A HARDWARE SWICH REGISTER
3651 010260 012737 177570 001142      MOV      #DDISP, DISPLAY      ;; AND A HARDWARE DISPLAY REGISTER
3652 010266 022777 177777 170644      CMP      #-1, #SWR      ;; TRY TO REFERENCE HARDWARE SWR
3653 010274 001012      BNE      66$      ;; BRANCH IF NO TIMEOUT TRAP OCCURRED
3654                                     ;; AND THE HARDWARE SWR IS NOT = -1
3655 010276 000403      BR      65$      ;; BRANCH IF NO TIMEOUT
3656 010300 012716 010306 64$:      MOV      #65$, (SP)      ;; SET UP FOR TRAP RETURN
3657 010304 000002      RTI
3658 010306 012737 000176 001140 65$:      MOV      #SWREG, SWR      ;; POINT TO SOFTWARE SWR
3659 010314 012737 000174 001142      MOV      #DISPREG, DISPLAY
3660 010322 012637 000004 66$:      MOV      (SP)+, #ERRVEC      ;; RESTORE ERROR VECTOR
3661
3662 010326 005037 001216      CLR      $PASS      ;; CLEAR PASS COUNT
3663 010332 132737 000200 001231      BITB     #APTSIZE, $ENVN      ;; TEST USER SIZE UNDER APT
3664 010340 001403      BEQ      67$      ;; YES, USE NON-APT SWITCH
3665 010342 012737 001232 001140      MOV      #SSWREG, SWR      ;; NO, USE APT SWITCH REGISTER
3666 010350
3667 010350 012737 010414 000004 67$:      MOV      #1$, #ERRVEC      ;; SETUP TIMEOUT VECTOR
3668 010356 012737 000340 000006      MOV      #PR7, #ERRVEC+2
3669
3670 010364 012701 172100      MOV      #MEMBAS, R1      ;; ADDR OF MEM CSR
3671 010370 005011 3$:      CLR      (R1)      ;; SEE IF CAN REFERENCE
3672 010372 012711 000001      MOV      #1, (R1)      ;; SET ENABLE BIT IF YES
3673 010376 012737 050024 000114      MOV      #MEMERR, #MEMVEC      ;; LOAD VECTOR IF NO TIMEOUT
3674 010404 012737 000340 000116      MOV      #PR7, #MEMVEC+2
3675 010412 000401      BR      2$
3676
3677 010414 022626 1$:      CMP      (SP)+, (SP)+      ;; ADJ STACK
3678 010416 062701 000002 2$:      ADD      #2, R1      ;; TRY NEXT CSR
3679 010422 020127 172140      CMP      R1, #MEMBAS+40      ;; SEE IF TRIED ALL
3680 010426 001360      BNE      3$      ;; BR IF NO
3681 010430 012737 000006 000004      MOV      #ERRVEC+2, #ERRVEC      ;; RESTORE TRAP CATCHER
3682 010436 005037 000006      CLR      #ERRVEC+2
3683
3684 010442 004737 043026      JSR      PC, CLRFLG      ;; CLEAR DDUMP THRU UNITB
3685 010446 005037 001220      CLR      $DEVCT
3686 010452 005037 001222      CLR      $UNIT
3687
3688
3689                                     ;FIND OUT IF XXDP. ACT, APT; CHAIN OR DUMP MODE

```

CZR6GB0 RK611 DU PORT LGC TST
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INITIALIZE THE COMMON TAGS

SEQ 0073

```

3690 ;
3691 ;
3692 010456 005737 000042 START1: TST 42
3693 010462 001014 BNE 1$ ;BR IF AUTO
3694 010464 004737 043046 JSR PC,TITLE ;MANUAL, TYPE PROG ID
3695 010470 123727 000041 000013 CMPB 41,#13 ;13=LOADED BY XXDP
3696 010476 001010 BNE 2$
3697 010500 005237 005424 INC DDUMP ;SET RK06 DUMP MODE FLAG
3698 010504 104401 055725 TYPE MSG2 ;REPLACE DRO PACK W/SCRATCH & DO<CR>
3699 010510 000137 010524 JMP ST2
3700 010514 000137 010570 1$: JMP ST3
3701 010520 005237 005432 2$: INC PPTP ;SET ACT/APT/PTP DUMP MODE FLAG
3702 ;
3703 ;CHECK IF ALL PARAMETERS DEFAULTED. IF NOT, BEGIN INPUT DIALOGUE
3704 ;WITH OPERATOR. THE REPLY TO 'DRIVES TO BE TESTED' SHOULD BE
3705 ;DRIVE NOS. SEPERATED BY COMMAS & TERMINATED BY <CR>
3706 ;EX: DRIVES TO BE TESTED: 0,2,4<CR>
3707 ;FOR DUAL PORT, ONLY EVEN NUMBERED DRIVES MUST BE TESTED
3708 ;
3709 ST2: TST PARAM
3710 010524 005737 001336 BNE 1$ ;BR IF 220 START
3711 010530 001002 JMP ST4 ;200 START, DEFAULT & SIZE THE BUSS
3712 010532 000137 010622 1$: TYPE MSG3 ;DRIVES TO BE TESTED
3713 010536 104401 055776 JSR PC,GDRVS ;GET DR NOS.
3714 010542 004737 043126 TYPE MSG4 ;BUSS ADDR
3715 010546 104401 056051 JSR PC,GBA ;GET BA
3716 010552 004737 043274 TYPE MSG5 ;CONT INT VECTOR
3717 010556 104401 056103 JSR PC,GINT ;GET INT VECTOR
3718 010562 004737 043322 BR ST5
3719 010566 000427
3720 ;
3721 ;AUTO MODE
3722 ;CHECK IF LOADED BY XXDP OR OTHER. SET FLAGS & NO INPUT DIALOGUE.
3723 ;DEFAULT ALL PARAMETERS. TEST ONLY THOSE DRIVES THAT ARE READY
3724 ;ON THE BUSS
3725 ;
3726 ;
3727 ;
3728 010570 123727 000041 000013 ST3: CMPB 41,#13 ;13=LOADED BY XXDP
3729 010576 001007 BNE 1$
3730 010600 005237 005426 INC DDPCB ;SET RK06 CHAIN MODE FLAG
3731 010604 004737 043046 JSR PC,TITLE
3732 010610 104401 056205 TYPE MSG7 ;DRO NOT TSTD
3733 010614 000402 BR ST4
3734 010616 005237 005430 1$: INC ACT11 ;SET ACT AUTO FLAG.
3735 ;
3736 010622 012737 177440 001264 ST4: MOV #177440,$BASE ;DEFAULT VALUE
3737 010630 012737 000210 001314 MOV #210,RKVEC ;DEFAULT VALUE
3738 010636 004737 043354 JSR PC,SETINT
3739 010642 005237 005462 INC SI2FLG ;DO "SIZE THE BUSS" TEST
3740 ;
3741 010646 005037 005276 ST5: CLR UNLD ;INITIALIZE FLAGS
3742 010652 005037 005300 CLR BADHDR ;USED IN 'STOP' ROUTINE
3743 010656 005037 005302 CLR HPEND ;FOR VALID PROGRAM HALTS
3744 010662 005037 001176 CLR $ESCAPE
3745 010666 005037 001172 CLR $TMP5 ;CLEAR RK07 FLAG

```

J06

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INITIALIZE THE COMMON TAGS

SEQ 0074

3746	010672	012737	005436	001342	MOV	#DRIVO, DRVPTR	; SETUP
3747	010700	005037	001220		CLR	\$DEVCT	; NO. OF DRVS DONE
3748	010704	005037	001222		CLR	\$UNIT	; CURRENT DRV UNDER TEST
3749	010710	005037	005464		CLR	UNITB	; PORT A TESTING
3750	010714	112737	000101	056560	MOVB	#'A, MSG19A	; PORT A TESTING
3751	010722	012737	010770	000004	MOV	#1\$, ERRVEC	; SETUP TIMEOUT ERROR VECTOR
3752	010730	005777	170372		TST	@LKS	; SEE IF L-CLOCK THERE
3753	010734	005237	005456		INC	LCLKF	; PRESENT, SET FLAG.
3754	010740	013700	001330		MOV	LCVEC, RO	; VECTOR ADDR
3755	010744	012737	011026	000004	MOV	#2\$, ERRVEC	
3756	010752	005777	170342		TST	@PKS	; SEE IF P-CLOCK THERE
3757	010756	005237	005460		INC	PCLKF	; PRESENT, SET FLAG
3758	010762	013700	001332		MOV	PCVEC, RO	; VECTOR ADDR
3759	010766	000412			BR	3\$	
3760							
3761	010770	022626			1\$: CMP	(SP)+, (SP)+	; L-CLOCK NOT THERE, CLEAR STACK
3762	010772	012737	011032	000004	MOV	#4\$, ERRVEC	
3763	011000	005777	170314		TST	@PKS	; SEE IF P-CLOCK THERE
3764	011004	005237	005460		INC	PCLKF	; PRESENT, SET FLAG
3765	011010	013700	001332		MOV	PCVEC, RO	; VECTOR ADDR
3766	011014	012720	047154		3\$: MOV	#CLOCK, (RO)+	; SERVICE ROUTINE FOR CLOCKS
3767	011020	012710	000300		MOV	#PR6, (RO)	
3768	011024	000407			BR	TST1	; GO TO NEXT TEST
3769							
3770	011026	022626			2\$: CMP	(SP)+, (SP)+	; P-CLOCK NOT THERE, CLEAR STACK
3771	011030	000771			BR	3\$	
3772							
3773	011032	022626			4\$: CMP	(SP)+, (SP)+	; NEITHER CLOCK THERE, CLEAR STACK
3774	011034	104401	056360		TYPE	MSG13	; NO CLOCKS PRESENT TESTS BYPASSED
3775	011040	000137	042644		JMP	\$EOP	
3776							
3777							

K06

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BASIC CONTROLLER TESTS, SIZING & SETUP

SEQ 0075

.SBTTL BASIC CONTROLLER TESTS, SIZING & SETUP

```

*****
;TEST 1 REFERENCE ALL CONTROLLER REGISTERS

```

```

;
; THIS TEST VERIFIES THAT ALL THE CONTROLLER REGISTERS
; CAN BE ACCESSED. THE INABILITY TO BE ACCESSED WILL
; RESULT IN A TIMEOUT TRAP WITH AN ERROR MESSAGE. ANY
; ERROR IN THIS TEST WILL RESULT IN ABORTING ALL OTHER
; TESTS AND JUMPING TO 'END OF PASS'

```

```

*****

```

```

;ST1: SCOPE
;MOV #1,$TIMES ;DO 1 ITERATION
;MOV #STACK,SP ;RESTORE STK PTR
;MOV #PR0,-(SP) ;RESET PSW TO PRIORITY 0
;MOV #S$,-(SP) ;& MAKE IT LSI COMPATABLE
;RTI

```

S\$:

```

;MOV #1,$ERRVEC ;SETUP TIMEOUT ERROR VECTOR
;MOV $BASE,R5 ;SETUP INDEX REG.
;TST RKCS1(R5) ;REFERENCE ALL THE
;TST RKCS2(R5) ;CONTROLLER REGISTERS
;TST RKWC(R5)
;TST RKBA(R5)
;TST RKDA(R5)
;TST RKDS(R5) ;TIMEOUTS IN THIS SECTION
;TST RKER(R5) ;INDICATE THAT THE CONTROLLER
;TST RKASOF(R5) ;REGISTERS CANNOT BE READ.
;TST RKDC(R5) ;TESTING SHOULD NOT PROCEED
;TST RKDB(R5) ;UNTIL THIS IS REMEDIED.
;TST RKMR1(R5)
;TST RKMR2(R5)
;TST RKMR3(R5)
;TST RKECPS(R5)
;TST RKECPT(R5)

```

```

;MOV #BADTMO,ERRVEC ;SETUP TIMEOUT HANDLER
;MOV #PR7,ERRVEC+2
;BR TST2 ;GO TO NEXT TEST

```

```

;1$: CMP (SP)+,(SP)+ ;RESTORE STACK POINTER
;ERROR 7 ;ABORT-COULD NOT REFERENCE CONTROLLER REGISTER
;JMP $EOP1

```

```

*****
;TEST 2 SIZE THE BUSS

```

```

;
; THIS TEST IS ENTERED ONLY IF 'DRIVE SELECTION' IS DEFAULTED
; EITHER BY RUNNING IN THE AUTO MODE OR A 200 START IN THE
; MANUAL MODE.
; EVERY EVEN NUMBERED DRIVE (0,2,4,6) IS ADDRESSED.
; CONTROLLER ERROR (CERR) IS EXAMINED AND IF NOT SET, THE

```

```

3778
3779
3780
3781
3782
3783
3784
3785
3786
3787
3788
3789
3790 011044 000004
3791 011046 012737 000001 001174
3792 011054 012706 001100
3793
3794 011060 012746 000000
3795 011064 012746 011072
3796 011070 000002
3797 011072
3798
3799 011072 012737 011216 000004
3800 011100 013705 001264
3801 011104 005765 000000
3802 011110 005765 000010
3803 011114 005765 000002
3804 011120 005765 000004
3805 011124 005765 000006
3806 011130 005765 000012
3807 011134 005765 000014
3808 011140 005765 000016
3809 011144 005765 000020
3810 011150 005765 000024
3811 011154 005765 000026
3812 011160 005765 000034
3813 011164 005765 000036
3814 011170 005765 000030
3815 011174 005765 000032
3816
3817 011200 012737 047736 000004
3818 011206 012737 000340 000006
3819 011214 000404
3820
3821 011216 022626
3822 011220 104007
3823 011222 000137 042704
3824
3825
3826
3827
3828
3829
3830
3831
3832
3833

```

```

3834      * DRIVE WILL BE TESTED AS AN RK06. IF SET, THE PROGRAM WILL BYPASS
3835      * TESTING THAT DRIVE ONLY IF THE ERROR WAS A RESULT OF
3836      * MDS, UFE OR NED BEING SET; OR BOTH NED & DRA RESET IN-
3837      * DICATING THE OTHER PORT IS ACCESSED.
3838      * IF CERR DUE TO DTYE, DRIVE WILL BE TESTED AS AN RK07.
3839      *
3840      *****
3841      ST2: SCOPE
3842      MOV #1,STIMES ;DO 1 ITERATION
3843      MOV #STACK,SP ;RESTORE STK PTR
3844
3845      INC BYPCERR ;DO NOT DO 'CKCERR' ROUTINE
3846
3847
3848      BITB #BIT7,$ENVM ;SEE IF USE APT SELECTED DRIVES
3849      BNE 14$ ;BR IF YES
3850      JMP 12$ ;ELSE DO NORM SIZING OR VERIFY
3851
3852      14$: TYPE MSG10 ;WILL TEST DRIVES
3853      CLR DRVS ;# OF DRIVES PRESENT
3854      CLR RD ;DRV ADDR
3855      MOV #DRIV0,R1 ;DRV FLAG
3856      MOV $DEV0,R2 ;APT DEVICE MAP
3857
3858      15$: BIT #BIT0,R2 ;SEE IF DRV IN DEVICE MAP
3859      BEQ 16$ ;BR IF NO
3860      CMP #BIT0,R0 ;SEE IF ODD # DRIVE
3861      BEQ 11$ ;BR IF NO
3862
3863      TYPE ,EM28 ;ONLY EVEN # ALLOWED IN $DEV0
3864      HALT ;RELOAD $DEV0 & PRESS 'CONTINUE'
3865      JMP PRGSRT ;RESTART
3866      11$: INC DRVS ;ELSE INCR DRIVE COUNT
3867      INC (R1) ;& SET DRIVE PRESENT FLAG
3868      TYPE $CRLF
3869      MOV RD,-(SP) ;SAVE RD FOR TYPEOUT
3870      ;TYPE DRIVE #
3871      ;GO TYPE--OCTAL ASCII
3872      .BYTE 1 ;TYPE 1 DIGIT(S)
3873      .BYTE 0 ;SUPPRESS LEADING ZEROS
3874
3875      16$: CMP (R1)+,(R1)+ ;ADV PTR TO NEXT EVEN #
3876      ADD #2,R0 ;ADD DRV ADDR TO NEXT EVEN #
3877      CMP #8,R0 ;ALL 4 TESTED?
3878      BEQ 17$ ;BR IF YES
3879
3880      ROR R2 ;ELSE GET NEXT BIT OFF DEVICE MAP
3881      BR 15$ ;& TRY AGAIN
3882
3883      17$: TST DRVS ;SEE IF MORE DRIVES PRESENT
3884      BEQ 18$ ;BR IF NO
3885      JMP VERIFY ;ELSE EXIT TEST & SETUP FOR RK07'S
3886
3887      18$: ERROR 75 ;NO DRIVES FOUND IN $DEV0
3888      HALT ;SETUP CORRECTLY & PRESS 'CONTINUE'
3889      JMP ST5 ;TO TRY AGAIN

```

M06

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T2 SIZE THE BUSS

SEQ 0077

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3890 011414 000137 012076      20$: JMP      VERIFY      ;DO NOT SIZE, GO TO NEXT TEST
3891 011420 012765 000040      12$: MOV      #SCLR,RKCS2(R5) ;SUBSYSTEM CLEAR
3892 011426 013737 001400      MOV      T10,TEMP1      ;SET TIMEOUT
3893 011434 004737 043466      JSR      PC,FRDY      ;FIND RDY
3894 011440 104120      ERROR      120      ;RDY NOT SET BY END OF SCLR
3895 011442 005737 005462      TST      SIZEFLG      ;SIZE BUS?
3896 011446 001762      BEQ      20$      ;BR IF NO
3897 011450 104401 056273      TYPE      MSG10      ;WILL TEST DRIVES
3898 011454 005037 005434      CLR      DRVS      ;# OF DRIVES PRESENT
3899 011460 005000      CLR      RD      ;DRV ADDR
3900 011462 012701 005436      MOV      #DRIVO,R1      ;DRV FLAG
3901 011466      1$: SCOP1
3902 011470 012706 001100      MOV      #STACK,SP      ;RESTORE STK PTR
3903 011474 012765 000040      MOV      #SCLR,RKCS2(R5) ;SUBSYSTEM CLEAR
3904 011502 013737 001400      MOV      T10,TEMP1      ;SET TIMEOUT
3905 011510 004737 043466      JSR      PC,FRDY      ;FIND RDY
3906 011514 104120      ERROR      120      ;RDY NOT SET BY END OF SCLR
3907 011516 010065 000010      MOV      RD,RKCS2(R5) ;SELECT THE DRIVE ADDR
3908 011522 012737 000001      MOV      #SELDRV,HCS1
3909 011530 053737 001170      BIS      $TMP4,HCS1      ;ADD CDT IF RK07
3910 011536 013765 005314      MOV      HCS1,RKCS1(R5) ;GET STATUS
3911 011544 013737 001412      MOV      T50000,TEMP1
3912 011552 004737 044242      JSR      PC,DLY      ;DO DELAY TO CATCH MDS
3913 011556 013737 001400      MOV      T10,TEMP1
3914 011564 004737 043466      JSR      PC,FRDY      ;FIND RDY
3915 011570 104117      ERROR      117      ;NO RDY AFTER SELECT DRIVE CMD.
3916 011572 032737 100000      BIT      #CERR,HCS1
3917 011600 001053      BNE      2$
3918 011602 013737 005342      MOV      HMR2,TEMP1
3919 011610 042737 177770      BIC      #C<DRVMSK>,TEMP1
3920 011616 020037 005352      CMP      RD,TEMP1      ;S/B SAME
3921 011622 001020      BNE      3$
3922 011624 005700      TST      RD
3923 011626 001003      BNE      4$
3924 011630 005737 005426      TST      DDPCH      ;SEE IF XXDP CHAIN MODE
3925 011634 001016      BNE      5$
3926 011636 005237 005434      4$: INC      DRVS      ;INC DRIVE COUNT.
3927 011642 005211      INC      (R1)      ;SET DRIVE PRESENT FLAG
3928 011644 053711 001170      BIS      $TMP4,(R1)      ;ADD CDT IF RK07.
3929 011650 104401 001205      TYPE      $SCLF
3930 011654 010046      MOV      RD,-(SP)      ;SAVE RD FOR TYPEOUT
3931 011656 104403      TYP05      ;TYPE DR #
3932 011660 001      .BYTE      1      ;GO TYPE--OCTAL ASCII
3933 011661 000      .BYTE      0      ;TYPE 1 DIGIT(S)
3934 011662 000403      BR      5$      ;SUPPRESS LEADING ZEROS
3935 011664 004737 044260      3$: JSR      PC,BYP      ;TYPE BYPASS DR #
3936 011670 104001      ERROR      1      ;WRITTEN DR # DOES NOT MATCH RKMR2 DR #
3937 011672 022121      5$: CMP      (R1)+,(R1)+      ;ADV PTR TO NEXT EVEN #
3938 011674 062700      ADD      #2,RD      ;ADV DRV ADDR TO NEXT EVEN #
3939 011700 005037 001170      CLR      $TMP4      ;CLEAR FOR NEXT TRY

```

N06

CZR6GB0 RK611 DU PORT LGC TST
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T2 SIZE THE BUSS

SEQ 0078

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3946 011704 022700 000010      CMP      #8.,RO      ;TESTED ALL 4 DRIVES?
3947 011710 001266              BNE      1$          ;BR IF NO
3948 011712 005737 005434      TST      DRVS
3949 011716 001065              BNE      10$
3950 011720 104076              ERROR    76      ;NO DRIVES FOUND ON BUSS
3951 011722 000000              HALT
3952 011724 000137 010646      JMP      STS      ;SETUP CORRECTLY
3953                                ;AND PRESS 'CONTINUE'
3954 011730 032737 000040 005330 2$: BIT      #DTYE,HER
3955 011736 001405              BEQ      13$
3956 011740 012737 002000 001170 MOV      #CDT,$TMP4      ;ADD CDT
3957 011746 000137 011466              JMP      1$          ;TRY AGAIN
3958 011752 032737 001000 005316 13$: BIT      #MDS,HCS2
3959 011760 001015              BNE      6$
3960 011762 032737 000400 005316 BIT      #UFE,HCS2
3961 011770 001015              BNE      7$
3962 011772 032737 000001 005326 BIT      #DRA,HDS
3963 012000 001015              BNE      8$
3964 012002 032737 010000 005316 BIT      #NED,HCS2
3965 012010 001424              BEQ      9$
3966 012012 000727              BR       5$
3967
3968 012014 004737 044260          6$: JSR      PC,BYP      ;TYPE BYP DR #
3969 012020 104002              ERROR    2$          ;MDS DETECTED
3970 012022 000723              BR       5$
3971
3972 012024 004737 044260          7$: JSR      PC,BYP
3973 012030 104003              ERROR    3$          ;UFE DETECTED
3974 012032 000717              BR       5$
3975
3976 012034 032737 010000 005316 8$: BIT      #NED,HCS2
3977 012042 001675              BEQ      4$
3978 012044 104401 056462      TYPE      MSG15      ;DRV#
3979 012050 010046              MOV      RO,-(SP)      ;SAVE RO FOR TYPEOUT
3980                                ;TYPE DR#
3981 012052 104403              TYP0S
3982 012054 001              .BYTE      1      ;GO TYPE--OCTAL ASCII
3983 012055 000              .BYTE      0      ;TYPE 1 DIGIT(S)
3984 012056 104010              ERROR    10      ;SUPPRESS LEADING ZEROS
3985 012060 000704              BR       5$          ;DRA & NED BOTH SET
3986
3987 012062 004737 044260          9$: JSR      PC,BYP
3988 012066 104004              ERROR    4$          ;NO DRA & NO NED = OTHER PORT SELECTED
3989 012070 000700              BR       5$
3990 012072 000137 012472      10$: JMP      NUORV
3991
3992 012076      VERIFY:
3993
3994
3995      ;*****
3996      ;*TEST 3      VERIFY OPERATOR DRIVE SELECTIONS
3997      ;*
3998      ;*      THIS TEST IS ENTERED ONLY IF DRIVE SELECTION IS NOT
3999      ;*      DEFAULTED. EVERY EVEN NUMBERED DRIVE (0,2,4,6) IS ADDRESSED &
4000      ;*      CONTROLLER ERROR (CERR) IS EXAMINED. IF NOT SET, THE
4001      ;*      PROGRAM WILL ASSUME THE DRIVE IS PRESENT AS AN RK06.

```

B07

CZR6GB0 RK611 DU PORT LGC TST
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T3 VERIFY OPERATOR DRIVE SELECTIONS

SEQ 0079

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4002      *      IF CERR WAS SET, THAT DRIVE WILL BE BYPASSED
4003      *      ONLY IF THE ERROR WAS A RESULT OF MDS OR UFE SET OR BOTH
4004      *      NED & DRA RESET (WRONG PORT).  IF CERR IS A RESULT OF
4005      *      NED ONLY, IT IS CHECKED AGAINST THE INPUTTED INFORMATION TO
4006      *      VERIFY IT WAS NOT SPECIFIED.
4007      *      IF CERR DUE TO DTYE, DRIVE WILL BE TESTED AS AN RK07.
4008      *
4009      * *****
4010 012076 000004      TST3: SCOPE
4011 012100 012737 000001 001174 MOV #1,STIMES      ;DO 1 ITERATION
4012 012106 012706 001100 MOV #STACK,SP      ;RESTORE STK PTR
4013 012112 005000 CLR RO      ;DRIVE ADDR
4014 012114 012701 005436 MOV #DRIVO,R1      ;DRIVE FLAG
4015 012120 1S:
4016 012120 104415 SCOP1
4017 012122 012706 001100 MOV #STACK,SP      ;RESTORE STK PTR
4018
4019 012126 012765 000040 000010 MOV #SCLR,RKCS2(R5) ;SUBSYSTEM CLEAR
4020 012134 013737 001400 005352 T10,TEMP1      ;SET TIME OUT
4021 012142 004737 043466 JSR PC,FRDY      ;FIND RDY
4022 012146 104120 ERROR 120      ;NO RDY AFTER SCLR
4023 012150 010065 000010 MOV RO,RKCS2(R5) ;DRV ADDR
4024 012154 012737 000001 005314 MOV #SELDRV,HCS1
4025 012162 053737 001170 005314 BIS STMP4,HCS1      ;ADD CDT IF RK07
4026 012170 013765 005314 000000 MOV HCS1,RKCS1(R5) ;GET STATUS
4027 012176 013737 001412 005352 MOV T50000,TEMP1
4028 012204 004737 044242 JSR PC,DLY      ;DO DELAY TO CATCH MDS
4029 012210 013737 001400 005352 MOV T10,TEMP1
4030 012216 004737 043466 JSR PC,FRDY      ;FIND RDY
4031 012222 104117 ERROR 117      ;NO RDY AFTER SELECT DRIVE CMD.
4032 012224 032737 100000 005314 BIT #CERR,HCS1
4033 012232 001037 BNE 2S
4034 012234 013737 005342 005352 MOV HMR2,TEMP1
4035 012242 042737 177770 005352 BIC #1C(DRVMSK),TEMP1
4036 012250 020037 005352 CMP RO,TEMP1      ;S/B SAME
4037 012254 001015 CNE 3S
4038 012256 005711 11S: TST (R1)
4039 012260 001402 BGE 4S
4040 012262 053711 001170 JIS STMP4,(R1)      ;SET RK07 FLAG
4041 012266 022121 4S: CMC (R1)+,(R1)+      ;ADV PTR TO NEXT EVEN #
4042 012270 062700 000002 ADC #2,RO      ;ADV DRV ADDR TO NEXT EVEN #
4043 012274 005037 001170 CLR STMP4      ;CLEAR FOR NEXT DRIVE
4044 012300 022700 000010 CMP #8.,RO
4045 012304 001305 BNE 1S      ;MORE LEFT
4046 012306 000475 BR TST4      ;GO TO NEXT TEST
4047
4048 012310 004737 044260 3S: JSR PC,BYP      ;TRY BYPASS DRIVE#
4049 012314 104001 ERROR 1      ;WRITTEN DR# DOES NOT MATCH RKMR2 DR#
4050 012316 005711 TST (R1)
4051 012320 001762 BEQ 4S      ;BRANCH IF NOT SPEC BY INPUT
4052 012322 005337 005434 12S: DEC DRIVS      ;DECREMENT TOTAL DRIVS
4053 012326 005011 CLR (R1)      ;CLEAR DRIVE FLAG
4054 012330 000756 BR 4S
4055
4056 012332 032737 000040 005330 2S: BIT #DTYE,HER
4057 012340 001405 BEQ 13S

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C07

CZR6GB0 RK611 DU PORT LGC TST MACY11 30A(1052) 03-JAN-78 08:56 PAGE 80
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SEQ 0080

```

4058 012342 012737 002000 001170      MOV      #CDT,STMP4      ;ADD CDT
4059 012350 000137 012120      JMP      1$              ;TRY AGAIN
4060
4061 012354 032737 001000 005316 13$:    BIT      #MDS,HCS2
4062 012362 001027              BNE      6$
4063 012364 032737 000400 005316      BIT      #UFE,HCS2
4064 012372 001027              BNE      7$
4065 012374 032737 000001 005326      BIT      #DRA,HDS
4066 012402 001005              BNE      8$
4067 012404 032737 010000 005316      BIT      #NED,HCS2
4068 012412 001423              BEQ      9$
4069 012414 000404              BR       10$
4070 012416 032737 010000 005316 8$:     BIT      #NED,HCS2
4071 012424 001714              BEQ      11$
4072 012426 005711              TST      (R1)
4073 012430 001716              BEQ      4$
4074
4075 012432 004737 044260      JSR      PC,BYP          ;TYPE BYPASS DRIVE#
4076 012436 104006              ERROR    6
4077 012440 000730              BR       12$
4078
4079 012442 004737 044260      6$:     JSR      PC,BYP          ;TYPE BYPASS DRIVE#
4080 012446 104002              ERROR    2          ;MDS DETECTED
4081 012450 000724              BR       12$
4082
4083 012452 004737 044260      7$:     JSR      PC,BYP
4084 012456 104003              ERROR    3          ;UFE DETECTED
4085 012460 000720              BR       12$
4086
4087 012462 004737 044260      9$:     JSR      PC,BYP
4088 012466 104004              ERROR    4          ;DRA & NED RESET - OTHER PORT SELECTED
4089 012470 000714              BR       12$
4090
4091
4092
4093
4094
4095
4096
4097
4098
4099
4100 012472 005037 001456      NUDRV:  CLR      BYPCERR      ;ENTER HERE FROM LAST TEST
4101
4102 012476 005037 001170      CLR      STMP4          ;ALLOW CHECKING CERR IN 'FRDY'
4103
4104
4105
4106
4107
4108
4109
4110
4111
4112
4113 012502 000004      *****
;TEST 4      FIND NEXT DRIVE TO BE TESTED
;
;      THIS TEST FINDS THE NEXT DRIVE PRESENT & PUTS THAT
;      ADDRESS IN '$UNIT' & STMP4 IS SET TO CDT IF Rk07.
;      THROUGHOUT THE FOLLOWING TESTS, THE DRIVE TESTED IS
;      THE DRIVE WHOSE ADDRESS IS IN '$UNIT'.
;      *****
;ST4:  SCOPE

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007

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T4 FIND NEXT DRIVE TO BE TESTED

SEQ 0081

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4114 012504 012737 000001 001174      MOV      #1,$TIMES      ;;DO 1 ITERATION
4115 012512 012706 001100      MOV      #STACK,SP      ;RESTORE STK PTR
4116 012516 012737 000004 001214      MOV      #STN-1,$TESTN
4117 012524 012737 000004 001102      MOV      #STN-1,$STNM
4118
4119 012532 005737 005434      TST      DRVS          ;ANY DRIVES PRESENT?
4120 012536 001004      BNE      4$          ;YES BRANCH
4121 012540 104401 056242      TYPE     MSG8          ;ALL DRIVES TESTED
4122 012544 000137 042704      JMP      $EOP1        ;NO, GO TO END
4123
4124 012550 005037 005464      CLR      UNITB        ;SETUP PORT A
4125 012554 112737 000101 056560 4$:  MOV      #A,MSG19A
4126 012562 013701 001342      MOV      DRVPTR,R1    ;ADDR OF NEXT DRIVE FLAG
4127 012566 005737 001220      TST      $DEVCT       ;IS FIRST DRIVE BEING CHECKED
4128 012572 001403      BEQ      2$          ;YES, BRANCH
4129 012574 062737 000002 001222 1$:  ADD      #2,$UNIT      ;INCR TO NEXT EVEN DRIVE
4130 012602 005711 2$:  TST      (R1)         ;IS DRIVE PRESENT?
4131 012604 001003      BNE      5$          ;BR IF YES
4132 012606 062701 000004      ADD      #4,R1        ;ELSE INCR PTR TO NEXT EVEN DRIVE
4133 012612 000770      BR       1$          ;& TRY AGAIN
4134
4135 012614 005737 005426      5$:  TST      DDPCH       ;DDP CHAIN MODE?
4136 012620 001406      BEQ      3$          ;BR IF NO
4137 012622 005737 001222      TST      $UNIT       ;ELSE SEE IF DRV 0
4138 012626 001003      BNE      3$          ;BR IF NO
4139 012630 062701 000004      ADD      #4,R1        ;ELSE FIND NEXT EVEN DRIVE PRESENT
4140 012634 000757      BR       1$
4141
4142 012636 032711 002000      3$:  BIT      #CDT,(R1)   ;SEE IF DRIVE UNDER TEST IS RK07
4143 012642 001403      BEQ      6$          ;BR IF NO
4144 012644 012737 002000 001170      MOV      #CDT,$TMP4   ;ELSE SET RK07 FLAG
4145 012652 062701 000004      ADD      #4,R1
4146 012656 010137 001342 6$:  MOV      R1,DRVPTR    ;STORE PTR OF NEXT EVEN DRIVE FLAG
4147 012662 104401 056462      TYPE     MSG15        ;"DRIVE"
4148 012666 013700 001222      MOV      $UNIT,RO
4149 012672 010046      MOV      RO,-($P)     ;;SAVE RO FOR TYPEOUT
4150
4151 012674 104403      TYP0S      ;DRIVE #
4152 012676 001      .BYTE 1      ;GO TYPE--OCTAL ASCII
4153 012677 000      .BYTE 0      ;TYPE 1 DIGIT(S)
4154
4155      ; TYPE , $CRLF ;29-SEP-77
4156
4157
4158 012700 005737 001170      TST      $TMP4        ;SEE IF RK07 UNDER TEST
4159 012704 001014      BNE      7$          ;BR IF YES
4160 012706 012737 000632 012770      MOV      #632,LC      ;ELSE LOAD RK06 PARAMERERS
4161 012714 005037 012776      CLR      E.DDT
4162 012720 012737 000777 012772      MOV      #777,MASK
4163 012726 012737 160017 012774      MOV      #160017,MASK1
4164 012734 000423      BR       TST5        ;;GOTO NEXT TEST
4165
4166 012736 012737 001456 012770 7$:  MOV      #1456,LC      ;LOAD RK07 PARAMETERS
4167 012744 012737 000400 012776      MOV      #0,DDT,E.DDT
4168 012752 012737 001777 012772      MOV      #1777,MASK
4169 012760 012737 140017 012774      MOV      #140017,MASK1

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E07

CZR6GB0 RK611 DU PORT LGC TST
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T4 FIND NEXT DRIVE TO BE TESTED

SEQ 0082

4170 012766 000406
4171
4172 012770 000000
4173 012772 000000
4174 012774 000000
4175 012776 000000
4176 013000 000000
4177 013002 000001
4178 013004

BR TST5 ;;GOTO NEXT TEST
LC: 0 ;;LAST CYL
MASK: 0
MASK1: 0
E.DOT: 0 ;;EXPECTED DRIVE TYPE TO E.A0
FC: 0 ;;FIRST CYL
FCP1: 1 ;;FC+1
PFSRT: ;;ENTER HERE FOR POWER FAIL RESTART

.SBTTL DUAL PORT TESTS

TEST 5 TEST PORT 'A' SEIZE & TIMEOUT

*
* VERIFY THAT THE DRIVE CAN BE SEIZED & THAT THE PORT
* TIMEOUT RELEASES THE DRIVE.
*
* A. SET VOLUME VALID FOR BOTH PORTS & DO RECAL COMMAND
*
* B. A SELECT DRIVE COMMAND IS ISSUED THRU PORT 'A'.
* THE PROGRAM VERIFIES THE DRIVE HAS BEEN SEIZED BY 'DRIVE
* AVAILABLE' SET.
*
* C. A SELECT DRIVE COMMAND IS ISSUED THRU PORT 'B' THE
* PROGRAM VERIFIES THAT 'DRIVE AVAILABLE' IS NOT SET
* FOR PORT 'B' & THAT CERR IS SET
*
* D. VERIFY THAT FOR ALL MESSAGES REQUESTED THRU PORT 'B' (MSG
* A0-A3, B0-B3) THAT MESSAGE 0 ALWAYS RETURNS FROM PORT B
* WHILE PORT 'A' IS SEIZED.
*
* E. WAIT FOR THE PORT TIMEOUT TO OCCUR ON PORT 'A' BY
* CONTINUOUSLY CHECKING FOR ATTN ON PORT 'B'.
* AFTER ATTN-B IS REC'D, A DRIVE SELECT COMMAND IS
* ISSUED THRU PORT 'B' TO VERIFY THAT DRIVE AVAILABLE IS SET
* IN MSG A0.
*
* MEASURE THE DURATION OF THE TIMEOUT & TYPE THE VALUE
* FOR THE FIRST PASS ONLY.
*
* F. VERIFY THAT ONLY PORT 'B' GETS 'DSC' & 'ATTN'.
*
* G. VERIFY THE DRIVE CLEAR COMMAND CLEARS 'DSC' & 'ATTN'
* ON PORT 'B' BUT DOES NOT RELEASE THE DRIVE FROM PORT 'B'.

4216 013004 000004
4217 013006 012737 000001 001174
4218 013014 012706 001100
4219 013020 012737 000000 005464
4220 013026 112737 000101 056560
4221 013034 013737 005466 001366
4222 013042 004737 047204
4223
4224
4225 013046 004737 045534

TST5: SCOPE
MOV #1,STIMES ;;DO 1 ITERATION
MOV #STACK,SP
MOV #0,UNITB ;;SETUP PORT A
MOVB #A,MSG19A
MOV TIMER,COUNT
JSR PC,TMO ;;DO TIMEOUT
JSR PC,SUBCLR

F07

CZR6G80 RK611 DU PORT LGC TST
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TS TEST PORT 'A' SEIZE & TIMEOUT

SEQ 0083

4226	013052	104024			ERROR	24		;CERR AFTER SCLR
4227								
4228								
4229	013054	004737	044172		JSR	PC, DRAY		;SEE IF DRIVE AVAIL
4230	013060	104045			ERROR	45		;PORT A NOT AVAIL AFTER TMO
4231	013062				7\$:			
4232	013062	012765	100000	000000	MOV	#CCLR, RKCS1(R5)		
4233	013070	013765	001222	000010	MOV	\$UNIT, RKCS2(R5)		
4234	013076	063765	005464	000010	ADD	UNITB, RKCS2(R5)		
4235	013104	012737	000003	005314	MOV	#PACK, HCS1		
4236	013112	004737	043372		JSR	PC, DOCMD		;DO PACK CMD & GET CONTR RDY
4237	013116	104116			ERROR	116		;CONTR NOT RDY AFT PACK CMD
4238								
4239	013120	032737	000100	005342	BIT	#D.VV, HMR2		
4240	013126	001001			BNE	64\$		
4241	013130	104027			ERROR	27		;VV NOT SET AFTER PACK CMD
4242	013132				64\$:			
4243	013132	012737	042644	001176	MOV	#SEOP, \$ESCAPE		
4244	013140	005737	005464		TST	UNITB		
4245	013144	001022			BNE	2\$		
4246	013146	012737	000001	005464	MOV	#1, UNITB		;SETUP PORT B
4247	013154	112737	000102	056560	MOVB	#B, MSG19A		
4248	013162	013737	005466	001366	MOV	TIMER, COUNT		
4249	013170	004737	047204		JSR	PC, TMO		;DO TIMEOUT
4250								
4251	013174	004737	045534		JSR	PC, SUBCLR		
4252	013200	104223			ERROR	223		;CERR AFTER SCLR
4253								
4254	013202	004737	044172		JSR	PC, DRAY		;SEE IF DROVE AVAIL
4255	013206	104045			ERROR	45		;PORT B NOT AVAIL AFTER TMO
4256	013210	000724			BR	7\$		
4257	013212				2\$:			
4258								
4259	013212	012765	100000	000000	MOV	#CCLR, RKCS1(R5)		
4260	013220	013765	001222	000010	MOV	\$UNIT, RKCS2(R5)		
4261	013226	063765	005464	000010	ADD	UNITB, RKCS2(R5)		;ADD 1 IF ON PORT B
4262	013234	012737	000013	005314	MOV	#RECAL, HCS1		
4263	013242	004737	043372		JSR	PC, DOCMD		;DO RECAL CMD & GET CONTR RDY
4264	013246	104124			ERROR	124		;RDY NOT SET AFTER RECAL CMD
4265								
4266	013250	012765	000001	000026	MOV	#1, RKMR1(R5)		;SELECT WORD 1
4267	013256	004737	045146		JSR	PC, GSTAT		
4268	013262	032737	020000	005342	BIT	#D.RTZ, HMR2		
4269	013270	001001			BNE	65\$		
4270	013272	104070			ERROR	70		;RTZ NOT SET DURING RECAL CMD
4271	013274	013737	001400	005354	MOV	T10, TEMP2		;SETUP TIMEOUT
4272	013302	004737	044006		JSR	PC, FATT1		;FIND ATTN
4273	013306	104055			ERROR	55		;NO ATTN AFTER RECAL CMD
4274								
4275	013310	012737	050340	005404	MOV	#<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>, E.A0		;EXPECTED MSG A0
4276	013316	005037	005406		CLR	E.B0		;EXPECTED MSG B0
4277	013322	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>, E.A1		;EXPECTED A1
4278	013330	012737	000001	005412	MOV	#1, E.B1		;MSG ID FOR EXPECTED MSG B1
4279	013336	005037	005414		CLR	E.A2		;EXPECTED MSG A2
4280	013342	012737	000002	005416	MOV	#2, E.B2		;MSG ID FOR EXPECTED MSG B2
4281	013350	012737	000003	005422	MOV	#3, E.B3		;MSG ID FOR EXPECTED MSG B3

Address	Hex 1	Hex 2	Hex 3	Hex 4	Assembly	Comments
4282	013356	004737	044274		JSR PC,CHKMSG	;CHECK MSGS AO,BO,A1,B1
4283	013362	000007			.WORD T.A2!T.B2!T.B3	; & MSGS SPECIFIED HERE
4284	013364	104221			ERROR 221	;MSG AO ERROR AFTER RECAL CMD
4285	013366	104066			ERROR 66	;MSH BO ERROR
4286	013370	104222			ERROR 222	;MSG A1 ERROR
4287	013372	104067			ERROR 67	;MSG B1 ERROR
4288	013374	012765	000002	000026	MOV #2,RKMR1(R5)	
4289	013402	004737	045146		JSR PC,GSTAT	
4290	013406	005737	001356		TST CYLDIF	;SEE IF MSG A2=0
4291	013412	001401			BEQ 66\$	;BR IF YES
4292	013414	104047			ERROR 47	;MSG A2 NOT CLEARED AFTER RECAL CMD
4293	013416	005737	001360		TST CYLADD	;SEE IF MSG B2=0
4294	013422	001401			BEQ 67\$	;BR IF YES
4295	013424	104050			ERROR 50	;MSG B2 NOT CLEARED AFTER RECAL CMD
4296	013426					
4297						
4298						
4299	013426	012765	100000	000000	MOV #CCLR,RKCS1(R5)	
4300	013434	013765	001222	000010	MOV \$UNIT,RKCS2(R5)	;DRIVE#
4301	013442	063765	005464	000010	ADD UNITB,RKCS2(R5)	;ADD 1 IF ON PORT B
4302	013450	012737	000005	005314	MOV #CLEAR,HCS1	
4303	013456	004737	043372		JSR PC,DOCMD	;DO DRIVE CLEAR CMD & GET CONTR RDY
4304	013462	104151			ERROR 151	;NO RDY AFTER DRIVE CLEAR CMD
4305	013464	004737	043750		JSR PC,TSTATN	;TEST FOR ATTN
4306	013470	000401			BR 68\$	
4307	013472	104154			ERROR 154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4308	013474					
4309						
4310	013474	012737	010340	005404	MOV #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG AO
4311	013502	005037	005406		CLR E.B0	;EXPECTED MSG BO
4312	013506	012737	001720	005410	MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
4313	013514	012737	000001	005412	MOV #1,E.B1	;MSG ID FOR EXPECTED MSG B1
4314	013522	005037	005414		CLR E.A2	;EXPECTED MSG A2
4315	013526	012737	000002	005416	MOV #2,E.B2	;MSG ID FOR EXPECTED MSG B2
4316	013534	012737	000003	005422	MOV #3,E.B3	;MSG ID FOR EXPECTED MSG B3
4317						
4318	013542	004737	044274		JSR PC,CHKMSG	;CHECK MSGS AO,BO,A1,B1
4319	013546	000003			.WORD T.A2!T.B2!0	; & MSGS SPECIFIED HERE
4320	013550	104033			ERROR 33	;MSG AO ERROR AFTER DRV CLEAR CMD
4321	013552	104034			ERROR 34	;MSH BO ERROR
4322	013554	104035			ERROR 35	;MSG A1 ERROR
4323	013556	104036			ERROR 36	;MSG B1 ERROR
4324						
4325						
4326	013560	012737	000000	005464	MOV #0,UNITB	;SETUP PORT A
4327	013566	112737	000101	056560	MOV #A,MSG19A	
4328	013574	013737	005466	001366	MOV TIMER,COUNT	
4329	013602	004737	047204		JSR PC,TMO	;DO TIMEOUT
4330						
4331	012606	004737	045534		JSR PC,SUBCLR	
4332	013612	104024			ERROR 24	;CERR AFTER SCLR
4333						
4334						
4335	013614	004737	044172		JSR PC,DRAV	;SEE IF DRIVE AVAIL
4336	013620	104045			ERROR 45	;PORT A NOT AVAIL AFTER TMO
4337	013622	012737	014544	001176	MOV #5\$, \$ESCAPE	

H07

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 CZR6GB.P11 03-JAN-78 08:46 TS TEST PORT 'A' SEIZE & TIMEOUT

SEQ 0085

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4338 013630 012737 010340 005404 MOV #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
4339 013636 005037 005406 CLR E.B0 ;EXPECTED MSG B0
4340 013642 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4341 013650 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
4342 013656 005037 005414 CLR E.A2 ;EXPECTED MSG A2
4343 013662 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
4344 013670 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
4345
4346
4347 013676 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
4348 013702 000000 .WORD 0!0!0 ;& MSGS SPECIFIED HERE
4349 013704 104077 ERROR 77 ;MSG A0 ERROR AFTER TIMEOUT
4350 013706 104100 ERROR 100 ;MSG B0 ERROR
4351 013710 104101 ERROR 101 ;MSG A1 ERROR
4352 013712 104102 ERROR 102 ;MSG B1 ERROR
4353 013714 012737 000001 005464 MOV #1,UNITB ;SELECT PORT B BEFORE TIMEOUT OR RELEASE
4354 013722 112737 000102 056560 MOV #B,MSG19A ;SETUP ERROR MSG FOR PORT B
4355 013730 005037 001176 CLR $ESCAPE
4356 013734 004737 044172 JSR PC,DRAV ;SEE IF DRIVE AVAIL
4357 013740 000401 BR 1$ ;BR IF NOT AVAIL
4358 013742 104103 ERROR 103 ;PORT B AVAIL BEFORE TMO OR RELEASE
4359
4360 013744 032737 100000 005314 1$: BIT #CERR,HCS1
4361 013752 001001 BNE 6$
4362 013754 104130 ERROR 130 ;CERR NOT SET AFTER SEL DRIVE & DRIVE NOT AVAIL
4363 013756 012737 010100 005404 6$: MOV #<D.SPIN!D.VV>,E.A0
4364 013764 013737 005404 005410 MOV E.A0,E.A1 ;MSG 0 & 1 SHOULD ALWAYS RETURN SAME
4365 013772 053737 012776 005410 BIS E.DD!,E.A1
4366 014000 005037 005406 CLR E.B0 ;WORD 0 FOR PORT B
4367 014004 005037 005412 CLR E.B1
4368 014010 012737 014544 001176 MOV #5$, $ESCAPE
4369
4370 014016 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
4371 014022 000000 .WORD 0!0!0 ;& MSGS SPECIFIED HERE
4372 014024 104104 ERROR 104 ;MSG A0 ERROR WHILE PORT B UNAVAILABLE
4373 014026 104105 ERROR 105 ;MSG B0 ERROR
4374 014030 104106 ERROR 106 ;MSG A1 ERROR
4375 014032 104107 ERROR 107 ;MSG B1 ERROR
4376
4377 014034 005737 001216 TST $PASS
4378 014040 001402 BEQ 8$ ;BR IF FIRST PASS
4379 014042 000137 014544 JMP 5$ ;ELSE EXIT TEST
4380 014046 005037 001176 8$: CLR $ESCAPE
4381 014052 012765 100000 000000 MOV #CCLR,RKCS1(R5)
4382 014060 012737 000000 005464 MOV #0,UNITB ;SETUP FOR PORT A AGAIN
4383 014066 112737 000101 056560 MOV #A,MSG19A
4384 014074 012737 000360 001366 MOV #360,COUNT ;SETUP 4 SEC TIMEOUT
4385 014102 004737 047114 JSR PC,CLKON ;TURN ON CLOCK
4386
4387 014106 004737 044172 JSR PC,DRAV
4388 014112 104045 ERROR 45 ;PORT A NOT AVAIL AFTER TIMEOUT
4389
4390 014114 012737 000001 005464 MOV #1,UNITB ;SELECT PORT B BEFORE TIMEOUT OR RELEASE
4391 014122 112737 000102 056560 MOV #B,MSG19A
4392 014130 004737 044172 JSR PC,DRAV ;SEE IF PORT B DRIVE AVAIL
4393 014134 000401 BR 3$ ;BR IF NOT AVAIL

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SEQ 0086

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4394 014136 104103 ERROR 103 ;PORT B AVAIL BEFORE TMO OR RELEASE
4395
4396 014140 012765 100000 000000 3$: MOV #CCLR,RKCS1(R5)
4397 014146 013704 001222 MOV $UNIT,R4
4398 014152 063704 005464 ADD UNITB,R4
4399 014156 004737 044214 JSR PC,FATT3
4400 014162 104110 ERROR 110 ;NO ATTN ON PORT B TO ALLOW SEIZE
4401
4402 014164 004737 047162 JSR PC,CLKOF
4403 014170 004737 044172 JSR PC,DRAV ;SEE IF PORT B DRIVE AVAIL
4404 014174 104045 ERROR 45 ;PORT B NOT AVAIL
4405
4406 014176 012737 014544 001176 MOV #5$, $ESCAPE
4407
4408 014204 012737 050340 005404 MOV #<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
4409 014212 005037 005406 CLR E.B0 ;EXPECTED MSG B0
4410 014216 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4411 014224 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
4412 014232 005037 005414 CLR E.A2 ;EXPECTED MSG A2
4413 014236 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
4414 014244 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
4415
4416 014252 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
4417 014256 000000 .WORD 0!0!0 ;& MSGS SPECIFIED HERE
4418 014260 104077 ERROR 77 ;MSG A0 ERROR AFTER TIMEOUT
4419 014262 104100 ERROR 100 ;MSG B0 ERROR
4420 014264 104101 ERROR 101 ;MSG A1 ERROR
4421 014266 104102 ERROR 102 ;MSG B1 ERROR
4422 014270 005037 001176 CLR $ESCAPE
4423 014274 012737 000000 005464 MOV #0,UNITB ;SETUP FOR PORT A
4424 014302 112737 000101 056560 MOVB #'A,MSG19A
4425 014310 004737 043750 JSR PC,TSTATN ;TEST FOR ATTN ON PORT A
4426 014314 000401 BR 45
4427 014316 104111 ERROR 111 ;PORT A ATTN SET W/O REQUEST PENDING
4428
4429 014320 012737 014544 001176 4$: MOV #5$, $ESCAPE
4430 014326 012737 000001 005464 MOV #1,UNITB ;SETUP FOR PORT B
4431 014334 112737 000102 056560 MOVB #'B,MSG19A
4432
4433 014342 012765 100000 000000 MOV #CCLR,RKCS1(R5)
4434 014350 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;DRIVE#
4435 014356 063765 005464 000010 ADD UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
4436 014364 012737 000005 005314 MOV #CLEAR,HCS1
4437 014372 004737 043372 JSR PC,DOCMD ;DO DRIVE CLEAR CMD & GET CONTR RDY
4438 014376 104151 ERROR 151 ;NO RDY AFTER DRIVE CLEAR CMD
4439 014400 004737 043750 JSR PC,TSTATN ;TEST FOR ATTN
4440 014404 000401 BR 69$
4441 014406 104154 ERROR 154 ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4442
4443 014410 012737 010340 005404 MOV #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
4444 014416 005037 005406 CLR E.B0 ;EXPECTED MSG B0
4445 014422 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4446 014430 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
4447 014436 005037 005414 CLR E.A2 ;EXPECTED MSG A2
4448 014442 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2

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SEQ 0087

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4450      4450 012737 000003 005422      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
4451
4452 014456 004737 044274      JSR      PC,CHKMSG      ;CHECK MSGS A0, B0, A1, B1
4453 014462 000003      .WORD      T.A2!T.B2!0      ;& MSGS SPECIFIED HERE
4454 014464 104033      ERROR      33      ;MSG A0 ERROR AFTER DRV CLEAR CMD
4455 014466 104034      ERROR      34      ;MSG B0 ERROR
4456 014470 104035      ERROR      35      ;MSG A1 ERROR
4457 014472 104036      ERROR      36      ;MSG B1 ERROR
4458
4459
4460 014474 012701 000360      MOV      #360,R1
4461 014500 163701 001366      SUB      COUNT,R1      ;R1-COUNT=R1
4462 014504 012746 000021      MOV      #17,-(SP)      ;PUT THE MULTIPLIER ON THE STACK
4463 014510 010146      MOV      R1,-(SP)      ;PUT THE MULTIPLICAND ON THE STACK
4464 014512 004737 054270      JSR      PC,@#MULT      ;CALL THE MULTIPLY ROUTINE
4465 014516 012616      MOV      (SP)+,(SP)      ;DISREGARD THE MSB'S
4466 014520 012601      MOV      (SP)+,R1      ;GET THE LSB'S OF THE PRODUCT
4467 014522 104401 056564      TYPE      MSG20      ;PORT TIMEOUT
4468 014526 010146      MOV      R1,-(SP)      ;PUSH BINARY ONTO STACK
4469 014530 004737 054174      JSR      PC,$$SB2D      ;CONVERT TO ASCII
4470 014534 004737 054230      JSR      PC,$$SUPRS      ;TYPE IT
4471 014540 104401 056645      TYPE      ,MSG22      ;MS
4472
4473 014544 005037 001176      $$:      CLR      $ESCAPE
4474 014550 004737 047162      JSR      PC,CLKOF
4475
4476      ;*****
4477      ;TEST 6      TEST PORT 'B' SEIZE & TIMEOUT
4478      ;
4479      ;      THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.
4480      ;
4481      ;*****
4482      ;ST6:      SCOPE
4483 014554 000004      MOV      #1,$TIMES      ;;DO 1 ITERATION
4484 014556 012737 000001 001174      MOV      #STACK,SP
4485 014570 012737 000001 005464      MOV      #1,UNITB      ;SETUP PORT B
4486 014576 112737 000102 056560      MOV      #B,MSG19A
4487 014604 013737 005466 001366      MOV      TIMER,COUNT
4488 014612 004737 047204      JSR      PC,TMO      ;DO TIMEOUT
4489
4490 014616 004737 045534      JSR      PC,SUBCLR
4491 014622 104024      ERROR      24      ;CERR AFTER SCLR
4492
4493
4494 014624 004737 044172      JSR      PC,DRAV      ;SEE IF DRIVE AVAIL
4495 014630 104045      ERROR      45      ;PORT B NOT AVAIL AFTER TMO
4496 014632 012737 015554 001176      MOV      $$,$$ESCAPE
4497
4498 014640 012737 010340 005404      MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0      ;EXPECTED MSG A0
4499 014646 005037 005406      CLR      E.B0      ;EXPECTED MSG B0
4500 014652 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1      ;EXPECTED A1
4501 014660 012737 000001 005412      MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
4502 014666 005037 005414      CLR      E.A2      ;EXPECTED MSG A2
4503 014672 012737 000002 005416      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
4504 014700 012737 000003 005422      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
4505

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T6 TEST PORT 'B' SEIZE & TIMEOUT

SEQ 0088

4506	014706	004737	044274			JSR	PC,CHKMSG	;CHECK MSGS AO, BO, A1, B1
4507	014712	000000				.WORD	0!0!0	; & MSGS SPECIFIED HERE
4508	014714	104077				ERROR	77	;MSG AO ERROR AFTER TIMEOUT
4509	014716	104100				ERROR	100	;MSH BO ERROR
4510	014720	104101				ERROR	101	;MSG A1 ERROR
4511	014722	104102				ERROR	102	;MSG B1 ERROR
4512	014724	012737	000000	005464		MOV	#0,UNITB	;SELECT PORT A BEFORE TIMEOUT OR RELEASE
4513	014732	112737	000101	056560		MOVB	#'A,MSG19A	;SETUP ERROR MSG FOR PORT A
4514	014740	005037	001176			CLR	\$ESCAPE	
4515	014744	004737	044172			JSR	PC,DRAV	;SEE IF DRIVE AVAIL
4516	014750	000401				BR	1\$	;BR IF NOT AVAIL
4517	014752	104103				ERROR	103	;PORT A AVAIL BEFORE TMO OR RELEASE
4518								
4519	014754	032737	100000	005314	1\$:	BIT	#CERR,HCS1	
4520	014762	001001				BNE	6\$	
4521	014764	104130				ERROR	130	;CERR NOT SET AFTER SEL DRIVE & DRIVE NOT AVAIL
4522	014766	012737	010100	005404	6\$:	MOV	#<D.SPIN!D.VV>,E.A0	
4523	014774	013737	005404	005410		MOV	E.A0,E.A1	;MSG 1 & 0 SHOULD ALWAYS RETURN SAME
4524	015002	053737	012776	005410		BIS	E.D0†,E.A1	
4525	015010	005037	005406			CLR	E.B0	;WORD 0 FOR PORT A
4526	015014	005037	005412			CLR	E.B1	
4527	015020	012737	015554	001176		MOV	#5\$, \$ESCAPE	
4528								
4529	015026	004737	044274			JSR	PC,CHKMSG	;CHECK MSGS AO, BO, A1, B1
4530	015032	000000				.WORD	0!0!0	; & MSGS SPECIFIED HERE
4531	015034	104104				ERROR	104	;MSG AO ERROR WHILE PORT A UNAVAILABLE
4532	015036	104105				ERROR	105	;MSH BO ERROR
4533	015040	104106				ERROR	106	;MSG A1 ERROR
4534	015042	104107				ERROR	107	;MSG B1 ERROR
4535								
4536	015044	005737	001216			TST	\$PASS	
4537	015050	001402				BEQ	8\$	;BR IF FIRST PASS
4538	015052	000137	015554			JMP	5\$	;ELSE EXIT TEST
4539	015056	005037	001176		8\$:	CLR	\$ESCAPE	
4540	015062	012765	100000	000000		MOV	#CCLR,RKCS1(R5)	
4541	015070	012737	000001	005464		MOV	#1,UNITB	;SETUP FOR PORT B AGAIN
4542	015076	112737	000102	056560		MOVB	#'B,MSG19A	
4543	015104	012737	000360	001366		MOV	#360,COUNT	;SETUP 4 SEC TIMEOUT
4544	015112	004737	047114			JSR	PC,CLKON	;TURN ON CLOCK
4545								
4546	015116	004737	044172			JSR	PC,DRAV	
4547	015122	104045				ERROR	45	;PORT B NOT AVAIL AFTER TIMEOUT
4548								
4549	015124	012737	000000	005464		MOV	#0,UNITB	;SELECT PORT A BEFORE TIMEOUT OR RELEASE
4550	015132	112737	000101	056560		MOVB	#'A,MSG19A	
4551	015140	004737	044172			JSR	PC,DRAV	;SEE IF PORT A DRIVE AVAIL
4552	015144	000401				BR	3\$	;BR IF NOT AVAIL
4553	015146	104103				ERROR	103	;PORT A AVAIL BEFORE TMO OR RELEASE
4554								
4555	015150	012765	100000	000000	3\$:	MOV	#CCLR,RKCS1(R5)	
4556	015156	013704	001222			MOV	\$UNIT,R4	
4557	015162	063704	005464			ADD	UNITB,R4	
4558	015166	004737	044214			JSR	PC,FATT3	
4559	015172	104110				ERROR	110	;NO ATTN ON PORT A TO ALLOW SEIZE
4560								
4561	015174	004737	047162			JSR	PC,CLKOF	

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T6 TEST PORT 'B' SEIZE & TIMEOUT

SEQ 0089

4562	015200	004737	044172		JSR	PC,DRAV	;SEE IF PORT A DRIVE AVAIL
4563	015204	104045			ERROR	45	;PORT A NOT AVAIL
4564							
4565	015206	012737	015554	001176	MOV	#55,\$ESCAPE	
4566							
4567	015214	012737	050340	005404	MOV	#<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
4568	015222	005037	005406		CLR	E.B0	;EXPECTED MSG B0
4569	015226	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
4570	015234	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4571	015242	005037	005414		CLR	E.A2	;EXPECTED MSG A2
4572	015246	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4573	015254	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4574							
4575	015262	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
4576	015266	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
4577	015270	104077			ERROR	77	;MSG A0 ERROR AFTER TIMEOUT
4578	015272	104100			ERROR	100	;MSG B0 ERROR
4579	015274	104101			ERROR	101	;MSG A1 ERROR
4580	015276	104102			ERROR	102	;MSG B1 ERROR
4581	015300	005037	001176		CLR	\$ESCAPE	
4582	015304	012737	000001	005464	MOV	#1,UNITB	;SETUP FOR PORT B
4583	015312	112737	000102	056560	MOV	#'B,MSG19A	
4584	015320	004737	043750		JSR	PC,TSTATN	;TEST FOR ATTN ON PORT B
4585	015324	000401			BR	45	
4586	015326	104111			ERROR	111	;PORT B ATTN SET W/O REQUEST PENDING
4587							
4588	015330	012737	015554	001176	MOV	#55,\$ESCAPE	
4589	015336	012737	000000	005464	MOV	#0,UNITB	;SETUP FOR PORT A
4590	015344	112737	000101	056560	MOV	#'A,MSG19A	
4591							
4592	015352	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
4593	015360	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
4594	015366	063765	005464	000010	ADD	UNITB,RKCS2(R5)	;ADD 1 IF ON PORT B
4595	015374	012737	000005	005314	MOV	#CLEAR,HCS1	
4596	015402	004737	043372		JSR	PC,DOCMD	;DO DRIVE CLEAR CMD & GET CONTR RDY
4597	015406	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
4598	015410	004737	043750		JSR	PC,TSTATN	;TEST FOR ATTN
4599	015414	000401			BR	645	
4600	015416	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4601	015420						
4602							
4603	015420	012737	010340	005404	MOV	#<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
4604	015426	005037	005406		CLR	E.B0	;EXPECTED MSG B0
4605	015432	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
4606	015440	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4607	015446	005037	005414		CLR	E.A2	;EXPECTED MSG A2
4608	015452	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4609	015460	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4610							
4611	015466	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
4612	015472	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
4613	015474	104033			ERROR	33	;MSG A0 ERROR AFTER DRV CLEAR CMD
4614	015476	104034			ERROR	34	;MSG B0 ERROR
4615	015500	104035			ERROR	35	;MSG A1 ERROR
4616	015502	104036			ERROR	36	;MSG B1 ERROR
4617							

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T6 TEST PORT 'B' SEIZE & TIMEOUT

SEQ 0090

4618					MOV	#360,R1	
4619	015504	012701	000360		SUB	COUNT,R1	;R1-COUNT=R1
4620	015510	163701	001366		MOV	#17,-(SP)	;;PUT THE MULTIPLIER ON THE STACK
4621	015514	012746	000021		MOV	R1,-(SP)	;;PUT THE MULTIPLICAND ON THE STACK
4622	015520	010146			JSR	PC,2*MSG2	;;CALL THE MULTIPLY ROUTINE
4623	015522	004737	054270		MOV	(SP)+,(SP)	;;DISREGARD THE MSB'S
4624	015526	012616			MOV	(SP)+,R1	;;GET THE LSB'S OF THE PRODUCT
4625	015530	012601			TYPE	MSG23	;PORT TIMEOUT
4626	015532	104401	056651		MOV	R1,-(SP)	;PUSH BINARY ONTO STACK
4627	015536	010146			JSR	PC,\$\$SB20	;CONVERT TO ASCII
4628	015540	004737	054174		JSR	PC,\$\$SUPRS	;TYPE IT
4629	015544	004737	054230		TYPE	MSG22	;MS
4630	015550	104401	056645				
4631							
4632	015554	005037	001176	5\$:	CLR	\$ESCAPE	
4633	015560	004737	047162		JSR	PC,CLKOF	
4634							
4635							
4636							
4637							
4638							
4639							
4640							
4641							
4642							
4643							
4644	015564	000004					
4645	015566	012737	000001	001174	ST7:	SCOPE	
4646	015574	012706	001100		MOV	#1,\$TIMES	;;DO 1 ITERATION
4647					MOV	#STACK,SP	
4648	015600	005737	001216		TST	\$PASS	
4649	015604	001042			BNE	TST10	;;GO TO NEXT TST IF NOT 1ST PASS
4650							
4651	015606	004737	045534		JSR	PC,SUBCLR	
4652	015612	104024			ERROR	24	;CERR AFTER SCLR
4653							
4654	015614	104401	056474		TYPE	MSG16	;DRIVE SERIAL NO.
4655	015620	012765	000003	000026	MOV	#3,RKMR1(R5)	;SELECT BYTE 3
4656	015626	004737	045146		JSR	PC,GSTAT	;GET STATUS
4657	015632	013701	005342		MOV	HMA2,R1	;GET SERIAL #
4658	015636	012704	053762		MOV	#SOCTVL,R4	;GET ADDR CHAR BUFF
4659	015642	010446			MOV	R4,-(SP)	;STORE ON STACK FOR \$SUPRS
4660	015644	012703	000003		MOV	#3,R3	;SETUP CHAR COUNT
4661	015650	006101			ROL	R1	;INITIALIZE BIT POSITIONS
4662	015652	006101			ROL	R1	
4663	015654	006101		1\$:	ROL	R1	;GET NEXT 4 BITS
4664	015656	006101			ROL	R1	
4665	015660	006101			ROL	R1	
4666	015662	006101			ROL	R1	
4667	015664	010100			MOV	R1,RO	;GET WORKING COPY
4668	015666	042700	177760		BIC	#177760,RO	;CLEAR ALL BUT LOW 4 BITS
4669	015672	052700	000060		BIS	#60,RO	;CONVERT TO ASCII DIGIT
4670	015675	110024			MOVB	RO,(R4)+	;PUT ASCII DIGIT INTO CHAR BUFF
4671	015700	005303			DEC	R3	
4672	015702	001364			BNE	1\$	;BR IF ALL 3 CHARS NOT DONE
4673	015704	105014			CLRB	(R4)	;ELSE INSERT NULL TERMINATOR

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T7 PRINT DRIVE SERIAL NUMBER

SEQ 0091

4674
4675 015706 004737 054230

JSR PC,SSUPRS ;TYPE
TYPE ,SCRLF ;29-SEP-77
TYPE ,SCRLF ;29-SEP-77

*TEST 10 TEST PORT 'A' COMMAND SEIZE & ATTENTION
*
* VERIFY THE OPERATION OF 'DSC' & 'ATTN' BITS AFTER A COMMAND.
*
* A. ISSUE A SEEK COMMAND TO CYLINDER 10 THRU PORT 'A'.
*
* B. VERIFY SEIZURE & THAT 'DSC' & 'ATTN' SETS FOR PORT 'A'
* ONLY AFTER SEEK COMPLETION
*
* C. VERIFY 'ATTN' REMAINS SET BEYOND TIMEOUT
*
* D. VERIFY A DRIVE CLEAR COMMAND RESETS 'DSC' & 'ATTN'
* & DOES NOT RELEASE THE DRIVE FROM PORT 'A'.

4695 015712 000004
4696 015714 012737 000001 001174
4697 015722 012706 001100
4698 015726 012737 000000 005464
4699 015734 112737 000101 056560
4700 015742 013737 005466 001366
4701 015750 004737 047204

*ST10: SCOPE
MOV #1,STIMES ;DO 1 ITERATION
MOV #STACK,SP
MOV #0,UNITB ;SETUP PORT A
MOVB #'A,MSG19A
MOV TIMER,COUNT
JSR PC,TMO ;DO TIMEOUT

4703 015754 004737 045534
4704 015760 104024

JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR

4707 015762 004737 044172
4708 015766 104045
4709 015770 012765 000012 000020
4710
4711 015776 012737 000017 005314
4712 016004 004737 043372
4713 016010 104131

JSR PC,DRAV ;SEE IF DRIVE AVAIL
ERROR 45 ;PORT A NOT AVAIL AFTER TMO
MOV #10.,RKDC(R5) ;SEEK TO CYL 10.

MOV #SEEK,HCS1
JSR PC,DOCMD ;DO SEEK CMD & GET CONTR READY
ERROR 131 ;NO RDY AFTER SEEK CMD

4715 016012 013737 001412 005352
4716 016020 004737 044106
4717 016024 104132

MOV T50000,TEMP1 ;SETUP TIMEOUT
JSR PC,FATT2 ;FIND ATTN
ERROR 132 ;NO ATTN AFTER SEEK CMD

4719 016026 032737 100000 005314
4720 016034 001401
4721 016036 104210

BIT #CERR,HCS1
BEQ 65\$
ERROR 210 ;CERR AFTER SEEK CMD

4723 016040

65\$:

4725 016040 012737 050340 005404
4726 016046 005037 005406
4727 016052 012737 001720 005410
4728 016060 012737 000001 005412
4729 016066 005037 005414

MOV #<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
CLR E.B0 ;EXPECTED MSG B0
MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
CLR E.A2 ;EXPECTED MSG A2

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T10 TEST PORT 'A' COMMAND SEIZE & ATTENTION

SEQ 0092

```

4730 016072 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
4731 016100 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
4732
4733 016106 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
4734 016112 000000 .WORD 0:0:0 ;& MSGS SPECIFIED HERE
4735 016114 104161 ERROR 161 ;MSG A0 ERROR AFTER SEEK CMD
4736 016116 104162 ERROR 162 ;MSG B0 ERROR
4737 016120 104163 ERROR 163 ;MSG A1 ERROR
4738 016122 104164 ERROR 164 ;MSG B1 ERROR
4739
4740 016124 004737 045756 JSR PC,RDCYLA ;READ CYL ADDR
4741 016130 023727 001360 000012 CMP CYLADD,#10. ;SEE IF CYL 10.
4742 016136 001415 BEQ 64$ ;BR IF YES
4743 016140 012737 000000 001344 MOV #0,FRCYL
4744 016146 012737 000012 001346 MOV #10.,TOCYL
4745 016154 012737 000012 001354 MOV #10.,CALDIF
4746 016162 012765 000012 000020 MOV #10.,RKDC(R5) ;REFRESH RKDC
4747 016170 104224 ERROR 224 ;DID NOT SEEK TO CYL 10.
4748
4749 016172 012737 000226 001366 64$: MOV #150.,COUNT
4750 016200 004737 047204 JSR PC,TMO ;DO 2.5 SEC TIMEOUT
4751 016204 004737 044106 JSR PC,FATT2
4752 016210 104112 ERROR 112 ;ATTN CLEARED AFTER TMO
4753
4754 016212 012765 100000 000000 MOV #CLR,RKCS1(R5)
4755 016220 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;DRIVE#
4756 016226 063765 005464 000010 ADD UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
4757 016234 012737 000005 005314 MOV #CLR,HCS1
4758 016242 004737 043372 JSR PC,DOCMD ;DO DRIVE CLEAR CMD & GET CONTR RDY
4759 016246 104151 ERROR 151 ;NO RDY AFTER DRIVE CLEAR CMD
4760 016250 004737 043750 JSR PC,TSTATN ;TEST FOR ATTN
4761 016254 000401 BR 66$
4762 016256 104154 ERROR 154 ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4763 66$:
4764
4765 016260 012737 010340 005404 MOV #<D.DRA!D.SPIN!D.DROY!D.VV>,E.A0 ;EXPECTED MSG A0
4766 016266 005037 005406 CLR E.B0 ;EXPECTED MSG B0
4767 016272 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4768 016300 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
4769 016306 005037 005414 CLR E.A2 ;EXPECTED MSG A2
4770 016312 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
4771 016320 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
4772
4773 016326 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
4774 016332 000003 .WORD T.A2:T.B2:0 ;& MSGS SPECIFIED HERE
4775 016334 104033 ERROR 33 ;MSG A0 ERROR AFTER DRV CLEAR CMD
4776 016336 104034 ERROR 34 ;MSG B0 ERROR
4777 016340 104035 ERROR 35 ;MSG A1 ERROR
4778 016342 104036 ERROR 36 ;MSG B1 ERROR
4779
4780 016344 004737 044172 JSR PC,DRAV
4781 016350 104113 ERROR 113 ;PORT A NOT AVAIL AFTER DRIVE CLEAR CMD
4782
4783 ;*****
4784 ;*TEST 11 TEST PORT 'B' COMMAND SEIZE & ATTENTION
4785 ;*

```

C08

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T11 TEST PORT 'B' COMMAND SEIZE & ATTENTION

SEQ 0093

```

4786      ;*      THE PREVIOUS TEST IS REPEATED FOR PORT 'B',
4787      ;*      BUT THE SEEK IS TO CYLINDER 0
4788      ;*
4789      ;*****
4790      TST11: SCOPE
4791      MOV      #1,STIMES      ;;DO 1 ITERATION
4792      MOV      #STACK,SP
4793      MOV      #1,UNITB      ;SETUP PORT B
4794      MOV      #B,MSG19A
4795      MOV      TIMER,COUNT
4796      JSR      PC,TMO      ;DO TIMEOUT
4797
4798      JSR      PC,SUBCLR
4799      ERROR    24      ;CERR AFTER SCLR
4800
4801
4802      JSR      PC,DRAV      ;SEE IF DRIVE AVAIL
4803      ERROR    45      ;PORT B NOT AVAIL AFTER TMO
4804      MOV      #0,RKDC(R5) ;SEEK TO CYL 0
4805
4806      MOV      #SEEK,HCS1
4807      JSR      PC,DOCMD      ;DO SEEK CMD & GET CONTR READY
4808      ERROR    131      ;NO RDY AFTER SEEK CMD
4809
4810      MOV      T50000,TEMP1 ;SETUP TIMEOUT
4811      JSR      PC,FATT2      ;FIND ATTN
4812      ERROR    132      ;NO ATTN AFTER SEEK CMD
4813
4814      BIT      #CERR,HCS1
4815      BEQ      65$
4816      ERROR    210      ;CERR AFTER SEEK CMD
4817
4818      65$:
4819
4820      MOV      #<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
4821      CLR      E.B0      ;EXPECTED MSG B0
4822      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4823      MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
4824      CLR      E.A2      ;EXPECTED MSG A2
4825      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
4826      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
4827
4828      JSR      PC,CHKMSG      ;CHECK MSGS A0, B0, A1, B1
4829      .WORD    0!0!0      ;& MSGS SPECIFIED HERE
4830      ERROR    161      ;MSG A0 ERROR AFTER SEEK CMD
4831      ERROR    162      ;MSG B0 ERROR
4832      ERROR    163      ;MSG A1 ERROR
4833      ERROR    164      ;MSG B1 ERROR
4834
4835      JSR      PC,RDCYLA      ;READ CYL ADDR
4836      CMP      CYLADD,#0      ;SEE IF CYL 0
4837      BEQ      64$      ;BR IF YES
4838      MOV      #10,FRCYL
4839      MOV      #0,T0CYL
4840      MOV      #0,CALDIF
4841      MOV      #0,RKDC(R5) ;REFRESH RKDC

```

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T11 TEST PORT 'B' COMMAND SEIZE & ATTENTION

SEQ 0094

```

4842 016630 104224          ERROR 224          ;DID NOT SEEK TO CYL 0
4843
4844 016632 012737 000226 001366 64$: MOV      #150, COUNT
4845 016640 004737 047204          JSR      PC, TMO          ;DO 2.5 SEC TIMEOUT
4846 016644 004737 044106          JSR      PC, FATT2
4847 016650 104112          ERROR 112          ;ATTN CLEARED AFTER TMO
4848
4849 016652 012765 100000 000000          MOV      #CCLR, RKCS1(R5)
4850 016660 013765 001222 000010          MOV      $UNIT, RKCS2(R5) ;DRIVE#
4851 016666 063765 005464 000010          ADD      UNITB, RKCS2(R5) ;ADD 1 IF ON PORT B
4852 016674 012737 000005 005314          MOV      #CLEAR, HCS1
4853 016702 004737 043372          JSR      PC, DOCMD          ;DO DRIVE CLEAR CMD & GET CONTR RDY
4854 016706 104151          ERROR 151          ;NO RDY AFTER DRIVE CLEAR CMD
4855 016710 004737 043750          JSR      PC, TSTATN          ;TEST FOR ATTN
4856 016714 000401          BR      66$
4857 016716 104154          ERROR 154          ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4858 016720
4859
4860 016720 012737 010340 005404          MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>, E.A0 ;EXPECTED MSG A0
4861 016726 005037 005406          CLR      E.B0          ;EXPECTED MSG B0
4862 016732 012737 001720 005410          MOV      #<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>, E.A1 ;EXPECTED A1
4863 016740 012737 000001 005412          MOV      #1, E.B1          ;MSG ID FOR EXPECTED MSG B1
4864 016746 005037 005414          CLR      E.A2          ;EXPECTED MSG A2
4865 016752 012737 000002 005416          MOV      #2, E.B2          ;MSG ID FOR EXPECTED MSG B2
4866 016760 012737 000003 005422          MOV      #3, E.B3          ;MSG ID FOR EXPECTED MSG B3
4867
4868 016766 004737 044274          JSR      PC, CHKMSG          ;CHECK MSGS A0, B0, A1, B1
4869 016772 000003          .WORD      T.A2!T.B2!0          ;& MSGS SPECIFIED HERE
4870 016774 104033          ERROR 33          ;MSG A0 ERROR AFTER DRV CLEAR CMD
4871 016776 104034          ERROR 34          ;MSG B0 ERROR
4872 017000 104035          ERROR 35          ;MSG A1 ERROR
4873 017002 104036          ERROR 36          ;MSG B1 ERROR
4874
4875 017004 004737 044172          JSR      PC, DRAW
4876 017010 104113          ERROR 113          ;PORT B NOT AVAIL AFTER DRIVE CLEAR CMD
4877
4878
4879
4880
4881
4882
4883
4884
4885
4886
4887
4888
4889
4890
4891
4892
4893
4894
4895
4896
4897

```

TEST 12 TEST RESET PORT 'A' ATTENTION BY DRIVE CLEAR COMMAND

*
* VERIFY THAT A DRIVE CLEAR COMMAND CLEARS ONLY THE ATTENTION BIT OF
* THE SEIZING PORT
*
* A. SET EACH PORT'S ATTENTION BIT BY PERFORMING SEEK
* COMMANDS TO CYLINDER 0 & ALLOWING TIMEOUTS.
*
* B. SEIZE THE DRIVE THRU PORT 'A' & ISSUE A DRIVE CLEAR COMMAND
* VERIFY THAT 'DSC' & 'ATTN' FOR PORT 'A' HAVE BEEN CLEARED
*
* C. SEIZE THE DRIVE THRU PORT 'B' & VERIFY 'DSC' & 'ATTN'
* HAVE NOT CLEARED

†ST12: SCOPE
MOV #1, \$TIMES ;DO 1 ITERATION
MOV #STACK, SP
MOV #0, UNITB ;SETUP PORT A
MOVB #'A', MSG19A

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SEQ 0095

```

4898 017042 013737 005466 001366 MOV TIMER,COUNT
4899 017050 004737 047204 JSR PC,TMO ;DO TIMEOUT
4900
4901 017054 004737 045534 JSR PC,SUBCLR
4902 017060 104024 ERROR 24 ;CERR AFTER SCLR
4903
4904
4905 017062 004737 044172 JSR PC,DRAV ;SEE IF DRIVE AVAIL
4906 017066 104045 ERROR 45 ;PORT A NOT AVAIL AFTER TMO
4907
4908 017070 012737 000017 005314 MOV #SEEK,HCS1
4909 017076 004737 043372 JSR PC,DOCMD ;DO SEEK CMD & GET CONTR READY
4910 017102 104131 ERROR 131 ;NO RDY AFTER SEEK CMD
4911
4912 017104 013737 001412 005352 MOV T50000,TEMP1 ;SETUP TIMEOUT
4913 017112 004737 044106 JSR PC,FAT12 ;FIND ATTN
4914 017116 104132 ERROR 132 ;NO ATTN AFTER SEEK CMD
4915
4916 017120 032737 100000 005314 BIT #CERR,HCS1
4917 017126 001401 BEQ 64$
4918 017130 104210 ERROR 210 ;CERR AFTER SEEK CMD
4919
4920 017132 64$:
4921
4922 017132 012737 050340 005404 MOV #<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
4923 017140 005037 005406 CLR E.B0 ;EXPECTED MSG B0
4924 017144 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4925 017152 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
4926 017160 005037 005414 CLR E.A2 ;EXPECTED MSG A2
4927 017164 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
4928 017172 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
4929
4930 017200 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
4931 017204 000000 .WORD 0!0!0 ;8 MSGS SPECIFIED HERE
4932 017206 104161 ERROR 161 ;MSG A0 ERROR AFTER SEEK CMD
4933 017210 104162 ERROR 162 ;MSG B0 ERROR
4934 017212 104163 ERROR 163 ;MSG A1 ERROR
4935 017214 104164 ERROR 164 ;MSG B1 ERROR
4936
4937 017216 013737 005466 001366 MOV TIMER,COUNT
4938 017224 004737 047204 JSR PC,TMO ;DO 1.5 SEC TIMEOUT
4939 017230 012737 000001 005464 MOV #1,UNITB ;SETUP PORT B
4940 017236 112737 000102 056560 MOVB #8,MSG19A
4941 017244 004737 044172 JSR PC,DRAV
4942 017250 104045 ERROR 45 ;PORT B NOT AVAIL AFTER TMO
4943
4944
4945 017252 012737 010340 005404 MOV #<D.DRA!0!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
4946 017260 005037 005406 CLR E.B0 ;EXPECTED MSG B0
4947 017264 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4948 017272 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
4949 017300 005037 005414 CLR E.A2 ;EXPECTED MSG A2
4950 017304 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
4951 017312 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
4952
4953 017320 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1

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T12 TEST RESET PORT 'A' ATTENTION BY DRIVE CLEAR COMMAND

SEQ 0096

```

4954 017324 000000 .WORD 0!0!0 ;& MSGS SPECIFIED HERE
4955 017326 104165 ERROR 165 ;MSG AO ERROR AFTER TIMEOUT
4956 017330 104166 ERROR 166 ;MSH BO ERROR
4957 017332 104167 ERROR 167 ;MSG A1 ERROR
4958 017334 104170 ERROR 170 ;MSG B1 ERROR
4959
4960 017336 012737 000017 005314 MOV #SEEK,HCS1
4961 017344 004737 043372 JSR PC,DOCMD ;DO SEEK CMD & GET CONTR READY
4962 017350 104131 ERROR 131 ;NO RDY AFTER SEEK CMD
4963
4964 017352 013737 001412 005352 MOV T50000,TEMP1 ;SETUP TIMEOUT
4965 017360 004737 044106 JSR PC,FAT12 ;FIND ATTN
4966 017364 104132 ERROR 132 ;NO ATTN AFTER SEEK CMD
4967
4968 017366 032737 100000 005314 BIT #CERR,HCS1
4969 017374 001401 BEQ 65$
4970 017376 104210 ERROR 210 ;CERR AFTER SEEK CMD
4971
4972 017400 65$:
4973
4974 017400 012737 050340 005404 MOV #<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG AO
4975 017406 005037 005406 CLR E.B0 ;EXPECTED MSG BO
4976 017412 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4977 017420 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
4978 017426 005037 005414 CLR E.A2 ;EXPECTED MSG A2
4979 017432 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
4980 017440 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
4981
4982 017446 004737 044274 JSR PC,CHKMSG ;CHECK MSGS AO, BO, A1, B1
4983 017452 000000 .WORD 0!0!0 ;& MSGS SPECIFIED HERE
4984 017454 104161 ERROR 161 ;MSG AO ERROR AFTER SEEK CMD
4985 017456 104162 ERROR 162 ;MSH BO ERROR
4986 017460 104163 ERROR 163 ;MSG A1 ERROR
4987 017462 104164 ERROR 164 ;MSG B1 ERROR
4988
4989 017464 013737 005466 001366 MOV TIMER,COUNT
4990 017472 004737 047204 JSR PC,TMO
4991 017476 012737 000000 005464 MOV #0,UNITB ;SETUP PORTC
4992 017504 112737 000101 056560 MOVB #A,MSG19A
4993 017512 004737 044172 JSR PC,DRAV
4994 017516 104045 ERROR 45 ;PORT A NOT AVAIL AFTER TMO
4995
4996
4997 017520 012737 050340 005404 MOV #<D.DRA!D.DSC!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG AO
4998 017526 005037 005406 CLR E.B0 ;EXPECTED MSG BO
4999 017532 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5000 017540 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5001 017546 005037 005414 CLR E.A2 ;EXPECTED MSG A2
5002 017552 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5003 017560 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5004
5005 017566 004737 044274 JSR PC,CHKMSG ;CHECK MSGS AO, BO, A1, B1
5006 017572 000000 .WORD 0!0!0 ;& MSGS SPECIFIED HERE
5007 017574 104165 ERROR 165 ;MSG AO ERROR AFTER TIMEOUT
5008 017576 104166 ERROR 166 ;MSH BO ERROR
5009 017600 104167 ERROR 167 ;MSG A1 ERROR

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T12 TEST RESET PORT 'A' ATTENTION BY DRIVE CLEAR COMMAND

SEQ 0097

```

5010 017602 104170 ERROR 170 ;MSG B1 ERROR
5011
5012 017604 012765 100000 000000 MOV #CCLR,RKCS1(R5)
5013 017612 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;DRIVE#
5014 017620 063765 005464 000010 ADD UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
5015 017626 012737 000005 005314 MOV #CLEAR,HCS1
5016 017634 004737 043372 JSR PC,COCMD ;DO DRIVE CLEAR CMD & GET CONTR RDY
5017 017640 104151 ERROR 151 ;NO RDY AFTER DRIVE CLEAR CMD
5018 017642 004737 043750 JSR PC,TSTATN ;TEST FOR ATTN
5019 017646 000401 BR 66$
5020 017650 104154 ERROR 154 ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5021 017652
5022
5023 017652 012737 010340 005404 MOV #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
5024 017660 005037 005406 CLR E.B0 ;EXPECTED MSG B0
5025 017664 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5026 017672 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5027 017700 005037 005414 CLR E.A2 ;EXPECTED MSG A2
5028 017704 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5029 017712 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5030
5031 017720 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
5032 017724 000003 .WORD T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
5033 017726 104033 ERROR 33 ;MSG A0 ERROR AFTER DRV CLEAR CMD
5034 017730 104034 ERROR 34 ;MSG B0 ERROR
5035 017732 104035 ERROR 35 ;MSG A1 ERROR
5036 017734 104036 ERROR 36 ;MSG B1 ERROR
5037
5038 017736 013737 005466 001366 MOV TIMER,COUNT
5039 017744 004737 047204 JSR PC,TMO ;DO 1.5 SEC TIMEOUT
5040 017750 012737 000001 005464 MOV #1,UNITB ;SETUP PORT B
5041 017756 112737 000102 056560 MOV #B,MSG19A
5042 017764 004737 043750 JSR PC,TSTATN
5043 017770 104114 ERROR 114 ;ATTN RESET ON PORT B AFTER DR CLR CMD
5044 ;ON PORT A
5045
5046
5047 017772 012737 050340 005404 MOV #<D.DRA!D.DSC!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
5048 020000 005037 005406 CLR E.B0 ;EXPECTED MSG B0
5049 020004 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5050 020012 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5051 020020 005037 005414 CLR E.A2 ;EXPECTED MSG A2
5052 020024 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5053 020032 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5054
5055 020040 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
5056 020044 000000 .WORD 0!0!0 ;& MSGS SPECIFIED HERE
5057 020046 104165 ERROR 165 ;MSG A0 ERROR AFTER TIMEOUT
5058 020050 104166 ERROR 166 ;MSG B0 ERROR
5059 020052 104167 ERROR 167 ;MSG A1 ERROR
5060 020054 104170 ERROR 170 ;MSG B1 ERROR
5061
5062 ;*****
5063 ;*TEST 13 TEST RESET PORT 'B' ATTENTION BY DRIVE CLEAR COMMAND
5064 ;*
5065 ;* THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.

```

H08

CZR6GB0 RK611 DU PORT LGC TST
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T13 TEST RESET PORT 'B' ATTENTION BY DRIVE CLEAR COMMAND

SEQ 0098

```

5066
5067
5068 020056 000004
5069 020060 012737 000001 001174
5070 020066 012706 001100
5071 020072 012737 000001 005464
5072 020100 112737 000102 056560
5073 020106 013737 005466 001366
5074 020114 004737 047204
5075
5076 020120 004737 045534
5077 020124 104024
5078
5079
5080 020126 004737 044172
5081 020132 104045
5082
5083 020134 012737 000017 005314
5084 020142 004737 043372
5085 020146 104131
5086
5087 020150 013737 001412 005352
5088 020156 004737 044106
5089 020162 104132
5090
5091 020164 032737 100000 005314
5092 020172 001401
5093 020174 104210
5094
5095 020176
5096
5097 020176 012737 050340 005404
5098 020204 005037 005406
5099 020210 012737 001720 005410
5100 020216 012737 000001 005412
5101 020224 005037 005414
5102 020230 012737 000002 005416
5103 020236 012737 000003 005422
5104
5105 020244 004737 044274
5106 020250 000000
5107 020252 104161
5108 020254 104162
5109 020256 104163
5110 020260 104164
5111
5112 020262 013737 005466 001366
5113 020270 004737 047204
5114 020274 012737 000000 005464
5115 020302 112737 000101 056560
5116 020310 004737 044172
5117 020314 104045
5118
5119
5120 020316 012737 010340 005404
5121 020324 005037 005406

*
*****
†ST13: SCOPE
MOV #1,STIMES ;;DO 1 ITERATION
MOV #STACK,SP
MOV #1,UNITB ;SETUP PORT B
MOVB #B,MSG19A
MOV TIMER,COUNT
JSR PC,TMO ;DO TIMEOUT
JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR
JSR PC,DRAW
ERROR 45 ;SEE IF DRIVE AVAIL
;PORT B NOT AVAIL AFTER TMO
MOV #SEEK,HCS1
JSR PC,DOCMD ;DO SEEK CMD & GET CONTR READY
ERROR 131 ;NO RDY AFTER SEEK CMD
MOV T50000,TEMP1 ;SETUP TIMEOUT
JSR PC,FAT12 ;FIND ATTN
ERROR 132 ;NO ATTN AFTER SEEK CMD
BIT #CERR,HCS1
BEQ 64$
ERROR 210 ;CERR AFTER SEEK CMD

64$:
MOV #<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
CLR E.B0 ;EXPECTED MSG B0
MOV #<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1 ;EXPECTED A1
MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
CLR E.A2 ;EXPECTED MSG A2
MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
WORD 0!0!0 ;& MSGS SPECIFIED HERE
ERROR 161 ;MSG A0 ERROR AFTER SEEK CMD
ERROR 162 ;MSG B0 ERROR
ERROR 163 ;MSG A1 ERROR
ERROR 164 ;MSG B1 ERROR
MOV TIMER,COUNT
JSR PC,TMO ;DO 1.5 SEC TIMEOUT
MOV #0,UNITB ;SETUP PORT A
MOVB #A,MSG19A
JSR PC,DRAW
ERROR 45 ;PORT A NOT AVAIL AFTER TMO
MOV #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
CLR E.B0 ;EXPECTED MSG B0

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SEQ 0099

5122	020330	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5123	020336	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5124	020344	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5125	020350	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5126	020356	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5127							
5128	020364	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5129	020370	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5130	020372	104165			ERROR	165	;MSG A0 ERROR AFTER TIMEOUT
5131	020374	104166			ERROR	166	;MSG B0 ERROR
5132	020376	104167			ERROR	167	;MSG A1 ERROR
5133	020400	104170			ERROR	170	;MSG B1 ERROR
5134							
5135	020402	012737	000017	005314	MOV	#SEEK,HCS1	
5136	020410	004737	043372		JSR	PC,DOCMD	;DO SEEK CMD & GET CONTR READY
5137	020414	104131			ERROR	131	;NO RDY AFTER SEEK CMD
5138							
5139	020416	013737	001412	005352	MOV	T50000,TEMP1	;SETUP TIMEOUT
5140	020424	004737	044106		JSR	PC,FAT12	;FIND ATTN
5141	020430	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
5142							
5143	020432	032737	100000	005314	BIT	#CERR,HCS1	
5144	020440	001401			BEQ	65\$	
5145	020442	104210			ERROR	210	;CERR AFTER SEEK CMD
5146							
5147	020444						
5148							
5149	020444	012737	050340	005404	MOV	#<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
5150	020452	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5151	020456	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5152	020464	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5153	020472	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5154	020476	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5155	020504	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5156							
5157	020512	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5158	020516	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5159	020520	104161			ERROR	161	;MSG A0 ERROR AFTER SEEK CMD
5160	020522	104162			ERROR	162	;MSG B0 ERROR
5161	020524	104163			ERROR	163	;MSG A1 ERROR
5162	020526	104164			ERROR	164	;MSG B1 ERROR
5163							
5164	020530	013737	005466	001366	MOV	TIMER,COUNT	
5165	020536	004737	047204		JSR	PC,TMO	
5166	020542	012737	000001	005464	MOV	#1,UNITB	;SETUP PORTC
5167	020550	112737	000102	056560	MOVB	#'B,MSG19A	
5168	020556	004737	044172		JSR	PC,DRAV	
5169	020562	104045			ERROR	45	;PORT B NOT AVAIL AFTER TMO
5170							
5171							
5172	020564	012737	050340	005404	MOV	#<D.DRA!D.DSC!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
5173	020572	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5174	020576	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5175	020604	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5176	020612	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5177	020616	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2

65\$:

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T13 TEST RESET PORT 'B' ATTENTION BY DRIVE CLEAR COMMAND

SEQ 0100

5178	020624	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5179							
5180	020632	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5181	020636	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5182	020640	104165			ERROR	165	;MSG A0 ERROR AFTER TIMEOUT
5183	020642	104166			ERROR	166	;MSG B0 ERROR
5184	020644	104167			ERROR	167	;MSG A1 ERROR
5185	020646	104170			ERROR	170	;MSG B1 ERROR
5186							
5187	020650	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
5188	020656	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
5189	020664	063765	005464	000010	ADD	UNITB,RKCS2(R5)	;ADD 1 IF ON PORT B
5190	020672	012737	000005	005314	MOV	#CLEAR,HCS1	
5191	020700	004737	043372		JSR	PC,DOCMD	;DO DRIVE CLEAR CMD & GET CONTR RDY
5192	020704	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
5193	020706	004737	043750		JSR	PC,TSTATN	;TEST FOR ATTN
5194	020712	000401			BR	66\$	
5195	020714	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5196	020716						
5197							
5198	020716	012737	010340	005404	MOV	#<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
5199	020724	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5200	020730	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5201	020736	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5202	020744	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5203	020750	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5204	020756	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5205							
5206	020764	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5207	020770	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
5208	020772	104033			ERROR	33	;MSG A0 ERROR AFTER DRV CLEAR CMD
5209	020774	104034			ERROR	34	;MSG B0 ERROR
5210	020776	104035			ERROR	35	;MSG A1 ERROR
5211	021000	104036			ERROR	36	;MSG B1 ERROR
5212							
5213	021002	013737	005466	001366	MOV	TIMER,COUNT	
5214	021010	004737	047204		JSR	PC,TMO	;DO 1.5 SEC TIMEOUT
5215	021014	012737	000000	005464	MOV	#0,UNITB	;SETUP PORT A
5216	021022	112737	000101	056560	MOV	#A,MSG19A	
5217	021030	004737	043750		JSR	PC,TSTATN	
5218	021034	104114			ERROR	114	;ATTN RESET ON PORT A AFTER DR CLR CMD
5219							;ON PORT B
5220							
5221							
5222	021036	012737	050340	005404	MOV	#<D.DRA!D.DSC!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
5223	021044	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5224	021050	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5225	021056	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5226	021064	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5227	021070	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5228	021076	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5229							
5230	021104	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5231	021110	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5232	021112	104165			ERROR	165	;MSG A0 ERROR AFTER TIMEOUT
5233	021114	104166			ERROR	166	;MSG B0 ERROR

66\$:

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T13 TEST RESET PORT 'B' ATTENTION BY DRIVE CLEAR COMMAND

SEQ 0101

5234 021116 104167
5235 021120 104170ERROR 167 ;MSG A1 ERROR
ERROR 170 ;MSG B1 ERROR

```

*****
:TEST 14      TEST RELEASE, DRIVE SEIZED BY PORT 'A'
:
:  A.  SEIZE THE DRIVE THRU PORT 'A'
:
:  B.  ISSUE A RELEASE USING RKCS2 THRU PORT 'A'
:
:  C.  VERIFY PORT 'B' CAN ACCESS THE DRIVE IMMEDIATELY &
:      THAT NEITHER PORT SEES 'DSC' OR 'ATTN'
:
*****

```

```

5247 021122 000004
5248 021124 012737 000001 001174
5249 021132 012706 001100
5250 021136 012737 000000 005464
5251 021144 112737 000101 056560
5252 021152 013737 005466 001366
5253 021160 004737 047204
5254
5255 021164 004737 045534
5256 021170 104024
5257
5258
5259
5260 021172 004737 044172
5261 021176 104045
5262 021200 013765 001222 000010
5263 021206 012737 000000 005464
5264 021214 063765 005464 000010
5265 021222 112737 000101 056560
5266 021230 062765 000010 000010
5267 021236 012737 000001 005314
5268 021244 004737 043372
5269 021250 104117
5270
5271 021252 013765 001222 000010
5272 021260 012737 000001 005464
5273 021266 063765 005464 000010
5274 021274 112737 000102 056560
5275 021302 012737 000001 005314
5276 021310 004737 043372
5277 021314 104117
5278
5279 021316 032737 000040 005342
5280 021324 001001
5281 021326 104071
5282 021330
5283 021330 004737 043750
5284 021334 000401
5285 021336 104115
5286 021340
5287
5288 021340 012737 010340 005404
5289 021346 005037 005406

```

```

*****
:ST14: SCOPE
:MOV      #1,STIMES      ;;DO 1 ITERATION
:MOV      #STACK,SP
:MOV      #0,UNITB      ;SETUP PORT A
:MOVB     #'A,MSG19A
:MOV      TIMER,COUNT
:JSR      PC,TMO        ;DO TIMEOUT
:
:JSR      PC,SUBCLR
:ERROR    24            ;CERR AFTER SCLR
:
:JSR      PC,DRAV       ;SEE IF DRIVE AVAIL
:ERROR    45            ;PORT A NOT AVAIL AFTER TMO
:MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT A
:MOV      #0,UNITB
:ADD      UNITB,RKCS2(R5)
:MOVB     #'A,MSG19A
:ADD      #RLS,RKCS2(R5) ;RELEASE PORT A
:MOV      #SELD, HCS1
:JSR      PC,DOCMD      ;DO SELDRV (STATUS) CMD & GET CONTR RDY
:ERROR    117           ;NO RDY AFTER SEL DRV CMD
:
:MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT B
:MOV      #1,UNITB
:ADD      UNITB,RKCS2(R5)
:MOVB     #'B,MSG19A
:MOV      #SELD, HCS1
:JSR      PC,DOCMD      ;DO SELDRV (STATUS) CMD & GET CONTR RDY
:ERROR    117           ;NO RKY AFTER SEL DRV CMD
:
:BIT      #D,DRA,HMR2    ;SEE IF DRIVE AVAIL ON PORT B
:BNE      64$           ;BR IF YES
:ERROR    71            ;PORT B NOT AVAIL AFTER PORT A RLS
:
:JSR      PC,TSTATN
:BR       1$
:ERROR    115           ;ATTN SET IN PORT B AFTER RLS OF PORT A
:
:1$:
:MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
:CLR      E.B0          ;EXPECTED MSG B0

```

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T14 TEST RELEASE, DRIVE SEIZED BY PORT 'A'

SEQ 0102

```
5290 021352 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5291 021360 012737 000001 005412      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5292 021366 005037 005414      CLR      E.A2 ;EXPECTED MSG A2
5293 021372 012737 000002 005416      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5294 021400 012737 000003 005422      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5295
5296 021406 004737 044274      JSR      PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
5297 021412 000000      .WORD    0!0!0 ;& MSGS SPECIFIED HERE
5298 021414 104133      ERROR    133 ;MSG A0 ERROR AFTER RELEASED TO PORT B
5299 021416 104134      ERROR    134 ;MSG B0 ERROR
5300 021420 104135      ERROR    135 ;MSG A1 ERROR
5301 021422 104136      ERROR    136 ;MSG B1 ERROR
5302
5303 021424 012737 000000 005464      MOV      #0,UNITB ;ADDRESS PORT A
5304 021432 112737 000101 056560      MOV      #A,MSG19A
5305 021440 004737 043750      JSR      PC,STATN
5306 021444 000433      BR      TST15 ;GOTO NEXT TST
5307 021446 104115      ERROR    115 ;ATTN SET AFTER RLS ISSUED
5308
5309 021450 012737 010340 005404      MOV      #<D.DRA!D.DRA!D.SPIN!D.DROY!D.VV>,E.A0 ;EXPECTED MSG A0
5310 021456 005037 005406      CLR      E.B0 ;EXPECTED MSG B0
5311 021462 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5312 021470 012737 000001 005412      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5313 021476 005037 005414      CLR      E.A2 ;EXPECTED MSG A2
5314 021502 012737 000002 005416      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5315 021510 012737 000003 005422      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5316
5317 021516 004737 044274      JSR      PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
5318 021522 000000      .WORD    0!0!0 ;& MSGS SPECIFIED HERE
5319 021524 104211      ERROR    211 ;MSG A0 ERROR AFTER RELEASE ISSUED
5320 021526 104212      ERROR    212 ;MSG B0 ERROR
5321 021530 104213      ERROR    213 ;MSG A1 ERROR
5322 021532 104214      ERROR    214 ;MSG B1 ERROR
5323
5324 *****
5325 *TEST 15 TEST RELEASE, DRIVE SEIZED BY PORT 'B'
5326 *
5327 * THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.
5328 *
5329 *****
5330 TST15: SCOPE
5331 021534 000004      MOV      #1,STIMES ;DO 1 ITERATION
5332 021536 012737 000001 001174      MOV      #STACK,SP
5333 021544 012706 001100      MOV      #1,UNITB ;SETUP PORT B
5334 021550 012737 000001 005464      MOV      #B,MSG19A
5335 021556 112737 000102 056560      MOV      TIMER,COUNT
5336 021564 013737 005466 001366      JSR      PC,TMO ;DO TIMEOUT
5337 021572 004737 047204
5338 021576 004737 045534      JSR      PC,SUBCLR
5339 021602 104024      ERROR    24 ;CERR AFTER SCLR
5340
5341
5342 021604 004737 044172      JSR      PC,DRAV ;SEE IF DRIVE AVAIL
5343 021610 104045      ERROR    45 ;PORT B NOT AVAIL AFTER TMO
5344 021612 013765 001222 000010      MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT B
5345 021620 012737 000001 005464      MOV      #1,UNITB
```

M08

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T15 TEST RELEASE, DRIVE SEIZED BY PORT 'B'

SEQ 0103

5346	021626	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5347	021634	112737	000102	056560	MOVB	#'B,MSG19A	
5348	021642	062765	000010	000010	ADD	RLS,RKCS2(R5)	;RELEASE PORT B
5349	021650	012737	000001	005314	MOV	#SELDV,HCS1	
5350	021656	004737	043372		JSR	PC,DOCM0	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5351	021662	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
5352							
5353	021664	013765	001222	000010	MOV	SUNIT,RKCS2(R5)	;SETUP FOR PORT A
5354	021672	012737	000000	005464	MOV	#0,UNITB	
5355	021700	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5356	021706	112737	000101	056560	MOVB	#'B,MSG19A	
5357	021714	012737	000001	005314	MOV	#SELDV,HCS1	
5358	021722	004737	043372		JSR	PC,DOCM0	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5359	021726	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
5360							
5361	021730	032737	000040	005342	BIT	#0,DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
5362	021736	001001			BNE	645	;BR IF YES
5363	021740	104071			ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
5364	021742						
5365	021742	004737	043750		JSR	PC,TSTATN	
5366	021746	000401			BR	15	
5367	021750	104115			ERROR	115	;ATTN SET IN PORT A AFTER RLS OF PORT B
5368	021752						
5369							
5370	021752	012737	010340	005404	MOV	#<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
5371	021760	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5372	021764	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5373	021772	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5374	022000	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5375	022004	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5376	022012	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5377							
5378	022020	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5379	022024	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5380	022026	104133			ERROR	133	;MSG A0 ERROR AFTER RELEASED TO PORT A
5381	022030	104134			ERROR	134	;MSG B0 ERROR
5382	022032	104135			ERROR	135	;MSG A1 ERROR
5383	022034	104136			ERROR	136	;MSG B1 ERROR
5384							
5385	022036	012737	000001	005464	MOV	#1,UNITB	;ADDRESS PORT B
5386	022044	112737	000102	056560	MOVB	#'B,MSG19A	
5387	022052	004737	043750		JSR	PC,TSTATN	
5388	022056	000433			BR	TST16	;GOTO NEXT TST
5389	022060	104115			ERROR	115	;ATTN SET AFTER RLS ISSUED
5390							
5391	022062	012737	010340	005404	MOV	#<D.DRA!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
5392	022070	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5393	022074	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5394	022102	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5395	022110	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5396	022114	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5397	022122	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5398							
5399	022130	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5400	022134	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5401	022136	104211			ERROR	211	;MSG A0 ERROR AFTER RELEASE ISSUED

N08

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T15 TEST RELEASE, DRIVE SEIZED BY PORT 'B'

SEQ 0104

5402 022140 104212
5403 022142 104213
5404 022144 104214

ERROR 212 ;MSH B0 ERROR
ERROR 213 ;MSG A1 ERROR
ERROR 214 ;MSG B1 ERROR

```
*****
TEST 16 TEST RELEASE FROM PORT 'A' WITH PORT 'B' REQUESTING
*
* A. PORT 'A' SEIZES THE DRIVE & DOES A SEEK TO SELF COMMAND.
* THE PROGRAM VERIFIES 'DSC' & 'ATTN' ON PORT 'A' ONLY
* ON COMPLETION
*
* B. PORT 'B' TRIES TO ACCESS THE DRIVE. THE PROGRAM VERIFIES
* DRIVE NOT AVAILABLE
*
* C. A RELEASE BY PORT 'A' IS ISSUED. VERIFY PORT 'B' CAN
* ACCESS THE DRIVE IMMEDIATELY & THAT 'DSC' & 'ATTN'
* ARE SEEN ON PORT 'B'
*
* D. VERIFY PORT 'A' 'DSC' & 'ATTN' REMAINS SET AFTER RELEASE
*
* E. THE PROGRAM ISSUES A DRIVE CLEAR COMMAND TO PORT 'B'
* & VERIFIES 'DSC' & 'ATTN' RESETS.
*
* F. THE PROGRAM THEN VERIFIES THAT PORT 'B' DOES NOT SEE
* FURTHER (MULTIPLE) ATTENTIONS FROM WHAT WOULD HAVE BEEN
* NORMAL TIMEOUT FROM PORT 'A'.
*****
```

5430 022146 000004
5431 022150 012737 000001 001174
5432 022156 012706 001100
5433 022162 013765 001222 000010
5434 022170 012737 000001 005464
5435 022176 063765 005464 000010
5436 022204 112737 000102 056560
5437 022212 062765 000010 000010
5438 022220 012737 000001 005314
5439 022226 004737 043372
5440 022232 104117
5441
5442 022234 013765 001222 000010
5443 022242 012737 000000 005464
5444 022250 063765 005464 000010
5445 022256 112737 000101 056560
5446 022264 012737 000001 005314
5447 022272 004737 043372
5448 022276 104117
5449
5450 022300 032737 000040 005342
5451 022306 001001
5452 022310 104071
5453 022312
5454
5455 022312 012737 010340 005404
5456 022320 005037 005406
5457 022324 012737 001720 005410

```
*****
TST16: SCOPE
MOV #1,STIMES ;DO 1 ITERATION
MOV #STACK,3P
MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
MOV #1,UNITB
ADD UNITB,RKCS2(R5)
MOVB #'B,MSG19A
ADD #RLS,RKCS2(R5) ;RELEASE PORT B
MOV #SELDV,HCS1
JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR 117 ;NO RDY AFTER SEL DRV CMD

MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
MOV #0,UNITB
ADD UNITB,RKCS2(R5)
MOVB #'A,MSG19A
MOV #SELDV,HCS1
JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR 117 ;NO RKY AFTER SEL DRV CMD

BIT #D.DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT A
BNE 64$ ;BR IF YES
ERROR 71 ;PORT A NOT AVAIL AFTER PORT B RLS

64$:
MOV #<D.DRA!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
CLR E.B0 ;EXPECTED MSG B0
MOV #<D.SPOK!D.CART!D.DOOR!D.BRAH!D.SSP>,E.A1 ;EXPECTED A1
*****
```

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T16 TEST RELEASE FROM PORT 'A' WITH PORT 'B' REQUESTING

SEQ 0105

5458	022332	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5459	022340	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5460	022344	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5461	022352	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5462							
5463	022360	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5464	022364	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5465	022366	104211			ERROR	211	;MSG A0 ERROR AFTER RELEASE ISSUED
5466	022370	104212			ERROR	212	;MSG B0 ERROR
5467	022372	104213			ERROR	213	;MSG A1 ERROR
5468	022374	104214			ERROR	214	;MSG B1 ERROR
5469	022376	004737	045534		JSR	PC,SUBCLR	
5470	022402	104024			ERROR	24	;CERR AFTER SCLR
5471							
5472	022404	012737	000017	005314	MOV	#SEEK,HCS1	
5473	022412	004737	043372		JSR	PC,DOCMD	;DO SEEK CMD & GET CONTR READY
5474	022416	104131			ERROR	131	;NO RDY AFTER SEEK CMD
5475							
5476	022420	013737	001412	005352	MOV	T50000,TEMP1	;SETUP TIMEOUT
5477	022426	004737	044106		JSR	PC,FAT12	;FIND ATTN
5478	022432	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
5479							
5480	022434	032737	100000	005314	BIT	#CERR,HCS1	
5481	022442	001401			BEQ	65\$	
5482	022444	104210			ERROR	210	;CERR AFTER SEEK CMD
5483							
5484	022446						
5485							
5486	022446	012737	050340	005404	MOV	#<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
5487	022454	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5488	022460	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
5489	022466	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5490	022474	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5491	022500	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5492	022506	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5493							
5494	022514	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5495	022520	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5496	022522	104161			ERROR	161	;MSG A0 ERROR AFTER SEEK CMD
5497	022524	104162			ERROR	162	;MSG B0 ERROR
5498	022526	104163			ERROR	163	;MSG A1 ERROR
5499	022530	104164			ERROR	164	;MSG B1 ERROR
5500							
5501							
5502	022532	012737	000001	005464	MOV	#1,UNITB	;SETUP PORT B
5503	022540	112737	000102	056560	MOV	#B,MSG19A	
5504	022546	004737	044172		JSR	PC,DRAV	;SEE IF DRIVE AVAIL
5505	022552	000401			BR	1\$	
5506	022554	104103			ERROR	103	;PORT B AVAIL BEFORE TMO OR RELEASE
5507							
5508	022556	032737	100000	005314	BIT	#CERR,HCS1	
5509	022564	001001			BNE	2\$	
5510	022566	104130			ERROR	130	;CERR NOT SET AFTER SEL DRIVE CMD
5511							; & NO DRA
5512	022570	004737	043750		JSR	PC,TSTATN	
5513	022574	000401			BR	3\$	

C09

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TEST RELEASE FROM PORT 'A' WITH PORT 'B' REQUESTING

SEQ 0106

5514	022576	104115			ERROR	115	;ATTN SET IN PORT 'A' AFTER RLS FROM PORT A
5515							
5516	022600	012765	100000	000000	3\$: MOV	#CCLR,RKCS1(R5)	
5517	022606	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
5518	022614	012737	000000	005464	MOV	#0,UNITB	
5519	022622	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5520	022630	112737	000101	056560	MOVB	#'A,MSG19A	
5521	022636	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT A
5522	022644	012737	000001	005314	MOV	#SELDRV,HCS1	
5523	022652	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5524	022656	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
5525							
5526	022660	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
5527	022666	012737	000001	005464	MOV	#1,UNITB	
5528	022674	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5529	022702	112737	000102	056560	MOVB	#'B,MSG19A	
5530	022710	012737	000001	005314	MOV	#SELDRV,HCS1	
5531	022716	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5532	022722	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
5533							
5534	022724	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF LIVE AVAIL ON PORT B
5535	022732	001001			BNE	66\$	;BR IF YES
5536	022734	104071			ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
5537	022736						
5538	022736	004737	043750		JSR	PC,TSTATN	
5539	022742	104122			ERROR	122	;NO ATTN IN PORT B AFTER RLS FROM PORT A
5540							
5541							
5542	022744	012737	050340	005404	MOV	#<D.DRA!D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
5543	022752	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5544	022756	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRAH!D.SSP>,E.A1	;EXPECTED A1
5545	022764	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5546	022772	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5547	022776	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5548	023004	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5549							
5550	023012	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5551	023016	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5552	023020	104211			ERROR	211	;MSG A0 ERROR AFTER RELEASE ISSUED
5553	023022	104212			ERROR	212	;MSG B0 ERROR
5554	023024	104213			ERROR	213	;MSG A1 ERROR
5555	023026	104214			ERROR	214	;MSG B1 ERROR
5556	023030	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
5557	023036	012737	000001	005464	MOV	#1,UNITB	
5558	023044	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5559	023052	112737	000102	056560	MOVB	#'B,MSG19A	
5560	023060	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
5561	023066	012737	000001	005314	MOV	#SELDRV,HCS1	
5562	023074	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5563	023100	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
5564							
5565	023102	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
5566	023110	012737	000000	005464	MOV	#0,UNITB	
5567	023116	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5568	023124	112737	000101	056560	MOVB	#'A,MSG19A	
5569	023132	012737	000001	005314	MOV	#SELDRV,HCS1	

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T16 TEST RELEASE FROM PORT 'A' WITH PORT 'B' REQUESTING

SEQ 0107

5570	023140	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5571	023144	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
5572							
5573	023146	032737	000040	005342	BIT	#D,DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
5574	023154	001001			BNE	67\$	;BR IF YES
5575	023156	104071			ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
5576	023160						
5577	023160	004737	043750		JSR	PC,TSTATN	
5578	023164	104123			ERROR	123	;ATTN CLEARED IN PORT A AFT RLS FROM PORT B
5579							
5580							
5581	023166	012737	050340	005404	MOV	#<D,DRA!D.DSC!D.DRA!D.SPIN!D.DROY!D.VV>,E.A0	;EXPECTED MSG A0
5582	023174	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5583	023200	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5584	023206	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5585	023214	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5586	023220	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5587	023226	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5588							
5589	023234	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5590	023240	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5591	023242	104211			ERROR	211	;MSG A0 ERROR AFTER RELEASE ISSUED
5592	023244	104212			ERROR	212	;MSG B0 ERROR
5593	023246	104213			ERROR	213	;MSG A1 ERROR
5594	023250	104214			ERROR	214	;MSG B1 ERROR
5595	023252	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
5596	023260	012737	000000	005464	MOV	#0,UNITB	
5597	023266	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5598	023274	112737	000101	056560	MOV	#A,MSG19A	
5599	023302	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT A
5600	023310	012737	000001	005314	MOV	#SELDV,HCS1	
5601	023316	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5602	023322	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
5603							
5604	023324	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
5605	023332	012737	000001	005464	MOV	#1,UNITB	
5606	023340	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5607	023346	112737	000102	056560	MOV	#B,MSG19A	
5608	023354	012737	000001	005314	MOV	#SELDV,HCS1	
5609	023362	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5610	023366	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
5611							
5612	023370	032737	000040	005342	BIT	#D,DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
5613	023376	001001			BNE	68\$	;BR IF YES
5614	023400	104071			ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
5615	023402						
5616							
5617	023402	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
5618	023410	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
5619	023416	063765	005464	000010	ADD	UNITB,RKCS2(R5)	;ADD 1 IF ON PORT B
5620	023424	012737	000005	005314	MOV	#CLEAR,HCS1	
5621	023432	004737	043372		JSR	PC,DOCMD	;DO DRIVE CLEAR CMD & GET CONTR RDY
5622	023436	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
5623	023440	004737	043750		JSR	PC,TSTATN	;TEST FOR ATTN
5624	023444	000401			BR	69\$	
5625	023446	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD

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T16 TEST RELEASE FROM PORT 'A' WITH PORT 'B' REQUESTING

SEQ 0108

5626 023450

69\$:

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5627 023450 012737 010340 005404      MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
5628 023456 005037 005406              CLR      E.B0 ;EXPECTED MSG B0
5629 023462 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5630 023470 012737 000001 005412      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5631 023476 005037 005414              CLR      E.A2 ;EXPECTED MSG A2
5632 023502 012737 000002 005416      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5633 023510 012737 000003 005422      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5634
5635
5636 023516 004737 044274              JSR      PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
5637 023522 000003              .WORD      T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
5638 023524 104033              ERROR     33 ;MSG A0 ERROR AFTER DRV CLEAR CMD
5639 023526 104034              ERROR     34 ;MSG B0 ERROR
5640 023530 104035              ERROR     35 ;MSG A1 ERROR
5641 023532 104036              ERROR     36 ;MSG B1 ERROR
5642
5643 023534 013737 005466 001366      MOV      TIMER,COUNT
5644 023542 004737 047204              JSR      PC,TMO ;DO 1.5 SEC TIMEOUT ON PORT B
5645 023546 004737 043750              JSR      PC,TSTATN
5646 023552 000401              BR       TST17 ;GOTO NEXT TST
5647 023554 104144              ERROR     144 ;MULT ATTN ON PORT B
5648
5649
5650
5651
5652
5653
5654
5655 023556 000004              *****
5656 023560 012737 000001 001174      TST17: SCOPE ;*****
5657 023566 012706 001100              MOV      #1,STIMES ;DO 1 ITERATION
5658 023572 013765 001222 000010      MOV      #STACK,SP
5659 023600 012737 000000 005464      MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT A
5660 023606 063765 005464 000010      MOV      #0,UNITB
5661 023614 112737 000101 056560      ADD      UNITB,RKCS2(R5)
5662 023622 062765 000010 000010      MOV      #'A,MSG19A
5663 023630 012737 000001 005314      ADD      #RLS,RKCS2(R5) ;RELEASE PORT A
5664 023636 004737 043372              MOV      #SELDV,HCS1
5665 023642 104117              JSR      PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5666
5667 023644 013765 001222 000010      ERROR     117 ;NO RDY AFTER SEL DRV CMD
5668 023652 012737 000001 005464      MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT B
5669 023660 063765 005464 000010      MOV      #1,UNITB
5670 023666 112737 000102 056560      ADD      UNITB,RKCS2(R5)
5671 023674 012737 000001 005314      MOV      #'B,MSG19A
5672 023702 004737 043372              MOV      #SELDV,HCS1
5673 023706 104117              JSR      PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5674
5675 023710 032737 000040 005342      ERROR     117 ;NO RKY AFTER SEL DRV CMD
5676 023716 001001              BIT      #D.DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT B
5677 023720 104071              BNE      64$ ;BR IF YES
5678 023722              ERROR     71 ;PORT B NOT AVAIL AFTER PORT A RLS
5679
5680 023722 012737 010340 005404      64$: MOV      #<D.DRA!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
5681 023730 005037 005406              CLR      E.B0 ;EXPECTED MSG B0

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F09

CZR6GB0 RK611 DU PORT LGC TST MACY11 30A(1052) 03-JAN-78 08:56 PAGE 109
 CZR6GB.P11 03-JAN-78 08:46 T17 TEST RELEASE FROM PORT 'B' WITH PORT 'A' REQUESTING

SEQ 0109

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5682 023734 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5683 023742 012737 000001 005412      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5684 023750 005037 005414      CLR      E.A2 ;EXPECTED MSG A2
5685 023754 012737 000002 005416      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5686 023762 012737 000003 005422      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5687
5688 023770 004737 044274      JSR      PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
5689 023774 000000      .WORD    0!0!0 ;& MSGS SPECIFIED HERE
5690 023776 104211      ERROR    211 ;MSG A0 ERROR AFTER RELEASE ISSUED
5691 024000 104212      ERROR    212 ;MSH B0 ERROR
5692 024002 104213      ERROR    213 ;MSG A1 ERROR
5693 024004 104214      ERROR    214 ;MSG B1 ERROR
5694 024006 004737 045534      JSR      PC,SUBCLR
5695 024012 104024      ERROR    24 ;CERR AFTER SCLR
5696
5697 024014 012737 000017 005314      MOV      #SEEK,HCS1
5698 024022 004737 043372      JSR      PC,DOCMD ;DO SEEK CMD & GET CONTR READY
5699 024026 104131      ERROR    131 ;NO RDY AFTER SEEK CMD
5700
5701 024030 013737 001412 005352      MOV      T50000,TEMP1 ;SETUP TIMEOUT
5702 024036 004737 044106      JSR      PC,FATT2 ;FIND ATTN
5703 024042 104132      ERROR    132 ;NO ATTN AFTER SEEK CMD
5704
5705 024044 032737 100000 005314      BIT      #CERR,HCS1
5706 024052 001401      BEQ      65$
5707 024054 104210      ERROR    210 ;CERR AFTER SEEK CMD
5708
5709 024056      65$:
5710
5711 024056 012737 050340 005404      MOV      #<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
5712 024064 005037 005406      CLR      E.B0 ;EXPECTED MSG B0
5713 024070 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5714 024076 012737 000001 005412      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5715 024104 005037 005414      CLR      E.A2 ;EXPECTED MSG A2
5716 024110 012737 000002 005416      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5717 024116 012737 000003 005422      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5718
5719 024124 004737 044274      JSR      PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
5720 024130 000000      .WORD    0!0!0 ;& MSGS SPECIFIED HERE
5721 024132 104161      ERROR    161 ;MSG A0 ERROR AFTER SEEK CMD
5722 024134 104162      ERROR    162 ;MSH B0 ERROR
5723 024136 104163      ERROR    163 ;MSG A1 ERROR
5724 024140 104164      ERROR    164 ;MSG B1 ERROR
5725
5726
5727 024142 012737 000000 005464      MOV      #0,UNITB ;SETUP PORT A
5728 024150 112737 000101 056560      MOV      #A,MSG19A
5729 024156 004737 044172      JSR      PC,DRAV ;SEE IF DRIVE AVAIL
5730 024162 000401      BR      1$
5731 024164 104103      ERROR    103 ;PORT A AVAIL BEFORE TMO OR RELEASE
5732
5733 024166 032737 100000 005314 1$:      BIT      #CERR,HCS1
5734 024174 001001      BNE      2$
5735 024176 104130      ERROR    130 ;CERR NOT SET AFTER SEL DRIVE CMD
5736
5737 024200 004737 043750      2$:      JSR      PC,TSTATN

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G09

CZR6GB0 RK611 DU PORT LGC TST
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T17 TEST RELEASE FROM PORT 'B' WITH PORT 'A' REQUESTING

SEQ 0110

5738	024204	000401			BR	35	
5739	024206	104115			ERROR	115	;ATTN SET IN PORT A AFTER RLS FROM PORT B
5740							
5741	024210	012765	100000	000000	35:	MOV	#CCLR,RKCS1(R5)
5742	024216	013765	001222	000010		MOV	\$UNIT,RKCS2(R5) ;SETUP FOR PORT B
5743	024224	012737	000001	005464		MOV	#1,UNITB
5744	024232	063765	005464	000010		ADD	UNITB,RKCS2(R5)
5745	024240	112737	000102	056560		MOVB	#'B,MSG19A
5746	024246	062765	000010	000010		ADD	#RLS,RKCS2(R5) ;RELEASE PORT B
5747	024254	012737	000001	005314		MOV	#SELDV,HCS1
5748	024262	004737	043372			JSR	PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5749	024266	104117				ERROR	117 ;NO RDY AFTER SEL DRV CMD
5750							
5751	024270	013765	001222	000010		MOV	\$UNIT,RKCS2(R5) ;SETUP FOR PORT A
5752	024276	012737	000000	005464		MOV	#0,UNITB
5753	024304	063765	005464	000010		ADD	UNITB,RKCS2(R5)
5754	024312	112737	000101	056560		MOVB	#'A,MSG19A
5755	024320	012737	000001	005314		MOV	#SELDV,HCS1
5756	024326	004737	043372			JSR	PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5757	024332	104117				ERROR	117 ;NO RKY AFTER SEL DRV CMD
5758							
5759	024334	032737	000040	005342		BIT	#D.DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT A
5760	024342	001001				BNE	66\$;BR IF YES
5761	024344	104071				ERROR	71 ;PORT A NOT AVAIL AFTER PORT B RLS
5762	024346				66\$:		
5763	024346	004737	043750			JSR	PC,TSTATN
5764	024352	104122				ERROR	122 ;NO ATTN IN PORT A AFTER RLS FROM PORT B
5765							
5766							
5767	024354	012737	050340	005404		MOV	#<D.DRA!D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
5768	024362	005037	005406			CLR	E.B0 ;EXPECTED MSG B0
5769	024366	012737	001720	005410		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRAH!D.SSP>,E.A1 ;EXPECTED A1
5770	024374	012737	000001	005412		MOV	#1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5771	024402	005037	005414			CLR	E.A2 ;EXPECTED MSG A2
5772	024406	012737	000002	005416		MOV	#2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5773	024414	012737	000003	005422		MOV	#3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5774							
5775	024422	004737	044274			JSR	PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
5776	024426	000000				.WORD	0!0!0 ;& MSGS SPECIFIED HERE
5777	024430	104211				ERROR	211 ;MSG A0 ERROR AFTER RELEASE ISSUED
5778	024432	104212				ERROR	212 ;MSG B0 ERROR
5779	024434	104213				ERROR	213 ;MSG A1 ERROR
5780	024436	104214				ERROR	214 ;MSG B1 ERROR
5781	024440	013765	001222	000010		MOV	\$UNIT,RKCS2(R5) ;SETUP FOR PORT A
5782	024446	012737	000000	005464		MOV	#0,UNITB
5783	024454	063765	005464	000010		ADD	UNITB,RKCS2(R5)
5784	024462	112737	000101	056560		MOVB	#'A,MSG19A
5785	024470	062765	000010	000010		ADD	#RLS,RKCS2(R5) ;RELEASE PORT A
5786	024476	012737	000001	005314		MOV	#SELDV,HCS1
5787	024504	004737	043372			JSR	PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5788	024510	104117				ERROR	117 ;NO RDY AFTER SEL DRV CMD
5789							
5790	024512	013765	001222	000010		MOV	\$UNIT,RKCS2(R5) ;SETUP FOR PORT B
5791	024520	012737	000001	005464		MOV	#1,UNITB
5792	024526	063765	005464	000010		ADD	UNITB,RKCS2(R5)
5793	024534	112737	000102	056560		MOVB	#'B,MSG19A

H09

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T17 TEST RELEASE FROM PORT 'B' WITH PORT 'A' REQUESTING

SEQ 0111

5794	024542	012737	000001	005314	MOV	#SELDV,HCS1	
5795	024550	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5796	024554	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
5797							
5798	024556	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
5799	024564	001001			BNE	67\$	;BR IF YES
5800	024566	104071			ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
5801	024570						
5802	024570	004737	043750		JSR	PC,TSTATN	
5803	024574	104123			ERROR	123	;ATTN CLEARED IN PORT B AFT RLS FROM PORT A
5804							
5805							
5806	024576	012737	050340	005404	MOV	#<D.DRA!D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
5807	024604	005037	005406		CLR	E.B0	;EXPECTED MSG B0
5808	024610	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5809	024616	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5810	024624	005037	005414		CLR	E.A2	;EXPECTED MSG A2
5811	024630	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5812	024636	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5813							
5814	024644	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
5815	024650	000000			WORD	0!0!0	;8 MSGS SPECIFIED HERE
5816	024652	104211			ERROR	211	;MSG A0 ERROR AFTER RELEASE ISSUED
5817	024654	104212			ERROR	212	;MSG B0 ERROR
5818	024656	104213			ERROR	213	;MSG A1 ERROR
5819	024660	104214			ERROR	214	;MSG B1 ERROR
5820	024662	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
5821	024670	012737	000001	005464	MOV	#1,UNITB	
5822	024676	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5823	024704	112737	000102	056560	MOVB	#'B,MSG19A	
5824	024712	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
5825	024720	012737	000001	005314	MOV	#SELDV,HCS1	
5826	024726	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5827	024732	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
5828							
5829	024734	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
5830	024742	012737	000000	005464	MOV	#0,UNITB	
5831	024750	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5832	024756	112737	000101	056560	MOVB	#'A,MSG19A	
5833	024764	012737	000001	005314	MOV	#SELDV,HCS1	
5834	024772	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
5835	024776	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
5836							
5837	025000	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
5838	025006	001001			BNE	68\$	;BR IF YES
5839	025010	104071			ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
5840	025012						
5841							
5842	025012	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
5843	025020	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
5844	025026	063765	005464	000010	ADD	UNITB,RKCS2(R5)	;ADD 1 IF ON PORT B
5845	025034	012737	000005	005314	MOV	#CLEAR,HCS1	
5846	025042	004737	043372		JSR	PC,DOCMD	;DO DRIVE CLEAR CMD & GET CONTR RDY
5847	025046	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
5848	025050	004737	043750		JSR	PC,TSTATN	;TEST FOR ATTN
5849	025054	000401			BR	69\$	

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T17 TEST RELEASE FROM PORT 'B' WITH PORT 'A' REQUESTING

SEQ 0112

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5850 025056 104154          ERROR 154          ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5851 025060          69$:
5852
5853 025060 012737 010340 005404      MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
5854 025066 005037 005406      CLR      E.B0 ;EXPECTED MSG B0
5855 025072 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5856 025100 012737 000001 005412      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5857 025106 005037 005414      CLR      E.A2 ;EXPECTED MSG A2
5858 025112 012737 000002 005416      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5859 025120 012737 000003 005422      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5860
5861 025126 004737 044274          JSR      PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
5862 025132 000003          .WORD    T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
5863 025134 104033          ERROR    33 ;MSG A0 ERROR AFTER DRV CLEAR CMD
5864 025136 104034          ERROR    34 ;MSG B0 ERROR
5865 025140 104035          ERROR    35 ;MSG A1 ERROR
5866 025142 104036          ERROR    36 ;MSG B1 ERROR
5867
5868 025144 013737 005466 001366      MOV      TIMER,COUNT
5869 025152 004737 047204          JSR      PC,TMO ;DO 1.5 SEC TIMEOUT ON PORT A
5870 025156 004737 043750          JSR      PC,TSTATN
5871 025162 000401          BR        TST20 ;GOTO NEXT TST
5872 025164 104144          ERROR    144 ;MULT ATTN ON PORT A
5873
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TEST 20 TEST RELEASE FROM REQUESTING PORT 'B' INHIBITS 'ATTN'

A. PORT 'A' SEIZES THE DRIVE
B. PORT 'B' ATTEMPTS TO SEIZE THE DRIVE
C. PORT 'B' & PORT 'A' RELEASE THE DRIVE, IN THAT ORDER
D. THE PROGRAM VERIFIES THAT NEITHER PORT 'A' OR 'B' ATTENTION
BITS SET

```

TST20: SCOPE
MOV      #1,STIMES ;DO 1 ITERATION
MOV      #STACK,SP
MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT B
MOV      #1,UNITB
ADD      UNITB,RKCS2(R5)
MOVB     #'B,MSG19A
ADD      #RLS,RKCS2(R5) ;RELEASE PORT B
MOV      #SELDV,HCS1
JSR      PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR    117 ;NO RDY AFTER SEL DRV CMD

MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT A
MOV      #0,UNITB
ADD      UNITB,RKCS2(R5)
MOVB     #'A,MSG19A
MOV      #SELDV,HCS1
JSR      PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR    117 ;NO RKY AFTER SEL DRV CMD

BIT      #D.DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT A

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T20 TEST RELEASE FROM REQUESTING PORT 'B' INHIBITS 'ATTN'

SEQ 0113

5906	025326	001001			BNE	64\$		;BR IF YES
5907	025330	104071			ERROR	71		;PORT A NOT AVAIL AFTER PORT B RLS
5908	025332						64\$:	
5909								
5910	025332	012737	010340	005404	MOV	#<D.DRA!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0		;EXPECTED MSG A0
5911	025340	005037	005406		CLR	E.B0		;EXPECTED MSG B0
5912	025344	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1		;EXPECTED A1
5913	025352	012737	000001	005412	MOV	#1,E.B1		;MSG ID FOR EXPECTED MSG B1
5914	025360	005037	005414		CLR	E.A2		;EXPECTED MSG A2
5915	025364	012737	000002	005416	MOV	#2,E.B2		;MSG ID FOR EXPECTED MSG B2
5916	025372	012737	000003	005422	MOV	#3,E.B3		;MSG ID FOR EXPECTED MSG B3
5917								
5918	025400	004737	044274		JSR	PC,CHKMSG		;CHECK MSGS A0, B0, A1, B1
5919	025404	000000			.WORD	0!0!0		; & MSGS SPECIFIED HERE
5920	025406	104211			ERROR	211		;MSG A0 ERROR AFTER RELEASE ISSUED
5921	025410	104212			ERROR	212		;MSG B0 ERROR
5922	025412	104213			ERROR	213		;MSG A1 ERROR
5923	025414	104214			ERROR	214		;MSG B1 ERROR
5924	025416	004737	045534		JSR	PC,SUBCLR		
5925	025422	104024			ERROR	2!4		;CERR AFTER SCLR
5926								
5927	025424	012737	000001	005464	MOV	#1,UNITB		;SETUP PORT B
5928	025432	112737	000102	056560	MOVB	#'B,MSG19A		
5929	025440	004737	044172		JSR	PC,DRAY		;SEE IF DRIVE AVAIL
5930	025444	000401			BR	1\$		
5931	025446	104103			ERROR	103		;PORT B AVAIL BEFORE TMO OR RELEASE
5932								
5933	025450	032737	100000	005314	BIT	#CERR,HCS1	1\$:	
5934	025456	001001			BNE	2\$		
5935	025460	104130			ERROR	130		;CERR NOT SET BY NO DRA
5936								
5937	025462	004737	043750		JSR	PC,TSTATN	2\$:	
5938	025466	000401			BR	3\$		
5939	025470	104115			ERROR	115		;ATTN SET IN PORT B AFTER RLS FROM PORT A
5940								
5941	025472	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	3\$:	
5942	025500	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)		;SETUP FOR PORT B
5943	025506	012737	000001	005464	MOV	#1,UNITB		
5944	025514	063765	005464	000010	ADD	UNITB,RKCS2(R5)		
5945	025522	112737	000102	056560	MOVB	#'B,MSG19A		
5946	025530	062765	000010	000010	ADD	#RLS,RKCS2(R5)		;RELEASE PORT B
5947	025536	012737	000001	005314	MOV	#SELDRV,HCS1		
5948	025544	004737	043372		JSR	PC,DOCMO		;DO SELDRV (STATUS) CMD & GET CONTR RDY
5949	025550	104117			ERROR	117		;NO RDY AFTER SEL DRV CMD
5950								
5951	025552	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)		;SETUP FOR PORT A
5952	025560	012737	000000	005464	MOV	#0,UNITB		
5953	025566	063765	005464	000010	ADD	UNITB,RKCS2(R5)		
5954	025574	112737	000101	056560	MOVB	#'A,MSG19A		
5955	025602	012737	000001	005314	MOV	#SELDRV,HCS1		
5956	025610	004737	043372		JSR	PC,DOCMO		;DO SELDRV (STATUS) CMD & GET CONTR RDY
5957	025614	104117			ERROR	117		;NO RKY AFTER SEL DRV CMD
5958								
5959	025616	032737	000040	005342	BIT	#D.DRA,HMR2		;SEE IF DRIVE AVAIL ON PORT A
5960	025624	001001			BNE	65\$		;BR IF YES
5961	025626	104071			ERROR	71		;PORT A NOT AVAIL AFTER PORT B RLS

K09

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T20 TEST RELEASE FROM REQUESTING PORT 'B' INHIBITS 'ATTN'

SEQ 0114

```
5962 025630 013765 001222 000010 65$: MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
5963 025630 012737 000000 005464 MOV #0,UNITB
5964 025636 012737 000000 005464 ADD UNITB,RKCS2(R5)
5965 025644 063765 005464 000010 MOVB #'A,MSG19A
5966 025652 112737 000101 056560 ADD #PLS,RKCS2(R5) ;RELEASE PORT A
5967 025660 062765 000010 000010 MOV #SELD,PC,HCS1
5968 025666 012737 000001 005314 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5969 025674 004737 043372 ERROR 117 ;NO RDY AFTER SEL DRV CMD
5970 025700 104117
5971
5972 025702 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
5973 025710 012737 000001 005464 MOV #1,UNITB
5974 025716 063765 005464 000010 ADD UNITB,RKCS2(R5)
5975 025724 112737 000102 056560 MOVB #'B,MSG19A
5976 025732 012737 000001 005314 MOV #SELD,PC,HCS1
5977 025740 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5978 025744 104117 ERROR 117 ;NO RLY AFTER SEL DRV CMD
5979
5980 025746 032737 000040 005342 BIT #D.DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT B
5981 025754 001001 66$: BNE 66$ ;BR IF YES
5982 025756 104071 71 ERROR 71 ;PORT B NOT AVAIL AFTER PORT A RLS
5983 025760
5984 025760 013737 005466 001366 66$: MOV TIMER,COUNT
5985 025766 004737 047204 JSR PC,TMO ;DO 1.5 SEC TIMEOUT ON PORT B
5986 025772 004737 043750 JSR PC,TSTATN
5987 025776 000401 4$ BR 4$
5988 026000 104115 ERROR 115 ;ATTN SET ON PORT B AFTER RLS FROM PORT B
5989
5990 026002 4$:
5991
5992 026002 012737 010340 005404 MOV #<D.DRA!D!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
5993 026010 005037 005406 CLR E.B0 ;EXPECTED MSG B0
5994 026014 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1 ;EXPECTED A1
5995 026022 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5996 026030 005037 005414 CLR E.A2 ;EXPECTED MSG A2
5997 026034 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5998 026042 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
5999
6000 026050 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
6001 026054 000000 .WORD 0:0:0 ;& MSGS SPECIFIED HERE
6002 026056 104211 ERROR 211 ;MSG A0 ERROR AFTER RELEASE ISSUED
6003 026060 104212 ERROR 212 ;MSG B0 ERROR
6004 026062 104213 ERROR 213 ;MSG A1 ERROR
6005 026064 104214 ERROR 214 ;MSG B1 ERROR
6006 026066 012737 000000 005464 MOV #0,UNITB ;SETUP PORT A
6007 026074 112737 000101 056560 MOVB #'A,MSG19A
6008 026102 004737 043750 JSR PC,TSTATN
6009 026106 000401 BR TST21 ;GOTO NEXT TST
6010 026110 104115 ERROR 115 ;ATTN SET ON PORT A, AFTER RLS FROM PORT A
6011
6012
6013 *****
6014 *TEST 21 TEST RELEASE FROM REQUESTING PORT 'A' INHIBITS 'ATTN'
6015 *
6016 * THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.
6017 *****
```

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T21 TEST RELEASE FROM REQUESTING PORT 'A' INHIBITS 'ATTN'

SEQ 0115

```

6018 026112 000004 TST21: SCOPE
6019 026114 012737 000001 001174 MOV #1,STIMES ;DO 1 ITERATION
6020 026122 012706 001100 MOV #STACK,SP
6021 026126 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
6022 026134 012737 000000 005464 MOV #0,UNITB
6023 026142 063765 005464 000010 ADD UNITB,RKCS2(R5)
6024 026150 112737 000101 056560 MOV #A,MSG19A
6025 026156 062765 000010 000010 ADD #RLS,RKCS2(R5) ;RELEASE PORT A
6026 026164 012737 000001 005314 MOV #SELD, HCS1
6027 026172 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
6028 026176 104117 ERROR 117 ;NO RDY AFTER SEL DRV CMD
6029
6030 026200 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
6031 026206 012737 000001 005464 MOV #1,UNITB
6032 026214 063765 005464 000010 ADD UNITB,RKCS2(R5)
6033 026222 112737 000102 056560 MOV #B,MSG19A
6034 026230 012737 000001 005314 MOV #SELD, HCS1
6035 026236 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
6036 026242 104117 ERROR 117 ;NO RKY AFTER SEL DRV CMD
6037
6038 026244 032737 000040 005342 BIT #D,DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT B
6039 026252 001001 BNE 64$ ;BR IF YES
6040 026254 104071 ERROR 71 ;PORT B NOT AVAIL AFTER PORT A RLS
6041 026256
6042 64$:
6043 026256 012737 010340 005404 MOV #<D.DRA!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
6044 026264 005037 005406 CLR E.B0 ;EXPECTED MSG B0
6045 026270 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
6046 026276 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
6047 026304 005037 005414 CLR E.A2 ;EXPECTED MSG A2
6048 026310 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
6049 026316 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
6050
6051 026324 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
6052 026330 000000 .WORD 0 ;& MSGS SPECIFIED HERE
6053 026332 104211 ERROR 211 ;MSG A0 ERROR AFTER RELEASE ISSUED
6054 026334 104212 ERROR 212 ;MSG B0 ERROR
6055 026336 104213 ERROR 213 ;MSG A1 ERROR
6056 026340 104214 ERROR 214 ;MSG B1 ERROR
6057 026342 004737 045534 JSR PC,SUBCLR
6058 026346 104024 ERROR 24 ;CERR AFTER SCLR
6059
6060 026350 012737 000000 005464 MOV #0,UNITB ;SETUP PORT A
6061 026356 112737 000101 056560 MOV #A,MSG19A
6062 026364 004737 044172 JSR PC,DRAV ;SEE IF DRIVE AVAIL
6063 026370 000401 BR 1$
6064 026372 104103 ERROR 103 ;PORT A AVAIL BEFORE TMO OR RELEASE
6065
6066 026374 032737 100000 005314 1$: BIT #CERR,HCS1
6067 026402 001001 BNE 2$
6068 026404 104130 ERROR 130 ;CERR NOT SET BY NO DRA
6069
6070 026406 004737 043750 2$: JSR PC,TSTATN
6071 026412 000401 BR 3$
6072 026414 104115 ERROR 115 ;ATTN SET IN PORT A AFTER RLS FROM PORT B
6073

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T21 TEST RELEASE FROM REQUESTING PORT 'A' INHIBITS 'ATTN'

SEQ 0116

6074	026416	012765	100000	000000	3\$:	MOV	#CCLR,RKCS1(R5)	
6075	026424	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6076	026432	012737	000000	005464		MOV	#0,UNITB	
6077	026440	063765	005464	000010		ADD	UNITB,RKCS2(R5)	
6078	026446	112737	000101	056560		MOVB	#'A,MSG19A	
6079	026454	062765	000010	000010		ADD	RLS,RKCS2(R5)	;RELEASE PORT A
6080	026462	012737	000001	005314		MOV	#SELDV,HCS1	
6081	026470	004737	043372			JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6082	026474	104117				ERROR	117	;NO RDY AFTER SEL DRV CMD
6083								
6084	026476	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6085	026504	012737	000001	005464		MOV	#1,UNITB	
6086	026512	063765	005464	000010		ADD	UNITB,RKCS2(R5)	
6087	026520	112737	000102	056560		MOVB	#'B,MSG19A	
6088	026526	012737	000001	005314		MOV	#SELDV,HCS1	
6089	026534	004737	043372			JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6090	026540	104117				ERROR	117	;NO RKY AFTER SEL DRV CMD
6091								
6092	026542	032737	000040	005342		BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
6093	026550	001001				BNE	65\$	;BR IF YES
6094	026552	104071				ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
6095	026554				65\$:			
6096	026554	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6097	026562	012737	000001	005464		MOV	#1,UNITB	
6098	026570	063765	005464	000010		ADD	UNITB,RKCS2(R5)	
6099	026576	112737	000102	056560		MOVB	#'B,MSG19A	
6100	026604	062765	000010	000010		ADD	RLS,RKCS2(R5)	;RELEASE PORT B
6101	026612	012737	000001	005314		MOV	#SELDV,HCS1	
6102	026620	004737	043372			JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6103	026624	104117				ERROR	117	;NO RDY AFTER SEL DRV CMD
6104								
6105	026626	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6106	026634	012737	000000	005464		MOV	#0,UNITB	
6107	026642	063765	005464	000010		ADD	UNITB,RKCS2(R5)	
6108	026650	112737	000101	056560		MOVB	#'A,MSG19A	
6109	026656	012737	000001	005314		MOV	#SELDV,HCS1	
6110	026664	004737	043372			JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6111	026670	104117				ERROR	117	;NO RKY AFTER SEL DRV CMD
6112								
6113	026672	032737	000040	005342		BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
6114	026700	001001				BNE	66\$	;BR IF YES
6115	026702	104071				ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
6116	026704				66\$:			
6117	026704	013737	005466	001366		MOV	TIMER,COUNT	
6118	026712	004737	047204			JSR	PC,TMO	;DO 1.5 SEC TIMEOUT ON PORT A
6119	026716	004737	043750			JSR	PC,TSTATN	
6120	026722	000401				BR	4\$	
6121	026724	104115				ERROR	115	;ATTN SET ON PORT A AFTER RLS FROM PORT A
6122								
6123	026726				4\$:			
6124								
6125	026726	012737	010340	005404		MOV	#<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
6126	026734	005037	005406			CLR	E.B0	;EXPECTED MSG B0
6127	026740	012737	001720	005410		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
6128	026746	012737	000001	005412		MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6129	026754	005037	005414			CLR	E.A2	;EXPECTED MSG A2

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T21 TEST RELEASE FROM REQUESTING PORT 'A' INHIBITS 'ATTN'

SEQ 0117

6130	026760	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6131	026766	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6132							
6133	026774	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
6134	027000	000000			WORD	0:0:0	; & MSGS SPECIFIED HERE
6135	027002	104211			ERROR	211	;MSG A0 ERROR AFTER RELEASE ISSUED
6136	027004	104212			ERROR	212	;MSH B0 ERROR
6137	027006	104213			ERROR	213	;MSG A1 ERROR
6138	027010	104214			ERROR	214	;MSG B1 ERROR
6139	027012	012737	000001	005464	MOV	#1,UNITB	;SETUP PORT B
6140	027020	112737	000102	056560	MOVB	#B,MSG19A	
6141	027026	004737	043750		JSR	PC,STATN	
6142	027032	000401			BR	TST22	;GOTO NEXT TST
6143	027034	104115			ERROR	115	;ATTN SET ON PORT B, AFTER RLS FROM PORT B
6144							
6145							
6146							
6147							
6148							
6149							
6150							
6151							
6152							
6153							
6154							
6155							
6156							
6157	027036	000004			TST22:	SCOPE	
6158	027040	012737	000001	001174	MOV	#1,STIMES	;DO 1 ITERATION
6159	027046	012706	001100		MOV	#STACK,SP	
6160	027052	012737	000000	005464	MOV	#0,UNITB	;SETUP PORT A
6161	027060	112737	000101	056560	MOVB	#A,MSG19A	
6162	027066	013737	005466	001366	MOV	TIMER,COUNT	
6163	027074	004737	047204		JSR	PC,TMO	;DO TIMEOUT
6164							
6165	027100	004737	045534		JSR	PC,SUBCLR	
6166	027104	104024			ERROR	24	;CERR AFTER SCLR
6167							
6168							
6169	027106	004737	044172		JSR	PC,DRAV	;SEE IF DRIVE AVAIL
6170	027112	104045			ERROR	45	;PORT A NOT AVAIL AFTER TMO
6171	027114	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6172	027122	012737	000001	005464	MOV	#1,UNITB	
6173	027130	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6174	027136	112737	000102	056560	MOVB	#B,MSG19A	
6175	027144	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
6176	027152	012737	000001	005314	MOV	#SELDV,HCS1	
6177	027160	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6178	027164	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
6179							
6180	027166	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6181	027174	012737	000000	005464	MOV	#0,UNITB	
6182	027202	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6183	027210	112737	000101	056560	MOVB	#A,MSG19A	
6184	027216	012737	000001	005314	MOV	#SELDV,HCS1	
6185	027224	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY

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T22 TEST RELEASE BY PORT 'B' WHEN SEIZED BY PORT 'A'

SEQ 0118

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6186 027230 104117 ERROR 117 ;NO RKY AFTER SEL DRV CMD
6187
6188 027232 032737 000040 005342 BIT #D.DRA,FMR2 ;SEE IF DRIVE AVAIL ON PORT A
6189 027240 001001 BNE 64$ ;BR IF YES
6190 027242 104071 ERROR 71 ;PORT A NOT AVAIL AFTER PORT B RLS
6191 027244 64$:
6192
6193 027244 012737 010340 005404 MOV #<D.DRA!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
6194 027252 005037 005406 CLR E.B0 ;EXPECTED MSG B0
6195 027256 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
6196 027264 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
6197 027272 005037 005414 CLR E.A2 ;EXPECTED MSG A2
6198 027276 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
6199 027304 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
6200
6201 027312 004737 044274 JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
6202 027316 000000 .WORD 0!0!0 ;& MSGS SPECIFIED HERE
6203 027320 104211 ERROR 211 ;MSG A0 ERROR AFTER RELEASE ISSUED
6204 027322 104212 ERROR 212 ;MSG B0 ERROR
6205 027324 104213 ERROR 213 ;MSG A1 ERROR
6206 027326 104214 ERROR 214 ;MSG B1 ERROR
6207
6208 *****
6209 *TEST 23 TEST RELEASE BY PORT 'A' WHEN SEIZED BY PORT 'B'
6210 *
6211 * THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.
6212 *
6213 *****
6214 *ST23: SCOPE
6215 027330 000004 MOV #1,$TIMES ;;DO 1 ITERATION
6216 027332 012737 000001 001174 MOV #STACK,SP
6217 027340 012706 001100 MOV #1,UNITB ;SETUP PORT B
6218 027344 012737 000001 005464 MOV #B,MSG19A
6219 027352 112737 000102 056560 MOVB #B,MSG19A
6220 027360 013737 005466 001366 MOV TIMER,COUNT
6221 027366 004737 047204 JSR PC,TMO ;DO TIMEOUT
6222
6223 027372 004737 045534 JSR PC,SUBCLR
6224 027376 104024 ERROR 24 ;CERR AFTER SCLR
6225
6226 027400 004737 044172 JSR PC,DRAW ;SEE IF DRIVE AVAIL
6227 027404 104045 ERROR 45 ;PORT B NOT AVAIL AFTER TMO
6228 027406 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
6229 027414 012737 000000 005464 MOV #0,UNITB
6230 027422 063765 005464 000010 ADD UNITB,RKCS2(R5)
6231 027430 112737 000101 056560 MOVB #A,MSG19A
6232 027436 062765 000010 000010 ADD #RLS,RKCS2(R5) ;RELEASE PORT A
6233 027444 012737 000001 005314 MOV #SELD, HCS1
6234 027452 004737 043372 JSR PC,DOCMO ;DO SELDRV (STATUS) CMD & GET CONTR RDY
6235 027456 104117 ERROR 117 ;NO RDY AFTER SEL DRV CMD
6236
6237 027460 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
6238 027466 012737 000001 005464 MOV #1,UNITB
6239 027474 063765 005464 000010 ADD UNITB,RKCS2(R5)
6240 027502 112737 000102 056560 MOVB #B,MSG19A
6241 027510 012737 000001 005314 MOV #SELD, HCS1

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T23

TEST RELEASE BY PORT 'A' WHEN SEIZED BY PORT 'B'

SEQ 0119

6242	027516	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6243	027522	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
6244							
6245	027524	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
6246	027532	001001			BNE	64\$	;BR IF YES
6247	027534	104071			ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
6248	027536						
6249							
6250	027536	012737	010340	005404	MOV	#<D.DRA!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
6251	027544	005037	005406		CLR	E.B0	;EXPECTED MSG B0
6252	027550	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
6253	027556	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6254	027564	005037	005414		CLR	E.A2	;EXPECTED MSG A2
6255	027570	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6256	027576	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6257							
6258	027604	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
6259	027610	000000			.WORD	0!0!0	& MSGS SPECIFIED HERE
6260	027612	104211			ERROR	211	;MSG A0 ERROR AFTER RELEASE ISSUED
6261	027614	104212			ERROR	212	;MSG B0 ERROR
6262	027616	104213			ERROR	213	;MSG A1 ERROR
6263	027620	104214			ERROR	214	;MSG B1 ERROR
6264							

64\$:

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T24 TEST COMMAND FOLLOWED BY IMMEDIATE RELEASE: PORT A

SEQ 0120

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6265
6266
6267
6268
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6270
6271
6272
6273
6274
6275
6276
6277 027622 000004
6278 027624 012737 000001 001174
6279 027632 012706 001100
6280 027636 013765 001222 000010
6281 027644 012737 000001 005464
6282 027652 063765 005464 000010
6283 027660 112737 000102 056560
6284 027666 062765 000010 000010
6285 027674 012737 000001 005314
6286 027702 004737 043372
6287 027706 104117
6288
6289 027710 013765 001222 000010
6290 027716 012737 000000 005464
6291 027724 063765 005464 000010
6292 027732 112737 000101 056560
6293 027740 012737 000001 005314
6294 027746 004737 043372
6295 027752 104117
6296
6297 027754 032737 000040 005342
6298 027762 001001
6299 027764 104071
6300 027766
6301 027766 004737 045534
6302 027772 104024
6303
6304 027774 012765 000012 000020
6305 030002 012737 000017 005314
6306 030010 004737 043372
6307 030014 104131
6308 030016 013765 001222 000010
6309 030024 012737 000000 005464
6310 030032 063765 005464 000010
6311 030040 112737 000101 056560
6312 030046 062765 000010 000010
6313 030054 012737 000001 005314
6314 030062 004737 043372
6315 030066 104117
6316
6317 030070 013765 001222 000010
6318 030076 012737 000001 005464
6319 030104 063765 005464 000010
6320 030112 112737 000102 056560

```

```

*****
TEST 24 TEST COMMAND FOLLOWED BY IMMEDIATE RELEASE: PORT A
*****
A. ISSUE A SEEK COMMAND TO CYL 10 FROM PORT 'A' & AN
IMMEDIATE RELEASE TO PORT 'A'
B. VERIFY THE DRIVE IS AVAILABLE TO PORT 'B' & PORT B SEES ATTN
C. VERIFY PORT A DOES NOT RAISE ATTN WHEN SEEK COMPLETED.
*****
ST24: SCOPE
MOV #1,STIMES ;;DO 1 ITERATION
MOV #STACK,SP
MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
MOV #1,UNITB
ADD UNITB,RKCS2(R5)
MOVB #'B,MSG19A
ADD #RLS,RKCS2(R5) ;RELEASE PORT B
MOV #SELDV,HCS1
JSR PC,DOCMD ;DO SELDRV (S1 TUS) CMD & GET CONTR RDY
ERROR 117 ;NO RDY AFTER SEL DRV CMD

MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
MOV #0,UNITB
ADD UNITB,RKCS2(R5)
MOVB #'A,MSG19A
MOV #SELDV,HCS1
JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR 117 ;NO RKY AFTER SEL DRV CMD

BIT #D,DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT A
BNE 64$ ;BR IF YES
ERROR 71 ;PORT A NOT AVAIL AFTER PORT B RLS

64$: JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR

MOV #10,RKDC(R5)
MOV #SEEK,HCS1
JSR PC,DOCMD ;DO SEEK CMD & GET CONTR READY
ERROR 131 ;NO RDY AFTER SEEK CMD

MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
MOV #0,UNITB
ADD UNITB,RKCS2(R5)
MOVB #'A,MSG19A
ADD #RLS,RKCS2(R5) ;RELEASE PORT A
MOV #SELDV,HCS1
JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR 117 ;NO RDY AFTER SEL DRV CMD

MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
MOV #1,UNITB
ADD UNITB,RKCS2(R5)
MOVB #'B,MSG19A

```

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TEST COMMAND FOLLOWED BY IMMEDIATE RELEASE: PORT A

SEQ 0121

6321	030120	012737	000001	005314	MOV	#SELDV HCS1	
6322	030126	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6323	030132	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
6324							
6325	030134	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
6326	030142	001001			BNE	65\$	;BR IF YES
6327	030144	104071			ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
6328	030146						
6329	030146	013737	001412	005352	MOV	T50000,TEMP1	
6330	030154	004737	044106		JSR	PC,FAT12	
6331	030160	104152			ERROR	152	;NO ATTN ON PORT B AFTER SEEK & RLS FROM PORT A
6332							
6333							
6334	030162	012737	050340	005404	MOV	#<D.DRA!D.DSC!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
6335	030170	005037	005406		CLR	E.B0	;EXPECTED MSG B0
6336	030174	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
6337	030202	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6338	030210	005037	005414		CLR	E.A2	;EXPECTED MSG A2
6339	030214	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6340	030222	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6341							
6342	030230	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
6343	030234	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
6344	030236	104145			ERROR	145	;MSG A0 ERROR AFTER SEEK & RLS FROM PORT A
6345	030240	104146			ERROR	146	;MSG B0 ERROR
6346	030242	104147			ERROR	147	;MSG A1 ERROR
6347	030244	104150			ERROR	150	;MSG B1 ERROR
6348	030246	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6349	030254	012737	000001	005464	MOV	#1,UNITB	
6350	030262	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6351	030270	112737	000102	056560	MOVB	#'B,MSG19A	
6352	030276	03765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
6353	030304	012737	000001	005314	MOV	#SELDV HCS1	
6354	030312	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6355	030316	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
6356							
6357	030320	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6358	030326	012737	000000	005464	MOV	#0,UNITB	
6359	030334	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6360	030342	112737	000101	056560	MOVB	#'A,MSG19A	
6361	030350	012737	000001	005314	MOV	#SELDV HCS1	
6362	030356	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6363	030362	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
6364							
6365	030364	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
6366	030372	001001			BNE	66\$	;BR IF YES
6367	030374	104071			ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
6368	030376						
6369	030376	004737	043750		JSR	PC,TSTATN	
6370	030402	000401			BR	1\$	
6371	030404	104160			ERROR	160	;ATTN ON PORT A AFTER SEEK & RLS FROM PORT A
6372							
6373	030406						
6374							
6375	030406	012737	010340	005404	MOV	#<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
6376	030414	005037	005406		CLR	E.B0	;EXPECTED MSG B0

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SEQ 0122

TEST COMMAND FOLLOWED BY IMMEDIATE RELEASE: PORT A

6377	030420	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
6378	030426	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6379	030434	005037	005414		CLR	E.A2	;EXPECTED MSG A2
6380	030440	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6381	030446	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6382							
6383	030454	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
6384	030460	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
6385	030462	104145			ERROR	145	;MSG A0 ERROR AFTER SEEK & RLS FROM PORT A
6386	030464	104146			ERROR	146	;MSG B0 ERROR
6387	030466	104147			ERROR	147	;MSG A1 ERROR
6388	030470	104150			ERROR	150	;MSG B1 ERROR

 *TEST 25 TEST COMMAND FOLLOWED BY IMMEDIATE RELEASE: PORT B
 *

THE PREVIOUS TEST IS REPEATED FOR PORT 'B',
 BUT THE SEEK IS TO CYLINDER 0

 *ST25: SCOPE

6397	030472	000004			MOV	#1,STIMES	;DO 1 ITERATION
6398	030474	012737	000001	001174	MOV	#STACK,SP	
6399	030502	012706	001100		MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6400	030506	013765	001222	000010	MOV	#0,UNITB	
6401	030514	012737	000000	005464	ADD	UNITB,RKCS2(R5)	
6402	030522	063765	005464	000010	MOV	#A,MSG19A	
6403	030530	112737	000101	056560	MOV	#RLS,RKCS2(R5)	;RELEASE PORT A
6404	030536	062765	000010	000010	ADD	#SELD,DRV,HCS1	
6405	030544	012737	000001	005314	JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6406	030552	004737	043372		ERROR	117	;NO RDY AFTER SEL DRV CMD
6407	030556	104117					
6408							
6409	030560	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6410	030566	012737	000001	005464	MOV	#1,UNITB	
6411	030574	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6412	030602	112737	000102	056560	MOV	#B,MSG19A	
6413	030610	012737	000001	005314	MOV	#SELD,DRV,HCS1	
6414	030616	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6415	030622	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
6416							
6417	030624	032737	000040	005342	BIT	#D,DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
6418	030632	001001			BNE	64\$	;BR IF YES
6419	030634	104071			ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
6420	030636						
6421	030636	004737	045534		JSR	PC,SUBCLR	
6422	030642	104024			ERROR	24	;CERR AFTER SCLR
6423							
6424	030644	012765	000000	000020	MOV	#0,RKDC(R5)	
6425	030652	012737	000017	005314	MOV	#SEEK,HCS1	
6426	030660	004737	043372		JSR	PC,DOCMD	;DO SEEK CMD & GET CONTR READY
6427	030664	104131			ERROR	131	;NO RDY AFTER SEEK CMD
6428	030666	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6429	030674	012737	000001	005464	MOV	#1,UNITB	
6430	030702	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6431	030710	112737	000102	056560	MOV	#B,MSG19A	
6432	030716	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B

64\$:

G10

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T25 TEST COMMAND FOLLOWED BY IMMEDIATE RELEASE: PORT B

SEQ 0123

6433	030724	012737	000001	005314	MOV	#SELDV,HCS1	
6434	030732	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6435	030736	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
6436							
6437	030740	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6438	030746	012737	000000	005464	MOV	#0,UNITB	
6439	030754	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6440	030762	112737	000101	056560	MOVB	#'A,MSG19A	
6441	030770	012737	000001	005314	MOV	#SELDV,HCS1	
6442	030776	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6443	031002	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
6444							
6445	031004	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
6446	031012	001001			BNE	65\$	;BR IF YES
6447	031014	104071			ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
6448	031016						
6449	031016	013737	001412	005352	MOV	T50000,TEMP1	
6450	031024	004737	044106		JSR	PC,FATT2	
6451	031030	104152			ERROR	152	;NO ATTN ON PORT A AFTER SEEK & RLS FROM PORT B
6452							
6453							
6454	031032	012737	050340	005404	MOV	#<D.DRA!D.DSC!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
6455	031040	005037	005406		CLR	E.B0	;EXPECTED MSG B0
6456	031044	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
6457	031052	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6458	031060	005037	005414		CLR	E.A2	;EXPECTED MSG A2
6459	031064	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6460	031072	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6461							
6462	031100	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
6463	031104	000000			WORD	0!0!0	& MSGS SPECIFIED HERE
6464	031106	104145			ERROR	145	;MSG A0 ERROR AFTER SEEK & RLS FROM PORT B
6465	031110	104146			ERROR	146	;MSG B0 ERROR
6466	031112	104147			ERROR	147	;MSG A1 ERROR
6467	031114	104150			ERROR	150	;MSG B1 ERROR
6468	031116	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6469	031124	012737	000000	005464	MOV	#0,UNITB	
6470	031132	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6471	031140	112737	000101	056560	MOVB	#'A,MSG19A	
6472	031146	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT A
6473	031154	012737	000001	005314	MOV	#SELDV,HCS1	
6474	031162	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6475	031166	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
6476							
6477	031170	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6478	031176	012737	000001	005464	MOV	#1,UNITB	
6479	031204	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6480	031212	112737	000102	056560	MOVB	#'B,MSG19A	
6481	031220	012737	000001	005314	MOV	#SELDV,HCS1	
6482	031226	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6483	031232	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
6484							
6485	031234	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
6486	031242	001001			BNE	66\$	;BR IF YES
6487	031244	104071			ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
6488	031246						

65\$:

66\$:

H10

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T25 TEST COMMAND FOLLOWED BY IMMEDIATE RELEASE: PORT B

SEQ 0124

6489 031246 004737 043750
6490 031252 000401
6491 031254 104160

JSR PC,TSTATN
BR 15
ERROR 160

;ATTN ON PORT B AFTER SEEK & RLS FROM PORT B

6492 031256

15:

6493 031256 012737 010340 005404
6494 031264 005037 005406
6495 031270 012737 001720 005410
6496 031276 012737 000001 005412
6497 031304 005037 005414
6500 031310 012737 000002 005416
6501 031316 012737 000003 005422

MOV #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
CLR E.B0 ;EXPECTED MSG B0
MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
CLR E.A2 ;EXPECTED MSG A2
MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3

6502 031324 004737 044274
6503 031330 000000
6504 031332 104145
6505 031334 104146
6506 031336 104147
6507 031340 104150

JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
.WORD 0!0!0 ;& MSGS SPECIFIED HERE
ERROR 145 ;MSG A0 ERROR AFTER SEEK & RLS FROM PORT B
ERROR 146 ;MSG B0 ERROR
ERROR 147 ;MSG A1 ERROR
ERROR 150 ;MSG B1 ERROR

:TEST 26 TEST TIMEOUT RETRIGGER THRU PORT 'A'

* VERIFY THAT THE PORT TIMEOUT ONE-SHOT CAN BE RETRIGGERED.

* A. PORT 'A' SEIZES THE DRIVE

* B. THE PROGRAM WAITS 500MS & RE-SEIZES THE DRIVE THRU PORT 'A'

* C. PORT 'B' ATTEMPTS TO SEIZE THE DRIVE & THE PROGRAM
* VERIFIES THAT FULL TIMEOUT TOOK PLACE FROM STEP B ABOVE.

:ST26: SCOPE

6524 031342 000004
6525 031344 012737 000001 001174
6526 031352 012706 001100
6527 031356 004737 045534
6528 031362 104024
6529 031364 013765 001222 000010
6530 031372 012737 000001 005464
6531 031400 063765 005464 000010
6532 031406 112737 000102 056560
6533 031414 062765 000010 000010
6534 031422 012737 000001 005314
6535 031430 004737 043372
6536 031434 104117
6537
6538 031436 013765 001222 000010
6539 031444 012737 000000 005464
6540 031452 063765 005464 000010
6541 031460 112737 000101 056560
6542 031466 012737 000001 005314
6543 031474 004737 043372
6544 031500 104117

MOV #1,STIMES ;DO 1 ITERATION
MOV #STACK,SP
JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR
MOV \$UNIT,RKCS2(R5) ;SETUP FOR PORT B
MOV #1,UNITB
ADD UNITB,RKCS2(R5)
MOVB #'B,MSG19A
ADD #RLS,RKCS2(R5) ;RELEASE PORT B
MOV #SELDV,HCS1
JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR 117 ;NO RDY AFTER SEL DRV CMD
MOV \$UNIT,RKCS2(R5) ;SETUP FOR PORT A
MOV #0,UNITB
ADD UNITB,RKCS2(R5)
MOVB #'A,MSG19A
MOV #SELDV,HCS1
JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR 117 ;NO RKY AFTER SEL DRV CMD

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T26 TEST TIMEOUT RETRIGGER THRU PORT 'A'

SEQ 0125

```

6545
6546 031502 032737 000040 005342      BIT      #D.DRA,HMR2      ;SEE IF DRIVE AVAIL ON PORT A
6547 031510 001001      BNE      64$      ;BR IF YES
6548 031512 104071      ERROR    71      ;PORT A NOT AVAIL AFTER PORT B RLS
6549 031514      64$:      JSR      PC,SUBCLR
6550 031514 004737 045534      ERROR    24      ;CERR AFTER SCLR
6551 031520 104024
6552
6553 031522 012737 000036 001366      MOV      #30,COUNT
6554 031530 004737 047204      JSR      PC,TMO      ;DO 500MS TIMEOUT
6555 031534 004737 044172      JSR      PC,DRAV      ;RE-SEIZE DRIVE THRU PORT A
6556 031540 104045      ERROR    45      ;PORT A NOT AVAIL AFTER TIMECUT
6557
6558 031542 012737 010340 005404      MOV      #<D.DRA!D!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
6559 031550 005037 005406      CLR      E.B0      ;EXPECTED MSG B0
6560 031554 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
6561 031562 012737 000001 005412      MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
6562 031570 005037 005414      CLR      E.A2      ;EXPECTED MSG A2
6563 031574 012737 000002 005416      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
6564 031602 012737 000003 005422      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
6565
6566 031610 004737 044274      JSR      PC,CHKMSG      ;CHECK MSGS A0, B0, A1, B1
6567 031614 000000      .WORD    0!0!0      ;& MSGS SPECIFIED HERE
6568 031616 104165      ERROR    165      ;MSG A0 ERROR AFTER TIMEOUT
6569 031620 104166      ERROR    166      ;MSG B0 ERROR
6570 031622 104167      ERROR    167      ;MSG A1 ERROR
6571 031624 104170      ERROR    170      ;MSG B1 ERROR
6572 031626 012737 177777 001366      MOV      #-1,COUNT
6573 031634 004737 047114      JSR      PC,CLKON      ;TURN ON CLOCK
6574 031640 012737 000001 005464      MOV      #1,UNITB      ;SETUP PORT B
6575 031646 004737 044172      JSR      PC,DRAV      ;SEE IF DRV AVAIL
6576 031652 000401      BR      1$      ;BR IF NO
6577 031654 104103      ERROR    103      ;PORT A AVAIL BEFORE TMO OR RLS
6578 031656 112737 000102 056560 1$:      MOV      #B,MSG19A
6579 031664 013704 001222      MOV      $UNIT,R4
6580 031670 063704 005464      ADD      UNITB,R4
6581 031674 004737 044214      JSR      PC,FATT3
6582 031700 104110      ERROR    110      ;NO ATTN ON PORT B TO ALLOW SEIZE
6583
6584 031702 004737 047162      JSR      PC,CLKOF      ;TURN CLOCK OFF
6585 031706 005137 001366      COM      COUNT
6586 031712 023727 001366 000043      CMP      COUNT,#35.      ;GET ACTUAL COUNT OF TIMEOUT
6587 031720 002001      BGE      TST27      ;COMPARE COUNT AGAINST APPROX 1 SEC
6588 031722 104153      ERROR    153      ;GO TO NEXT TEST
6589
6590      ;*****
6591      ;TEST 27      TEST TIMEOUT RETRIGGER THRU PORT 'B'
6592      ;
6593      ;THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.
6594      ;
6595      ;*****
6596 031724 000004      TST27:  SCOPE
6597 031726 012737 000001 001174      MOV      #1,$TIMES      ;DO 1 ITERATION
6598 031734 012706 001100      MOV      #STACK,SP
6599 031740 004737 045534      JSR      PC,SUBCLR
6600 031744 104024      ERROR    24      ;CERR AFTER SCLR

```

J10

CZR6GB0 RK611 DU PORT LGC TST
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T27 TEST TIMEOUT RETRIGGER THRU PORT 'B'

SEQ 0126

6601	031746	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6602	031754	012737	000000	005464	MOV	#0,UNITB	
6603	031762	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6604	031770	112737	000101	056560	MOVB	#'A,MSG19A	
6605	031776	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT A
6606	032004	012737	000001	005314	MOV	#SELD,DRV,HCS1	
6607	032012	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6608	032016	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
6609							
6610	032020	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6611	032026	012737	000001	005464	MOV	#1,UNITB	
6612	032034	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6613	032042	112737	000102	056560	MOVB	#'B,MSG19A	
6614	032050	012737	000001	005314	MOV	#SELD,DRV,HCS1	
6615	032056	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6616	032062	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
6617							
6618	032064	032737	000040	005342	BIT	#D,DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
6619	032072	001001			BNE	64\$	;BR IF YES
6620	032074	104071			ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
6621	032076						
6622	032076	004737	045534		JSR	PC,SUBCLR	
6623	032102	104024			ERROR	24	;CERR AFTER SCLR
6624							
6625	032104	012737	000036	001366	MOV	#30,COUNT	
6626	032112	004737	047204		JSR	PC,TMO	;DO 500MS TIMEOUT
6627	032116	004737	044172		JSR	PC,DRV	;RE-SEIZE DRIVE THRU PORT B
6628	032122	104045			ERROR	45	;PORT B NOT AVAIL AFTER TIMEOUT
6629							
6630	032124	012737	010340	005404	MOV	#<D.DRA!D!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
6631	032132	005037	005406		CLR	E.B0	;EXPECTED MSG B0
6632	032136	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
6633	032144	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6634	032152	005037	005414		CLR	E.A2	;EXPECTED MSG A2
6635	032156	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6636	032164	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6637							
6638	032172	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
6639	032176	000000			.WORD	0!0!0	;8 MSGS SPECIFIED HERE
6640	032200	104165			ERROR	165	;MSG A0 ERROR AFTER TIMEOUT
6641	032202	104166			ERROR	166	;MSG B0 ERROR
6642	032204	104167			ERROR	167	;MSG A1 ERROR
6643	032206	104170			ERROR	170	;MSG B1 ERROR
6644	032210	012737	177777	001366	MOV	#-1,COUNT	
6645	032216	004737	047114		JSR	PC,CLKON	;TURN ON CLOCK
6646	032222	012737	000000	005464	MOV	#0,UNITB	;SETUP PORT A
6647	032230	004737	044172		JSR	PC,DRV	;SEE IF DRV AVAIL
6648	032234	000401			BR	1\$	;BR IF NO
6649	032236	104103			ERROR	103	;PORT B AVAIL BEFORE TMO OR RLS
6650	032240	112737	000101	056560	MOVB	#'A,MSG19A	
6651	032246	013704	001222		MOV	\$UNIT,R4	
6652	032252	063704	005464		ADD	UNITB,R4	
6653	032256	004737	044214		JSR	PC,FATT3	
6654	032262	104110			ERROR	110	;NO ATTN ON PORT A TO ALLOW SEIZE
6655							
6656	032264	004737	047162		JSR	PC,CLKOF	;TURN CLOCK OFF

K10

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T27 TEST TIMEOUT RETRIGGER THRU PORT 'B'

SEQ 0127

6657 032270 005137 001366
6658 032274 023727 001366
6659 032302 002001
6660 032304 104153
6661

000043

COM COUNT
CMP COUNT, #35.
BGE TST30
ERROR 153

;GET ACTUAL COUNT OF TIMEOUT
;COMPARE COUNT AGAINST APPROX 1 SEC
;GO TO NEXT TEST
;TIMEOUT DID NOT RE-TRIGGER

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T30 TEST PORT 'A' TIMER INHIBIT

SEQ 0128

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032306	000004		
032310	012737	000001	001174
032316	012706	001100	
032322	004737	045534	
032326	104024		
032330	013765	001222	000010
032336	012737	000001	005464
032344	063765	005464	000010
032352	112737	000102	056560
032360	062765	000010	000010
032366	012737	000001	005314
032374	004737	043372	
032400	104117		
032402	013765	001222	000010
032410	012737	000000	005464
032416	063765	005464	000010
032424	112737	000101	056560
032432	012737	000001	005314
032440	004737	043372	
032444	104117		
032446	032777	000040	005342
032454	001001		
032456	104071		
032460			
032460	004737	045534	
032464	104024		
032466	012737	000001	005464
032474	112737	000102	056560
032502	004737	044172	
032506	000401		
032510	104103		
032512	012765	100000	000000
032520	013765	001222	000010
032526	012737	000000	005464
032534	063765	005464	000010
032542	112737	000101	056560
032550	062765	000010	000010
032556	012737	000001	005314
032564	004737	043372	

```

*****
TEST 30      TEST PORT 'A' TIMER INHIBIT
*****
A.  PORT 'A' SEIZES THE DRIVE
B.  PORT 'B' ATTEMPTS TO SEIZE THE DRIVE
C.  PORT 'A' RELEASES THE DRIVE
D.  PORT 'A' ATTEMPTS TO GET THE DRIVE BACK.

THE PROGRAM VERIFIES THAT PORT 'A' CANNOT ACCESS
THE DRIVE FOR APPROX 1 SEC
*****
TST30:  SCOPE
        MOV      #1,STIMES      ;;DO 1 ITERATION
        MOV      #STACK,SP
        JSR      PC,SUBCLR
        ERROR    24              ;CERR AFTER SCLR
        MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT B
        MOV      #1,UNITB
        ADD      UNITB,RKCS2(R5)
        MOVB     #'B,MSG19A
        ADD      #RLS,RKCS2(R5) ;RELEASE PORT B
        MOV      #SELDV,HCS1
        JSR      PC,DOCMD        ;DO SELDRV (STATUS) CMD & GET CONTR RDY
        ERROR    117             ;NO RDY AFTER SEL DRV CMD

        MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT A
        MOV      #0,UNITB
        ADD      UNITB,RKCS2(R5)
        MOVB     #'A,MSG19A
        MOV      #SELDV,HCS1
        JSR      PC,DOCMD        ;DO SELDRV (STATUS) CMD & GET CONTR RDY
        ERROR    117             ;NO RKY AFTER SEL DRV CMD

        BIT      #D,DRA,HMR2     ;SEE IF DRIVE AVAIL ON PORT A
        BNE     64$              ;BR IF YES
        ERROR    71              ;PORT A NOT AVAIL AFTER PORT B RLS

64$:    JSR      PC,SUBCLR
        ERROR    24              ;CERR AFTER SCLR

        MOV      #1,UNITB        ;SETUP FOR PORT B
        MOVB     #'B,MSG19A
        JSR      PC,DRAV          ;PORT B TRIES TO SEIZE THE DRIVE
        BR       1$              ;BR IF NOT AVAIL
        ERROR    103             ;PORT B AVAIL BEFORE TMO OR RELEASE

1$:    MOV      #CCLR,RKCS1(R5)
        MOV      $UNIT,RKCS2(R5) ;SETUP FOR PORT A
        MOV      #0,UNITB
        ADD      UNITB,RKCS2(R5)
        MOVB     #'A,MSG19A
        ADD      #RLS,RKCS2(R5) ;RELEASE PORT A
        MOV      #SELDV,HCS1
        JSR      PC,DOCMD        ;DO SELDRV (STATUS) CMD & GET CONTR RDY

```

M10

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T30 TEST PORT 'A' TIMER INHIBIT

SEQ 0129

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6718 032570 104117 ERROR 117 ;NO RDY AFTER SEL DRV CMD
6719
6720 032572 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
6721 032600 012737 000001 005464 MOV #1,UNITB
6722 032606 063765 005464 000010 ADD UNITB,RKCS2(R5)
6723 032614 112737 000102 056560 MOVB #'B,MSG19A
6724 032622 012737 000001 005314 MOV #SELDV,HCS1
6725 032630 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
6726 032634 104117 ERROR 117 ;NO RKY AFTER SEL DRV CMD
6727
6728 032636 032737 000040 005342 BIT #D,DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT B
6729 032644 001001 BNE 65$ ;BR IF YES
6730 032646 104071 ERROR 71 ;PORT B NOT AVAIL AFTER PORT A RLS
6731 032650 65$:
6732 032650 012737 000000 005464 MOV #0,UNITB ;SETUP FOR PORT A
6733 032656 112737 000101 056560 MOVB #'A,MSG19A
6734 032664 004737 044172 JSR PC,DRAV
6735 032670 000401 BR 2$
6736 032672 104103 ERROR 103 ;PORT A AVAIL BEFORE TMO OR RELEASE
6737
6738 032674 012765 100000 000000 2$: MOV #CCLR,RKCS1(R5)
6739 032702 012737 177777 001366 MOV #-1,COUNT
6740 032710 004737 047114 JSR PC,CLKON
6741 032714 013704 001222 MOV $UNIT,R4
6742 032720 063704 005464 ADD UNITB,R4
6743 032724 004737 044214 JSR PC,FATT3
6744 032730 104110 ERROR 110 ;NO ATTN ON PORT A TO ALLOW SEIZE
6745
6746 032732 004737 047162 JSR PC,CLKOF ;TURN CLOCK OFF
6747 032736 005137 001366 COM COUNT ;GET ACTUAL COUNT OF TIMEOUT
6748 032742 023727 001366 000043 CMP COUNT,#35. ;COMPARE AGAINST APPROX 1 SEC
6749 032750 002001 BGE TST31 ;GO TO NEXT TST
6750 032752 104153 ERROR 153 ;TIMEOUT DID NOT RE-TRIGGER
6751
6752 *****
6753 ;*TEST 31 TEST PORT 'B' TIMER INHIBIT
6754 ;*
6755 ;* THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.
6756 ;*
6757 *****
6758 032754 000004 TST31: SCOPE
6759 032756 012737 000001 001174 MOV #1,$TIMES ;DO 1 ITERATION
6760 032764 012706 001100 MOV #STACK,SP
6761 032770 004737 045534 JSR PC,SUBCLR
6762 032774 104024 ERROR 24 ;CERR AFTER SCLR
6763 032776 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
6764 033004 012737 000000 005464 MOV #0,UNITB
6765 033012 063765 005464 000010 ADD UNITB,RKCS2(R5)
6766 033020 112737 000101 056560 MOVB #'A,MSG19A
6767 033026 062765 000010 000010 ADD #RLS,RKCS2(R5) ;RELEASE PORT A
6768 033034 012737 000001 005314 MOV #SELDV,HCS1
6769 033042 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
6770 033046 104117 ERROR 117 ;NO RDY AFTER SEL DRV CMD
6771
6772 033050 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
6773 033056 012737 000001 005464 MOV #1,UNITB

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N10

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T31 TEST PORT 'B' TIMER INHIBIT

SEQ 0130

6774	033064	063765	005464	000010		ADD	UNITB,RKCS2(R5)	
6775	033072	112737	000102	056560		MOVB	#'B,MSG19A	
6776	033100	012737	000001	005314		MOV	#SELDV,HCS1	
6777	033106	004737	043372			JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6778	033112	104117				ERROR	117	;NO RKY AFTER SEL DRV CMD
6779								
6780	033114	032737	000040	005342		BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
6781	033122	001001				BNE	64\$	;BR IF YES
6782	033124	104071			64\$:	ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
6783	033126							
6784	033126	004737	045534			JSR	PC,SUBCLR	
6785	033132	104024				ERROR	24	;CERR AFTER SCLR
6786								
6787	033134	012737	000000	005464		MOV	#0,UNITB	;SETUP FOR PORT A
6788	033142	112737	000101	056560		MOVB	#'A,MSG19A	
6789	033150	004737	044172			JSR	PC,DRAV	;PORT A TRIES TO SEIZE THE DRIVE
6790	033154	000401				BR	1\$	;BR IF NOT AVAIL
6791	033156	104103				ERROR	103	;PORT A AVAIL BEFORE TMO OR RELEASE
6792								
6793	033160	012765	100000	000000	1\$:	MOV	#CCLR,RKCS1(R5)	
6794	033166	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6795	033174	012737	000001	005464		MOV	#1,UNITB	
6796	033202	063765	005464	000010		ADD	UNITB,RKCS2(R5)	
6797	033210	112737	000102	056560		MOVB	#'B,MSG19A	
6798	033216	062765	000010	000010		ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
6799	033224	012737	000001	005314		MOV	#SELDV,HCS1	
6800	033232	004737	043372			JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6801	033236	104117				ERROR	117	;NO RDY AFTER SEL DRV CMD
6802								
6803	033240	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6804	033246	012737	000000	005464		MOV	#0,UNITB	
6805	033254	063765	005464	000010		ADD	UNITB,RKCS2(R5)	
6806	033262	112737	000101	056560		MOVB	#'A,MSG19A	
6807	033270	012737	000001	005314		MOV	#SELDV,HCS1	
6808	033276	004737	043372			JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6809	033302	104117				ERROR	117	;NO RKY AFTER SEL DRV CMD
6810								
6811	033304	032737	000040	005342		BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
6812	033312	001001				BNE	65\$	;BR IF YES
6813	033314	104071			65\$:	ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
6814	033316							
6815	033316	012737	000001	005464		MOV	#1,UNITB	;SETUP FOR PORT B
6816	033324	112737	000102	056560		MOVB	#'B,MSG19A	
6817	033332	004737	044172			JSR	PC,DRAV	
6818	033336	000401				BR	2\$	
6819	033340	104103				ERROR	103	;PORT B AVAIL BEFORE TMO OR RELEASE
6820								
6821	033342	012765	100000	000000	2\$:	MOV	#CCLR,RKCS1(R5)	
6822	033350	012737	177777	001366		MOV	#-1,COUNT	
6823	033356	004737	047114			JSR	PC,CLKON	
6824	033362	013704	001222			MOV	\$UNIT,R4	
6825	033366	063704	005464			ADD	UNITB,R4	
6826	033372	004737	044214			JSR	PC,FAIT3	
6827	033376	104110				ERROR	110	;NO ATTN ON PORT B TO ALLOW SEIZE
6828								
6829	033400	004737	047162			JSR	PC,CLKOF	;TURN CLOCK OFF

B11

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SEQ 0131

6830	033404	005137	001366		COM	COUNT	;GET ACTUAL COUNT OF TIMEOUT
6831	033410	023727	001366	000043	CMP	COUNT.#35.	;COMPARE F AINST APPROX 1 SEC
6832	033416	002001			BGE	TST32	;GO TO NEXT TST
6833	033420	104153			ERROR	153	;TIMEOUT DID NOT RE-TRIGGER
6834							

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6856 033422 000004
6857 033424 012737 000001 001174
6858 033432 004737 045534
6859 033436 104024
6860 033440 012706 001100
6861 033444 013765 001222 000010
6862 033452 012737 000001 005464
6863 033460 063765 005464 000010
6864 033466 112737 000102 056560
6865 033474 062765 000010 000010
6866 033502 012737 000001 005314
6867 033510 004737 043372
6868 033514 104117
6869
6870 033516 013765 001222 000010
6871 033524 012737 000000 005464
6872 033532 063765 005464 000010
6873 033540 112737 000101 056560
6874 033546 012737 000001 005314
6875 033554 004737 043372
6876 033560 104117
6877
6878 033562 032737 000040 005342
6879 033570 001001
6880 033572 104071
6881 033574
6882 033574 004737 045534
6883 033600 104024
6884
6885 033602 005237 005276
6886 033606 012737 034046 001176
6887 033614 012737 000007 005314
6888 033622 053737 001170 005314
6889 033630 013765 005314 000000
6890 033636 013737 001400 005352

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*****
TEST 32 TEST UNLOAD COMMAND TIMER INHIBIT THRU PORT 'A'
*****
VERIFY THAT THE UNLOAD COMMAND THRU A PORT, SEIZES THAT
PORT FOR AS LONG HAS HEADS ARE UNLOADED & RELEASE IS NOT
ISSUED.
A. ISSUE AN UNLOAD COMMAND THRU PORT 'A'.
VERIFY DRIVE UNLOADS & ATTENTION IS SET.
B. DELAY FOR 5 SECONDS & VERIFY DRIVE NOT AVAILABLE
TO PORT 'B' TO INSURE TIMERS INHIBITED
C. ISSUE A RELEASE FROM PORT 'A'. VERIFY DRIVE BECOMES
AVAILABLE TO PORT 'B'
D. LOAD HEADS FROM PORT 'B' & VERIFY 'ATTN-B' AT COMPLETION
*****
TST32: SCOPE
MOV #1, $TIMES ;DO 1 ITERATION
JSR PC, SUBCLR ;SUB SYSTEM CLEAR 29-SEP-77
ERROR 24
MOV #STACK, SP
MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT B
MOV #1, UNITB
ADD UNITB, RKCS2(R5)
MOVB #'B, MSG19A
ADD #RLS, RKCS2(R5) ;RELEASE PORT B
MOV #SELD, HCS1
JSR PC, DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR 117 ;NO RDY AFTER SEL DRV CMD
MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT A
MOV #0, UNITB
ADD UNITB, RKCS2(R5)
MOVB #'A, MSG19A
MOV #SELD, HCS1
JSR PC, DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR 117 ;NO RDY AFTER SEL DRV CMD
BIT #0, DRA, HMR2 ;SEE IF DRIVE AVAIL ON PORT A
BNE 64$ ;BR IF YES
ERROR 71 ;PORT A NOT AVAIL AFTER PORT B RLS
64$: JSR PC, SUBCLR ;CERR AFTER SCLR
ERROR 24
INC UNLD ;USED FOR VALID HALT
MOV #25, $ESCAPE
MOV #UNLOAD, HCS1 ;UNLOAD CMD
BIS $TMP4, HCS1
MOV HCS1, RKCS1(R5)
MOV T10, TEMP1 ;SETUP TIMEOUT

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TEST UNLOAD COMMAND TIMER INHIBIT THRU PORT 'A'

SEQ 0133

6891	033644	004737	044106		JSR	PC,FATT2	;FIND ATTN
6892	033650	104073			ERROR	73	;NO ATTN AFTER UNLD CMD
6893							
6894	033652	012737	000454	001366	MOV	#300,COUNT	
6895	033660	004737	047204		JSR	PC,TMO	;DO 5 SEC DELAY
6896	033664	012737	000001	005464	MOV	#1,UNITB	;SETUP FOR PORT B
6897	033672	112737	000102	056560	MOVB	#B,MSG19A	
6898	033700	004737	044172		JSR	PC,DRAV	
6899	033704	000401			BR	15	
6900	033706	104155			ERROR	155	;PORT B AVAIL BEFORE RLS WHEN UNLOADED
6901							;UNLOAD DID NOT INHIBIT TIMERS
6902							
6903	033710	012765	100000	000000	1\$: MOV	#CCLR,RKCS1(R5)	
6904	033716	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
6905	033724	012737	000000	005464	MOV	#0,UNITB	
6906	033732	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6907	033740	112737	000101	056560	MOVB	#A,MSG19A	
6908	033746	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT A
6909	033754	012737	000001	005314	MOV	#SELDV,HCS1	
6910	033762	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6911	033766	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
6912							
6913	033770	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
6914	033776	012737	000001	005464	MOV	#1,UNITB	
6915	034004	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
6916	034012	112737	000102	056560	MOVB	#B,MSG19A	
6917	034020	012737	000001	005314	MOV	#SELDV,HCS1	
6918	034026	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
6919	034032	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
6920							
6921	034034	032737	000040	005342	BIT	#D,DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT B
6922	034042	001001			BNE	655	;BR IF YES
6923	034044	104071			ERROR	71	;PORT B NOT AVAIL AFTER PORT A RLS
6924	034046						
6925	034046	005037	001176		65\$: CLR	\$ESCAPE	
6926					2\$:		
6927	034052	004737	045534		JSR	PC,SUBCLR	
6928	034056	104024			ERROR	24	;CERR AFTER SCLR
6929							
6930	034060	012737	000011	005314	MOV	#SRTSPL,HCS1	
6931	034066	004737	043372		JSR	PC,DOCMD	;DO START SPINDLE CMD & GET CONTR RDY
6932	034072	104121			ERROR	121	;RDY NOT SET AFTER ST SPIN CMD.
6933							
6934	034074	013737	001406	005354	MOV	T100,TEMP2	;SETUP TIMEOUT
6935	034102	004737	044006		JSR	PC,FATT1	;FIND ATTN
6936	034106	104074			ERROR	74	;NO ATTN AFTER ST SPIN CMD.
6937							
6938	034110	005037	005276		CLR	UNLD	
6939							
6940	034114	005037	005276		CLR	UNLD	
6941							

```

*****
;TEST 33      TEST UNLOAD COMMAND TIMER INHIBIT THRU PORT 'B'
;
;      THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.
;

```

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T33 TEST UNLOAD COMMAND TIMER INHIBIT THRU PORT 'B'

SEQ 0134

```

6947 034120 000004 000001 001174 1ST33: SCOPE
6948 034122 012737 000001 001174 MOV #1, $TIMES ;DO 1 ITERATION
6949 034130 004737 045534 JSR PC, SUBCLR ;SUB SYSTEM CLEAR 29-SEP-77
6950 034134 104024 ERROR 24
6951 034136 012706 001100 MOV #STACK, SP
6952 034142 013765 001222 000010 MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT A
6953 034150 012737 000000 005464 MOV #0, UNITB
6954 034156 063765 005464 000010 ADD UNITB, RKCS2(R5)
6955 034164 112737 000101 056560 MOVB #A, MSG19A
6956 034172 062765 000010 000010 ADD #RLS, RKCS2(R5) ;RELEASE PORT A
6957 034200 012737 000001 005314 MOV #SELD, HCS1
6958 034206 004737 043372 JSR PC, DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
6959 034212 104117 ERROR 117 ;NO RDY AFTER SEL DRV CMD
6960 034214 013765 001222 000010 MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT B
6961 034222 012737 000001 005464 MOV #1, UNITB
6962 034230 063765 005464 000010 ADD UNITB, RKCS2(R5)
6963 034236 112737 000102 056560 MOVB #B, MSG19A
6964 034244 012737 000001 005314 MOV #SELD, HCS1
6965 034252 004737 043372 JSR PC, DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
6966 034256 104117 ERROR 117 ;NO RKY AFTER SEL DRV CMD
6967 034260 032737 000040 005342 BIT #D, DRA, HMR2 ;SEE IF DRIVE AVAIL ON PORT B
6968 034266 001001 001001 BNE 64$ ;BR IF YES
6969 034270 104071 ERROR 71 ;PORT B NOT AVAIL AFTER PORT A RLS
6970 034272 004737 045534 64$: JSR PC, SUBCLR
6971 034276 104024 ERROR 24 ;CERR AFTER SCLR
6972 034300 005237 005276 INC UNLD ;USED FOR VALID HALT
6973 034304 012737 034544 001176 MOV #25, $ESCAPE
6974 034312 012737 000007 005314 MOV #UNLOAD, HCS1 ;UNLOAD CMD
6975 034320 053737 001170 005314 BIS $TMP4, HCS1
6976 034326 013765 005314 000000 MOV HCS1, RKCS1(R5)
6977 034334 013737 001400 005352 MOV T10, TEMP1 ;SETUP TIMEOUT
6978 034342 004737 044106 JSR PC, FATT2 ;FIND ATTN
6979 034346 104073 ERROR 73 ;NO ATTN AFTER UNLD CMD
6980 034350 012737 000454 001366 MOV #300, COUNT
6981 034356 004737 047204 JSR PC, TMO ;DO 5 SEC DELAY
6982 034362 012737 000000 005464 MOV #0, UNITB ;SETUP FOR PORT A
6983 034370 112737 000101 056560 MOVB #A, MSG19A
6984 034376 004737 044172 JSR PC, DRAV
6985 034402 000401 BR 1$
6986 034404 104155 ERROR 155 ;PORT A AVAIL BEFORE RLS WHEN UNLOADED
6987 034406 012765 100000 000000 1$: MOV #CCLR, RKCS1(R5)
6988 034414 013765 001222 000010 MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT B
6989 034422 012737 000001 005464 MOV #1, UNITB
6990 034430 063765 005464 000010 ADD UNITB, RKCS2(R5)
6991 034436 112737 000102 056560 MOVB #B, MSG19A
6992 034444 062765 000010 000010 ADD #RLS, RKCS2(R5) ;RELEASE PORT B
6993 034452 012737 000001 005314 MOV #SELD, HCS1
6994 034460 004737 043372 JSR PC, DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY

```

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T33 TEST UNLOAD COMMAND TIMER INHIBIT THRU PORT 'B'

SEQ 0135

7003	034464	104117			ERROR	117		;NO RDY AFTER SEL DRV CMD
7004								
7005	034466	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)		;SETUP FOR PORT A
7006	034474	012737	000000	005464	MOV	#0,UNITB		
7007	034502	063765	005464	000010	ADD	UNITB,RKCS2(R5)		
7008	034510	112737	000101	056560	MOVB	#'A,MSG19A		
7009	034516	012737	000001	005314	MOV	#SELDV,HCS1		
7010	034524	004737	043372		JSR	PC,DOCMD		;DO SELDRV (STATUS) CMD & GET CONTR RDY
7011	034530	104117			ERROR	117		;NO RKY AFTER SEL DRV CMD
7012								
7013	034532	032737	000040	005342	BIT	#D.DRA,HMR2		;SEE IF DRIVE AVAIL ON PORT A
7014	034540	001001			BNE	655		;BR IF YES
7015	034542	104071			ERROR	71		;PORT A NOT AVAIL AFTER PORT B RLS
7016	034544							
7017	034544	005037	001176		CLR	\$ESCAPE		
7018								
7019	034550	004737	045534		JSR	PC,SUBCLR		
7020	034554	104024			ERROR	24		;CERR AFTER SCLR
7021								
7022	034556	012737	000011	005314	MOV	#SRTSPL,HCS1		
7023	034564	004737	043372		JSR	PC,DOCMD		;DO START SPINDLE CMD & GET CONTR RDY
7024	034570	104121			ERROR	121		;RDY NOT SET AFTER ST SPIN CMD.
7025								
7026	034572	013737	001406	005354	MOV	T100,TEMP2		;SETUP TIMEOUT
7027	034600	004737	044006		JSR	PC,FATT1		;FIND ATTN
7028	034604	104074			ERROR	74		;NO ATTN AFTER ST SPIN CMD.
7029								
7030	034606	005037	005276		CLR	UNLD		
7031								
7032	034612	005037	005276		CLR	UNLD		
7033								
7034								
7035								
7036								
7037								
7038								
7039								
7040								
7041								
7042								
7043								
7044								
7045								
7046								
7047								
7048	034616	000004						
7049	034620	012737	000001	001174	MOV	#1,\$TIMES		;DO 1 ITERATION
7050	034626	004737	045534		JSR	PC,SUBCLR		;SUB SYSTEM CLEAR 29-SEP-77
7051	034632	104024			ERROR	24		;29-SEP-77
7052	034634	012706	001100		MOV	#STACK,SP		
7053	034640	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)		;SETUP FOR PORT B
7054	034646	012737	000001	005464	MOV	#1,UNITB		
7055	034654	063765	005464	000010	ADD	UNITB,RKCS2(R5)		
7056	034662	112737	000102	056560	MOVB	#'B,MSG19A		
7057	034670	062765	000010	000010	ADD	#RLS,RKCS2(R5)		;RELEASE PORT B
7058	034676	012737	000001	005314	MOV	#SELDV,HCS1		

```

*****
TEST 34      TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'A'
*
*   VERIFY THAT THE RECAL COMMAND THRU A PORT SEIZES THAT PORT
*   FOR AS LONG AS THE RECAL IS IN PROGRESS & RELEASE IS NOT ISSUED.
*
*   A.      ISSUE A RECAL COMMAND FROM CYL 410 THRU PORT 'A'
*
*   B.      VERIFY PORT 'B' CANNOT SEIZE THE DRIVE UNTIL PORT 'A'
*            RECEIVES ATTN AND TIMES OUT. THIS INSURES THAT
*            THE TIMERS ARE INHIBITED.
*****

```

```

TEST34:  SCOPE
          MOV      #1,$TIMES          ;DO 1 ITERATION
          JSR      PC,SUBCLR          ;SUB SYSTEM CLEAR 29-SEP-77
          ERROR    24                 ;29-SEP-77
          MOV      #STACK,SP
          MOV      $UNIT,RKCS2(R5)    ;SETUP FOR PORT B
          MOV      #1,UNITB
          ADD      UNITB,RKCS2(R5)
          MOVB     #'B,MSG19A
          ADD      #RLS,RKCS2(R5)    ;RELEASE PORT B
          MOV      #SELDV,HCS1

```

G11

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T34 TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'A'

SEQ 0136

7059	034704	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
7060	034710	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
7061							
7062	034712	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
7063	034720	012737	000000	005464	MOV	#0,UNITB	
7064	034726	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
7065	034734	112737	000101	056560	MOVB	#'A,MSG19A	
7066	034742	012737	000001	005314	MOV	#SELDV,HCS1	
7067	034750	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
7068	034754	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
7069							
7070	034756	032737	000040	005342	BIT	#D,DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
7071	034764	001001			BNE	64\$	;BR IF YES
7072	034766	104071			ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
7073	034770						
7074	034770	004737	045534		JSR	PC,SUBCLR	
7075	034774	104024			ERROR	24	;CERR AFTER SCLR
7076							
7077	034776	012737	035464	001176	MOV	#5\$,SESCAPE	
7078	035004	013765	012770	000020	MOV	LC,RKDC(R5)	;SEEK TO LAST CYL
7079							
7080	035012	012737	000017	005314	MOV	#SEEK,HCS1	
7081	035020	004737	043372		JSR	PC,DOCMD	;DO SEEK CMD & GET CONTR READY
7082	035024	104131			ERROR	131	;NO RDY AFTER SEEK CMD
7083							
7084	035026	013737	001412	005352	MOV	T50000,TEMP1	;SETUP TIMEOUT
7085	035034	004737	044106		JSR	PC,FAT12	;FIND ATTN
7086	035040	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
7087							
7088	035042	032737	100000	005314	BIT	#CERR,HCS1	
7089	035050	001401			BEQ	65\$	
7090	035052	104210			ERROR	210	;CERR AFTER SEEK CMD
7091							
7092	035054						
7093							
7094	035054	012737	050340	005404	MOV	#D,DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
7095	035062	005037	005406		CLR	E.B0	;EXPECTED MSG B0
7096	035066	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
7097	035074	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7098	035102	005037	005414		CLR	E.A2	;EXPECTED MSG A2
7099	035106	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7100	035114	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7101							
7102	035122	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
7103	035126	000000			.WORD	0!0!0	;8 MSGS SPECIFIED HERE
7104	035130	104161			ERROR	161	;MSG A0 ERROR AFTER SEEK CMD
7105	035132	104162			ERROR	162	;MSG B0 ERROR
7106	035134	104163			ERROR	163	;MSG A1 ERROR
7107	035136	104164			ERROR	164	;MSG B1 ERROR
7108							
7109							
7110	035140	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
7111	035146	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
7112	035154	063765	005464	000010	ADD	UNITB,RKCS2(R5)	;ADD 1 IF ON PORT B
7113	035162	012737	000005	005314	MOV	#CLEAR,HCS1	
7114	035170	004737	043372		JSR	PC,DOCMD	;DO DRIVE CLEAR CMD & GET CONTR RDY

64\$:

65\$:

H11

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T34 TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'A'

SEQ 0137

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7115 035174 104151          ERROR 151          ;NO RDY AFTER DRIVE CLEAR CMD
7116 035176 004737 043750   JSR     PC,TSTATN      ;TEST FOR ATTN
7117 035202 000401          BR      66$          ;
7118 035204 104154          ERROR 154          ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
7119 035206          66$:
7120
7121 035206 012737 010340 005404   MOV     #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
7122 035214 005037 005406          CLR     E.B0          ;EXPECTED MSG B0
7123 035220 012737 001720 005410   MOV     #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
7124 035226 012737 000001 005412   MOV     #1,E.B1          ;MSG ID FOR EXPECTED MSG B1
7125 035234 005037 005414          CLR     E.A2          ;EXPECTED MSG A2
7126 035240 012737 000002 005416   MOV     #2,E.B2          ;MSG ID FOR EXPECTED MSG B2
7127 035246 012737 000003 005422   MOV     #3,E.B3          ;MSG ID FOR EXPECTED MSG B3
7128
7129 035254 004737 044274          JSR     PC,CHKMSG      ;CHECK MSGS A0, B0, A1, B1
7130 035260 000003          .WORD  T.A2!T.B2!0      ;& MSGS SPECIFIED HERE
7131 035262 104033          ERROR 33          ;MSG A0 ERROR AFTER DRV CLEAR CMD
7132 035264 104034          ERROR 34          ;MSG B0 ERROR
7133 035266 104035          ERROR 35          ;MSG A1 ERROR
7134 035270 104036          ERROR 36          ;MSG B1 ERROR
7135
7136 035272 012737 000013 005314   MOV     #RECAL,HCS1      ;RECAL COMMAND
7137 035300 053737 001170 005314   BIS     $TMP4,HCS1
7138 035306 013765 005314 000000   MOV     HCS1,RKCS1(R5)
7139 035314 013704 001222          MOV     $UNIT,R4
7140 035320 063704 005464          ADD     UNITB,R4
7141 035324 136465 005304 000017 1$:   BITB   ATTN(R4),RKASOF+1(R5) ;SEE IF ATTN SET
7142 035332 001027          BNE     3$          ;BR IF YES
7143
7144 035334 012737 000001 005464   MOV     #1,UNITB        ;SETUP FOR PORT B
7145 035342 112737 000102 056560   MOVB   #B,MSG19A
7146 035350 004737 044172          JSR     PC,DRAV        ;SEE IF DRV AVAIL
7147 035354 000401          BR      2$          ;RETURN HERE IF NO
7148 035356 104177          ERROR 177        ;PORT B AVAIL
7149          ;RECAL DID NOT INHIBIT TIMERS
7150 035360 012765 100000 000000 2$:   MOV     #CCLR,RKCS1(R5)
7151 035366 012737 000000 005464   MOV     #0,UNITB
7152 035374 112737 000101 056560   MOVB   #A,MSG19A
7153 035402 004737 044172          JSR     PC,DRAV        ;SEE IF DRV AVAIL
7154 035406 104203          ERROR 203        ;PORT A NOT REMAIN AVAIL DURING RECAL
7155 035410 000745          BR      1$
7156
7157 035412 004737 045146          JSR     PC,GSTAT
7158 035416 032737 020000 005342   BIT     #D.PIP,HMR2      ;SEE IF ANY MOTION
7159 035424 001401          BEQ     4$          ;BR IF NO
7160 035426 104072          ERROR 72          ;PIP SET AFTER ATTN RECB FROM RECAL
7161 035430 012737 000170 001366 4$:   MOV     #120,COUNT
7162 035436 004737 047204          JSR     PC,TMO
7163 035442 012737 000001 005464   MOV     #1,UNITB
7164 035450 112737 000102 056560   MOVB   #B,MSG19A
7165 035456 004737 044172          JSR     PC,DRAV        ;SEE IF DRV NOW AVAIL
7166 035462 104045          ERROR 45          ;PORT B NOT AVAIL AFTER TMO
7167
7168 035464 005037 001176          5$:   CLR     $ESCAPE
7169
7170          ;:*****

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T35 TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'B'

SEQ 0138

```

7171 ;*TEST 35 TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'B'
7172 ;*
7173 ;* THE PREVIOUS TEST IS REPEATED FOR PORT 'B'.
7174 ;*
7175 ;*****
7176 ST35: SCOPE
7177 MOV #1, $TIMES ;DO 1 ITERATION
7178 JSR PC, SUBCLR ;SUBSYSTEM CLEAR 29-SEP-77
7179 ERROR 24 ;29-SEP-77
7180 MOV #STACK, SP
7181 MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT A
7182 MOV #0, UNITB
7183 ADD UNITB, RKCS2(R5)
7184 MOV #A, MSG19A
7185 ADD #RLS, RKCS2(R5) ;RELEASE PORT A
7186 MOV #SELD, HCS1
7187 JSR PC, DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
7188 ERROR 117 ;NO RDY AFTER SEL DRV CMD
7189
7190 MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT B
7191 MOV #1, UNITB
7192 ADD UNITB, RKCS2(R5)
7193 MOV #B, MSG19A
7194 MOV #SELD, HCS1
7195 JSR PC, DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
7196 ERROR 117 ;NO RKY AFTER SEL DRV CMD
7197
7198 BIT #D.DRA, HMR2 ;SEE IF DRIVE AVAIL ON PORT B
7199 BNE 64$ ;BR IF YES
7200 ERROR 71 ;PORT B NOT AVAIL AFTER PORT A RLS
7201
7202 JSR PC, SUBCLR
7203 ERROR 24 ;CERR AFTER SCLR
7204
7205 MOV #5$, $ESCAPE
7206 MOV LC, RKDC(R5) ;SEEK TO LAST CYL
7207
7208 MOV #SEEK, HCS1
7209 JSR PC, DOCMD ;DO SEEK CMD & GET CONTR READY
7210 ERROR 131 ;NO RDY AFTER SEEK CMD
7211
7212 MOV T50000, TEMP1 ;SETUP TIMEOUT
7213 JSR PC, FAT2 ;FIND ATTN
7214 ERROR 132 ;NO ATTN AFTER SEEK CMD
7215
7216 BIT #CERR, HCS1
7217 BEQ 65$
7218 ERROR 210 ;CERR AFTER SEEK CMD
7219
7220 65$:
7221
7222 MOV #<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>, E.A0 ;EXPECTED MSG A0
7223 CLR E.B0 ;EXPECTED MSG B0
7224 MOV #<D.SPOK!D.CART!D.DOOR!D.BRAH!D.SSP>, E.A1 ;EXPECTED A1
7225 MOV #1, E.B1 ;MSG ID FOR EXPECTED MSG B1
7226 CLR E.A2 ;EXPECTED MSG A2

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J11

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TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'B'

SEQ 0139

```

7227 035760 012737 000002 005416      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
7228 035766 012737 000003 005422      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
7229
7230 035774 004737 044274      JSR      PC,CHKMSG      ;CHECK MSGS AD, BO, A1, B1
7231 036000 000000      .WORD      0!0!0      ; & MSGS SPECIFIED HERE
7232 036002 104161      ERROR     161      ;MSG AD ERROR AFTER SEEK CMD
7233 036004 104162      ERROR     162      ;MSH BO ERROR
7234 036006 104163      ERROR     163      ;MSG A1 ERROR
7235 036010 104164      ERROR     164      ;MSG B1 ERROR
7236
7237
7238 036012 012765 100000 000000      MOV      #CCLR,RKCS1(R5)
7239 036020 013765 001222 000010      MOV      $UNIT,RKCS2(R5) ;DRIVE#
7240 036026 063765 005464 000010      ADD      UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
7241 036034 012737 000005 005314      MOV      #CLEAR,HCS1
7242 036042 004737 043372      JSR      PC,DOCMD      ;DO DRIVE CLEAR CMD & GET CONTR RDY
7243 036046 104151      ERROR     151      ;NO RDY AFTER DRIVE CLEAR CMD
7244 036050 004737 043750      JSR      PC,TSTATN      ;TEST FOR ATTN
7245 036054 000401      BR      66$
7246 036056 104154      ERROR     154      ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
7247 036060
7248
7249 036060 012737 010340 005404      MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG AD
7250 036066 005037 005406      CLR      E.B0      ;EXPECTED MSG B0
7251 036072 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRAH!D.SSP>,E.A1 ;EXPECTED A1
7252 036100 012737 000001 005412      MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
7253 036106 005037 005414      CLR      E.A2      ;EXPECTED MSG A2
7254 036112 012737 000002 005416      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
7255 036120 012737 000003 005422      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
7256
7257 036126 004737 044274      JSR      PC,CHKMSG      ;CHECK MSGS AD, BO, A1, B1
7258 036132 000003      .WORD      T.A2!T.B2!0      ; & MSGS SPECIFIED HERE
7259 036134 104033      ERROR     33      ;MSG AD ERROR AFTER DRV CLEAR CMD
7260 036136 104034      ERROR     34      ;MSH BO ERROR
7261 036140 104035      ERROR     35      ;MSG A1 ERROR
7262 036142 104036      ERROR     36      ;MSG B1 ERROR
7263
7264 036144 012737 000013 005314      MOV      #RECAL,HCS1      ;RECAL COMMAND
7265 036152 053737 001170 005314      BIS      $TMP4,HCS1
7266 036160 013765 005314 000000      MOV      HCS1,RKCS1(R5)
7267 036166 013704 001222      MOV      $UNIT,R4
7268 036172 063704 005464      ADD      UNITB,R4
7269 036176 136465 005304 000017 1$:      BITB     ATTN(R4),RKASOF+1(R5) ;SEE IF ATTN SET
7270 036204 001027      BNE      3$      ;BR IF YES
7271
7272 036206 012737 000000 005464      MOV      #0,UNITB      ;SETUP FOR PORT A
7273 036214 112737 000101 056560      MOVB     #'A,MSG19A
7274 036222 004737 044172      JSR      PC,DRAY      ;SEE IF DRV AVAIL
7275 036226 000401      BR      2$      ;RETURN HERE IF NO
7276 036230 104177      ERROR     177      ;PORT A AVAIL
7277
7278 036232 012765 100000 000000 2$:      MOV      #CCLR,RKCS1(R5)
7279 036240 012737 000001 005464      MOV      #1,UNITB      ;SETUP PORT B
7280 036246 112737 000102 056560      MOVB     #'B,MSG19A
7281 036254 004737 044172      JSR      PC,DRAY      ;SEE IF DRV AVAIL
7282 036260 104203      ERROR     203      ;PORT B NOT REMAIN AVAIL DURING RECAL

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K11

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T35 TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'B'

SEQ 0140

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7283 036262 000745 BR 1$
7284
7285 036264 004737 045146 005342 3$: JSR PC,GSTAT
7286 036270 032737 020000 BIT #0,PIP,HMR2 ;SEE IF ANY MOTICN
7287 036276 001401 BEQ 4$ ;BR IF NO
7288 036300 104072 ERROR 72 ;PIP SET AFTER ATTN RECA FROM RECAL
7289 036302 012737 000170 001366 4$: MOV #120,COUNT
7290 036310 004737 047204 JSR PC,TMO ;DO 2 SEC DLY
7291 036314 012737 000000 005464 MOV #0,UNITB ;SETUP FOR PORT A
7292 036322 112737 000101 056560 MOVB #'A,MSG19A
7293 036330 004737 044172 JSR PC,DRAV ;SEE IF DRV NOW AVAIL
7294 036334 104045 ERROR 45 ;PORT A NOT AVAIL AFTER TMO
7295
7296 036336 005037 001176 5$: CLR $ESCAPE
7297
7298
7299
7300 *****
7301 *TEST 36 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL *
7302 *
7303 * THIS TEST VERIFIES THAT CYL 632 (1456 FOR RK07), TRACK 2 CAN BE READ.
7304 * THIS AREA CONTAINS BAD SECTOR INFO WHICH IS WRITTEN BY THE
7305 * FACTORY DURING MANF. ALL BAD SECTOR INFO (BSE) WILL BE STORED
7306 * AT THIS TIME TO MASK FUTURE READ HEADER OR DATA ERROR PRINTOUTS.
7307 *
7308 * SECTORS 0,2,4,6,8 CONTAIN IDENTICAL INFO FOR 22 SECTOR HARDWARE DETECTED BAD SEC
7309 * SECTORS 10,12,14,16,18,20 CONTAIN IDENTICAL INFO FOR 22 SECTOR SOFTWARE DETECTED
7310 *
7311 * IF BSE INFO CANNOT BE READ, OR IF AFTER READING THE BSE INFO
7312 * IT IS DETERMINED THAT AN ALIGNMENT CARTRIDGE IS USED,
7313 * A MESSAGE WILL BE TYPED INDICATING THAT ALL
7314 * FUTURE FORMAT AND READ-WRITE TESTS WILL BE BYPASSED.
7315 * THIS IS DONE SO AS NOT TO DESTROY BSE INFO OR AN ALIGNMENT PACK BY WRITING
7316 *
7317 * THE PACK SERIAL # IS TYPED IN OCTAL & FOR THE FIRST PASS ONLY.
7318 *
7319 *****
7320 *ST36: SCOPE
7321 036342 000004 MOV #1,$TIMES ;DO 1 ITERATION
7322 036344 012737 000001 001174 MOV #STACK,SP ;RESTORE STK PTR
7323 036352 012706 001100
7324 036356 004737 045534 JSR PC,SUBCLR
7325 036362 104024 ERROR 24 ;CERR AFTER SCLR
7326 036364 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
7327 036372 012737 000001 005464 MOV #1,UNITB
7328 036400 063765 005464 000010 ADD UNITB,RKCS2(R5)
7329 036406 112737 000102 056560 MOVB #'9,MSG19A
7330 036414 062765 000010 000010 ADD #LS,RKCS2(R5) ;RELEASE PORT B
7331 036422 012737 000001 005314 MOV #SELDV,HCS1
7332 036430 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
7333 036434 104117 ERROR 117 ;NO RDY AFTER SEL DRV CMD
7334
7335 036436 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
7336 036444 012737 000000 005464 MOV #0,UNITB
7337 036452 063765 005464 000010 ADD UNITB,RKCS2(R5)
7338 036460 112737 000101 056560 MOVB #'A,MSG19A

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 CZR6GB.P11 03-JAN-78 08:46 T36 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #

SEQ 0141

7339	036466	012737	000001	005314	MOV	#SELD, HCS1	
7340	036474	004737	043372		JSR	PC, DOCMD	; DO SELDRV (STATUS) CMD & GET CONTR RDY
7341	036500	104117			ERROR	117	; NO RKY AFTER SEL DRV CMD
7342							
7343	036502	032737	000040	005342	BIT	#D.DRA, HMR2	; SEE IF DRIVE AVAIL ON PORT A
7344	036510	001001			BNE	64\$	; BR IF YES
7345	036512	104071			ERROR	71	; PORT A NOT AVAIL AFTER PORT B RLS
7346	036514						
7347							
7348	036514	004737	045534		JSR	PC, SUBCLR	
7349	036520	104024			ERROR	24	; CERR AFTER SCLR
7350							
7351	036522	005037	005354		CLR	TEMP2	; SECTOR CTR
7352	036526	005037	005356		CLR	TEMP3	; 0=22 SECTOR HARDWARE DETECTED TABLE
7353							; 1=22 SECTOR SOFTWARE DETECTED TABLE
7354							; 2=DONE
7355	036532	012737	002276	005360	MOV	#BSE22H, TEMP4	; STORE 22 SECTOR HARDWARE BSE ADDR.
7356	036540	013765	005360	000004	MOV	TEMP4, RKBA(R5)	
7357	036546	012737	001000	005362	MOV	#1000, TEMP5	; TRACK 2, SECTOR 0
7358	036554	013765	005362	000006	MOV	TEMP5, RKDA(R5)	
7359							
7360	036562	013765	012770	000020	MOV	LC, RKDC(R5)	; LAST CYL
7361	036570	012765	177400	000002	MOV	#-256, RKWC(R5)	; LOAD WORD CT
7362	036576	013765	001222	000010	MOV	\$UNIT, RKCS2(R5)	
7363	036604	063765	005464	000010	ADD	UNIT8, RKCS2(R5)	
7364	036612	012737	000021	005314	MOV	#RDATA, HCS1	
7365	036620	004737	043430		JSR	PC, DATCMD	; DO READ DATA CMD & GET CONTR READY
7366	036624	104226			ERROR	226	; NO RDY AFTER READ DATA CMD
7367	036626	004737	045146		JSR	PC, GSTAT	; GET FRESH DATA
7368	036632	032737	100000	005314	BIT	#CERR, HCS1	
7369	036640	001470			BEQ	8\$	
7370	036642	104227			ERROR	227	; CERR AFTER READ DATA CMD
7371							
7372	036644	012737	010340	005404	MOV	#(D.DRA!D.SPIN!D.DRDY!D.VV), E.A0	; EXPECTED MSG A0
7373	036652	005037	005406		CLR	E.B0	; EXPECTED MSG B0
7374	036656	012737	001720	005410	MOV	#(D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP), E.A1	; EXPECTED A1
7375	036664	012737	000001	005412	MOV	#1, E.B1	; MSG ID FOR EXPECTED MSG B1
7376	036672	005037	005414		CLR	E.A2	; EXPECTED MSG A2
7377	036676	012737	000002	005416	MOV	#2, E.B2	; MSG ID FOR EXPECTED MSG B2
7378	036704	012737	000003	005422	MOV	#3, E.B3	; MSG ID FOR EXPECTED MSG B3
7379							
7380	036712	004737	044274		JSR	PC, CHKMSG	; CHECK MSGS A0, B0, A1, B1
7381	036716	000000			WORD	0!0!0	; & MSGS SPECIFIED HERE
7382	036720	104054			ERROR	54	; MSG A0 ERROR AFTER READ DATA CMD
7383	036722	104026			ERROR	26	; MSG B0 ERROR
7384	036724	104056			ERROR	56	; MSG A1 ERROR
7385	036726	104030			ERROR	30	; MSG B1 ERROR
7386							
7387	036730	004737	045534		JSR	PC, SUBCLR	
7388	036734	104024			ERROR	24	; CERR AFTER SUBCLR
7389							
7390	036736	005237	005354		INC	TEMP2	
7391	036742	023727	005354	000005	CMP	TEMP2, #5	; READ ALL 5 SECTORS?
7392	036750	001007			BNE	5\$	
7393	036752	005737	005356		TST	TEMP3	
7394	036756	001002			BNE	2\$	

M11

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T36 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #

SEQ 0142

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7395 036760 104233          ERROR 233          ;CANT READ SECTORS 0,2,4,6,8
7396 036762 000414          BR 3$
7397 036764 104230          2$: ERROR 230          ;CANT READ SECTORS 10,12,14,16,18,20
7398 036766 000412          BR 3$
7400 036770 013765 005360 000004 5$: MOV TEMP4,RKBA(R5) ;RESTORE TABLE ADDR
7401 036776 062737 000002 005362 ADD #2,TEMP5 ;SETUP TO READ 2 SECTORS FROM LAST
7402 037004 013765 005362 MOV TEMP5,RKDA(R5)
7403 037012 000663          BR 1$
7404
7405 037014 005237 001452          3$: INC BSERR          ;SET BSE FLAG
7406 037020 000454          BR TST37          ;GO TO NEXT TEST
7407 037022 005737 002304          8$: TST BSE22H+6          ;TEST CARTRIDGE TYPE
7408 037026 001404          BEQ 9$          ;BRANCH IF DATA CARTRIDGE
7409 037030 104235          ERROR 235          ;ALIGNMENT CARTRIDGE USED
7410 037032 005237 001452          INC BSERR          ;SET BSE ERROR FLAG
7411 037036 000426          BR 10$
7412
7413 037040 005237 005356          9$: INC TEMP3
7414 037044 023727 005356 000001 CMP TEMP3,#1
7415 037052 001020          BNE 10$
7416 037054 005037 005354 CLR TEMP2
7417 037060 012737 003276 005360 MOV #BSE22S,TEMP4 ;STORE 22 SECTOR SOFTWARE BSE ADDR
7418 037066 013765 005360 000004 MOV TEMP4,RKBA(R5)
7419 037074 012737 001012 005362 MOV #1012,TEMP5 ;TRACK 2, SECTOR 12
7420 037102 013765 005362 000006 MOV TEMP5,RKDA(R5)
7421 037110 000137 036562          JMP 1$          ;REPEAT
7422
7423 037114 005737 001216          10$: TST $PASS
7424 037120 001014          BNE TST37          ;GO TO NEXT TST IF NOT 1'ST PASS
7425 037122 104401 056521          TYPE MSG17          ;CART SERIAL #
7426 037126 012746 002276          MOV #BSE22H, -(SP)
7427 037132 004737 053660          JSR PC,$0B20          ;CONVERT DBL BINARY WORD TO OCTAL
7428 037136 004737 054230          JSR PC,$SUPRS          ;TYPE SERIAL #
7429 037142 104401 001205          TYPE $CRLF
7430 037146 104401 001205          TYPE $CRLF
7431
7432
7433 *****
7434 *TEST 37 DATA TESTS
7435 *
7436 * VERIFY UNIQUE DATA CAN BE WRITTEN THRU EITHER PORT & READ
7437 * BACK CORRECTLY THRU BOTH PORTS.
7438 *
7439 * A. ALL 0'S ARE WRITTEN THRU PORT 'A' ON CYL 0, SECTOR 0,
7440 * TRACK 0 & VERIFIED BY READING BACK THRU BOTH PORTS.
7441 *
7442 * B. ALL 1'S ARE WRITTEN THRU PORT 'B' ON CYL 10, SECTOR 0,
7443 * TRACK 0 & VERIFIED BY READING BACK THRU BOTH PORTS.
7444 *
7445 * C. THE PROGRAM CHECKS THAT CYL 0 WAS NOT OVERWRITTEN
7446 * BY READING & VERIFYING ALL 0'S THRU PORT 'B'.
7447 *
7448 *****
7449 037152 000004          TST37: SCOPE
7450 037154 012737 000001 001174 MOV #1,$TIMES          ;;DO 1 ITERATION

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7451	037162	012706	001100		MOV	#STACK,SP	
7452							
7453	037166	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
7454	037174	012737	000001	005464	MOV	#1,UNITB	
7455	037202	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
7456	037210	112737	000102	056560	MOVB	#'B,MSG19A	
7457	037216	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
7458	037224	012737	000001	005314	MOV	#SELDIV,HCS1	
7459	037232	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
7460	037236	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
7461							
7462	037240	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
7463	037246	012737	000000	005464	MOV	#0,UNITB	
7464	037254	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
7465	037262	112737	000101	056560	MOVB	#'A,MSG19A	
7466	037270	012737	000001	005314	MOV	#SELDIV,HCS1	
7467	037276	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
7468	037302	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
7469							
7470	037304	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
7471	037312	001001			BNE	64\$	;BR IF YES
7472	037314	104071			ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
7473	037316						
7474	037316	004737	045534		JSR	PC,SUBCLR	
7475	037322	104024			ERROR	24	;CERR AFTER SCLR
7476							
7477	037324	005037	001374		CLR	SECTOR	
7478	037330	005037	001360		CLR	CYLADD	
7479	037334	012737	001434	001436	MOV	#DATA0,DATA01	;HOLD DATA
7480	037342	013765	001374	000006	MOV	SECTOR,RKDA(R5)	;SETUP TO WRITE
7481	037350	013765	001436	000004	MOV	DATA01,RKBA(R5)	;SETUP DATA
7482	037356	013765	001360	000020	MOV	CYLADD,RKDC(R5)	;SETUP CYLINDER
7483	037364	052765	000020	000010	BIS	#BAI,RKCS2(R5)	
7484	037372	012765	177400	000002	MOV	#-256.,RKWC(R5)	
7485							
7486	037400	012737	000023	005314	MOV	#<WRDATA>,HCS1	
7487	037406	004737	043430		JSR	PC,DATCMD	;DO DATA X FOR CMD & GET CONTR RDY
7488	037412	104011			ERROR	11	;NO RDY AFTER WRITE DATA CMD
7489	037414	004737	045146		JSR	PC,GSTAT	;GET FRESH STATUS
7490	037420	032737	100000	005314	BIT	#CERR,HCS1	
7491	037426	001465			BEQ	68\$	;BR IF NO ERRORS
7492							
7493	037430	032737	000200	005330	BIT	#BSE,HER	;SEE IF BAD SECTOR FLAG
7494	037436	001421			BEQ	66\$	;BR IF NO
7495	037440	004737	047002		JSR	PC,TRUERR	;ELSE SEE IF SECTOR LISTED IN BSE TABLE
7496	037444	000455			BR	67\$	;RETURN HERE IF NO
7497							
7498	037446	005237	001374		INC	SECTOR	;RETURN HERE IF YES
7499	037452	023727	001374	000012	CMP	SECTOR,#10.	;ARE 10 CONSEC. SECTORS BAD
7500	037460	001003			BNE	65\$	;BR IF NO
7501	037462	104046			ERROR	46	;ABORTING TEST DETECTED 10 BAD SECTORS
7502	037464	000137	040246		JMP	7\$	;BYPASS TEST
7503	037470	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	;TRY ANOTHER SECTOR
7504	037476	000137	037342		JMP	1\$	
7505	037502	104012			ERROR	12	;CERR WITH WRITE DATA CMD
7506							

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T37 DATA TESTS

SEQ 0144

7507	037504	012737	010340	005404	MOV	#<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
7508	037512	005037	005406		CLR	E.B0	;EXPECTED MSG B0
7509	037516	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
7510	037524	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7511	037532	005037	005414		CLR	E.A2	;EXPECTED MSG A2
7512	037536	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7513	037544	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7514							
7515	037552	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
7516	037556	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
7517	037560	104052			ERROR	52	;MSG A0 ERROR AFTER WRITE DATA CMD
7518	037562	104023			ERROR	23	;MSG B0 ERROR
7519	037564	104053			ERROR	53	;MSG A1 ERROR
7520	037566	104025			ERROR	25	;MSG B1 ERROR
7521	037570	104401	056607		TYPE	MSG21	;ABORTING BALANCE OF TESTS
7522	037574	000137	042644		JMP	\$EOP	
7523	037600	104043			ERROR	43	;BAD SECTOR NOT LISTED IN TABLE
7524	037602						
7525							
7526	037602	012737	010340	005404	MOV	#<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
7527	037610	005037	005406		CLR	E.B0	;EXPECTED MSG B0
7528	037614	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
7529	037622	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7530	037630	005037	005414		CLR	E.A2	;EXPECTED MSG A2
7531	037634	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7532	037642	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7533							
7534	037650	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
7535	037654	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
7536	037656	104052			ERROR	52	;MSG A0 ERROR AFTER WRITE DATA CMD
7537	037660	104023			ERROR	23	;MSG B0 ERROR
7538	037662	104053			ERROR	53	;MSG A1 ERROR
7539	037664	104025			ERROR	25	;MSG B1 ERROR
7540	037666	005000			CLR	R0	;CLEAR TO DO PORT A FIRST
7541							
7542	037670	005700			TST	R0	;SEE IF DOING PORT 'A'
7543	037672	001056			BNE	35	;BR IF NO
7544	037674	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
7545	037702	012737	000001	005464	MOV	#1,UNITB	
7546	037710	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
7547	037716	112737	000102	056560	MOVB	#'B,MSG19A	
7548	037724	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
7549	037732	012737	000001	005314	MOV	#SELDV,HCS1	
7550	037740	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
7551	037744	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
7552							
7553	037746	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
7554	037754	012737	000000	005464	MOV	#0,UNITB	
7555	037762	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
7556	037770	112737	000101	056560	MOVB	#'A,MSG19A	
7557	037776	012737	000001	005314	MOV	#SELDV,HCS1	
7558	040004	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
7559	040010	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
7560							
7561	040012	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
7562	040020	001001			BNE	69\$	;BR IF YES

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T37 DATA TESTS

SEQ 0145

7563	040022	104071			ERROR	71		;PORT A NOT AVAIL AFTER PORT B RLS
7564	040024				69\$:			
7565	040024	000137	040246		JMP	7\$		;GO & WRITE CHECK THRU PORT 'A'
7566					3\$:			
7567	040030	020027	000001		CMP	RO,#1		;SEE IF DOING PORT 'B'
7568	040034	001056			BNE	4\$		;BR IF NO
7569	040036	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)		;SETUP FOR PORT A
7570	040044	012737	000000	005464	MOV	#0,UNITB		
7571	040052	063765	005464	000010	ADD	UNITB,RKCS2(R5)		
7572	040060	112737	000101	056560	MOVB	#'A,MSG19A		
7573	040066	062765	000010	000010	ADD	#RLS,RKCS2(R5)		;RELEASE PORT A
7574	040074	012737	000001	005314	MOV	#SELDV,HCS1		
7575	040102	004737	043372		JSR	PC,DOCMD		;DO SELDRV (STATUS) CMD & GET CONTR RDY
7576	040106	104117			ERROR	117		;NO RDY AFTER SEL DRV CMD
7577								
7578	040110	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)		;SETUP FOR PORT B
7579	040116	012737	000001	005464	MOV	#1,UNITB		
7580	040124	063765	005464	000010	ADD	UNITB,RKCS2(R5)		
7581	040132	112737	000102	056560	MOVB	#'B,MSG19A		
7582	040140	012737	000001	005314	MOV	#SELDV,HCS1		
7583	040146	004737	043372		JSR	PC,DOCMD		;DO SELDRV (STATUS) CMD & GET CONTR RDY
7584	040152	104117			ERROR	117		;NO RLY AFTER SEL DRV CMD
7585								
7586	040154	032737	000040	005342	BIT	#D.DRA,HMR2		;SEE IF DRIVE AVAIL ON PORT B
7587	040162	001001			BNE	70\$		;BR IF YES
7588	040164	104071			ERROR	71		;PORT B NOT AVAIL AFTER PORT A RLS
7589	040166				70\$:			
7590	040166	000137	040246		JMP	7\$		;GO WRITE CHECK THRU PORT 'B'
7591								
7592	040172	020027	000002		4\$:			
7593	040176	001402			CMP	RO,#2		;SEE IF DID WRT CHK THRU PORT A & B
7594	040200	000137	040562		BEQ	5\$		;BR IF YES
7595					JMP	8\$		;ELSE RO=3, EXIT TEST
7596	040204	023727	001436	001434	5\$:			
7597	040212	001010			CMP	DATA01,#DATA0		;SEE IF JUST WROTE 0'S ON CYL 0
7598	040214	012737	000012	001360	BNE	6\$		;BR IF NO
7599	040222	012737	001440	001436	MOV	#10,CYLADD		;ELSE WRITE 1'S ON CYL 10
7600	040230	000137	037342		MOV	#DATA1,DATA01		
7601					JMP	1\$		;GO DO IT
7602	040234	005037	001360		6\$:			
7603	040240	012737	001434	001436	CLR	CYLADD		;RECHK CYL 0 FOR 0'S
7604					MOV	#DATA0,DATA01		
7605	040246	052765	000020	000010	7\$:			
7606	040254	013765	001436	000004	BIS	#BA1,RKCS2(R5)		;SETUP TO WRITE CHECK
7607	040262	013765	001360	000020	MOV	DATA01,RKBA(R5)		
7608	040270	012765	177400	000002	MOV	CYLADD,RKDC(R5)		
7609	040276	013765	001374	000006	MOV	#-256.,RKWC(R5)		
7610	040304	013737	001374	001370	MOV	SECTOR,RKDA(R5)		
7611					MOV	SECTOR,SEC		;COPY FOR FUTURE USE
7612	040312	012737	000031	005314	MOV	#<WRTCHK>,HCS1		
7613	040320	004737	043430		JSR	PC,DATCMD		;DO DATA X FOR CMD & GET CONTR RDY
7614	040324	104015			ERROR	15		;NO RDY AFTER WRITE CHECK CMD
7615	040326	004737	045146		JSR	PC,GSTAT		;GET FRESH STATUS
7616	040332	032737	100000	005314	BIT	#CERR,HCS1		
7617	0403' 0	001453			BEQ	72\$		
7618	0403' 2	032737	040000	005316	BIT	#WCE,HCS2		;SEE IF WRITE CHECK ERROR

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7619 040350 001410      BEQ      71$
7620 040352 016537 000024 001414      MOV      RKDB(R5),WD1 ;ACTUAL WORD FOR PRINTOUT
7621 040360 013737 001434 001416      MOV      DATA0,WD2 ;EXPECTED WORD FOR TYPEOUT
7622 040366 104016      ERROR     16 ;WCE AFTER WRITE CMD
7623 040370 000437      BR        72$
7624
7625 040372 104022      71$:      ERROR     22 ;CERR AFTER WRITE CHECK CMD
7626
7627 C 0374 012737 010340 005404      MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;FXPECTED MSG A0
7628 040402 005037 005406      CLR      E.B0 ;EXPECTED MSG B0
7629 040406 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
7630 040414 012737 000001 005412      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
7631 040422 005037 005414      CLR      E.A2 ;EXPECTED MSG A2
7632 040426 012737 000002 005416      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
7633 040434 012737 000003 005422      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
7634
7635 040442 004737 044274      JSR      PC,CHKMSG ;CHECK MSGS A0 B0 A1 B1
7636 040446 000003      .WORD    T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
7637 040450 104057      ERROR     57 ;MSG A0 ERROR AFTER WRITE CHECK CMD
7638 040452 104031      ERROR     31 ;MSG B0 ERROR
7639 040454 104060      ERROR     60 ;MSG A1 ERROR
7640 040456 104032      ERROR     32 ;MSG B1 ERROR
7641 040460 104401 056607      TYPE     MSG21 ;ABORTING BALANCE OF TESTS
7642 040464 000137 042644      JMP      $EOP
7643
7644 040470      72$:
7645
7646 040470 012737 010340 005404      MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
7647 040476 005037 005406      CLR      E.B0 ;EXPECTED MSG B0
7648 040502 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
7649 040510 012737 000001 005412      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
7650 040516 005037 005414      CLR      E.A2 ;EXPECTED MSG A2
7651 040522 012737 000002 005416      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
7652 040530 012737 000003 005422      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
7653
7654 040536 004737 044274      JSR      PC,CHKMSG ;CHECK MSGS A0 B0 A1 B1
7655 040542 000003      .WORD    T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
7656 040544 104057      ERROR     57 ;MSG A0 ERROR AFTER WRITE CHECK CMD
7657 040546 104031      ERROR     31 ;MSG B0 ERROR
7658 040550 104060      ERROR     60 ;MSG A1 ERROR
7659 040552 104032      ERROR     32 ;MSG B1 ERROR
7660
7661 040554 005200      INC      R0
7662 040556 000137 037670      JMP      2$
7663
7664      8$:
7665      ;*****
7666      ;*TEST 40 ALTERNATING SEEK INTERACTION TEST
7667      ;*
7668      ;* THIS TEST VERIFIES THAT THERE ARE NO TIMING INTERACTION PROBLEMS
7669      ;* BETWEEN SEEKS FROM BOTH PORTS.
7670      ;*
7671      ;* A. PORT 'A' SEIZES THE DRIVE & SEEKS TO CYLINDER 0 & RELEASES
7672      ;* THE DRIVE AFTER 'ATTN' IS RECEIVED.
7673      ;*
7674      ;* THE PROGRAM VERIFIES THAT UNTIL ATTN IS RECEIVED,

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SEQ 0147

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7675      *
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7999      *
8000      *

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PORT 'B' SEES CONTROLLER ERROR & DRIVE NOT AVAILABLE.

B. PORT 'B' SEIZES THE DRIVE & SEEKS TO THE LAST CYL
& RELEASES THE DRIVE AFTER 'ATTN' IS RECEIVED

THE PROGRAM VERIFIES THAT UNTIL ATTN IS RECEIVED
PORT 'A' SEES CONTROLLER ERROR & DRIVE NOT AVAILABLE.

C. THE ABOVE IS REPEATED FOR A PATTERN OF CONVERGING SEEKS
TOWARD THE CENTER OF THE CARTRIDGE.

D. THE PROGRAM VERIFIES MULTIPLE ATTENTIONS OR ERRORS
DO NOT OCCUR AS A RESULT OF TIMING PROBLEMS.

T40: SCOPE

MOV #1, \$TIMES ; DO 1 ITERATION

MOV #STACK, SP

JSR PC, SUBCLR

ERROR 24 ; CERR AFTER SCLR

MOV \$UNIT, RKCS2(R5) ; SETUP FOR PORT B

MOV #1, UNITB

ADD UNITB, RKCS2(R5)

MOV #B, MSG19A

ADD #RLS, RKCS2(R5) ; RELEASE PORT B

MOV #SELD, HCS1

JSR PC, DOCMD

ERROR 117 ; DO SELDRV (STATUS) CMD & GET CONTR RDY
; NO RDY AFTER SEL DRV CMD

MOV \$UNIT, RKCS2(R5) ; SETUP FOR PORT A

MOV #0, UNITB

ADD UNITB, RKCS2(R5)

MOV #A, MSG19A

MOV #SELD, HCS1

JSR PC, DOCMD

ERROR 117 ; DO SELDRV (STATUS) CMD & GET CONTR RDY
; NO RLY AFTER SEL DRV CMD

BIT #D, DRA, HMR2 ; SEE IF DRIVE AVAIL ON PORT A

BNE 645 ; BR IF YES

ERROR 71 ; PORT A NOT AVAIL AFTER PORT B RLS

645:

CLR WD1 ; SETUP CONVERGING LIMITS

MOV LC, WD2

105: MOV #CCLR, RKCS1(R5)

MOV \$UNIT, RKCS2(R5)

ADD UNITB, RKCS2(R5)

MOV WD1, RKDC(R5)

MOV #SEEK, HCS1

JSR PC, DOCMD

ERROR 131 ; DO SEEK CMD & GET CONTR READY
; NO RDY AFTER SEEK CMD-PORT A

MOV T50000, TEMP1

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7731	041020	013704	001222		1\$:	MOV	\$UNIT,R4	
7732	041024	136465	005304	000017		BITB	ATTN(R4),RKASOF+1(R5)	;TEST FOR ATTN ON PORT A
7733	041032	001032				BNE	3\$	;BR IF THERE
7734	041034	012737	000001	005464		MOV	#1,UNITB	;ELSE VERIFY PORT B NOT AVAIL
7735	041042	112737	000102	056560		MOVB	#'B,MSG19A	
7736	041050	004737	044172			JSR	PC,DRAV	
7737	041054	000403				BR	2\$	
7738	041056	104103				ERROR	103	;PORT B AVAIL BEFORE TMO OR RELEASE
7739	041060	000137	042644			JMP	11\$	
7740								
7741	041064	012765	100000	000000	2\$:	MOV	#CCLR,RKCS1(R5)	
7742	041072	005337	005352			DEC	TEMP1	
7743	041076	001350				BNE	1\$	;SEE IF PORT A HAS ATTN
7744	041100	005037	005464			CLR	UNITB	
7745	041104	112737	000101	056560		MOVB	#'A,MSG19A	
7746	041112	104156				ERROR	156	;NO ATTN ON PORT A AFTER SEEK
7747	041114	000137	042644			JMP	11\$	;EXIT TEST
7748								
7749	041120	005037	005464		3\$:	CLR	UNITB	;SETUP FOR PORT A
7750	041124	112737	000101	056560		MOVB	#'A,MSG19A	
7751	041132	004737	044172			JSR	PC,DRAV	
7752	041136	104157				ERROR	157	;PORT A NOT AVAIL AFTER SEEK
7753								
7754	041140	032737	100000	005314		BIT	#CERR,HCS1	
7755	041146	001401				BEQ	4\$	
7756	041150	104210				ERROR	210	;CERR AFTER SEEK CMD ON PORT A
7757								
7758	041152				4\$:			
7759								
7760	041152	012737	050340	005404		MOV	#<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
7761	041160	005037	005406			CLR	E.B0	;EXPECTED MSG B0
7762	041164	012737	001720	005410		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRAH!D.SSP>,E.A1	;EXPECTED A1
7763	041172	012737	000001	005412		MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7764	041200	005037	005414			CLR	E.A2	;EXPECTED MSG A2
7765	041204	012737	000002	005416		MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7766	041212	012737	000003	005422		MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7767								
7768	041220	004737	044274			JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
7769	041224	000000				.WORD	0!0!0	; & MSGS SPECIFIED HERE
7770	041226	104161				ERROR	161	;MSG A0 ERROR AFTER SEEK CMD
7771	041230	104162				ERROR	162	;MSG B0 ERROR
7772	041232	104163				ERROR	163	;MSG A1 ERROR
7773	041234	104164				ERROR	164	;MSG B1 ERROR
7774	041236	013737	001414	001346		MOV	WD1,TOCYL	;SETUP TO SEE IF ON CORRECT CYL
7775	041244	013765	001414	000020		MOV	WD1,RKDC(R5)	
7776	041252	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)	
7777	041260	063765	005464	000010		ADD	UNITB,RKCS2(R5)	
7778								
7779								
7780	041266	012700	001666			MOV	#RHTAB,R0	
7781	041272	012737	000025	005314		MOV	#<RDHEAD>,HCS1	
7782	041300	004737	043430			JSR	PC,DATCMD	;DO DATA X FOR CMD & GET CONTR RDY
7783	041304	104171				ERROR	171	;NO RDY AFTER READ HEADER CMD
7784	041306	032737	100000	005314		BIT	#CERR,HCS1	
7785	041314	001401				BEQ	66\$	
7786	041316	104174				ERROR	174	;CERR AFTER READ HEADER CMD

G12

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SEQ 0149

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7787
7788 041320 016520 000024      66$: MOV RKDB(R5),(R0)+ ;1'ST WORD FROM SILO TO RHTAB
7789 041324 016520 000024      MOV RKDB(R5),(R0)+ ;2'ND WORD
7790 041330 016520 000024      MOV RKDB(R5),(R0)+ ;3'RD WORD
7791
7792
7793 041334 032765 100000 000010      BIT #DLT,RKCS2(R5)
7794 041342 001403          BEQ 67$
7795 041344 004737 045146      JSR PC,GSTAT
7796 041350 104173          ERROR 173 ;DLT AFTER READ HEADER CMD
7797 041352      67$:
7798
7799 041352 012737 010340 005404      MOV #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
7800 041360 005037 005406      CLR E.B0 ;EXPECTED MSG B0
7801 041364 012737 001720 005410      MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
7802 041372 012737 000001 005412      MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
7803 041400 005037 005414      CLR E.A2 ;EXPECTED MSG A2
7804 041404 012737 000002 005416      MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
7805 041412 012737 000003 005422      MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
7806
7807 041420 004737 044274      JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
7808 041424 000003          .WORD T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
7809 041426 104301          ERROR 301 ;MSG A0 ERROR AFTER READ HEADER CMD
7810 041430 104271          ERROR 271 ;MSG B0 ERROR
7811 041432 104302          ERROR 302 ;MSG A1 ERROR
7812 041434 104272          ERROR 272 ;MSG B1 ERROR
7813
7814 041436 023737 001666 001346      CMP RHTAB,TOCYL ;CHECK WORD 0 ONLY, CYL#
7815 041444 001401          BEQ 65$ ;BR IF SAME
7816 041446 104051          ERROR 51 ;WRONG CYL# ON HEADER
7817 041450      65$:
7818
7819 041450 004737 045534      JSR PC,SUBCLR
7820 041454 104024          ERROR 24 ;CERR AFTER SCLR
7821
7822 041456 013765 001222 000010      MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
7823 041464 012737 000000 005464      MOV #0,UNITB
7824 041472 063765 005464 000010      ADD UNITB,RKCS2(R5)
7825 041500 112737 000101 056560      MOV #A,MSG19A
7826 041506 062765 000010 000010      ADD #RLS,RKCS2(R5) ;RELEASE PORT A
7827 041514 012737 000001 005314      MOV #SELDV,HCS1
7828 041522 004737 043372      JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
7829 041526 104117          ERROR 117 ;NO RDY AFTER SEL DRV CMD
7830
7831 041530 013765 001222 000010      MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
7832 041536 012737 000001 005464      MOV #1,UNITB
7833 041544 063765 005464 000010      ADD UNITB,RKCS2(R5)
7834 041552 112737 000102 056560      MOV #B,MSG19A
7835 041560 012737 000001 005314      MOV #SELDV,HCS1
7836 041566 004737 043372      JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
7837 041572 104117          ERROR 117 ;NO RKY AFTER SEL DRV CMD
7838
7839 041574 032737 000040 005342      BIT #D.DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT B
7840 041602 001001          BNE 68$ ;BR IF YES
7841 041604 104071          ERROR 71 ;PORT B NOT AVAIL AFTER PORT A RLS
7842 041606      68$:

```

H12

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SEQ 0150

7843	041606	012765	100000	000000		MOV	#CCLR,RKCS1(R5)	
7844	041614	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)	
7845	041622	063765	005464	000010		ADD	UNITB,RKCS2(R5)	
7846	041630	013765	001416	000020		MOV	WD2,RKDC(R5)	
7847	041636	012737	000017	005314		MOV	#SEEK,HCS1	
7848	041644	004737	043372			JSR	PC,DOCMD	;DO SEEK CMD & GET CONTR READY
7849	041650	104131				ERROR	131	;NO READY AFTER SEEK CMD-PORT B
7850								
7851	041652	013737	001412	005352		MOV	T50000,TEMP1	
7852	041660	013704	001222		5\$:	MOV	\$UNIT,R4	
7853	041664	005204				INC	R4	
7854	041666	136465	005304	000017		BITB	ATTN(R4),RKASOF+1(R5)	;TEST FOR ATTN ON PORT B
7855	041674	001032				BNE	7\$	;BR IF THERE
7856	041676	005037	005464			CLR	UNITB	;ELSE VERIFY PORT A NOT AVAIL
7857	041702	112737	000101	056560		MOVB	#'A,MSG19A	
7858	041710	004737	044172			JSR	PC,DRAV	
7859	041714	000403				BR	6\$	
7860	041716	104103				ERROR	103	;PORT A AVAIL BEFORE TMO OR RELEASE
7861	041720	000137	042644			JMP	11\$	
7862								
7863	041724	012765	100000	000000	6\$:	MOV	#CCLR,RKCS1(R5)	
7864	041732	005337	005352			DEC	TEMP1	
7865	041736	001350				BNE	5\$	;SEE IF PORT B HAS ATTN
7866	041740	012737	000001	005464		MOV	#1,UNITB	
7867	041746	112737	000102	056560		MOVB	#'B,MSG19A	
7868	041754	104156				ERROR	156	;NO ATTN ON PORT B AFTER SEEK
7869	041756	000137	042644			JMP	11\$	;EXIT
7870								
7871	041762	012737	000001	005464	7\$:	MOV	#1,UNITB	;SETUP FOR PORT B
7872	041770	112737	000102	056560		MOVB	#'B,MSG19A	
7873	041776	004737	044172			JSR	PC,DRAV	
7874	042002	104157				ERROR	157	;PORT B NOT AVAIL AFTER SEEK
7875	042004	032737	100000	005314		BIT	#CERR,HCS1	
7876	042012	001401				BEQ	8\$	
7877	042014	104210				ERROR	210	;CERR AFTER SEEK CMD ON PORT B
7878								
7879	042016				8\$:			
7880								
7881	042016	012737	050340	005404		MOV	#<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
7882	042024	005037	005406			CLR	E.B0	;EXPECTED MSG B0
7883	042030	012737	001720	005410		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRAH!D.SSP>,E.A1	;EXPECTED A1
7884	042036	012737	000001	005412		MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7885	042044	005037	005414			CLR	E.A2	;EXPECTED MSG A2
7886	042050	012737	000002	005416		MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7887	042056	012737	000003	005422		MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7888								
7889	042064	004737	044274			JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
7890	042070	000000				.WORD	C!D!0	; & MSGS SPECIFIED HERE
7891	042072	104161				ERROR	161	;MSG A0 ERROR AFTER SEEK CMD
7892	042074	104162				ERROR	162	;MSG B0 ERROR
7893	042076	104163				ERROR	163	;MSG A1 ERROR
7894	042100	104164				ERROR	164	;MSG B1 ERROR
7895	042102	013737	001416	001346		MOV	WD2,TOCYL	;SETUP TO SEE IF ON CORRECT CYL
7896	042110	013765	001416	000020		MOV	WD2,RKDC(R5)	
7897	042116	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)	
7898	042124	063765	005464	000010		ADD	UNITB,RKCS2(R5)	

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SEQ 0151

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7899
7900
7901 042132 012700 001666      MOV      #RHTAB,PC
7902 042136 012737 000025 005314 MOV      #<RDHEAD>,HCS1
7903 042144 004737 043430      JSR      PC,DATCMD      ;DO DATA X FOR CMD & GET CONTR RDY
7904 042150 104171      ERROR 171      ;NO RDY AFTER READ HEADER CMD
7905 042152 032737 100000 005314 BIT      #CERR,HCS1
7906 042160 001401      BEQ      70$
7907 042162 104174      ERROR 174      ;CERR AFTER READ HEADER CMD
7908
7909 042164 016520 000024      70$: MOV      RKDB(R5),(R0)+ ;1'ST WORD FROM SILO TO RHTAB
7910 042170 016520 000024      MOV      RKDB(R5),(R0)+ ;2'ND WORD
7911 042174 016520 000024      MOV      RKDB(R5),(R0)+ ;3'RD WORD
7912
7913
7914 042200 032765 100000 000010 BIT      #DLT,RKCS2(R5)
7915 042206 001403      BEQ      71$
7916 042210 004737 045146      JSR      PC,GSTAT
7917 042214 104173      ERROR 173      ;DLT AFTER READ HEADER CMD
7918 042216
7919      71$:
7920 042216 012737 010340 005404 MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
7921 042224 005037 005406      CLR      E.B0      ;EXPECTED MSG B0
7922 042230 012737 001720 005410 MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
7923 042236 012737 000001 005412 MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
7924 042244 005037 005414      CLR      E.A2      ;EXPECTED MSG A2
7925 042250 012737 000002 005416 MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
7926 042256 012737 000003 005422 MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
7927
7928 042264 004737 044274      JSR      PC,CHKMSG      ;CHECK MSGS A0, B0, A1, B1
7929 042270 000003      .WORD T.A2!T.B2!0      ;& MSGS SPECIFIED HERE
7930 042272 104301      ERROR 301      ;MSG A0 ERROR AFTER READ HEADER CMD
7931 042274 104271      ERROR 271      ;MSG B0 ERROR
7932 042276 104302      ERROR 302      ;MSG A1 ERROR
7933 042300 104272      ERROR 272      ;MSG B1 ERROR
7934
7935 042302 023737 001666 001346 CMP      RHTAB,TOCYL      ;CHECK WORD 0 ONLY, CYL#
7936 042310 001401      BEQ      69$
7937 042312 104051      ERROR 51      ;BR IF SAME
7938 042314      69$:
7939
7940 042314 004737 045534      JSR      PC,SUBCLR
7941 042320 104024      ERROR 24      ;CERR AFTER SCLR
7942
7943 042322 005237 001414      INC      WD1      ;CONVERGE THE CYLINDERS
7944 042326 005337 001416      DEC      WD2
7945 042332 023737 001414 001416 CMP      WD1,WD2      ;SEE IF CONVERGED TOGETHER
7946 042340 001063      BNE      9$      ;BR IF NO & REPEAT
7947 042342 013765 001222 000010 MOV      $UNIT,RKCS2(R5)
7948 042350 063765 005464 000010 ADD      UNITB,RKCS2(R5)
7949
7950 042356 012737 000017 005314 MOV      #SEEK,HCS1
7951 042364 004737 043372      JSR      PC,DOCMD      ;DO SEEK CMD & GET CONTR READY
7952 042370 104131      ERROR 131      ;NO RDY AFTER SEEK CMD
7953
7954 042372 013737 001412 005352 MOV      T50000,TEMP1      ;SETUP TIMEOUT

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SEQ 0152

7955	042400	004737	044106		JSR	PC,FATT2	;FIND ATTN
7956	042404	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
7957							
7958	042406	032737	100000	005314	BIT	#CERR,HCS1	
7959	042414	001401			BEQ	72\$	
7960	042416	104210			ERROR	210	;CERR AFTER SEEK CMD
7961							
7962	042420						
7963							
7964	042420	012737	050340	005404	MOV	#<D.DSC!D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0	;EXPECTED MSG A0
7965	042426	005037	005406		CLR	E.B0	;EXPECTED MSG B0
7966	042432	012737	001720	005410	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
7967	042440	012737	000001	005412	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7968	042446	005037	005414		CLR	E.A2	;EXPECTED MSG A2
7969	042452	012737	000002	005416	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7970	042460	012737	000003	005422	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7971							
7972	042466	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
7973	042472	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
7974	042474	104161			ERROR	161	;MSG A0 ERROR AFTER SEEK CMD
7975	042476	104162			ERROR	162	;MSG B0 ERROR
7976	042500	104163			ERROR	163	;MSG A1 ERROR
7977	042502	104164			ERROR	164	;MSG B1 ERROR
7978							
7979	042504	000137	042644		JMP	11\$	;EXIT TEST
7980	042510						
7981	042510	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT B
7982	042516	012737	000001	005464	MOV	#1,UNITB	
7983	042524	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
7984	042532	112737	000102	056560	MOVB	#'B,MSG19A	
7985	042540	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
7986	042546	012737	000001	005314	MOV	#SELDRV,HCS1	
7987	042554	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
7988	042560	104117			ERROR	117	;NO RDY AFTER SEL DRV CMD
7989							
7990	042562	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
7991	042570	012737	000000	005464	MOV	#0,UNITB	
7992	042576	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
7993	042604	112737	000101	056560	MOVB	#'A,MSG19A	
7994	042612	012737	000001	005314	MOV	#SELDRV,HCS1	
7995	042620	004737	043372		JSR	PC,DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
7996	042624	104117			ERROR	117	;NO RKY AFTER SEL DRV CMD
7997							
7998	042626	032737	000040	005342	BIT	#D.DRA,HMR2	;SEE IF DRIVE AVAIL ON PORT A
7999	042634	001001			BNE	73\$	;BR IF YES
8000	042636	104071			ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
8001	042640						
8002	042640	000137	040746		JMP	10\$	
8003							
8004	042644						
8005							
8006							
8007							
8008							
9009							

```

8010      .SBTTL  END OF PASS ROUTINE
8011
8012      ;*****
8013      ;*INCREMENT THE PASS NUMBER ($PASS)
8014      ;*TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
8015      ;*IF THERES A MONITOR GO TO IT
8016      ;*IF THERE ISN'T JUMP TO ST5
8017
8018      042644      $EOP:
8019
8020      042644      000004      SCOPE
8021      042646      005037      001176      CLR      $ESCAPE
8022      042652      012737      000001      001174      MOV      #1,$TIMES
8023      042660      012706      001100      MOV      #STACK,SP
8024      042664      005237      001220      INC      $DEVCT
8025      042670      023737      005434      001220      CMP      DRVS,$DEVCT      ; INCR COUNT FOR # DRIVES CHECKED
8026      042676      001403      BEQ      $EOP1+2      ; ARE ALL DRIVES PRESENT TESTED?
8027      042700      000137      012472      JMP      NUDRV      ; BR IF YES
8028      042704      000004      $EOP1: SCOPE      ; ELSE TEST NEXT DRIVE PRESENT
8029      042706      005037      001102      CLR      $TSTNM      ; ZERO THE TEST NUMBER
8030      042712      005037      001174      CLR      $TIMES      ; ZERO THE NUMBER OF ITERATIONS
8031      042716      005237      001216      INC      $PASS      ; INCREMENT THE PASS NUMBER
8032      042722      042737      100000      001216      BIC      #100000,$PASS      ; DON'T ALLOW A NEG. NUMBER
8033      042730      005327      DEC      (PC)+      ; LOOP?
8034      042732      000001      $EOPCT: .WORD      1
8035      042734      003022      BGT      $DOAGN      ; YES
8036      042736      012737      MOV      (PC)+,$(PC)+      ; RESTORE COUNTER
8037      042740      000001      $ENDCT: .WORD      1
8038      042742      042732      $EOPCT
8039      042744      104401      043011      TYPE      $ENDMG      ; TYPE "END PASS #"
8040      042750      013746      001216      MOV      $PASS,-(SP)      ; SAVE $PASS FOR TYPEOUT
8041      042754      104405      TYPDS      ; GO TYPE--DECIMAL ASCII WITH SIGN
8042      042756      104401      043006      TYPE      $ENULL      ; TYPE A NULL CHARACTER
8043      042762      013700      000042      $GET42: MOV      #42,R0      ; GET MONITOR ADDRESS
8044      042766      001405      BEQ      $DOAGN      ; BRANCH IF NO MONITOR
8045      042770      000005      RESET      ; CLEAR THE WORLD
8046      042772      004710      $ENDAD: JSR      PC,(R0)      ; GO TO MONITOR
8047      042774      000240      NOP      ; SAVE ROOM
8048      042776      000240      NOP      ; FOR
8049      043000      000240      NOP      ; ACT11
8050
8051      043002      $DOAGN: JMP      $(PC)+      ; RETURN
8052      043004      010646      $RTNAD: .WORD      ST5
8053      043006      377      377      000      $ENULL: .BYTE      -1,-1,0      ; NULL CHARACTER STRING
8054      043011      015      042412      042116      $ENDMG: .ASCIZ      <15><12>/END PASS #/
8055      043016      050040      051501      020123
8056      043024      000043

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SUBROUTINES

SEQ 0154

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8057      .SBTTL SUBROUTINES
8058
8059      ;SUBROUTINE TO CLEAR ALL FLAGS FROM DDUMP THRU UNITB
8060      ;
8061
8062      043026 012700 005424 CLRFLG: MOV      #DDUMP,R0
8063      043032 012701 177757      MOV      #-17.,R1
8064      043036 005020      1$:      CLR      (R0)+
8065      043040 005201      INC      R1
8066      043042 001375      BNE      1$
8067      043044 000207      RTS      PC
8068
8069
8070      ;TYPE PROGRAM ID IF FTITLE=0
8071      ;
8072
8073      043046 005737 001340 TITLE:  TST      FTITLE
8074      043052 001024      BNE      1$
8075      043054 005237 001340      INC      FTITLE
8076      043060 104401 054566      TYPE     MSG1
8077      .SBTTL GET VALUE FOR SOFTWARE SWITCH REGISTER
8078      043064 005737 000042      TST      0#42
8079      043070 001012      BNE      64$
8080      043072 123727 001230 000001      CMPB     $ENV,#1
8081      043100 001406      BEQ      64$
8082      043102 023727 001140 000176      CMP      SWR,#SWREG
8083      043110 001005      BNE      65$
8084      043112 104406      GTSWR
8085      043114 000403      BR       65$
8086      043116 112737 000001 001134 64$:  MOVB     #1,$AUTOB      ;;SET AUTO-MODE INDICATOR
8087      043124      65$:
8088      043124 000207      1$:      RTS      PC
8089
8090
8091      ;ROUTINE TO INPUT DRIVE NOS. TYPED IN & SET
8092      ;DRIVS, DRIVO-DRIV7 REGISTERS APPROPRIATELY
8093      ;ONLY EVEN NUMBERS ALLOWED (0,2,4,6)
8094      ;
8095
8096      043126 104411      GDRVS:  RDLIN
8097      043130 012600      MOV      (SP)+,R0
8098      043132 012701 177774      MOV      #-4,R1
8099      043136 112002      1$:      MOVB     (R0)+,R2
8100      043140 042702 177400      BIC      #177400,R2
8101      043144 012703 005436      MOV      #DRIVO,R3
8102      043150 012704 000060      MOV      #60,R4
8103
8104      043154 020402      2$:      CMP      R4,R2
8105      043156 001415      BEQ      3$
8106      043160 005723      TST      (R3)+
8107      043162 005204      INC      R4
8108      043164 020427 000067      CMP      R4,#67
8109      043170 001371      BNE      2$
8110      043172 005702      TST      R2
8111      043174 001025      BNE      4$
8112      043176 020127 177774      CMP      R1,#-4

```

```

;PROGRAM ID
;;ARE WE RUNNING UNDER XXDP/ACT?
;;BRANCH IF YES
;;ARE WE RUNNING UNDER APT?
;;BRANCH IF YES
;;SOFTWARE SWITCH REG SELECTED?
;;BRANCH IF NO
;;GET SOFT-SWR SETTINGS
;;SET AUTO-MODE INDICATOR

```

```

;WAS TYPED CHAR 0 THRU 6?
;;BRANCH IF YES
;;NO, INCREMENT DR FLAG ADDR
;S/B 0-6 OR TERMINATOR
;TERMINATOR=0

```

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GET VALUE FOR SOFTWARE SWITCH REGISTER

SEQ 0155

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8113 043202 001431
8114 043204 005037 005462
8115 043210 000207
8116
8117 043212 032704 000001
8118 043216 001014
8119 043220 005213
8120 043222 005237 005434
8121 043226 112002
8122 043230 042702 177400
8123 043234 022702 000054
8124 043240 001407
8125 043242 005702
8126 043244 001001
8127 043246 000756
8128
8129 043250 104401 057036
8130 043254 000137 010054
8131
8132 043260 005201
8133 043262 001325
8134 043264 000771
8135
8136 043266 005237 005462
8137 043272 000207
8138
8139
8140
8141
8142
8143 043274 104412
8144 043276 012600
8145 043300 005700
8146 043302 001403
8147 043304 010037 001264
8148 043310 000207
8149 043312 012737 177440 001264
8150 043320 000207
8151
8152
8153
8154
8155
8156 043322 104412
8157 043324 012600
8158 043326 005700
8159 043330 001405
8160 043332 010037 001314
8161 043336 004737 043354
8162 043342 000207
8163 043344 012737 000210 001314
8164 043352 000771
8165
8166
8167
8168

7$: BEQ 6$ ;DEFAULT ALL DRIVES
CLR SIZFLG ;BYPASS TEST 1 (SIZING)
RTS PC ;FOUND TERMINATOR, EXIT

3$: BIT #BIT0,R4 ;SEE IF ODD #
BNE 4$
INC J3
INC DRVS ;SET UP FLAG FOR THE DRIVE
MOVA (R0)+,R2 ;INCREMENT TOTAL # DRIVES TO BE TESTED
BIC #177400,R2 ;GET NEXT ASCII CHAR.
CMP #54,R2 ;MASK
BEQ 5$ ;IS IT A COMMA?
TST R2 ;YES, GO TO NEXT WORD.
BNE 4$ ;NO, IS IT A TERMINATOR?
BR 7$ ;IF NOT, SOMETHING WRONG.
;FOUND TERMINATOR, EXIT

4$: TYPE EM1 ;ONLY 0,2,4,6 ALLOWED.
JMP PRGSRT ;START ALL OVER

5$: INC R1 ;S/B NO MORE THAN 4 DIFF
BNE 1$ ;DRIVES TYPED IN.
BR 4$ ;IF MORE, HAVE ERROR.

6$: INC SIZFLG ;DO TEST 1 (SIZING)
RTS PC ;EXIT.

;ROUTINE TO INPUT RKBAS OR DEFAULT.
;
GBA: RDOCT
MOV (SP)+,R0 ;GET LOW ORDER FROM STACK
TST R0
BEQ 1$ ;BRANCH IF DEFAULT.
MOV R0,$BASE
RTS PC
1$: MOV #177440,$BASE ;DEFAULT VALUE
RTS PC

;ROUTINE TO INPUT RKVEC OR DEFAULT
;
GINT: RDOCT
MOV (SP)+,R0 ;GET LOW ORDER FROM STACK
TST R0
BEQ 1$ ;BRANCH IF DEFAULT
MOV R0,RKVEC
JSR PC,SETINT
RTS PC
1$: MOV #210,RKVEC ;DEFAULT VALUE
BR 2$

;ROUTINE TO SETUP INTERRUPT VECTOR & PRIORITY
;

```

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GET VALUE FOR SOFTWARE SWITCH REGISTER

SEQ 0156

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8169
8170 043354 013700 001314
8171 043360 012720 050066
8172 043364 013710 001316
8173 043370 000207
8174
8175
8176
8177
8178
8179 043372 053737 001170 005314
8180 043400 013765 005314 000000
8181 043406 013737 001400 005352
8182 043414 004737 043466
8183 043420 000207
8184 043422 062716 000002
8185 043426 000207
8186
8187
8188
8189
8190 043430 053737 001170 005314
8191 043436 013765 005314 000000
8192 043444 013737 001412 005352
8193 043452 004737 043466
8194 043456 000207
8195 043460 062716 000002
8196 043464 000207
8197
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8200
8201
8202
8203
8204
8205 043466 032765 000200 000000
8206 043474 001010
8207 043476 005337 005352
8208 043502 001371
8209 043504 004737 043622
8210 043510 004737 045064
8211 043514 000207
8212 043516 062716 000002
8213 043522 004737 043622
8214 043526 004737 045064
8215 043532 000207
8216
8217
8218
8219 043534 032765 000200 000000
8220 043542 001014
8221 043544 005337 005352
8222 043550 001371
8223 043552 016537 000034 005342
8224 043560 016537 000036 005344

SETINT: MOV RKVEC,R0
        MOV #INTER,(R0)+ ;INTER ADDR TO RKVEC
        MOV RKPRI,(R0) ;PRS TO RKVEC+2
        RTS PC

; THIS ROUTINE SETS CDT IN RKCS1 IF DRIVE UNDER TEST IS AN RK07.
; ENTER WITH COMMAND IN HCS1
DOCMD: BIS $TMP4,HCS1 ;ADD CDT IF RK07
        MOV HCS1,RKCS1(R5) ;DO COMMAND
        MOV T10,TEMP1
        JSR PC,FRDY ;FIND CONTR READY
        RTS ;SET HERE IF NOT RDY
        ADD #2,(SP) ;ELSE SKIP OVER ERROR
        RTS PC

; THIS ROUTINE IS SIMILAR TO THE ABOVE BUT IS USED FOR DATA TRANSFERS
; & REQUIRES A LONGER TIMEOUT
DATCMD: BIS $TMP4,HCS1 ;ADD CDT IF RK07
        MOV HCS1,RKCS1(R5) ;DO CMD
        MOV T50000,TEMP1
        JSR PC,FRDY ;FIND CONTR RDY
        RTS
        ADD #2,(SP)
        RTS PC

; ROUTINE TO FIND CONTROLLER READY (RDY) DURING A DELAY
; ENTER WITH A COUNT IN TEMP1
; RETURN IF RDY NOT PRESENT (ERROR CONDITION)
; RETURN +2 IF RDY PRESENT (SKIP 0 FR ERROR)
; STATUS IS OBTAINED BEFORE THE RE JRN FOR EITHER CASE
FRDY: BIT #RDY,RKCS1(R5)
      BNE 1$
      DEC TEMP1
      BNE FRDY
      JSR PC,HOLD ;STORE ALL RK611 REGS IN HOLDING REGS.
      JSR PC,CKCERR ;CHECK FOR SPECIAL CERR
      RTS PC ;NO RDY, EXIT
      ADD #2,(SP) ;SKIP OVER ERROR
      JSR PC,HOLD
      JSR PC,CKCERR ;CHECK FOR SPECIAL CERR
      RTS PC

; ROUTINE TO FIND CONTROLLER READY AND STORE DRIVE REGS ONLY
FRDY1: BIT #RDY,RKCS1(R5)
      BNE 1$
      DEC TEMP1
      BNE FRDY1
      MOV RKMR2(R5),HMR2
      MOV RKMR3(R5),HMR3

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8225 043566 004737 045064      JSR    PC,CKCERR      ;CHECK FOR SPECIAL CERR CONDITIONS
8226 043572 000207              RTS    PC                ;NO RDY, EXIT
8227 043574 062716 000002      1$:  ADD    #2,(SP)          ;SKIP OVER ERROR
8228 043600 016537 000034 005342 MOV    RKMR2(R5),HMR2
8229 043606 016537 000036 005344 MOV    RKMR3(R5),HMR3
8230 043614 004737 045064      JSR    PC,CKCERR      ;CHECK FOR SPECIAL CERR CONDITIONS
8231 043620 000207              RTS    PC
8232
8233      ;STORE ALL RK611 REGISTERS IN HOLDING REGS
8234      ;
8235
8236
8237 043622 016537 000000 005314 HOLD:  MOV    RKCS1(R5),HCS1
8238 043630 016537 000010 005316      MOV    RKCS2(R5),HCS2
8239 043636 016537 000002 005320      MOV    RKWC(R5),HWC
8240 043644 016537 000004 005322      MOV    RKBA(R5),HBA
8241 043652 016537 000006 005324      MOV    RKDA(R5),HDA
8242 043660 016537 000012 005326      MOV    RKDS(R5),HDS
8243 043666 016537 000014 005330      MOV    RKER(R5),HER
8244 043674 016537 000016 005332      MOV    RKASOF(R5),HASOF
8245 043702 016537 000020 005334      MOV    RKDC(R5),HDC
8246 043710 016537 000026 005340      MOV    RKMR1(R5),HMR1
8247 043716 016537 000034 005342      MOV    RKMR2(R5),HMR2
8248 043724 016537 000036 005344      MOV    RKMR3(R5),HMR3
8249 043732 016537 000030 005346      MOV    RKECPS(R5),HPQS
8250 043740 016537 000032 005350      MOV    RKECPT(R5),HPAT
8251 043746 000207              RTS    PC
8252
8253      ;ROUTINE TO CHECK FOR CORRECT ATTN
8254      ;RETURN IF ATTN NOT PRESENT (ERROR CONDITION)
8255      ;RETURN +2 IF ATTN PRESENT (SKIP OVER ERROR)
8256
8257
8258 043750 010446              1$STATN: MOV    R4,-(SP)          ;SAV R4
8259 043752 013704 001222      MOV    $UNIT,R4
8260 043756 063704 005464      ADD    UNITB,R4          ;ADD 1 IF ON PORT B
8261 043762 136437 005304 005333 BITB   ATTN(R4),HASOF+1
8262 043770 001404              BEQ    1$                ;BRANCH IF ATTN NOT PRESENT
8263 043772 012604              MOV    (SP)+,R4          ;RESTOR R4
8264 043774 062716 000002      ADD    #2,(SP)          ;INCR RET ADDR TO JUMP OVER ERROR.
8265 044000 000207              RTS    PC
8266 044002 012604      1$:  MOV    (SP)+,R4          ;RESTOR R4
8267 044004 000207              RTS    PC
8268
8269
8270      ;ROUTINE TO FIND ATTN WITHIN TIMES GREATER THAN 1 SEC
8271      ;ENTER WITH TIME IN SECONDS IN TEMP2
8272      ;RETURN IF NO ATTN (ERROR CONDITION)
8273      ;RETURN +2 IF ATTN FOUND
8274      ;STATUS IS OBTAINED BEFORE THE RETURN FOR EITHER CASE
8275      ;
8276
8277 044006 010446              FATT1:  MOV    R4,-(SP)          ;SAV R4
8278 044010 012737 177777 005352 3$:  MOV    #-1,TEMP1
8279 044016 013704 001222      MOV    $UNIT,R4
8280 044022 063704 005464      ADD    UNITB,R4          ;ADD 1 IF ON PORT B

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8281 044026 136465 005304 000017 1$: BITB ATTN(R4),RKASOF+1(R5) ;FIND CORRECT ATTN
8282 044034 001014 BNE 2$
8283 044036 005337 005352 DEC TEMP1
8284 044042 001371 BNE 1$
8285 044044 005337 005354 DEC TEMP2
8286 044050 001357 BNE 3$
8287 044052 005065 000026 CLR RKMR1(R5) ;SELECT WORD 0
8288 044056 004737 045146 JSR PC,GSTAT ;GET LATEST STATUS
8289 044062 012604 MOV (SP)+,R4 ;RESTOR R4
8290 044064 000207 RTS PC
8291 044066 005065 000026 2$: CLR RKMR1(R5)
8292 044072 004737 045146 JSR PC,GSTAT ;GET STATUS AFTER ATTN SEEN
8293 044076 012604 MOV (SP)+,R4 ;RESTOR R4
8294 044100 062716 000002 ADD #2,(SP) ;SKIP OVER ERROR
8295 044104 000207 RTS PC
8296
8297 ;
8298 ;ROUTINE TO FIND ATTN WITHIN 1 SEC
8299 ;ENTER WITH COUNT IN TEMP1
8300 ;RETURN IF NO ATTN (ERROR)
8301 ;RETURN +2 IF ATTN FOUND
8302 ;STATUS IS OBTAINED BEFORE THE RETURN FOR EITHER CASE
8303 ;
8304
8305 044106 010446 FATT2: MOV R4,-(SP) ;SAV R4
8306 044110 013704 001222 2$: MOV $UNIT,R4
8307 044114 063704 005464 ADD UNITB,R4 ;ADD 1 IF ON PORT B
8308 044120 136465 005304 000017 BITB ATTN(R4),RKASOF+1(R5) ;FIND CORRECT ATTN
8309 044126 001011 BNE 1$
8310 044130 005337 005352 DEC TEMP1
8311 044134 001365 BNE 2$
8312 044136 005065 000026 CLR RKMR1(R5) ;SELECT WORD 0
8313 044142 004737 045146 JSR PC,GSTAT ;GET LATEST STATUS.
8314 044146 012604 MOV (SP)+,R4 ;RESTOR R4
8315 044150 000207 RTS PC
8316 044152 005065 000026 1$: CLR RKMR1(R5)
8317 044156 004737 045146 JSR PC,GSTAT
8318 044162 012604 MOV (SP)+,R4 ;RESTOR R4
8319 044164 062716 000002 ADD #2,(SP) ;SKIP OVER ERROR
8320 044170 000207 RTS PC
8321
8322 ;
8323 ;THIS ROUTINE CHECKS 'DRIVE AVAILABLE' IN MSG AO AFTER A SELECT COMMAND
8324 ; IF NOT SET, IT DOES A NORMAL RETURN
8325 ; IF SET, IT DOES A RETURN+2
8326
8326 044172 004737 045146 005342 DRAY: JSR PC,GSTAT
8327 044176 032737 000040 BIT #0,DRA,HMR2 ;SEE IF DRIVE AVAILABLE SET
8328 044204 001402 BEQ 1$ ;BR IF NO & RETURN
8329 044206 062716 000002 ADD #2,(SP) ;ELSE RETURN+2
8330 044212 000207 1$: RTS PC
8331
8332 ;
8333 ;THIS ROUTINE LOOKS FOR ATTN
8334 ; RETURN+2 IF FOUND BEFORE COUNT=0
8335 ; RETURN IF COUNT=0 (ERROR CONDITION)
8336 ;

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8337 044214 136465 005304 000017 FATT3: BITB ATTN(R4),RKASOF+1(R5) ;TEST FOR ATTN
8338 044222 001004 BNE 1$
8339 044224 005737 001366 TST COUNT ;SEE IF TIME UP
8340 044230 001371 BNE FATT3 ;BR IF NO
8341 044232 000207 RTS PC
8342 044234 062716 000002 1$: ADD #2,(SP) ;JUMP OVER ERROR
8343 044240 000207 RTS PC
8344
8345 ;
8346 ;ENTER WITH A COUNT IN TEMP1
8347 ;THE DELAY IS APPROX 17 US/ITERATION + 12 US TO EXIT
8348 ;WHEN COUNT IS 0. BASED ON AN 11/05
8349 ;
8350 044242 005737 005352 DLY: TST TEMP1 ;5.6 US
8351 044246 001403 BEQ 1$ ;2.5 US
8352 044250 005337 005352 DEC TEMP1 ;6.8 US
8353 044254 000772 BR DLY ;2.5 US
8354 044256 000207 1$: RTS PC ;3.8 US
8355
8356 ;THIS ROUTINE TYPES BYPASSED DRIVE#. ENTER WITH DRIVE# IN R0
8357 ;
8358 ;
8359 044260 104401 056437 BYP: TYPE MSG14 ;BYPASS DRIVE
8360 044264 010046 MOV R0,-(SP) ;SAVE R0 FOR TYPEOUT
8361 ;TYPE DR#
8362 044266 104403 TYPOS ;GO TYPE--OCTAL ASCII
8363 044270 001 .BYTE 1 ;TYPE 1 DIGIT(S)
8364 044271 000 .BYTE 0 ;SUPPRESS LEADING ZEROS
8365 044272 000207 RTS PC
8366
8367 ;THIS ROUTINE READS ALL MSG A & B WORDS & CHECKS THEM AS REQ'D.
8368 ;
8369 044274 017437 000000 001460 CHKMSG: MOV @ (SP),CHKFLG ;PASS MSGS TO BE TESTED
8370 044302 062716 000002 ADD #2,(SP) ;BUMP RETURN ADDR TO 1ST ERROR
8371 044306 004737 045210 JSR PC,GSTAT1 ;GET ALL ACTUAL DRIVE & CONTR STATUS
8372
8373 044312 053737 001222 005404 BIS $UNIT,E.A0 ;SET UNIT #
8374 044320 063737 005464 005404 ADD UNITB,E.A0 ;ADD 1 IF ON PORT B
8375 044326 053737 001222 005410 BIS $UNIT,E.A1
8376 044334 063737 005464 005410 ADD UNITB,E.A1
8377 044342 053737 001222 005414 BIS $UNIT,E.A2
8378 044350 063737 005464 005414 ADD UNITB,E.A2
8379 044356 053737 001222 005420 BIS $UNIT,E.A3
8380 044364 063737 005464 005420 ADD UNITB,E.A3
8381 044372 053737 012776 005404 BIS E.DOT,E.A0 ;SET CDT IF RK07
8382
8383 044400 013746 005352 MOV TEMP1,-(SP) ;SAVE TEMP1
8384
8385 044404 013737 005404 005352 MOV E.A0,TEMP1
8386 044412 004737 047224 JSR PC,SBPARG ;GET PARITY FOR MSG A0
8387 044416 013737 005352 005404 MOV TEMP1,E.A0
8388
8389 044424 013737 005410 005352 MOV E.A1,TEMP1
8390 044432 004737 047224 JSR PC,SBPARG ;GET PARITY FOR MSG A1
8391 044436 013737 005352 005410 MOV TEMP1,E.A1
8392

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E13

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8393	044444	013737	005414	005352	MOV	E.A2,TEMP1	
8394	044452	004737	047224		JSR	PC,SBP	;GET PARITY FOR MSG A2
8395	044456	013737	005352	005414	MOV	TEMP1,E.A2	
8396							
8397	044464	013737	005406	005352	MOV	E.B0,TEMP1	
8398	044472	004737	047224		JSR	PC,SBP	;GET PARITY FOR MSG B0
8399	044476	013737	005352	005406	MOV	TEMP1,E.B0	
8400							
8401	044504	013737	005412	005352	MOV	E.B1,TEMP1	
8402	044512	004737	047224		JSR	PC,SBP	;GET PARITY FOR MSG B1
8403	044516	013737	005352	005412	MOV	TEMP1,E.B1	
8404							
8405	044524	013737	005416	005352	MOV	E.B2,TEMP1	
8406	044532	004737	047224		JSR	PC,SBP	;GET PARITY FOR MSG B2
8407	044536	013737	005352	005416	MOV	TEMP1,E.B2	
8408							
8409	044544	013737	005422	005352	MOV	E.B3,TEMP1	
8410	044552	004737	047224		JSR	PC,SBP	;GET PARITY FOR MSG B3
8411	044556	013737	005352	005422	MOV	TEMP1,E.B3	
8412							
8413	044564	012637	005352		MOV	(SP)+,TEMP1	;RESTORE TEMP1
8414	044570	013737	001176	001172	MOV	\$ESCAPE,\$TMP5	;SAVE ESCAPE
8415							
8416	044576	023737	005364	005404	CMP	H.A0,E.A0	;TEST MSG A0
8417	044604	001411			BEQ	2\$	;BR IF OK
8418	044606	012737	044620	001176	MOV	#1\$,\$ESCAPE	;ELSE SETUP ESCAPE
8419	044614	011646			MOV	(SP),-(SP)	;COPY RET ADDR
8420	044616	000207			RTS	PC	;RETURN TO MAINLINE ERROR
8421							
8422	044620	032777	001000	134312	1\$: BIT	#SW9,\$SWR	;RET HERE FROM MAINLINE ERROR
8423	044626	001107			BNE	20\$	;BR IF LOOP ON ERROR
8424	044630	062716	000002		2\$: ADD	#2,(SP)	;BUMP RET ADDR TO NEXT ERROR
8425							
8426	044634	023737	005366	005406	CMP	H.B0,E.B0	;TEST MSG B0
8427	044642	001411			BEQ	5\$	;BR IF OK
8428	044644	012737	044656	001176	MOV	#4\$,\$ESCAPE	;ELSE SETUP ESCAPE
8429	044652	011646			MOV	(SP),-(SP)	;COPY RET ADDR
8430	044654	000207			RTS	PC	;RETURN TO MAINLINE ERROR
8431							
8432	044656	032777	001000	134254	4\$: BIT	#SW9,\$SWR	;RETURN HERE FROM MAINLINE ERROR
8433	044664	001070			BNE	20\$	;BR IF LOOP ON ERROR
8434	044666	062716	000002		5\$: ADD	#2,(SP)	;BUMP RET ADDR TO NEXT ERROR
8435							
8436	044672	023737	005370	005410	CMP	H.A1,E.A1	;TEST MSG A1
8437	044700	001411			BEQ	8\$	;BR IF OK
8438	044702	012737	044714	001176	MOV	#7\$,\$ESCAPE	
8439	044710	011646			MOV	(SP),-(SP)	
8440	044712	000207			RTS	PC	
8441							
8442	044714	032777	001000	134216	7\$: BIT	#SW9,\$SWR	
8443	044722	001051			BNE	20\$	
8444	044724	062716	000002		8\$: ADD	#2,(SP)	
8445							
8446	044730	023737	005372	005412	CMP	H.B1,E.B1	;TEST MSG B1
8447	044736	001411			BEQ	11\$	;BR IF OK
8448	044740	012737	044752	001176	MOV	#10\$,\$ESCAPE	

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8449 044746 011646      MOV      (SP),-(SP)
8450 044750 000207      RTS      PC
8451
8452 044752 032777 001000 134160 10$:  BIT      #SW9,@SWR      ;TEST MSG A2?
8453 044760 001032      BNE      20$      ;BR IF NO
8454 044762 062716 000002      ADD      #2,(SP)      ;PUT INFO CYLDIF, DO NOT CHECK
8455
8456 044766 032737 000001 001460 12$:  BIT      #T.A2,CHKFLG      ;TEST MSG A2?
8457 044774 001402      BEQ      13$      ;BR IF NO
8458 044776 004737 046026      JSR      PC,RCYLD      ;PUT INFO CYLDIF, DO NOT CHECK
8459 045002 032737 000002 001460 13$:  BIT      #T.B2,CHKFLG      ;TEST MSG B2?
8460 045010 001402      BEQ      14$      ;BR IF NO
8461 045012 004737 046100      JSR      PC,RCYLA      ;PUT INFO IN CYLADD, DO NOT CHECK
8462
8463 045016 032737 000004 001460 14$:  BIT      #T.B3,CHKFLG      ;TEST MSG B3?
8464 045024 001404      BEQ      15$      ;BR IF NO
8465 045026 004737 046136      JSR      PC,RSEC      ;PUT INFO IN SECTOR, DO NOT CHECK
8466 045032 004737 046174      JSR      PC,RHEAD      ;PUT INFO IN HEAD, DO NOT CHECK
8467
8468 045036 013737 001172 001176 15$:  MOV      $TMP5,$ESCAPE      ;RESTORE
8469 045044 000207      RTS      PC
8470
8471 045046 012706 001100      MOV      #STACK,SP      ;RESET STACK PTR
8472 045052 013737 001172 001176 20$:  MOV      $TMP5,$ESCAPE      ;RESTORE
8473 045060 000177 134024      JMP      @SLPERR
8474
8475      ; THIS ROUTINE CHECKS FOR CERTAIN ERROR CONDITIONS ONLY
8476      ; I.E.: IF NED, CTO OR MDS SET MESSAGE A & B ARE INVALID
8477
8478 045064 005737 001456      CKCERR: TST      BYPCERR
8479 045070 001025      BNE      4$
8480 045072 032737 100000 005314      BIT      #CERR,HCS1
8481 045100 001001      BNE      1$      ;BR IF CERR
8482 045102 000207      RTS      PC
8483
8484 045104 032737 004000 005314 1$:  BIT      #CTO,HCS1
8485 045112 001402      BEQ      2$      ;BR IF NOT CTO
8486 045114 104125      ERROR    125      ;CTO ERROR, MSG A & B INVALID
8487 045116 000207      RTS      PC
8488
8489 045120 032737 010000 005316 2$:  BIT      #NED,HCS2
8490 045126 001401      BEQ      3$      ;BR IF NOT NED
8491 045130 104126      ERROR    126      ;NED ERROR, MSG A & B INVALID
8492
8493 045132 032737 001000 005316 3$:  BIT      #MDS,HCS2
8494 045140 001401      BEQ      4$
8495 045142 104127      ERROR    127      ;MDS ERROR, MSG A & B INVALID
8496
8497 045144 000207      4$:  RTS      PC
8498
8499      ; THIS ROUTINE DOES THE SELECT DRIVE COMMAND TO GET STATUS
8500      ; IT THEN WAITS FOR CONTROLLER READY
8501      ; IF RDY NOT RECEIVED BY THE TIMEOUT, AN ERROR IS FLAGGED
8502
8503
8504

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8505	045146	013746	005352		GSTAT: MOV	TEMP1, -(SP)	;SAVE TEMP1
8506	045152	013765	001222	000010	MOV	\$UNIT, RKCS2(R5)	;CURRENT DRIVE #
8507	045160	063765	005464	000010	ADD	UNITB, RKCS2(R5)	;ADD 1 IF ON PORT B
8508	045166	012737	000001	005314	MOV	#SELDIV, HCS1	
8509	045174	004737	043372		JSR	PC, DOCMD	;DO SELDRV (STATUS) CMD & GET CONTR RDY
8510	045200	104117			ERROR	117	;RDY NOT SET BY END OF SELECT DRIVE CMD
8511	045202	012637	005352		MOV	(SP)+, TEMP1	;RESTOR TEMP1.
8512	045206	000207			RTS	PC	
8513							
8514							
8515							
8516							
8517	045210	013746	005352		GSTAT1: MOV	TEMP1, -(SP)	;SAVE TEMP1
8518	045214	004737	043622		JSR	PC, HOLD	;GET ALL CONTR REG
8519	045220	012765	100000	000000	MOV	#CCLR, RKCS1(R5)	;CLEAR CONTR
8520	045226	013765	001222	000010	MOV	\$UNIT, RKCS2(R5)	;CURRENT DRIVE #
8521	045234	063765	005464	000010	ADD	UNITB, RKCS2(R5)	;ADD 1 IF ON PORT B
8522	045242	012765	000003	000026	MOV	#3, RKMR1(R5)	;SELECT WORD 3
8523	045250	004737	045470		JSR	PC, GSTAT2	
8524	045254	104117			ERROR	117	;RDY NOT SET BY END OF SELECT DRV CMD
8525	045256	013737	005342	005400	MOV	HMR2, H.A3	;STORE MSG A3
8526	045264	013737	005344	005402	MOV	HMR3, H.B3	;STORE MSG B3
8527							
8528	045272	012765	100000	000000	MOV	#CCLR, RKCS1(R5)	
8529	045280	013765	001222	000010	MOV	\$UNIT, RKCS2(R5)	
8530	045306	063765	005464	000010	ADD	UNITB, RKCS2(R5)	;ADD 1 IF ON PORT B
8531	045314	012765	000002	000026	MOV	#2, RKMR1(R5)	;SELECT WORD 2
8532	045322	004737	045470		JSR	PC, GSTAT2	
8533	045326	104117			ERROR	117	;RDY NOT SET BY END OF SELECT DRV CMD
8534	045330	013737	005342	005374	MOV	HMR2, H.A2	;STORE MSG A2
8535	045336	013737	005344	005376	MOV	HMR3, H.B2	;STORE MSG B2
8536							
8537	045344	012765	100000	000000	MOV	#CCLR, RKCS1(R5)	
8538	045352	013765	001222	000010	MOV	\$UNIT, RKCS2(R5)	
8539	045360	063765	005464	000010	ADD	UNITB, RKCS2(R5)	;ADD 1 IF ON PORT B
8540	045366	012765	000001	000026	MOV	#1, RKMR1(R5)	;SELECT WORD 1
8541	045374	004737	045470		JSR	PC, GSTAT2	
8542	045400	104117			ERROR	117	;RDY NOT SET BY END OF SELECT DRV CMD
8543	045402	013737	005342	005370	MOV	HMR2, H.A1	;STORE MSG A1
8544	045410	013737	005344	005372	MOV	HMR3, H.B1	;STORE MSG B1
8545							
8546	045416	012765	100000	000000	MOV	#CCLR, RKCS1(R5)	
8547	045424	013765	001222	000010	MOV	\$UNIT, RKCS2(R5)	
8548	045432	063765	005464	000010	ADD	UNITB, RKCS2(R5)	;ADD 1 IF ON PORT B
8549	045440	004737	045470		JSR	PC, GSTAT2	
8550	045444	104117			ERROR	117	;RDY NOT SET BY END OF SEL DRV CMD
8551	045446	013737	005342	005364	MOV	HMR2, H.A0	;STORE MSG A0
8552	045454	013737	005344	005366	MOV	HMR3, H.B0	;STORE MSG B0
8553							
8554	045462	012637	005352		MOV	(SP)+, TEMP1	;RESTORE TEMP1
8555	045466	000207			RTS	PC	
8556							
8557	045470	012737	000001	005314	GSTAT2: MOV	#SELDIV, HCS1	
8558	045476	053737	001170	005314	BIS	\$TMP4, HCS1	;ADD CDT IF RK07
8559	045504	013765	005314	000000	MOV	HCS1, RKCS1(R5)	;GET STATUS
8560	045512	013737	001400	005352	MOV	T10, TEMP1	

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SEQ 0163

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8561 045520 004737 043534      JSR    PC,FRDY1      ;FIND CONTR RDY & STORE DRIVE REGS ONLY
8562 045524 000207              RTS    PC              ;RET HERE IF NOT RDY
8563 045526 062716 000002      ADD    #2,(SP)      ;RET HERE IF OK
8564 045532 000207              RTS    PC
8565
8566
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8573 045534 012765 000040 000010 SUBCLR: MOV    #SCLR,RKCS2(R5) ;SUBSYS CLEAR
8574 045542 013737 001400 005352      MOV    T10,TEMP1
8575 045550 004737 043466              JSR    PC,FRDY      ;FIND RDY
8576 045554 104120              ERROR 120      ;RDY NOT SET BY END OF SCLR
8577 045556 013765 001222 000010      MOV    $UNIT,RKCS2(R5) ;CURRENT DRIVE #
8578 045564 063765 005464 000010      ADD    UNIT8,RKCS2(R5) ;ADD 1 IF ON PORT B
8579 045572 005065 000026              CLR    RKMR1(R5)      ;SELECT WORD 0
8580 045576 004737 045146              JSR    PC,GSTAT      ;GET STATUS
8581 045602 032737 100000 005314      BIT    #CERR,HCS1      ;CHECK FOR CONT ERROR
8582 045610 001401              BEQ    1$
8583 045612 000207              RTS    PC
8584 045614 062716 000002      1$:  ADD    #2,(SP)      ;SKIP OVER ERROR
8585 045620 000207              RTS    PC
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8590 045622 012765 000003 000026 RDSEC:  MOV    #3,RKMR1(R5) ;WORD 3
8591 045630 004737 045146              JSR    PC,GSTAT
8592 045634 013737 005344 001374      MOV    HMR3,SECTOR
8593 045642 042737 177017 001374      BIC    #1<M.SECT>,SECTOR
8594 045650 006237 001374              ASR    SECTOR      ;RIGHT JUSTIFY
8595 045654 006237 001374              ASR    SECTOR      ;SECTOR
8596 045660 006237 001374              ASR    SECTOR      ;INFO
8597 045664 006237 001374              ASR    SECTOR
8598 045670 000207              RTS    PC
8599
8600
8601
8602 045672 012765 000002 000026 RDICYLD: MOV    #2,RKMR1(R5) ;WORD 2
8603 045700 004737 045146              JSR    PC,GSTAT
8604 045704 013737 005342 001356      MOV    HMR2,CYLDIF
8605 045712 043737 012774 001356      BIC    MASK1,CYLDIF
8606 045720 006237 001356              ASR    CYLDIF      ;RIGHT JUSTIFY
8607 045724 006237 001356              ASR    CYLDIF      ;CYL DIFF/OFFSET
8608 045730 006237 001356              ASR    CYLDIF      ;INFO
8609 045734 006237 001356              ASR    CYLDIF
8610 045740 023737 001356 012772      CMP    CYLDIF,MASK      ;CHK TO SEE IF RET IN COMPL. FORM
8611 045746 001002              BNE    1$          ;BR IF NOT
8612 045750 005037 001356              CLR    CYLDIF      ;CLR IF YES
8613 045754 000207      1$:  RTS    PC
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8617
8618 045756 012765 000002 000026 ADCYLA: MOV #2,RKMR1(R5) ;WORD 2
8619 045764 004737 045146 JSR PC,GSTAT
8620 045770 013737 005344 001360 MOV HMA3,CYLADD
8621 045776 043737 012774 001360 BIC MASK1,CYLADD
8622 046004 006237 001360 ASR CYLADD ;RIGHT JUSTIFY
8623 046010 006237 001360 ASR CYLADD ;CYL ADDR
8624 046014 006237 001360 ASR CYLADD ;INFO
8625 046020 006237 001360 ASR CYLADD
8626 046024 000207 RTS PC
8627
8628 ;READ THE CYL DIFF/OFFSET IN H.A2, RIGHT JUSTIFY IT & STORE IT IN 'CYLDIF'
8629
8630 046026 013737 005374 001356 RCYLD: MOV H.A2,CYLDIF
8631 046034 043737 012774 001356 BIC MASK1,CYLDIF ;CLEAR UNWANTED INFO
8632 046042 006237 001356 ASR CYLDIF ;RIGHT JUSTIFY
8633 046046 006237 001356 ASR CYLDIF
8634 046052 006237 001356 ASR CYLDIF
8635 046056 006237 001356 ASR CYLDIF
8636 046062 023737 001356 012772 CMP CYLDIF,MASK ;CHK TO SEE IF RET IN COMPL. FORM
8637 046070 001002 BNE IS ;BR IF NO
8638 046072 005037 001356 CLR CYLDIF ;ELSE CLEAR
8639 046076 000207 IS: RTS PC
8640
8641 ;READ THE CYL ADDR IN H.B2, RIGHT JUSTIFY IT & STORE IT IN 'CYLADD'
8642
8643 046100 013737 005376 001360 RCYLA: MOV H.B2,CYLADD
8644 046106 043737 012774 001360 BIC MASK1,CYLADD ;CLEAR UNWANTED INFO
8645 046114 006237 001360 ASR CYLADD ;RIGHT JUSTIFY
8646 046120 006237 001360 ASR CYLADD
8647 046124 006237 001360 ASR CYLADD
8648 046130 006237 001360 ASR CYLADD
8649 046134 000207 RTS PC
8650
8651 ;READ THE SECTOR COUNT IN H.B3, RIGHT JUSTIFY IT & STORE IT IN 'SECTOR'
8652
8653 046136 013737 005402 001374 RSEC: MOV H.B3,SECTOR
8654 046144 042737 177017 001374 BIC #1C<M.SECT>,SECTOR ;CLEAR UNWANTED INFO
8655 046152 006237 001374 ASR SECTOR ;RIGHT JUSTIFY
8656 046156 006237 001374 ASR SECTOR
8657 046162 006237 001374 ASR SECTOR
8658 046166 006237 001374 ASR SECTOR
8659 046172 000207 RTS PC
8660
8661 ;READ THE HEAD ADDR IN H.B3, RIGHT IT & STORE IT IN 'HEAD'
8662
8663 046174 013737 005402 001422 RHEAD: MOV H.B3,HEAD
8664 046202 042737 170777 001422 BIC #1C<M.HEAD>,HEAD ;CLEAR UNWANTED INFO
8665 046210 006237 001422 ASR HEAD ;RIGHT JUSTIFY IT
8666 046214 000337 001422 SWAB HEAD
8667 046220 000207 RTS PC
8668
8669 ;ROUTINE TO FIND HEADS HOME IN RKMR2 WORD 1 BEFORE SPECIFIED DELAY
8670 ;ENTER WITH TIME IN SECONDS IN TEMP2
8671 ;RETURN IF NOT FOUND
8672 ;RETURN+2 IF FOUND - SKIP OVER ERROR

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8673
8674 046222 012737 177777 005352 FHDHM: MOV #1,TEMP1 ;ALL 1'S
8675 046230 012765 000001 000026 MOV #1,RKMR1(R5) ;WORD 1
8676 046236 004737 045146 JSR PC,GSTAT
8677 046242 032737 000040 005342 BIT #D.HDHM,HMR2
8678 046250 001007 BNE 2$
8679 046252 005337 005352 DEC TEMP1
8680 046256 001367 BNE 1$
8681 046260 005337 005354 DEC TEMP2
8682 046264 001356 BNE FHDHM
8683 046266 000207 RTS PC
8684 046270 062716 000002 2$: ADD #2,(SP) ;SKIP OVER ERROR
8685 046274 000207 RTS PC
8686
8687 ;ROUTINE TO FIND LOAD HEADS IN RKMR2 WORD 1 BEFORE THE TIMEOUT
8688 ;RETURN IF NOT FOUND
8689 ;RETURN+2 IF FOUND: SKIP OVER ERROR
8690
8691 046276 012737 000372 005352 FLOAD: MOV #250,TEMP1
8692 046304 012765 000001 000026 MOV #1,RKMR1(R5) ;WORD 1
8693 046312 004737 045146 JSR PC,GSTAT
8694 046316 032737 010000 005342 BIT #D.LOAD,HMR2
8695 046324 001004 BNE 2$
8696 046326 005337 005352 DEC TEMP1
8697 046332 001367 BNE 1$
8698 046334 000207 RTS PC
8699 046336 062716 000002 2$: ADD #2,(SP) ;SKIP OVER ERROR
8700 046342 000207 RTS PC
8701
8702 ;FILL HEADER TABLE WITH 66 WORDS OF VALID HEADERS
8703 ;ENTER WITH CYL # IN 'CALADD'
8704 ;ENTER WITH HEAD # IN 'HEAD'
8705 ;ENTER WITH FORMAT IN 'FORMAT'
8706
8707 046344 010046 FHDHTAB: MOV RO,-(SP) ;SAV RO
8708 046346 010146 MOV R1,-(SP) ;SAV R1
8709 046350 012700 001462 MOV #HDTAB,RO ;HEADER WORD TABLE ADDR
8710 046354 005001 CLR R1 ;SECTOR COUNTER
8711 046356 013737 001420 001424 MOV HEAD,HD1
8712 046364 006337 001424 ASL HD1
8713 046370 006337 001424 ASL HD1
8714 046374 006337 001424 ASL HD1
8715 046400 006337 001424 ASL HD1
8716 046404 006337 001424 ASL HD1 ;SETUP HEAD # FOR WORD 2 OF HEADER
8717 046410 013737 001426 001430 MOV FORMAT,FMT1
8718 046416 000337 001430 SWAB FMT1
8719 046422 006337 001430 ASL FMT1 ;SETUP FORMAT FOR WORD 2 OF HEADER
8720
8721 046426 013720 001362 1$: MOV CALADD,(RO)+ ;HEADER WORD 1-CYL ADDR
8722 046432 010110 MOV R1,(RO) ;HEADER WORD 2-SECTOR NO
8723 046434 053710 001424 BIS HD1,(RO) ; -HEAD NO
8724 046440 053710 001430 BIS FMT1,(RO) ; -FORMAT

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K13

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SEQ 0166

8725 046444 004737 046524

JSR PC,SECFLG

L13

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SEQ 0167

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8726
8727 046450 013737 001362 005352      MOV      CALADD,TEMP1
8728 046456 011037 005354              MOV      (RO),TEMP2
8729 046462 043737 001362 005354      BIC      CALADD,TEMP2
8730 046470 042037 005352              BIC      (RO)+,TEMP1
8731 046474 053737 005352 005354      BIS      TEMP1,TEMP2
8732 046502 013720 005354              MOV      TEMP2,(RO)+      ;HEADER WORD 3-HEADER CHECK
8733
8734 046506 005201              INC      R1              ;SECTOR CTR
8735 046510 020127 000026      CMP      R1,#22.      ;ALL 22 SECTORS DONE? (66 WORDS)
8736 046514 001344              BNE      1$              ;BR IF NO
8737
8738 046516 012601              MOV      (SP)+,R1      ;RESTOR R1
8739 046520 012600              MOV      (SP)+,R0      ;RESTOR R0
8740 046522 000207              RTS      PC
8741
8742      ;THIS ROUTINE GETS INFORMATION FROM THE BAD SECTOR TABLE FILLED BY A PREVIOUS
8743      ;TEST & SETS BITS 14 & 15 APPROPRIATLY.
8744      ;

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SEQ 0168

8745 046524 010246
8746 046526 005737 001426
8747 046532 001016
8748
8749 046534 012702 002306
8750 046540 004737 046574
8751 046544 052710 100000
8752
8753 046550 012702 003306
8754 046554 004737 046574
8755 046560 052710 040000
8756
8757 046564 012602
8758 046566 000207
8759
8760 046570 012602
8761 046572 000207
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8769 046574 010346
8770
8771 046576 021227 177777
8772 046602 001002
8773 046604 012603
8774 046606 000207
8775
8776 046610 022237 001362
8777 046614 001403
8778 046616 062702 000002
8779 046622 000765
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8781 046624 013703 001420
8782 046630 000303
8783 046632 050103
8784 046634 022203
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8786 046636 001401
8787 046640 000756
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8789 046642 012603
8790 046644 062716 000004
8791 046650 000207
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8797 046652 010046
8798 046654 010146
8799 046656 004737 045622
8800 046662 062737 000001 001374

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SECFLG: MOV R2, -(SP) ;SAVE R2
          TST FORMAT
          BNE 1$ ;BR IF 20 SECTOR FORMAT
;NOTE: ONLY 22 SECTOR PERFORMED
          MOV #BSE22H+8., R2
          JSR PC, FLGTST ;GET HARDWARE DETECTED FLAG
          BIS #BIT15, (R0) ;RETURN HERE IF GOOD SECTOR

          MOV #BSE22S+8., R2 ;ELSE RETURN HERE
          JSR PC, FLGTST ;GET SOFTWARE DETECTED FLAG
          BIS #BIT14, (R0) ;RETURN HERE IF GOOD SECTOR

          MOV (SP)+, R2 ;ELSE RETURN HERE
          RTS PC

1$: MOV (SP)+, R2 ;RESTORE R2
    RTS PC

; THIS ROUTINE DOES THE ACTUAL SCANNING OF THE BAD SECTOR TABLES
; ENTER WITH THE ADDRESS OF TABLE (BSE22H, BSE22S, ETC.) IN TEMP1
; RETURN IF NO COMPARE
; RETURN+4 IF COMPARE
FLGTST: MOV R3, -(SP) ;SAVE R3
1$: CMP (R2), #-1 ;SEE IF ALL 1'S
    BNE 2$ ;BR IF NO
    MOV (SP)+, R3 ;RESTORE R3
    RTS PC

2$: CMP (R2)+, CALADD ;SEE IF=CYL # & ADR PTR TO TRK/SECTOR WORD
    BEQ 3$
    ADD #2, R2 ;GO TO NEXT CYL WORD IN TABLE
    BR 1$

3$: MOV HEAD, R3 ;GET HEAD # FROM FHDTAB ROUTINE
    SWAB R3
    BIS R1, R3 ;ADD SECTOR # FROM FHDTAB ROUTINE
    CMP (R2)+, R3 ;SEE IF SECTOR/HEAD COMPARE
    ; & INCR PTR TO NEXT CYL WORD
    BEQ 4$ ;BR IF COMPARE
    BR 1$ ;ELSE TRY NEXT CYL

4$: MOV (SP)+, R3 ;RESTORE R3
    ADD #4, (SP) ;INCREMENT RET ADDR
    RTS PC

; THIS ROUTINE SORTS THE RHTAB TABLE FROM WHATEVER SECTOR IT BEGINS
; WITH AND RE-WITES THE INFO IN SRTTAB TABLE TO BEGIN WITH SECTOR 0
SORT: MOV R0, -(SP) ;SAVE R0
      MOV R1, -(SP) ;SAVE R1
      JSR PC, RDSEC
      ADD #1, SECTOR

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8801 046670 004737 046760      JSR      PC,MULT6      ;MULT SECTOR BY 6
8802
8803 046674 012700 000204      MOV      #132,R0
8804 046700 163700 001374      SUB      SECTOR,R0      ;R0-SECTOR TO R0 = INDEX
8805 046704 010037 001374      MOV      R0,SECTOR
8806 046710 062737 001666 001374  ADD      #PHTAB,SECTOR      ;SAVE INDEX
8807
8808 046716 062700 001666      ADD      #RHTAB,R0      ;INDEX TO BOT HALF OF RHTAB
8809 046722 012701 002072      MOV      #SRTTAB,R1      ;INDEX TO TOP HALF OF SRTTAB
8810
8811 046726 012021 002072      1$:      MOV      (R0)+(R1)+      ;PUT BOTTOM OF RHTAB TO TOP OF SRTTAB
8812 046730 020027 002072      CMP      R0,#RHTAB+132.
8813 046734 001374      BNE      1$
8814
8815 046736 012700 001666      2$:      MOV      #RHTAB,R0      ;PUT TOP OF RHTAB TO BOT OF SRTTAB
8816 046742 012021 001374      MOV      (R0)+(R1)+
8817 046744 020037 001374      CMP      R0,SECTOR
8818 046750 001374      BNE      2$
8819
8820 046752 012601      MOV      (SP)+,R1      ;RESTOR R1
8821 046754 012600      MOV      (SP)+,R0      ;RESTOR R0
8822 046756 000207      RTS      PC
8823
8824      ;MULT BY 6. ENTER WITH DESIRED # IN 'SECTOR'
8825
8826      MULT6:  ASL      SECTOR      ;2 X SECTOR
8827 046760 006337 001374      MOV      SECTOR,-(SP)
8828 046764 013746 001374      ASL      SECTOR      ;4 X SECTOR
8829 046770 006337 001374      ADD      (SP)+,SECTOR      ;(4 X S)+(2 X S) = 6 X SECTOR
8830 046774 062637 001374      RTS      PC
8831 047000 000207
8832
8833      ;THIS ROUTINE IS ENTERED ONLY IF THERE IS A BSE ERROR AFTER A WRITE DATA
8834      ;CMD. IT VERIFIES THAT THE BAD SECTOR IS LISTED IN THE BSE INFORMATION
8835      ;CYLINDER AT CYL 410, TRACK 2.
8836
8837      ;RETURN IF SECTOR NOT LISTED IN BSE TABLE, ERROR CONDITION.
8838      ;RETURN+2 IF LISTED, SKIP OVER ERROR
8839
8840      TRUEERR: MOV      R4,-(SP)      ;SAVE R4
8841 047002 010446
8842
8843 047004 032737 010000 005314      BIT      #CFMT,HCS1      ;CHECK FORMAT
8844 047012 001014      BNE      3$      ;BR FOR 20 SECTOR FORMAT
8845      ;ONLY 22 SECTOR FMT IN THIS PGM
8846
8847 047014 012704 002306      MOV      #BSE22H+8.,R4
8848 047020 004737 047054      JSR      PC,TERR1
8849 047024 000407      BR      3$      ;SEE IF ON HARDWARE DETECTED TABLE
8850      ;RETURN HERE IF YES
8851
8852 047026 012704 003306      MOV      #BSE22S+8.,R4
8853 047032 004737 047054      JSR      PC,TERR1
8854 047036 000402      BR      3$      ;ELSE RETURN HERE
8855      ;& SEE IF ON SOFTWARE DETECTED TABLE
8856      ;RETURN HERE IF YES
8857
8858 047040 012604      1$:      MOV      (SP)+,R4      ;RESTORE R4
8859 047042 000207      RTS      PC      ;RETURN WITHOUT JUMPING OVER ERROR

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8857
8858 047044 012604
8859 047046 062716 000002
8860 047052 000207
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8862
8863
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8868 047054 021427 177777
8869 047060 001405
8870 047062 022437 005334
8871 047066 001405
8872 047070 005724
8873 047072 000770
8874
8875 047074 062716 000002
8876 047100 000207
8877
8878 047102 022437 005324
8879 047106 001401
8880 047110 000761
8881
8882 047112 000207
8883
8884
8885
8886
8887
8888 047114 005037 001372
8889 047120 005737 005460
8890 047124 001004
8891 047126 012777 000100 132172
8892 047134 000207
8893 047136 012777 177777 132156
8894 047144 012777 000135 132146
8895 047152 000207
8896
8897
8898
8899 047154 005337 001366
8900 047160 000002
8901
8902
8903
8904 047162 005737 005460
8905 047166 001003
8906 047170 005077 132132
8907 047174 000207
8908 047176 005077 132116
8909 047202 000207
8910
8911
8912

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3$: MOV (SP)+,R4 ;RESTORE R4
ADD #2,(SP) ;SKIP OVER ERROR ON RETURN
RTS PC

; THIS ROUTINE DOES THE ACTUAL COMPARING OF CYLINDER, HEAD & TRACK AGAINST
; THE BSE TABLE FOR THE ABOVE SUBROUTINE.
; RETURN IF FOUND ON TABLE
; RETURN+2 IF NOT FOUND

TERR1: CMP (R4), #-1 ;SEE IF ALL 1'S
BEQ 1$ ;BR IF YES, NOT ON TABLE
CMP (R4)+,HDC ;SEE IF CYL MATCH
BEQ 2$ ;BR IF YES
TST (R4)+ ;ELSE ADV TO NEXT CYL WORD
BR TERR1 ;& TRY AGAIN.

1$: ADD #2,(SP)
RTS PC

2$: CMP (R4)+,HDC ;SEE IF SECTOR & TRACK MATCH
BEQ 3$ ;BR IF YES
BR TERR1 ;OR TRY AGAIN

3$: RTS PC

; ROUTINE TO TURN L OR P CLOCK INTERRUPT ON
CLKON: CLR TIMUP
TST PCLKF
BNE 1$ ;BRANCH IF P-CLOCK PRESENT
MOV #100,ALKS ;L-CLOCK, ENABLE INT
RTS PC

1$: MOV #-1,APKSB ;P-CLOCK, ALL 1'S
MOV #135,APKS ;ENABLE INT, CT UP, REP INT
RTS PC ;LINE FREQ & RUN

; KW11-L & KW11-P INTERRUPT HANDLER
CLOCK: DEC COUNT
RTI

; ROUTINE TO TURN L OR P CLOCK INTERRUPT OFF
CLKOF: TST PCLKF
BNE 1$ ;BRACH IF P-CLOCK PRESENT
CLR ALKS ;L-CLOCK, CLEAR INTERRUPT
RTS PC

1$: CLR APKS ;P-CLOCK, CLEAR INTERRUPT
RTS PC

; THIS ROUTINE DOES A TIMEOUT DEPENDING ON THE VALUE IN 'COUNT' WHICH THE

```

```

8913      ; 'CLOCK' HANDLER DECREMENTS EVERY 1/60 SEC.
8914
8915 047204 004737 047114      TMO:   JSR      PC,CLKON      ;TURN CLOCK ON
8916 047210 005737 001366      1$:   TST      COUNT      ;TIME UP?
8917      ;                   BNE      TMO      ;BR IF NO S9-SEP-77
8918 047214 001375              ;                   1$      ;29-SEP-77
8919 047216 004737 047162      ;                   JSR      PC,CLKOF     ;ELSE, TURN CLOCK OFF
8920 047222 000207              ;                   RTS      PC
8921
8922      ;
8923      ; THIS ROUTINE GENERATES PARITY FOR EXPECTED MESSAGES
8924      ; ENTER WITH THE EXPECTED WORD IN TEMP1
8925      ; TEMP1 IS ROTATED LEFT 17 TIMES. EACH TIME THE CARRY BIT IS SET,
8926      ; R1 IS INCREMENTED. AT THE END OF 17 ROTATES ( TEMP1 BACK TO ORIG),
8927      ; R1 BIT 0 IS EXAMINED. IF IT IS SET, INDICATING AN ODD # OF 1'S,
8928      ; THE PARITY BIT IS NOT SET IN B
8929      ; IF IT IS NOT SET, INDICATING AN EVEN # OF 1'S ,THE PARITY BIT IS
8930      ; SET IN TEMP1
8931
8932 047224 010046              SBPAR:  MOV      RO,-(SP)      ;SAVE RO
8933 047226 010146              ;                   MOV      R1,-(SP)      ;SAVE R1
8934 047230 012700 000021      ;                   MOV      #17,R0      ;SHIFT COUNTER
8935 047234 005001              ;                   CLR      R1      ;COUNT # OF 1'S IN TEMP1
8936 047236 000241              ;                   CLC      ;CLEAR CARRY
8937
8938 047240 006137 005352      1$:   ROL      TEMP1
8939 047244 103001              ;                   BCC      2$      ;BR IF CARRY CLEAR
8940 047246 005201              ;                   INC      R1      ;COUNT # OF 1'S
8941 047250 005300              2$:   DEC      R0      ;SHIFT COUNTER
8942 047252 001372              ;                   BNE      1$
8943
8944 047254 032701 000001      ;                   BIT      #BIT0,R1
8945 047260 001003              ;                   BNE      3$      ;BR IF ODD # IN R0
8946 047262 052737 100000 005352 ;                   BIS      #M.PAR,TEMP1 ;SET PARITY BIT
8947 047270 012601              3$:   MOV      (SP)+,R1      ;RESTORE R1
8948 047272 012600              ;                   MOV      (SP)+,R0      ;RESTORE R0
8949 047274 000207              ;                   RTS      PC
8950
8951      ;
8952      ; ROUTINE TO ENABLE LOOPING ON INTERMITTANT ERRORS
8953      ; WHEN $LPERR SET BY OTHER THAN SCOPE ROUTINE
8954      ; IE: MY LOOP MACRO
8955
8956 047276 032777 001000 131634 SCOP1$: BIT      #SW9,$SWR      ;LOOP ON ERROR?
8957 047304 001406              ;                   BEQ      1$      ;BR IF NO
8958 047306 105737 001103      ;                   TSTB     $ERFLG      ;HAD ERROR?
8959 047312 001403              ;                   BEQ      1$      ;BR IF NO
8960 047314 013716 001110      ;                   MOV      $LPERR,(SP)
8961 047320 000002              ;                   RTI
8962
8963 047322 011637 001110      1$:   MOV      (SP),$LPERR      ;SET LOOP ADDR FOR TIGHT SCOPE LOOP
8964 047326 000002              ;                   RTI
8965
8966
8967
8968

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GET VALUE FOR SOFTWARE SWITCH REGISTER

SEQ 0172

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8969
8970
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8972
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8974
8975 047330 022626
8976
8977 047332 004737 045534
8978 047336 104024
8979
8980 047340 005737 005276
8981 047344 001431
8982 047346 005737 000042
8983 047352 001403
8984 047354 104401 056674
8985 047360 000402
8986 047362 104401 056742
8987 047366
8988
8989 047366 004737 045534
8990 047372 104024
8991
8992 047374 012737 000011 005314
8993 047402 004737 043372
8994 047406 104121
8995
8996 047410 013737 001406 005354
8997 047416 004737 044006
8998 047422 104074
8999
9000 047424 005037 005276
9001
9002
9003 047430 005737 005300
9004 047434 001520
9005 047436 005237 005302
9006
9007 047442 012765 100000 000000
9008 047450 013765 001222 000010
9009 047456 063765 005464 000010
9010 047464 012737 000013 005314
9011 047472 004737 043372
9012 047476 104124
9013
9014 047500 012765 000001 000026
9015 047506 004737 045146
9016 047512 032737 020000 005342
9017 047520 001001
9018 047522 104070
9019 047524 013737 001400 005354
9020 047532 004737 044006
9021 047536 104055
9022
9023 047540 012765 100000 000000
9024 047546 013765 001222 000010

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; THIS ROUTINE IS ENTERED BY TYPING A CONTROL-C.
 ; IT IS USED TO ALLOW THE OPERATOR TO HLT THE CPU WHILE INSURING
 ; THAT HEADS ARE LOADED & FORMATTING IS VALID BEFORE ACTUALLY HALTING
 ; THE CPU.
 STOP: CMP (SP)+,(SP)+ ;RESTORE STACK FROM INTERRUPT
 JSR PC,SUBCLR
 ERROR 24 ;CERR AFTER
 TST UNLD ;SEE IF HEADS UNLOADED
 BEQ 3\$;BR IF NO
 TST 42 ;SEE IF MANUAL OR AUTO MODE
 BEQ 1\$;BR IF MANUAL MODE
 TYPE MSG74 ;PGM ABORT PENDING
 BR 2\$
 1\$: TYPE ,MSG75 ;HALT PENDING
 2\$:

JSR PC,SUBCLR
 ERROR 24 ;CERR AFTER SCLR
 MOV #SRTSPL,HCS1
 JSR PC,DOCMD ;DO START SPINDLE CMD & GET CONTR RDY
 ERROR 121 ;RDY NOT SET AFTER ST SPIN CMD.
 MOV T100,TEMP2 ;SETUP TIMEOUT
 JSR PC,FATT1 ;FIND ATTN
 ERROR 74 ;NO ATTN AFTER ST SPIN CMD.
 CLR UNLD
 3\$: TST BADHDR ;SEE IF HEADERS VALID
 BEQ 4\$;BR IF YES
 INC HPEND
 MOV #CCLR,RKCS1(R5)
 MOV \$UNIT,RKCS2(R5)
 ADD UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
 MOV #RECAL,HCS1
 JSR PC,DOCMD ;DO RECAL CMD & GET CONTR RDY
 ERROR 124 ;RDY NOT SET AFTER RECAL CMD
 MOV #1,RKMR1(R5) ;SELECT WORD 1
 JSR PC,GSTAT
 BIT #0,RTZ,HMR2
 BNE 64\$
 ERROR 70 ;RTZ NOT SET DURING RECAL CMD
 64\$: MOV T10,TEMP2 ;SETUP TIMEOUT
 JSR PC,FATT1 ;FIND ATTN
 ERROR 55 ;NO ATTN AFTER RECAL CMD
 MOV #CCLR,RKCS1(R5)
 MOV \$UNIT,RKCS2(R5) ;DRIVE#

E14

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GET VALUE FOR SOFTWARE SWITCH REGISTER

SEQ 0173

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9025 047554 063765 005464 000010      ADD      UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
9026 047562 012737 000005 005314      MOV      #CLEAR,HCS1
9027 047570 004737 043372      JSR      PC,DOCMD ;DO DRIVE CLEAR CMD & GET CONTR RDY
9028 047574 104151 043750      ERROR    151 ;NO RDY AFTER DRIVE CLEAR CMD
9029 047576 004737 043750      JSR      PC,TSTATN ;TEST FOR ATTN
9030 047602 000401 043750      BR       65$
9031 047604 104154 043750      ERROR    154 ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
9032 047606 043750 043750      65$:
9033
9034 047606 012737 010340 005404      MOV      #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
9035 047614 005037 005406 005404      CLR      E.B0 ;EXPECTED MSG B0
9036 047620 012737 001720 005410      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
9037 047626 012737 000001 005412      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
9038 047634 005037 005414 005412      CLR      E.A2 ;EXPECTED MSG A2
9039 047640 012737 000002 005416      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
9040 047646 012737 000003 005422      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
9041
9042 047654 004737 044274 044274      JSR      PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
9043 047660 000003 044274 044274      .WORD    T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
9044 047662 104033 044274 044274      ERROR    33 ;MSG A0 ERROR AFTER DRV CLEAR CMD
9045 047664 104034 044274 044274      ERROR    34 ;MSG B0 ERROR
9046 047666 104035 044274 044274      ERROR    35 ;MSG A1 ERROR
9047 047670 104036 044274 044274      ERROR    36 ;MSG B1 ERROR
9048
9049
9050 047672 000137 047736 047736      JMP      FORM ;WRITE VALID FORMATS
9051
9052 047676 005737 000042 000042      4$: TST      42 ;SEE IF MANUAL OR AUTO MODE
9053 047702 001410 000042 000042      BEQ      5$ ;BR IF MANUAL MODE
9054 047704 104401 056777 056777      TYPE     MSG76 ;PGM ABORTED
9055 047710 005037 042732 042732      CLR      $EOPCT ;SET UP EOP TO EXIT TO MONITOR
9056 047714 005037 001176 001176      CLR      $ESCAPE
9057 047720 000137 042704 042704      JMP      $EOP1 ;ABORT PGM
9058
9059 047724 104401 057021 057021      5$: TYPE     ,MSG77 ;CPU HALTED
9060 047730 000000 057021 057021      HALT
9061 047732 000137 010646 010646      JMP      ST5 ;START OVER IF CONTINUE PRESSED
9062 047736
9063
9064
9065
9066
9067
9068
9069
9070
9071
9072 047736 011600 020000 131170      BADTMO: MOV      (SP),RO ;SAVE PC WHERE TIMEOUT OCCURRED.
9073 047740 005740 020000 131170      TST      -(RO) ;GET PC BEFORE UPDATE
9074 047742 032777 020000 131170      BIT      #SW13,ASWR ;INHIBIT ERR TYP0UT?
9075 047750 001005 057201 057201      BNE      1$ ;YES, CON'T TYPE
9076 047752 104401 057201 057201      TYPE     EM3 ;ABORT TESTS,UNEXP T.O. @ PC=
9077 047756 010046 057201 057201      MOV      RO,-(SP) ;SAVE RO FOR TYPEOUT
9078
9079 047760 104403 057201 057201      TYPE     PC ;TYPE PC
9080 047762 006 057201 057201      .BYTE    6 ;GO TYPE--OCTAL ASCII
;TYPE 6 DIGIT S)

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9081 047763 000      .BYTE 0      ; SUPPRESS LEADING ZEROS
9082 047764 032777 001000 131146 1$: BIT #SW9,2SWR ; LOOP ON ERROR?
9083 047772 001403      BEQ 2$      ; NO BRANCH
9084 047774 022626      CMP (SP)+,(SP)+ ; YES RESTORE STACK
9085 047776 000177 131104      JMP 2$LPADR ; GO TO STARTING ADDR OF TEST
9086                                     ; THAT GAVE BAD TIMEOUT
9087 050002 032777 040000 131130 2$: BIT #SW4,2SWR ; LOOP ON TEST?
9088 050010 001401      BEQ 3$      ; NO BRANCH
9089 050012 000002      RTI          ; YES
9090
9091 050014 000000      3$: HALT      ; UNEXPECTED TIME OUT OCCURRED
9092                                     ; AS INDICATED. YOU CAN LOOP ON
9093                                     ; ERROR, LOOP ON TEST OR INHIBIT
9094                                     ; ERROR TIMEOUT BY SETTING THOSE
9095                                     ; SWITCHES.
9096
9097 050016 022626      CMP (SP)+,(SP)+ ; RESTORE STACK
9098 050020 000137 042704      JMP $EOP1 ; ABORT TESTS
9099
9100 .SBTTL MEMORY CHECK ENABLE TRAP
9101
9102 050024 012737 050040 001176 MEMERR: MOV #1$, $ESCAPE
9103 050032 011637 001334      MOV (SP), TRAPPC ; STORE PC
9104 050036 104017      ERROR 17      ; UNEXP MEM PARITY TRAP
9105 050040 005037 001176 1$: CLR $ESCAPE
9106 050044 032777 001000 131066      BIT #SW9,2SWR ; CHECK IF LOOP ON ERROR
9107 050052 001001      BNE 2$      ; YES FORCE STACK AND TRY AGAIN
9108 050054 000002      RTI          ; ELSE RETURN
9109
9110 050056 012706 001100 2$: MOV #STACK, SP ; INIT STACK
9111 050062 000177 131022      JMP 2$LPERR ; LOOP ON ERROR
9112
9113 .SBTTL RK06 INTERRUPT HANDLER
9114
9115 INTER: NOP
9116 050066 000240      NOP
9117 050070 000240      NOP
9118 050072 000240      NOP
9119 050074 011600      MOV (SP), RD ; SAVE PC WHERE INT OCCURRED.
9120 050076 005740      TST -(RD) ; GET PC BEFORE UPDATE.
9121 050100 104401 056151      TYPE MSG6 ; INT AT PC=
9122 050104 010046      MOV RD, -(SP) ; SAVE RD FOR TYPEOUT
9123                                     ; TYPE PC
9124 050106 104403      TYP0S ; GO TYPE--OCTAL ASCII
9125 050110 006        .BYTE 6 ; TYPE 6 DIGIT(S)
9126 050111 000        .BYTE 0 ; SUPPRESS LEADING ZEROS
9127 050112 000000      HALT
9128 050114 000240      NOP
9129 050116 000240      NOP
9130 050120 000002      RTI
9131
9132 .SBTTL POWER DOWN AND UP ROUTINES
9133
9134 :POWER DOWN ROUTINE
9135
9136 050122 012737 050134 000024 $PWRDN: MOV # $PWRUP.PWRVEC ; SET UP VECTOR

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9137 050130 000000          HALT
9138 050132 000776          BR      -2          ;HANG UP.
9139
9140          ;POWER UP ROUTINE
9141
9142 050134 005037 050206  $PWRUP: CLR      $PWRCT      ;WAIT LOOP FOR TTY
9143 050140 005237 050206  1$:      INC      $PWRCT      ;WAIT FOR THE INCR
9144 050144 001375          BNE      1$      ;OF WORD
9145 050146 012737 050122 000024  MOV      $PWRDN,PWRVEC ;SET POWER DOWN VECTOR
9146 050154 012737 000340 000026  MOV      $PR7,PWRVEC+2 ;PRIORITY 7
9147 050162 012737 000340 000036  MOV      $PR7,TRAPVEC+2 ;LOCKOUT ALL INTERRUPTS FOR TRAPS
9148 050170 012706 001100      MOV      $STACK,SP ;INITIALIZE STACK
9149 050174 104401 056320      TYPE      ,MSG11 ;REPORT POWER FAIL
9150 050200 000005
9151 050202 000137 013004      RESET
9152          JMP      PFSRT
9153 050206 000000          $PWRCT: 0          ;WAIT COUNT FOR TTY
9154
9155          ;DIVISION UTILITY ROUTINE
9156
9157          ;R0-R1-R2-R3=DIVIDEND
9158          ;R4-R5=DIVISOR
9159          ;R0-R1=REMAINDER AFTER DIVISION
9160          ;R2-R3=QUOTIENT AFTER DIVISION
9161          ;ENTER WITH JSR PC,M.DPID
9162
9163          M.DPID: MOV      $40,-(SP)      ;COUNTER FOR DIVISION CYCLES
9164 050210 012746 000040      MOV      R4,-(SP)      ;HI ORDER
9165 050214 010446          MOV      R5,-(SP)      ;LO ORDER TO THE STACK
9166 050216 010546          NEG      2(SP)      ;FORM NEGATIVE
9167 050220 005466 000002      NEG      2SP      ;VERSION OF DIVISOR
9168 050224 005416          SBC      2(SP)
9169 050226 005666 000002      ADD      2SP,R1
9170 050232 061601          ADC      R0
9171 050234 005500          ADD      2(SP),R0      ;PERFORM INIT SUBT.
9172 050236 066600 000002      BCS      M.DP50
9173 050242 103445          CLR      -(SP)      ;IF CARRY THEN OVERFLOW HAS OCCURRED
9174 050244 005046          M.DP40: ROL      R3      ;THIS IS A LONGER LASTING CARRY BIT
9175 050246 006103          ROL      R2
9176 050250 006102          ROL      R1
9177 050252 006101          ROL      R0
9178 050254 006100          TST      2SP
9179 050256 005716          BEQ      M.DP41      ;TEST CARRY INDICATOR
9180 050260 001410          CLR      2SP      ;IF TO CARRY THEN ADD, ELSE SUBT.
9181 050262 005016          ADD      2(SP),R1      ;CLEAR UP FOR NEXT TIME
9182 050264 066601 000002      ADC      R0
9183 050270 005500          ADC      2SP
9184 050272 005516          ADD      4(SP),R0      ;ADD -(DIVISOR)
9185 050274 066600 000004      BR      M.DP42      ;SET CARRY
9186 050300 000404
9187
9188 050302 060501          M.DP41: ADD      R5,R1
9189 050304 005500          ADC      R0
9190 050306 005516          ADC      2SP      ;ADD +(DIVISOR)
9191 050310 060400          ADD      R4,R0      ;SET CARRY
9192 050312 005516          M.DP42: ADC      2SP      ;SET CARRY

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H14

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POWER DOWN AND UP ROUTINES

SEQ 0176

9193	050314	005716		TST	2SP	:TEST THE UPDATE INDICATOR
9194	050316	001401		BEQ	.+4	:IF 0, FORGET IT
9195	050320	005203		INC	R3	:NO CARRY POSSIBLE HERE
9196	050322	005366	000006	DEC	6(SP)	:DECREMENT CTR
9197	050326	003347		BGT	M.DP40	:BR IF MORE TO DO
9198	050330	006003		ROR	R3	
9199	050332	103404		BCS	M.DF44	
9200	050334	060501		ADD	R5,R1	
9201	050336	005500		ADC	R0	
9202	050340	060400		ADD	R4,R0	
9203	050342	000241		CLC		
9204						
9205	050344	006103		M.DP44: ROL	R3	
9206	050346	062706	000010	ADD	#10,SP	;ADJUST STACK BY 4 WORDS
9207	050352	000242		CLV		
9208	050354	000207		RTS	PC	
9209						
9210	050356	062706	000006	M.DP50: ADD	#6,SP	
9211	050362	000262		SEV		
9212	050364	000207		RTS	PC	
9213						

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9214 .SBTTL SCOPE HANDLER ROUTINE
9215
9216 *****
9217 ; THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
9218 ; AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG. (DISPLAY<7:0>)
9219 ; AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
9220 ; THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
9221 ; $SW14=1 LOOP ON TEST
9222 ; $SW11=1 INHIBIT ITERATIONS
9223 ; $SW09=1 LOOP ON ERROR
9224 ; $SW08=1 LOOP ON TEST IN SWR<7:0>
9225 ; CALL
9226 ; * SCOPE ; ; SCOPE=IOT
9227
9228 $SCOPE:
9229 050366 104407 040000 130542 1$: CKSWR ; TEST FOR CHANGE IN SOFT-SWR
9230 050370 032777 040000 130542 1$: BIT #BIT14,$SWR ; LOOP ON PRESENT TEST?
9231 050376 001114 040000 130542 1$: BNE $OVER ; YES IF SW14=1
9232 ; ***** START OF CODE FOR THE XOR TESTER *****
9233 050400 000416 040000 130542 $XTSTR: BR 6$ ; IF RUNNING ON THE "XOR" TESTER CHANGE
9234 ; THIS INSTRUCTION TO A "NOP" (NOP=240)
9235 050402 013746 000004 000004 MOV $ERRVEC, -(SP) ; SAVE THE CONTENTS OF THE ERROR VECTOR
9236 050406 012737 050426 000004 MOV $SS, $ERRVEC ; SET FOR TIMEOUT
9237 050414 005737 177060 000004 TST $#177060 ; TIME OUT ON XOR?
9238 050420 012637 000004 MOV (SP)+, $ERRVEC ; RESTORE THE ERROR VECTOR
9239 050424 000463 000004 BR $SVLAD ; GO TO THE NEXT TEST
9240 050426 022626 000004 5$: CMP (SP)+, (SP)+ ; CLEAR THE STACK AFTER A TIME OUT
9241 050430 012637 000004 MOV (SP)+, $ERRVEC ; RESTORE THE ERROR VECTOR
9242 050434 000423 000004 BR 7$ ; LOOP ON THE PRESENT TEST
9243 050436 032777 000400 130474 6$: ; ***** END OF CODE FOR THE XOR TESTER *****
9244 050436 001404 000400 130474 BIT #BIT08,$SWR ; LOOP ON SPEC. TEST?
9245 050444 127737 130466 001102 BEQ 2$ ; BR IF NO
9246 050446 001465 001102 CMPB $SWR, $TSTNM ; ON THE RIGHT TEST? SWR<7:0>
9247 050454 105737 001103 2$: BEQ $OVER ; BR IF YES
9248 050456 001421 001103 TSTB $ERFLG ; HAS AN ERROR OCCURRED?
9249 050462 123737 001115 001103 BEQ 3$ ; BR IF NO
9250 050464 101015 001103 CMPB $ERMAX, $ERFLG ; MAX. ERRORS FOR THIS TEST OCCURRED?
9251 050472 032777 001000 130436 BHI 3$ ; BR IF NO
9252 050474 001404 001106 7$: BIT #BIT09,$SWR ; LOOP ON ERROR?
9253 050502 013737 001110 001106 BEQ 4$ ; BR IF NO
9254 050504 000446 001103 4$: MOV $LPERR, $LPADR ; SET LOOP ADDRESS TO LAST SCOPE
9255 050512 105037 001103 CLRB $ERFLG ; ZERO THE ERROR FLAG
9256 050514 005037 001174 CLR $TIMES ; CLEAR THE NUMBER OF ITERATIONS TO MAKE
9257 050520 000415 004000 130404 3$: BR 1$ ; ESCAPE TO THE NEXT TEST
9258 050524 000415 004000 130404 3$: BIT #BIT11,$SWR ; INHIBIT ITERATIONS?
9259 050534 000415 004000 130404 3$: BNE 1$ ; BR IF YES
9260 050536 000415 004000 130404 3$: TST $PASS ; IF FIRST PASS OF PROGRAM
9261 050542 000415 004000 130404 3$: BEQ 1$ ; INHIBIT ITERATIONS
9262 050544 000415 004000 130404 3$: INC $ICNT ; INCREMENT ITERATION COUNT
9263 050550 023737 001174 001104 CMP $TIMES, $ICNT ; CHECK THE NUMBER OF ITERATIONS MADE
9264 050556 002024 001104 BGE $OVER ; BR IF MORE ITERATION REQUIRED
9265 050560 012737 000001 001104 1$: MOV #1, $ICNT ; REINITIALIZE THE ITERATION COUNTER
9266 050566 013737 050644 001174 MOV $MXCNT, $TIMES ; SET NUMBER OF ITERATIONS TO DO
9267 050574 105237 001102 001214 $SVLAD: INCB $TSTNM ; COUNT TEST NUMBERS
9268 050600 113737 001102 001214 MOVB $TSTNM, $TESTN ; SET TEST NUMBER IN APT MAILBOX

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9270 050606 011637 001106      MOV      (SP), $LPADR      ;; SAVE SCOPE LOOP ADDRESS
9271 050612 011637 001110      MOV      (SP), $LPERR      ;; SAVE ERROR LOOP ADDRESS
9272 050616 005037 001176      CLR      $ESCAPE      ;; CLEAR THE ESCAPE FROM ERROR ADDRESS
9273 050622 112737 000001      MOV      #1, $ERMAX      ;; ONLY ALLOW ONE(1) ERROR ON NEXT TEST
9274 050630 013777 001102      $OVER:  MOV      $STNM, @DISPLAY  ;; DISPLAY TEST NUMBER
9275 050636 013716 001106      MOV      $LPADR, (SP)      ;; FUDGE RETURN ADDRESS
9276 050642 000002              RTI              ;; FIXES PS
9277 050644 003720      $MXCNT: 2000.      ;; MAX. NUMBER OF ITERATIONS
9278                      .SBTTL  ERROR HANDLER ROUTINE
9279
9280                      ;; *****
9281                      ;; *THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT.
9282                      ;; *SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
9283                      ;; *AND GO TO TYPERR ON ERROR
9284                      ;; *THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
9285                      ;; *SW15=1      HALT ON ERROR
9286                      ;; *SW13=1      INHIBIT ERROR TYPEOUTS
9287                      ;; *SW10=1      BELL ON ERROR
9288                      ;; *SW09=1      LOOP ON ERROR
9289                      ;; *CALL
9290                      ;; *      ERROR      N      ;; ERROR=EMT AND N=ERROR ITEM NUMBER
9291
9292 050646      $ERROR:
9293 050646      104407      CKSWR      ;; TEST FOR CHANGE IN SOFT-SWR
9294 050650      105237 001103 7$:      INCB      $ERFLG      ;; SET THE ERROR FLAG
9295 050654      001775      BEQ      7$      ;; DON'T LET THE FLAG GO TO ZERO
9296 050656      013777 001102 130256      MOV      $STNM, @DISPLAY  ;; DISPLAY TEST NUMBER AND ERROR FLAG
9297 050664      032777 002000 130246      BIT      #BIT10, @SWR      ;; BELL ON ERROR?
9298 050672      001402      BEQ      1$      ;; NO - SKIP
9299 050674      104401 001200      TYPE      $BELL      ;; RING BELL
9300 050700      005237 001112      INC      $ERTTL      ;; COUNT THE NUMBER OF ERRORS
9301 050704      011637 001116      MOV      (SP), $ERRPC      ;; GET ADDRESS OF ERROR INSTRUCTION
9302 050710      162737 000002 001116      SUB      #2, $ERRPC
9303 050716      117737 130174 001114      MOV      @ERRPC, $ITEMB      ;; STRIP AND SAVE THE ERROR ITEM CODE
9304 050724      032777 020000 130206      BIT      #BIT13, @SWR      ;; SKIP TYPEOUT IF SET
9305 050732      001004      BNE      20$      ;; SKIP TYPEOUTS
9306 050734      004737 066720      JSR      PC, TYPERR      ;; GO TO USER ERROR ROUTINE
9307 050740      104401 001205      TYPE      $CRLF
9308 050744
9309 050744      122737 000001 001230 20$:      CMPB      #APTENV, $ENV      ;; RUNNING IN APT MODE
9310 050752      001007      BNE      2$      ;; NO, SKIP APT ERROR REPORT
9311 050754      113737 001114 050766      MOV      $ITEMB, 21$      ;; SET ITEM NUMBER AS ERROR NUMBER
9312 050762      004737 051572      JSR      PC, $ATY4      ;; REPORT FATAL ERROR TO APT
9313 050766      000      21$:      .BYTE      0
9314 050767      000      .BYTE      0
9315 050770      000777      22$:      BR      22$      ;; APT ERROR LOOP
9316 050772      005777 130142      2$:      TST      @SWR      ;; HALT ON ERROR
9317 050776      100002      BPL      3$      ;; SKIP IF CONTINUE
9318 051000      000000      HALT      ;; HALT ON ERROR!
9319 051002      104407      CKSWR      ;; TEST FOR CHANGE IN SOFT-SWR
9320 051004      032777 001000 130126 3$:      BIT      #BIT09, @SWR      ;; LOOP ON ERROR SWITCH SET?
9321 051012      001402      BEQ      4$      ;; BR IF NO
9322 051014      013716 001110      MOV      $LPERR, (SP)      ;; FUDGE RETURN FOR LOOPING
9323 051020      005737 001176      TST      $ESCAPE      ;; CHECK FOR AN ESCAPE ADDRESS
9324 051024      001402      BEQ      5$      ;; BR IF NONE
9325 051026      013716 001176      MOV      $ESCAPE, (SP)      ;; FUDGE RETURN ADDRESS FOR ESCAPE

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9326 051032
9327 051032 022737 042772 000042 5$:      CMP      #SENDAD,2#42      ;;ACT-11 AUTO-ACCEPT?
9328 051040 001001      BNE      6$              ;;BRANCH IF NO
9329 051042 000000      HALT                      ;;YES
9330 051044
9331 051044 000002 6$:      RTI                      ;;RETURN
9332
9333 .SBTTL  TYPE ROUTINE
9334
9335 ;*****
9336 ;ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
9337 ;THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
9338 ;NOTE1:      $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
9339 ;NOTE2:      $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
9340 ;NOTE3:      $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
9341 ;
9342 ;CALL:
9343 ;1) USING A TRAP INSTRUCTION
9344 ;      TYPE      ,MESADR      ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
9345 ;OR
9346 ;      TYPE
9347 ;      MESADR
9348 ;
9349 051046 105737 001157 $TYPE:  TSTB      $TPFLG      ;; IS THERE A TERMINAL?
9350 051052 100002      BPL      1$              ;;BR IF YES
9351 051054 000000      HALT                      ;;HALT HERE IF NO TERMINAL
9352 051056 000430      BR              ;;LEAVE
9353 051060 010046 1$:      MOV      RO,-(SP)      ;;SAVE RO
9354 051062 017600      MOV      22(SP),RO      ;;GET ADDRESS OF ASCIZ STRING
9355 051066 122737 000001 001230      CMPB      #APTENV,$ENV      ;;RUNNING IN APT MODE
9356 051074 001011      BNE      62$              ;;NO GO CHECK FOR APT CONSOLE
9357 051076 132737 000100 001231      BITB      #APTPOOL,$ENV      ;;SPOOL MESSAGE TO APT
9358 051104 001405      BEQ      62$              ;;NO GO CHECK FOR CONSOLE
9359 051106 010037 051116      MOV      RO,61$      ;;SETUP MESSAGE ADDRESS FOR APT
9360 051112 004737 051562      JSR      PC,$ATY3      ;;SPOOL MESSAGE TO APT
9361 051116 000000 61$:      .WORD      0      ;;MESSAGE ADDRESS
9362 051120 132737 000040 001231 62$:      BITB      #APTCUP,$ENV      ;;APT CONSOLE SUPPRESSED
9363 051126 001003      BNE      60$              ;;YES, SKIP TYPE OUT
9364 051130 112046 2$:      MOVB      (RO)+,-(SP)      ;;PUSH CHARACTER TO BE TYPED ONTO STACK
9365 051132 001005      BNE      4$              ;;BR IF IT ISN'T THE TERMINATOR
9366 051134 005726      TST      (SP)+      ;;IF TERMINATOR POP IT OFF THE STACK
9367 051136 012600 60$:      MOV      (SP)+,RO      ;;RESTORE RO
9368 051140 062716 000002 3$:      ADD      #2,(SP)      ;;ADJUST RETURN PC
9369 051144 000002      RTI                      ;;RETURN
9370 051146 122716 000011 4$:      CMPB      #HT,(SP)      ;;BRANCH IF <HT>
9371 051152 001430      BEQ      8$              ;;BRANCH IF NOT <CRLF>
9372 051154 122716 000200      CMPB      #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
9373 051160 001006      BNE      5$              ;;POP <CR><LF> EQUIV
9374 051162 005726      TST      (SP)+      ;;TYPE A CR AND LF
9375 051164 104401      TYPE
9376 051166 001205      $CRLF
9377 051170 105037 051324      CLRB      $CHARCNT      ;;CLEAR CHARACTER COUNT
9378 051174 000755      BR      2$              ;;GET NEXT CHARACTER
9379 051176 004737 051260      JSR      PC,$TYPEC      ;;GO TYPE THIS CHARACTER
9380 051202 123726 001156 5$:      CMPB      $FILLC,(SP)+      ;;IS IT TIME FOR FILLER CHARS.?
9381 051206 001350      BNE      2$              ;;IF NO GO GET NEXT CHAR.

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9382 051210 013746 001154      MOV      $NULL,-(SP)      ;;GET # OF FILLER CHARS. NEEDED
9383                                ;;AND THE NULL CHAR.
9384 051214 105366 000001      7$:  DECB      1(SP)      ;;DOES A NULL NEED TO BE TYPED?
9385 051220 002770                BLT      6$      ;;BR IF NO--GO POP THE NULL OFF OF STACK
9386 051222 004737 051260      JSR      PC,$TYPEC      ;;GO TYPE A NULL
9387 051226 105337 051324      DECB      $CHARCNT      ;;DO NOT COUNT AS A COUNT
9388 051232 000770                BR      7$      ;;LOOP
9389
9390                                ;HORIZONTAL TAB PROCESSOR
9391
9392 051234 112716 000040      8$:  MOVB      #' (SP)      ;;REPLACE TAB WITH SPACE
9393 051240 004737 051260      9$:  JSR      PC,$TYPEC      ;;TYPE A SPACE
9394 051244 132737 000007 051324  BITB      #7,$CHARCNT      ;;BRANCH IF NOT AT
9395 051252 001372                BNE      9$      ;;TAB STOP
9396 051254 005726                TST      (SP)+      ;;POP SPACE OFF STACK
9397 051256 000724                BR      2$      ;;GET NEXT CHARACTER
9398 051260 105777 127664      $TYPEC: TSTB      @STPS      ;;WAIT UNTIL PRINTER IS READY
9399 051264 100375                BPL      $TYPEC
9400 051266 116677 000002 127656  MOVB      2(SP),@STPB      ;;LOAD CHAR TO BE TYPED INTO DATA REG.
9401 051274 122766 000015 000002  CMPB      #CR,2(SP)      ;;IS CHARACTER A CARRIAGE RETURN?
9402 051302 001003                BNE      1$      ;;BRANCH IF NO
9403 051304 105037 051324      CLRB      $CHARCNT      ;;YES--CLEAR CHARACTER COUNT
9404 051310 000406                BR      $TYPEX      ;;EXIT
9405 051312 122766 000012 000002  1$:  CMPB      #LF,2(SP)      ;;IS CHARACTER A LINE FEED?
9406 051320 001402                BEQ      $TYPEX      ;;BRANCH IF YES
9407 051322 105227                INCB      (PC)+      ;;COUNT THE CHARACTER
9408 051324 000000      $CHARCNT: .WORD      0      ;;CHARACTER COUNT STORAGE
9409 051326 000207      $TYPEX:  RTS      PC
9410
9411      .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
9412
9413      ;*****
9414      ;THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
9415      ;SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
9416      ;NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
9417      ;BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
9418      ;REPLACED WITH SPACES.
9419      ;CALL:
9420      ;*      MOV      NUM,-(SP)      ;;PUT THE BINARY NUMBER ON THE STACK
9421      ;*      TYPDS      ;;GO TO THE ROUTINE
9422
9423      $TYPDS:
9424 051330 010046      MOV      R0,-(SP)      ;;PUSH R0 ON STACK
9425 051332 010146      MOV      R1,-(SP)      ;;PUSH R1 ON STACK
9426 051334 010246      MOV      R2,-(SP)      ;;PUSH R2 ON STACK
9427 051336 010346      MOV      R3,-(SP)      ;;PUSH R3 ON STACK
9428 051340 010546      MOV      R5,-(SP)      ;;PUSH R5 ON STACK
9429 051342 012746 020200      MOV      #20200,-(SP)      ;;SET BLANK SWITCH AND SIGN
9430 051346 016605 000020      MOV      20(SP),R5      ;;GET THE INPUT NUMBER
9431 051352 100004      BPL      1$      ;;BR IF INPUT IS POS.
9432 051354 005405      NEG      R5      ;;MAKE THE BINARY NUMBER POS.
9433 051356 112766 000055 000001  1$:  MOVB      #'-,1(SP)      ;;MAKE THE ASCII NUMBER NEG.
9434 051364 005000      CLR      R0      ;;ZERO THE CONSTANTS INDEX
9435 051366 012703 051544      MOV      #SDBLK,R3      ;;SETUP THE OUTPUT POINTER
9436 051372 112723 000040      MOVB      #'',(R3)+      ;;SET THE FIRST CHARACTER TO A BLANK
9437 051376 005002      2$:  CLR      R2      ;;CLEAR THE BCD NUMBER

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CONVERT BINARY TO DECIMAL AND TYPE ROUTINE

SEQ 0181

9438	051400	016001	051534		MOV	\$DTBL(R0),R1	;; GET THE CONSTANT
9439	051404	160105		3\$:	SUB	R1,R5	;; FORM THIS BCD DIGIT
9440	051406	002402			BLT	4\$	;; BR IF DONE
9441	051410	005202			INC	R2	;; INCREASE THE BCD DIGIT BY 1
9442	051412	000774			BR	3\$	
9443	051414	060105		4\$:	ADD	R1,R5	;; ADD BACK THE CONSTANT
9444	051416	005702			TST	R2	;; CHECK IF BCD DIGIT=0
9445	051420	001002			BNE	5\$	;; FALL THROUGH IF 0
9446	051422	105716			TSTB	(SP)	;; STILL DOING LEADING 0'S?
9447	051424	100407			BMI	7\$	;; BR IF YES
9448	051426	106316		5\$:	ASLB	(SP)	;; MSD?
9449	051430	103003			BCC	6\$	;; BR IF NO
9450	051432	116663	000001 177777		MOVB	1(SP),-1(R3)	;; YES--SET THE SIGN
9451	051440	052702	000060	6\$:	BIS	#'0,R2	;; MAKE THE BCD DIGIT ASCII
9452	051444	052702	000040	7\$:	BIS	#' ,R2	;; MAKE IT A SPACE IF NOT ALREADY A DIGIT
9453	051450	110223			MOVB	R2,(R3)+	;; PUT THIS CHARACTER IN THE OUTPUT BUFFER
9454	051452	005720			TST	(R0)+	;; JUST INCREMENTING
9455	051454	020027	000010		CMP	R0,#10	;; CHECK THE TABLE INDEX
9456	051460	002746			BLT	2\$	;; GO DO THE NEXT DIGIT
9457	051462	003002			BGT	8\$	;; GO TO EXIT
9458	051464	010502			MOV	R5,R2	;; GET THE LSD
9459	051466	000764			BR	6\$	;; GO CHANGE TO ASCII
9460	051470	105726		8\$:	TSTB	(SP)+	;; WAS THE LSD THE FIRST NON-ZERO?
9461	051472	100003			BPL	9\$	;; BR IF NO
9462	051474	116663	177777 177776		MOVB	-1(SP),-2(R3)	;; YES--SET THE SIGN FOR TYPING
9463	051502	105013		9\$:	CLRB	(R3)	;; SET THE TERMINATOR
9464	051504	012605			MOV	(SP)+,R5	;; POP STACK INTO R5
9465	051506	012603			MOV	(SP)+,R3	;; POP STACK INTO R3
9466	051510	012602			MOV	(SP)+,R2	;; POP STACK INTO R2
9467	051512	012601			MOV	(SP)+,R1	;; POP STACK INTO R1
9468	051514	012600			MOV	(SP)+,R0	;; POP STACK INTO R0
9469	051516	104401	051544		TYPE	\$DBLK	;; NOW TYPE THE NUMBER
9470	051522	016666	000002 000004		MOV	2(SP),4(SP)	;; ADJUST THE STACK
9471	051530	012616			MOV	(SP)+,(SP)	
9472	051532	000002			RTI		;; RETURN TO USER
9473	051534	023420		\$DTBL:	10000.		
9474	051536	001750			1000.		
9475	051540	000144			100.		
9476	051542	000012			10.		
9477	051544	000004		\$DBLK:	.BLKW 4		
9478				.SBTTL	APT COMMUNICATIONS ROUTINE		
9479							
9480							
9481	051554	112737	000001 052020	*****	\$ATY1:	MOVB #1,\$FFLG	;; TO REPORT FATAL ERROR
9482	051562	112737	000001 052016		\$ATY3:	MOVB #1,\$MFLG	;; TO TYPE A MESSAGE
9483	051570	000403			BR	\$ATYC	
9484	051572	112737	000001 052020		\$ATY4:	MOVB #1,\$FFLG	;; TO ONLY REPORT FATAL ERROR
9485	051600				\$ATYC:		
9486	051600	010046			MOV	R0,-(SP)	;; PUSH R0 ON STACK
9487	051602	010146			MOV	R1,-(SP)	;; PUSH R1 ON STACK
9488	051604	105737	052016		TSTB	\$MFLG	;; SHOULD TYPE A MESSAGE?
9489	051610	001450			BEQ	5\$	;; IF NOT: BR
9490	051612	122737	000001 001230		CMPB	#APTENV,\$ENV	;; OPERATING UNDER APT?
9491	051620	001031			BNE	3\$	;; IF NOT: BR
9492	051622	132737	000100 001231		BITB	#APTSPool,\$ENV	;; SHOULD SPOOL MESSAGES?
9493	051630	001425			BEQ	3\$	;; IF NOT: BR

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APT COMMUNICATIONS ROUTINE

SEQ 0182

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9494 051632 017600 000004      MOV      24(SP),R0      ;;GET MESSAGE ADDR.
9495 051636 062766 000002      ADD      #2,4(SP)      ;;BUMP RETURN ADDR.
9496 051644 005737 001210      1$:      TST      $MSGTYPE      ;;SEE IF DONE W/ LAST XMISSION?
9497 051650 001375      BNE      1$      ;;IF NOT: WAIT
9498 051652 010037 001224      MOV      R0,$MSGAD      ;;PUT ADDR IN MAILBOX
9499 051656 105720      2$:      TSTB      (R0)+      ;;FIND END OF MESSAGE
9500 051660 001376      BNE      2$
9501 051662 163700 001224      SUB      $MSGAD,R0      ;;SUB START OF MESSAGE
9502 051666 006200      ASR      R0      ;;GET MESSAGE LNTH IN WORDS
9503 051670 010037 001226      MOV      R0,$MSGGLT      ;;PUT LENGTH IN MAILBOX
9504 051674 012737 000004      MOV      #4,$MSGTYPE      ;;TELL APT TO TAKE MSG.
9505 051702 000413      BR      5$
9506 051704 017637 000004      3$:      MOV      24(SP),4$      ;;PUT MSG ADDR IN JSR LINKAGE
9507 051712 062766 000002      ADD      #2,4(SP)      ;;BUMP RETURN ADDRESS
9508 051720 013746 177776      MOV      177776,-(SP)      ;;PUSH 177776 ON STACK
9509 051724 004737 051046      JSR      PC,$TYPE      ;;CALL TYPE MACRO
9510 051730 000000      4$:      .WORD      0
9511 051732      5$:
9512 051732 105737 052020      10$:      TSTB      $FFLG      ;;SHOULD REPORT FATAL ERROR?
9513 051736 001416      BEQ      12$      ;;IF NOT: BR
9514 051740 005737 001230      TST      $ENV      ;;RUNNING UNDER APT?
9515 051744 001413      BEQ      12$      ;;IF NOT: BR
9516 051746 005737 001210      11$:      TST      $MSGTYPE      ;;FINISHED LAST MESSAGE?
9517 051752 001375      BNE      11$      ;;IF NOT: WAIT
9518 051754 017637 000004      MOV      24(SP),$FATAL      ;;GET ERROR #
9519 051762 062766 000002      ADD      #2,4(SP)      ;;BUMP RETURN ADDR.
9520 051770 005237 001210      INC      $MSGTYPE      ;;TELL APT TO TAKE ERROR
9521 051774 105037 052020      12$:      CLRB      $FFLG      ;;CLEAR FATAL FLAG
9522 052000 105037 052017      CLRB      $LFLG      ;;CLEAR LOG FLAG
9523 052004 105037 052016      CLRB      $MFLG      ;;CLEAR MESSAGE FLAG
9524 052010 012601      MOV      (SP)+,R1      ;;POP STACK INTO R1
9525 052012 012600      MOV      (SP)+,R0      ;;POP STACK INTO R0
9526 052014 000207      RTS      PC      ;;RETURN
9527 052016      000      $MFLG: .BYTE      0      ;;MESSG. FLAG
9528 052017      000      $LFLG: .BYTE      0      ;;LOG FLAG
9529 052020      000      $FFLG: .BYTE      0      ;;FATAL FLAG
9530      052022      .EVEN
9531      000200      APTSIZE=200
9532      000001      APTENV=001
9533      000100      APTSPool=100
9534      000040      APTCSUP=040
9535      .SBTTL      BINARY TO OCTAL (ASCII) AND TYPE
9536
9537      ;*****
9538      ;THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
9539      ;OCTAL (ASCII) NUMBER AND TYPE IT.
9540      ;$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
9541      ;CALL:
9542      ;      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED
9543      ;      TYPOS      ;;CALL FOR TYPEOUT
9544      ;      .BYTE      N      ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
9545      ;      .BYTE      M      ;;M=1 OR 0
9546      ;      ;;1=TYPE LEADING ZEROS
9547      ;      ;;0=SUPPRESS LEADING ZEROS
9548      ;
9549      ;$STYPON---ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST

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9550      ;*STYPOS OR STYPOC
9551      ;*CALL:
9552      ;*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED
9553      ;*      TYPON      ;;CALL FOR TYPEOUT
9554      ;*
9555      ;*STYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
9556      ;*CALL:
9557      ;*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED
9558      ;*      TYPOC      ;;CALL FOR TYPEOUT
9559      ;*
9560 052022 017646 000000      STYPOS: MOV      2(SP),-(SP)      ;;PICKUP THE MODE
9561 052026 116637 000001 052245      MOV      1(SP),SOFILL      ;;LOAD ZERO FILL SWITCH
9562 052034 112637 052247      MOV      (SP)+,SOMODE+1      ;;NUMBER OF DIGITS TO TYPE
9563 052040 062716 000002      ADD      #2,(SP)      ;;ADJUST RETURN ADDRESS
9564 052044 000406      BR      STYPOC
9565 052046 112737 000001 052245      STYPOC: MOV      #1,SOFILL      ;;SET THE ZERO FILL SWITCH
9566 052054 112737 000006 052247      MOV      #6,SOMODE+1      ;;SET FOR SIX(6) DIGITS
9567 052062 112737 000005 052244      STYPOC: MOV      #5,SOCNT      ;;SET THE ITERATION COUNT
9568 052070 010346      MOV      R3,-(SP)      ;;SAVE R3
9569 052072 010446      MOV      R4,-(SP)      ;;SAVE R4
9570 052074 010546      MOV      R5,-(SP)      ;;SAVE R5
9571 052076 113704 052247      MOV      $OMODE+1,R4      ;;GET THE NUMBER OF DIGITS TO TYPE
9572 052102 005404      NEG      R4
9573 052104 062704 000006      ADD      #6,R4      ;;SUBTRACT IT FOR MAX. ALLOWED
9574 052110 110437 052246      MOV      R4,SOMODE      ;;SAVE IT FOR USE
9575 052114 113704 052245      MOV      SOFILL,R4      ;;GET THE ZERO FILL SWITCH
9576 052120 016605 000012      MOV      12(SP),R5      ;;PICKUP THE INPUT NUMBER
9577 052124 005003      CLR      R3      ;;CLEAR THE OUTPUT WORD
9578 052126 006105      1$: ROL      R5      ;;ROTATE MSB INTO "C"
9579 052130 000404      BR      3$      ;;GO DO MSB
9580 052132 006105      2$: ROL      R5      ;;FORM THIS DIGIT
9581 052134 006105      ROL      R5
9582 052136 006105      ROL      R5
9583 052140 010503      MOV      R5,R3
9584 052142 006103      3$: ROL      R3      ;;GET LSB OF THIS DIGIT
9585 052144 105337 052246      DECB      $OMODE      ;;TYPE THIS DIGIT?
9586 052150 100016      BPL      7$      ;;BR IF NO
9587 052152 042703 177770      BIC      #177770,R3      ;;GET RID OF JUNK
9588 052156 001002      4$: BNE      4$      ;;TEST FOR 0
9589 052160 005704      TST      R4      ;;SUPPRESS THIS 0?
9590 052162 001403      BEQ      5$      ;;BR IF YES
9591 052164 005204      4$: INC      R4      ;;DON'T SUPPRESS ANYMORE 0'S
9592 052166 052703 000060      BIS      #'0,R3      ;;MAKE THIS DIGIT ASCII
9593 052172 052703 000040      BIS      #'',R3      ;;MAKE ASCII IF NOT ALREADY
9594 052176 110337 052242      MOV      R3,$$      ;;SAVE FOR TYPING
9595 052202 104401 052242      TYPE      8$      ;;GO TYPE THIS DIGIT
9596 052206 105337 052244      7$: DECB      $OCNT      ;;COUNT BY 1
9597 052212 003347      BGT      2$      ;;BR IF MORE TO DO
9598 052214 002402      BLT      6$      ;;BR IF DONE
9599 052216 005204      INC      R4      ;;INSURE LAST DIGIT ISN'T A BLANK
9600 052220 000744      BR      2$      ;;GO DO THE LAST DIGIT
9601 052222 012605      6$: MOV      (SP)+,R5      ;;RESTORE R5
9602 052224 012604      MOV      (SP)+,R4      ;;RESTORE R4
9603 052226 012603      MOV      (SP)+,R3      ;;RESTORE R3
9604 052230 016666 000002 000004      MOV      2(SP),4(SP)      ;;SET THE STACK FOR RETURNING
9605 052236 012616      MOV      (SP)+,(SP)

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BINARY TO OCTAL (ASCII) AND TYPE

SEQ 0184

9606	052240	000002				RTI		;; RETURN
9607	052242	000				8\$: .BYTE 0		;; STORAGE FOR ASCII DIGIT
9608	052243	000				.BYTE 0		;; TERMINATOR FOR TYPE ROUTINE
9609	052244	000				\$OCNT: .BYTE 0		;; OCTAL DIGIT COUNTER
9610	052245	000				\$OFILL: .BYTE 0		;; ZERO FILL SWITCH
9611	052246	000000				\$OMODE: .WORD 0		;; NUMBER OF DIGITS TO TYPE
9612						.SBTTL TTY INPUT ROUTINE		
9613								
9614						*****		
9615						.ENABL LSB		
9616	052250	000000				\$TKCNT: .WORD 0		;; NUMBER OF ITEMS IN QUEUE
9617	052252	000000				\$TKQIN: .WORD 0		;; INPUT POINTER
9618	052254	000000				\$TKQOUT: .WORD 0		;; OUTPUT POINTER
9619	052256	000001				\$TKQSRT: .BLKB 1		;; TTY KEYBOARD QUEUE
9620		052257				\$TKQEND=.		
9621		052260				.EVEN		
9622								
9623						;; *TK INITIALIZE ROUTINE		
9624						;; *THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE		
9625						;; *SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT		
9626								
9627						;; *CALL:		
9628						;; * JSR PC, \$TKINT		
9629						;; * RETURN		
9630								
9631	052260	005037	052250			\$TKINT: CLR \$TKCNT		;; CLEAR COUNT OF ITEMS IN QUEUE
9632	052264	012737	052256	052252		MOV \$TKQSRT, \$TKQIN		;; MOVE THE STARTING ADDRESS OF THE
9633	052272	013737	052252	052254		MOV \$TKQIN, \$TKQOUT		;; QUEUE INTO THE INPUT & OUTPUT POINTERS.
9634	052300	012737	052330	000060		MOV \$TKSRV, \$TKVEC		;; INITIALIZE THE KEYBOARD VECTOR
9635	052306	012777	000200	000062		MOV \$200, \$TKVEC+2		;; "BR" LEVEL 4
9636	052314	005777	126626			TST \$TKB		;; CLEAR DONE FLAG
9637	052320	012777	000100	126616		MOV \$100, \$TKS		;; ENABLE TTY KEYBOARD INTERRUPT
9638	052326	000207				RTS PC		;; RETURN TO CALLER
9639								
9640						;; *TK SERVICE ROUTINE		
9641						;; *THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT		
9642						;; *BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING		
9643						;; *IT IN THE QUEUE.		
9644						;; *IF THE CHARACTER IS A "CONTROL-C" (↑C) \$TKINT IS CALLED AND		
9645						;; *UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (STOP)		
9646								
9647	052330	117746	126612			\$TKSRV: MOVB \$TKB, -(SP)		;; PICKUP THE CHARACTER
9648	052334	042716	177600			BIC \$↑C177, (SP)		;; STRIP THE JUNK
9649	052340	021627	000003			CMP (SP), #3		;; IS IT A CONTROL C?
9650	052344	001007				BNE 1\$		;; BRANCH IF NO
9651	052346	104401	053456			TYPE \$CNTLC		;; TYPE A CONTROL-C (↑C)
9652	052352	004737	052260			JSR PC, \$TKINT		;; INIT THE KEYBOARD
9653	052356	005726				TST (SP)+		;; CLEAN UP STACK
9654	052360	000137	047330			JMP STOP		;; CONTROL C RESTART
9655	052364	021627	000007			1\$: CMP (SP), #7		;; IS IT A CONTROL G?
9656	052370	001004				BNE 2\$		;; BRANCH IF NO
9657	052372	022737	000176	001140		CMP \$SWREG, SWR		;; IS SOFT-SWR SELECTED?
9658	052400	001500				BEQ 6\$		;; GO TO SWR CHANGE
9659								
9660	052402					2\$: CMP #1, \$TKCNT		;; IS THE QUEUE FULL?
9661	052402	022737	000001	052250				

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9662 052410 001004      BNE      3$      ;:BRANCH IF NO
9663 052412 104401 001200 TYPE      ,SBELL      ;:RING THE TTY BELL
9664 052416 005726      TST      (SP)+      ;:CLEAN CHARACTER OFF OF STACK
9665 052420 000451      BR       5$      ;:EXIT
9666 052422 021627 000023 3$:      CMP      (SP),#23      ;:IS IT A CONTROL-S?
9667 052426 001021      BNE      32$     ;:BRANCH IF NO
9668 052430 005077 126510 CLR      @STKS      ;:DISABLE TTY KEYBOARD INTERRUPTS
9669 052434 005726      TST      (SP)+      ;:CLEAN CHAR OFF STACK
9670 052436 105777 126502 31$:     TSTB     @STKS      ;:WAIT FOR A CHAR
9671 052442 100375      BPL      31$      ;:LOOP UNTIL ITS THERE
9672 052444 117746 126476 MOVB     @STKB,-(SP) ;:GET THE CHARACTER
9673 052450 042716 177600 BIC      #1C177,(SP) ;:MAKE IT 7-BIT ASCII
9674 052454 022627 000021 CMP      (SP)+,#21    ;:IS IT A CONTROL-Q?
9675 052460 001366      BNE      31$      ;:BRANCH IF NO
9676 052462 012777 000100 126454 MOV      #100,@STKS    ;:REENABLE TTY KEYBOARD INTERRUPTS
9677 052470 000002      RTI      ;:RETURN
9678 052472 005237 052250 32$:     INC      $TKCNT      ;:COUNT THIS CHARACTER
9679 052476 021627 000140 CMP      (SP),#140    ;:IS IT UPPER CASE?
9680 052502 002405      BLT      4$      ;:BRANCH IF YES
9681 052504 021627 000175 CMP      (SP),#175    ;:IS IT A SPECIAL CHAR?
9682 052510 003002      BGT      4$      ;:BRANCH IF YES
9683 052512 042716 000040 BIC      #40,(SP)     ;:MAKE IT UPPER CASE
9684 052516 112677 177530 4$:      MOVB     (SP)+,@STKQIN ;:AND PUT IT IN QUEUE
9685 052522 005237 052252 INC      $TKQIN      ;:UPDATE THE POINTER
9686 052526 023727 052252 052257 CMP      $TKQIN,#$TKQEND ;:GO OFF THE END?
9687 052534 001003      BNE      5$      ;:BRANCH IF NO
9688 052536 012737 052256 052252 MOV      #$TKQSRT,$TKQIN ;:RESET THE POINTER
9689 052544 000002      5$:      RTI      ;:RETURN
9690
9691 ;:*****
9692 ;:SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
9693 ;:ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
9694 ;:SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP
9695 ;:CALL WHEN OPERATING IN TTY INTERRUPT MODE.
9696 052546 022737 000176 001140 $CKSWR: CMP      #SWREG,SWR      ;:IS THE SOFT-SWR SELECTED
9697 052554 001124      BNE      15$      ;:EXIT IF NOT
9698 052556 105777 126362 TSTB     @STKS      ;:IS A CHAR WAITING?
9699 052562 100121      BPL      15$      ;:IF NOT, EXIT
9700 052564 117746 126356 MOVB     @STKB,-(SP) ;:YES
9701 052570 042716 177600 BIC      #1C177,(SP) ;:MAKE IT 7-BIT ASCII
9702 052574 021627 000007 CMP      (SP),#7      ;:IS IT A CONTROL-G?
9703 052600 001300      BNE      2$      ;:IF NOT, PUT IT IN THE TTY QUEUE
9704 ;:AND EXIT
9705
9706 ;:*****
9707 ;:CONTROL IS PASSED TO THIS POINT FROM EITHER THE TTY INTERRUPT SERVICE
9708 ;:ROUTINE OR FROM THE SOFTWARE SWITCH REGISTER TRAP CALL, AS A RESULT OF A
9709 ;:CONTROL-G BEING TYPED, AND THE SOFTWARE SWITCH REGISTER BEING SELECTED.
9710 052602 123727 001134 000001 6$:  CMPB     $AUTOB,#1      ;:ARE WE RUNNING IN AUTO-MODE?
9711 052610 001674      BEQ      2$      ;:BRANCH IF YES
9712 052612 005726      TST      (SP)+      ;:CLEAR CONTROL-G OFF STACK
9713 052614 004737 052260 JSR      PC,$TKINT    ;:FLUSH THE TTY INPUT QUEUE
9714 052620 005077 126320 CLR      @STKS      ;:DISABLE TTY KEYBOARD INTERRUPTS
9715 052624 112737 000001 001135 MOVB     #1,$INTAG    ;:SET INTERRUPT MODE INDICATOR
9716
9717 052632 104401 053470 TYPE      ,SCNTLG      ;:ECHO THE CONTROL-G (↑G)

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9718	052636	104401	053475		\$GTSWR:	TYPE	\$MSWR	:: TYPE CURRENT CONTENTS
9719	052642	013746	000176			MOV	\$WREG, -(SP)	:: SAVE SWREG FOR TYPEOUT
9720	052646	104402				TYPOC		:: GO TYPE--OCTAL ASCII(ALL DIGITS)
9721	052650	104401	053506			TYPE	\$MNEW	:: PROMPT FOR NEW SWR
9722	052654	005046			19\$:	CLR	-(SP)	:: CLEAR COUNTER
9723	052656	005046				CLR	-(SP)	:: THE NEW SWR
9724	052660	105777	126260		7\$:	TSTB	\$STKS	:: CHAR THERE?
9725	052664	100375				BPL	7\$	:: IF NOT TRY AGAIN
9726								
9727	052666	117746	126254			MOVB	\$STKB, -(SP)	:: PICK UP CHAR
9728	052672	042716	177600			BIC	#1C177, (SP)	:: MAKE IT 7-BIT ASCII
9729								
9730	052676	021627	000003			CMP	(SP), #3	:: IS IT A CONTROL-C?
9731	052702	001015				BNE	9\$	:: BRANCH IF NOT
9732	052704	104401	053456			TYPE	\$CNTLC	:: YES, ECHO CONTROL-C (↑C)
9733	052710	062706	000006			ADD	#6, SP	:: CLEAN UP STACK
9734	052714	123727	001135	000001		CMPB	\$INTAG, #1	:: REENABLE TTY KEYBOARD INTERRUPTS?
9735	052722	001003				BNE	8\$	:: BRANCH IF NO
9736	052724	012777	000100	126212		MOV	#100, \$STKS	:: ALLOW TTY KEYBOARD INTERRUPTS
9737	052732	000137	047330		8\$:	JMP	STOP	:: CONTROL-C RESTART
9738								
9739								
9740	052736	021627	000025		9\$:	CMP	(SP), #25	:: IS IT A CONTROL-U?
9741	052742	001005				BNE	10\$	:: BRANCH IF NOT
9742	052744	104401	053463			TYPE	\$CNTLU	:: YES, ECHO CONTROL-U (↑U)
9743	052750	062706	000006		20\$:	ADD	#6, SP	:: IGNORE PREVIOUS INPUT
9744	052754	000737				BR	19\$	:: LET'S TRY IT AGAIN
9745								
9746								
9747	052756	021627	000015		10\$:	CMP	(SP), #15	:: IS IT A <CR>?
9748	052762	001022				BNE	16\$	:: BRANCH IF NO
9749	052764	005766	000004			TST	4(SP)	:: YES, IS IT THE FIRST CHAR?
9750	052770	001403				BEQ	11\$	:: BRANCH IF YES
9751	052772	016677	000002	126140		MOV	2(SP), \$SWR	:: SAVE NEW SWR
9752	053000	062706	000006		11\$:	ADD	#6, SP	:: CLEAN UP STACK
9753	053004	104401	001205		14\$:	TYPE	\$CRLF	:: ECHO <CR> AND <LF>
9754	053010	123727	001135	000001		CMPB	\$INTAG, #1	:: RE-ENABLE TTY KBD INTERRUPTS?
9755	053016	001003				BNE	15\$	:: BRANCH IF NOT
9756	053020	012777	000100	126116		MOV	#100, \$STKS	:: RE-ENABLE TTY KBD INTERRUPTS
9757	053026	000002			15\$:	RTI		:: RETURN
9758	053030	004737	051260		16\$:	JSR	PC, \$TYPEC	:: ECHO CHAR
9759	053034	021627	000060			CMP	(SP), #60	:: CHAR < 0?
9760	053040	002420				BLT	18\$	:: BRANCH IF YES
9761	053042	021627	000067			CMP	(SP), #67	:: CHAR > 7?
9762	053046	003015				BGT	18\$	:: BRANCH IF YES
9763	053050	042726	000060			BIC	#60, (SP)+	:: STRIP-OFF ASCII
9764	053054	005766	000002			TST	2(SP)	:: IS THIS THE FIRST CHAR
9765	053060	001403				BEQ	17\$	:: BRANCH IF YES
9766	053062	006316				ASL	(SP)	:: NO, SHIFT PRESENT
9767	053064	006316				ASL	(SP)	:: CHAR OVER TO MAKE
9768	053066	006316				ASL	(SP)	:: ROOM FOR NEW ONE.
9769	053070	005266	000002		17\$:	INC	2(SP)	:: KEEP COUNT OF CHAR
9770	053074	056616	177776			BIS	-2(SP), (SP)	:: SET IN NEW CHAR
9771	053100	000667				BR	7\$	:: GET THE NEXT ONE
9772	053102	104401	001204		18\$:	TYPE	\$QUES	:: TYPE ?<CR><LF>
9773	053106	000720				BR	20\$	:: SIMULATE CONTROL-U

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9774      .DSABL  LSB
9775
9776
9777      ;*****
9778      ;THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
9779      ;CALL:
9780      ;*      RDCHR          ; GET A CHARACTER FROM THE QUEUE
9781      ;*      RETURN HERE    ; CHARACTER IS ON THE STACK
9782      ;*                    ; WITH PARITY BIT STRIPPED OFF
9783
9784
9785      053110 011646          $RDCHR: MOV      (SP), -(SP)      ; PUSH DOWN THE PC AND
9786      053112 016666 000004 000002  MOV      4(SP), 2(SP)      ; THE PS
9787      053120 005066 000004          CLR      4(SP)          ; GET READY FOR A CHARACTER
9788      053124 005046          CLR      -(SP)          ; PUT NEW PS ON STACK
9789      053126 012746 053134          MOV      #64$, -(SP)      ; PUT NEW PC ON STACK
9790      053132 000002          RTI          ; POP NEW PC AND PS
9791
9792      053134 005737 052250      64$:  TST      $TKCNT          ; WAIT ON A CHARACTER
9793      053140 001775          1$:      BEQ      1$
9794      053142 005337 052250          DEC      $TKCNT          ; DECREMENT THE COUNTER
9795      053146 117766 177102 000004  MOVB     2$TKQOUT, 4(SP)      ; GET ONE CHARACTER
9796      053154 005237 052254          INC      $TKQOUT          ; UPDATE THE POINTER
9797      053160 023727 052254 052257  CMP      $TKQOUT, $TKQEND ; DID IT GO OFF OF THE END?
9798      053166 001003          BNE      2$              ; BRANCH IF NO
9799      053170 012737 052256 052254  MOV      $STKQSR, $TKQOUT ; RESET THE POINTER
9800      053176 000002          RTI          ; RETURN
9801
9802      ;*****
9803      ;THIS ROUTINE WILL INPUT A STRING FROM THE TTY
9804      ;CALL:
9805      ;*      RDLIN          ; INPUT A STRING FROM THE TTY
9806      ;*      RETURN HERE    ; ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
9807      ;*                    ; TERMINATOR WILL BE A BYTE OF ALL 0'S
9808
9809      053200 010346          $RDLIN: MOV      R3, -(SP)          ; SAVE R3
9810      053202 005046          CLR      -(SP)          ; CLEAR THE RUBOUT KEY
9811      053204 012703 053434      1$:      MOV      $TTYIN, R3      ; GET ADDRESS
9812      053210 022703 053456      2$:      CMP      $TTYIN+22, R3 ; BUFFER FULL?
9813      053214 101456          BLOS     4$              ; BR IF YES
9814      053216 104410          RDCHR     (SP)+, (R3)          ; GO READ ONE CHARACTER FROM THE TTY
9815      053220 112613          MOVB     (SP)+, (R3)          ; GET CHARACTER
9816      053222 122713 000177      10$:  CMPB     #177, (R3)      ; IS IT A RUBOUT
9817      053226 001022          BNE      5$              ; BR IF NO
9818      053230 005716          TST      (SP)          ; IS THIS THE FIRST RUBOUT?
9819      053232 001007          BNE      6$              ; BR IF NO
9820      053234 112737 000134 053432  MOVB     #'\\, 9$          ; TYPE A BACK SLASH
9821      053242 104401 053432          TYPE     9$
9822      053246 012716 177777          MOV      #-1, (SP)      ; SET THE RUBOUT KEY
9823      053252 005303          DEC      R3              ; BACKUP BY ONE
9824      053254 020327 053434          CMP      R3, $TTYIN      ; STACK EMPTY?
9825      053260 103434          BLO      4$              ; BR IF YES
9826      053262 111337 053432          MOVB     (R3), 9$          ; SETUP TO TYPEOUT THE DELETED CHAR.
9827      053266 104401 053432          TYPE     9$
9828      053272 000746          BR       2$              ; GO TYPE
9829      053274 005716          5$:      TST      (SP)          ; GO READ ANOTHER CHAR.
9830      053276 001406          BEQ      7$              ; RUBOUT KEY SET?
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9830 053300 112737 000134 053432      MOVB      #' \, 9$      ;; TYPE A BACK SLASH
9831 053306 104401 053432      TYPE      9$
9832 053312 005016      CLR      (SP)      ;; CLEAR THE RUBOUT KEY
9833 053314 122713 000025      7$: CMPB      #25, (R3)      ;; IS CHARACTER A CTRL U?
9834 053320 001003      BNE      8$      ;; BR IF NO
9835 053322 104401 053463      TYPE      $CNTLU      ;; TYPE A CONTROL "U"
9836 053326 000726      BR      1$      ;; GO START OVER
9837 053330 122713 000022      8$: CMPB      #22, (R3)      ;; IS CHARACTER A "↑R"?
9838 053334 001011      BNE      3$      ;; BRANCH IF NO
9839 053336 105013      CLRB      (R3)      ;; CLEAR THE CHARACTER
9840 053340 104401 001205      TYPE      $SCRLF      ;; TYPE A "CR" & "LF"
9841 053344 104401 053434      TYPE      $TTYIN      ;; TYPE THE INPUT STRING
9842 053350 000717      BR      2$      ;; GO PICKUP ANOTHER CHACTER
9843 053352 104401 001204      4$: TYPE      $QUES      ;; TYPE A '?'
9844 053356 000712      BR      1$      ;; CLEAR THE BUFFER AND LOOP
9845 053360 111337 053432      3$: MOVB      (R3), 9$      ;; ECHO THE CHARACTER
9846 053364 104401 053432      TYPE      9$
9847 053370 122723 000015      CMPB      #15, (R3)+      ;; CHECK FOR RETURN
9848 053374 001305      BNE      2$      ;; LOOP IF NOT RETURN
9849 053376 105063 177777      CLRB      -1(R3)      ;; CLEAR RETURN (THE 15)
9850 053402 104401 001206      TYPE      $LF      ;; TYPE A LINE FEED
9851 053406 005726      TST      (SP)+      ;; CLEAN RUBOUT KEY FROM THE STACK
9852 053410 012603      MOV      (SP)+, R3      ;; RESTORE R3
9853 053412 011646      MOV      (SP), -(SP)      ;; ADJUST THE STACK AND PUT ADDRESS OF THE
9854 053414 016666 000004 000002      MOV      4(SP), 2(SP)      ;; FIRST ASCII CHARACTER ON IT
9855 053422 012766 053434 000004      MOV      $TTYIN, 4(SP)
9856 053430 000002      RTI      ;; RETURN
9857 053432 000      9$: .BYTE      0      ;; STORAGE FOR ASCII CHAR. TO TYPE
9858 053433 000      .BYTE      0      ;; TERMINATOR
9859 053434 000022      $TTYIN: .BLKB      22      ;; RESERVE 22 BYTES FOR TTY INPUT
9860 053456 041536 005015 000      $CNTLC: .ASCIZ /↑C/ <15> <12>      ;; CONTROL "C"
9861 053463 0136 006525 000012      $CNTLU: .ASCIZ /↑U/ <15> <12>      ;; CONTROL "U"
9862 053470 043536 005015 000      $CNTLG: .ASCIZ /↑G/ <15> <12>      ;; CONTROL "G"
9863 053475 015 051412 051127      $MSWR: .ASCIZ <15> <12> /SWR = /
9864 053502 036440 000040      $MNEW: .ASCIZ / NEW = /
9865 053506 020040 042516 020127
9866 053514 020075 000
9867 053520
9868 .EVEN
9869 .SBTTL READ AN OCTAL NUMBER FROM THE TTY
9870
9871 *****
9872 *THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
9873 *CHANGE IT TO BINARY.
9874 *THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
9875 *OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
9876 *FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
9877 *THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
9878 *CALL:
9879 *      RDOCT      ;; READ AN OCTAL NUMBER
9880 *      RETURN HERE      ;; LOW ORDER BITS ARE ON TOP OF THE STACK
9881 *                      ;; HIGH ORDER BITS ARE IN $HI OCT
9882 053520 011646 000004 000002      $RDOCT: MOV      (SP), -(SP)      ;; PROVIDE SPACE FOR THE
9883 053522 016666      MOV      4(SP), 2(SP)      ;; INPUT NUMBER
9884 053530 010046      MOV      R0, -(SP)      ;; PUSH R0 ON STACK
9885 053532 010146      MOV      R1, -(SP)      ;; PUSH R1 ON STACK

```

H15

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READ AN OCTAL NUMBER FROM THE TTY

SEQ 0189

9886	053534	010246			MOV	R2,-(SP)	;;PUSH R2 ON STACK
9887	053536	104411			1\$: RDLIN		;;READ AN ASCII LINE
9888	053540	012600			MOV	(SP)+,R0	;;GET ADDRESS OF 1ST CHARACTER
9889	053542	010037	053646		MOV	R0,\$\$	;;AND SAVE IT
9890	053546	005001			CLR	R1	;;CLEAR DATA WORD
9891	053550	005002			CLR	R2	
9892	053552	112046			2\$: MOVB	(R0)+,-(SP)	;;PICKUP THIS CHARACTER
9893	053554	001420			BEQ	3\$	;;IF ZERO GET OUT
9894	053556	122716	000060		CMPB	#'0,(SP)	;;MAKE SURE THIS CHARACTER
9895	053562	003026			BGT	4\$	;;IS AN OCTAL DIGIT
9896	053564	122716	000067		CMPB	#'7,(SP)	
9897	053570	002423			BLT	4\$	
9898	053572	006301			ASL	R1	;;*2
9899	053574	006102			ROL	R2	
9900	053576	006301			ASL	R1	;;*4
9901	053600	006102			ROL	R2	
9902	053602	006301			ASL	R1	;;*8
9903	053604	006102			ROL	R2	
9904	053606	042716	177770		BIC	#'C7,(SP)	;;STRIP THE ASCII JUNK
9905	053612	062601			ADD	(SP)+,R1	;;ADD IN THIS DIGIT
9906	053614	000756			BR	2\$	;;LOOP
9907	053616	005726			3\$: TST	(SP)+	;;CLEAN TERMINATOR FROM STACK
9908	053620	010166	000012		MOV	R1,12(SP)	;;SAVE THE RESULT
9909	053624	010237	053656		MOV	R2,\$HIOCT	
9910	053630	012602			MOV	(SP)+,R2	;;POP STACK INTO R2
9911	053632	012601			MOV	(SP)+,R1	;;POP STACK INTO R1
9912	053634	012600			MOV	(SP)+,R0	;;POP STACK INTO R0
9913	053636	000002			RTI		;;RETURN
9914	053640	005726			4\$: TST	(SP)+	;;CLEAN PARTIAL FROM STACK
9915	053642	105010			CLRB	(R0)	;;SET A TERMINATOR
9916	053644	104401			TYPE		;;TYPE UP THRU THE BAD CHAR.
9917	053646	000000			5\$: .WORD	0	
9918	053650	104401	001204		TYPE	\$QUES	;;"? "CR" & "LF"
9919	053654	000730			BR	1\$	;;TRY AGAIN
9920	053656	000000			\$HIOCT: .WORD	0	;;HIGH ORDER BITS GO HERE
9921					.SBTTL	DOUBLE LENGTH BINARY TO OCTAL ASCII CONVERT ROUTINE	
9922							
9923							
9924							
9925							
9926							
9927							
9928							
9929							
9930							
9931							
9932	053660	104413			\$DB20: SAVREG		;;SAVE ALL REGISTERS
9933	053662	016601	000002		MOV	2(SP),R1	;;PICKUP THE POINTER TO LOW WORD
9934	053666	012705	053777		MOV	#SOCTVL+13.,R5	;;FOINTER TO DATA TABLE
9935	053672	012704	000014		MOV	#12.,R4	;;DO ELEVEN CHARACTERS
9936	053676	012703	177770		MOV	#'C7,R3	;;MASK
9937	053702	012100			MOV	(R1)+,R0	;;LOWER WORD
9938	053704	012101			MOV	(R1)+,R1	;;HIGH WORD
9939	053706	005002			CLR	R2	;;TERMINATOR
9940	053710	110245			1\$: MOVB	R2,-(R5)	;;PUT CHARACTER IN DATA TABLE
9941	053712	010002			MOV	R0,R2	;;GET THIS DIGIT

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DCUBLE LENGTH BINARY TO OCTAL ASCII CONVERT ROUTINE

SEQ 0190

```

9942 053714 005304      DEC      R4      ;; COUNT THIS CHARACTER
9943 053716 003007      BGT      3$      ;; BR IF NOT THE LAST DIGIT
9944 053720 001405      BEQ      2$      ;; BR IF IT IS THE LAST DIGIT
9945 053722 005205      INC      R5      ;; ALL DIGITS DONE-ADJUST POINTER FOR FIRST
9946 053724 010566 000002  MOV     R5,2(SP)  ;; ASCII CHAR. & PUT IT ON THE STACK
9947 053730 104414      RESREG      ;; RESTORE ALL REGISTERS
9948 053732 000207      RTS      PC      ;; RETURN TO USER
9949 053734 006203      2$: ASR      R3      ;; POSITION THE MASK FOR THE LAST DIGIT
9950 053736 006001      3$: ROR      R1      ;; POSITION THE BINARY NUMBER FOR
9951 053740 006000      ROR      R0      ;; THE NEXT OCTAL DIGIT
9952 053742 006001      ROR      R1
9953 053744 006000      ROR      R0
9954 053746 006001      ROR      R1
9955 053750 006000      ROR      R0
9956 053752 040302      BIC      R3,R2      ;; MASK OUT ALL JUNK
9957 053754 062702 000060  ADD     #'0,R2  ;; MAKE THIS CHAR. ASCII
9958 053760 000753      BR       1$      ;; GO PUT IT IN THE DATA TABLE
9959 053762 000016      $OCTVL: .BLKB 14.  ;; RESERVE DATA TABLE
9960      .SBTTL DOUBLE LENGTH BINARY TO DECIMAL ASCII CONVERT ROUTINE
9961
9962      ;*****
9963      ;THIS ROUTINE WILL CONVERT A 32-BIT BINARY NUMBER TO AN UNSIGNED
9964      ;DECIMAL (ASCII) NUMBER. THE SIGN OF THE BINARY NUMBER MUST BE
9965      ;POSITIVE.
9966      ;CALL
9967      ;*      MOV      #PNTR, -(SP)      ;; POINTER TO LOW WORD OF BINARY NUMBER
9968      ;*      JSR      PC, 2#$D820      ;; THE FIRST ADDRESS OF ASCII
9969      ;*      RETURN      ;; IS ON THE STACK
9970
9971
9972
9973 054000 104413      $D820 SAVREG      ;; SAVE REGISTERS
9974 054002 016602 000002  MOV     2(SP), R2  ;; PICKUP THE DATA POINTER
9975 054006 012700 054160  MOV     #$DECVL, R0  ;; GET ADDRESS OF "$DECVL" STRING
9976 054012 010066 000002  MOV     R0, 2(SP)  ;; PUT ADDRESS OF ASCII STRING ON STACK
9977 054016 012201      MOV     (R2)+, R1  ;; PICKUP THE BINARY NUMBER
9978 054020 012202      MOV     (R2)+, R2
9979 054022 012737 000012 054076  MOV     #10, 4$      ;; SET UP TO DO 10 CONVERSIONS
9980 054030 012704 054110  MOV     #$TNPWR, R4  ;; ADDRESS OF TEN POWER
9981 054034 012705 054112  MOV     #$TNPWR+2, R5
9982 054040 005003      1$: CLR      R3      ;; CLEAR PARTIAL
9983 054042 161401      2$: SUB     (R4), R1  ;; SUBTRACT TEN POWER
9984 054044 005602      SBC      R2
9985 054046 161502      SUB     (R5), R2
9986 054050 002402      BLT      3$      ;; BR IF TEN POWER TO LARGE
9987 054052 005203      INC      R3      ;; ADD 1 TO PARTIAL
9988 054054 000772      BR       2$      ;; LOOP
9989 054056 062401      3$: ADD     (R4)+, R1  ;; RESTORE SUBTRACTED VALUE
9990 054060 005502      ADC      R2
9991 054062 062402      ADD     (R4)+, R2
9992 054064 022525      CMP     (R5)+, (R5)+  ;; MOVE TO NEXT TEN POWER
9993 054066 052703 000060  BIC     #'0, R3  ;; CHANGE PARTIAL TO ASCII
9994 054072 110320      MOV     R3, (R0)+  ;; SAVE IT
9995 054074 005327      DEC     (PC)+  ;; DONE?
9996 054076 000000      4$: .WORD 0
9997 054100 001357      BNE     1$      ;; BR IF NO

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DOUBLE LENGTH BINARY TO DECIMAL ASCII CONVERT ROUTINE

SEQ 0191

```

9998 054102 105020          CLR8      (RO)+          ;; TERMINATOR
9999 054104 104414          RESREG          ;; RESTORE REGISTERS
10000 054106 000207          RTS      PC          ;; RETURN
10001 054110 145000          $TNPWR: 35632          ;; 1.0E09
10002 054112 035632          160400          ;; 1.0E08
10003 054114 160400          2765          ;; 1.0E07
10004 054116 002765          113200          ;; 1.0E06
10005 054120 113200          230          ;; 1.0E05
10006 054122 000230          041100          ;; 1.0E04
10007 054124 041100          17          ;; 1.0E03
10008 054126 000017          103240          ;; 1.0E02
10009 054130 103240          1          ;; 1.0E01
10010 054132 000001          23420          ;; 1.0E00
10011 054134 023420          0          ;; 1.0E00
10012 054136 000000          1750          ;; 1.0E00
10013 054140 001750          0          ;; 1.0E00
10014 054142 000000          144          ;; 1.0E00
10015 054144 000144          0          ;; 1.0E00
10016 054146 000000          12          ;; 1.0E00
10017 054150 000012          0          ;; 1.0E00
10018 054152 000000          1          ;; 1.0E00
10019 054154 000001          0          ;; 1.0E00
10020 054156 000000          0          ;; 1.0E00
10021 054160 000014          $DECVL: .BLK6 12.          ;; RESERVE STORAGE FOR ASCII STRING
10022          .SBTTL SINGLE LENGTH BINARY TO DECIMAL ASCII ROUTINE
10023          ;; *****
10024          ;; THIS ROUTINE WILL CONVERT A 16-BIT UNSIGNED BINARY NUMBER TO AN
10025          ;; UNSIGNED DECIMAL ASCII NUMBER.
10026          ;; CALL
10027          ;; *
10028          MOV      NUMBER, -(SP)          ;; PUT BINARY NUMBER ON THE STACK
10029          JSR      PC, @$$SB2D          ;; CALL
10030          RETURN          ;; ADDRESS OF THE 1ST ASCII CHAR. IS ON THE STACK
10031          ;; *
10032          054174 016637 000002 054224 $$SB2D: MOV      2(SP), 1$          ;; SAVE BINARY NUMBER
10033          054202 012746 054224          MOV      1$, -(SP)          ;; SET POINTER
10034          054206 004737 054000          JSR      PC, @$$SDB2D          ;; CALL DOUBLE LENGTH CONVERT
10035          054212 062716 000005          ADD      #5, (SP)          ;; ONLY ALLOW FIVE CHARACTERS
10036          054216 012666 000002          MOV      (SP)+, 2(SP)          ;; PICKUP POINTER
10037          054222 000207 000000          RTS      PC          ;; RETURN
10038          054224 000000 000000          1$: .WORD 0,0
10039          .SBTTL TYPE NUMERICAL ASCII STRING SUPPRESS LEADING ZEROS
10040          ;; *****
10041          ;; THIS ROUTINE IS USED TO TYPE AN ASCII NUMBER SUPPRESSING THE
10042          ;; LEADING NUMBERS.
10043          ;; CALL
10044          ;; *
10045          MOV      #NUMADR, -(SP)          ;; FIRST ADDRESS OF ASCII STRING
10046          JSR      PC, @$$SUPRS
10047          ;; *
10048          054230 010046 000004 $$SUPRS: MOV      RO, -(SP)          ;; SAVE RO
10049          054232 016600          MOV      4(SP), RO          ;; PICKUP THE POINTER
10050          054236 105710          1$: TSTB      (RO)          ;; TERMINATOR?
10051          054240 001403          BEQ      2$          ;; BR IF YES
10052
10053

```

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TYPE NUMERICAL ASCIZ STRING SUPPRESS LEADING ZEROS

K15

SEQ 0192

10054 054242 122720 000060
10055 054246 001773
10056 054250 005300
10057 054252 010037 054260
10058 054256 104401
10059 054260 000000
10060 054262 012600
10061 054264 012616
10062 054266 000207
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10077 054270
10078 054270 010046
10079 054272 010146
10080 054274 010246
10081 054276 005046
10082 054300 016601 000012
10083 054304 100002
10084 054306 005216
10085 054310 005401
10086 054312 016602 000014
10087 054316 100002
10088 054320 005316
10089 054322 005402
10090 054324 012746 000021
10091 054330 005000
10092 054332 103001
10093 054334 060200
10094 054336 006000
10095 054340 006001
10096 054342 005316
10097 054344 001372
10098 054346 022616
10099 054350 001403
10100 054352 005400
10101 054354 005401
10102 054356 005600
10103 054360 005726
10104 054362 010066 000012
10105 054366 010166 000010
10106 054372 012602
10107 054374 012601
10108 054376 012600
10109 054400 000207

```

      CMPB    #'0',(RO)+      ;; IS THIS AN ASCII "0" ?
      BEQ     1$              ;; BR IF YES
2$:    DEC     RO              ;; BACKUP BY "1"
      MOV     RO,3$           ;; SAVE FOR TYPING
      TYPE    GO TYPE         ;; GO TYPE
3$:    .WORD   0               ;; ASCIZ POINTER GOES HERE
      MOV     (SP)+,RO        ;; RESTORE RO
      MOV     (SP)+,(SP)      ;; RESTORE THE STACK
      RTS     PC              ;; RETURN
      .SBTTL   INTEGER MULTIPLY ROUTINE

      ;*****
      ;CALL
      ;      MOV     MULTIPLIER,-(SP)
      ;      MOV     MULTIPLICAND,-(SP)
      ;      JSR     PC,@$MULT
      ;      RETURN    ;; PRODUCT IS ON THE STACK
      ;
      ;      STACK   PRODUCT
      ;      -----
      ;      TOP     LSB'S
      ;      +2      MSB'S
      ;
      $MULT:
      MOV     RO,-(SP)        ;; PUSH RO ON STACK
      MOV     R1,-(SP)        ;; PUSH R1 ON STACK
      MOV     R2,-(SP)        ;; PUSH R2 ON STACK
      CLR     -(SP)           ;; CLEAR THE SIGN KEY
      MOV     12(SP),R1       ;; GET THE MULTIPLICAND
      BPL     1$              ;; BR IF PLUS
      INC     (SP)            ;; SET THE SIGN KEY
      NEG     R1              ;; MAKE THE MULTIPLICAND POSTIVE
1$:    MOV     14(SP),R2       ;; GET THE MULTIPLIER
      BPL     2$              ;; BR IF PLUS
      DEC     (SP)            ;; UPDATE THE SIGN KEY
      NEG     R2              ;; MAKE THE MULTIPLIER POSTIVE
2$:    MOV     #17,-(SP)      ;; SET THE LOOP COUNT
      CLR     RO              ;; SETUP FOR THE MULTIPLY LOOP
3$:    BCC     4$              ;; DON'T ADD IF MULTIPLICAND = 0
      ADD     R2,R0
4$:    ROR     RO              ;; POSITION THE PARTIAL PRODUCT AND
      ROR     R1              ;; THE MULTIPLICAND
      DEC     (SP)            ;; HAS ALL BITS OF THE MULTIPLICAND BEEN DONE?
      BNE     3$              ;; BR IF NO
      CMP     (SP)+,(SP)      ;; SHOULD PRODUCT BE NEGATIVE?
      BEQ     5$              ;; GO TO EXIT IF NO
      NEG     RO              ;; YES--SO MAKE IT SO
      NEG     R1
      SBC     RO
5$:    TST     (SP)+          ;; CLEAR SIGN INFO. OFF OF STACK
      MOV     RO,12(SP)       ;; PUT THE PRODUCT ON THE STACK (MSB'S)
      MOV     R1,10(SP)       ;; LSB'S
      MOV     (SP)+,R2        ;; POP STACK INTO R2
      MOV     (SP)+,R1        ;; POP STACK INTO R1
      MOV     (SP)+,RO        ;; POP STACK INTO RO
      RTS     PC

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10127 054402
10128 054402 010046
10129 054404 010146
10130 054406 010246
10131 054410 010346
10132 054412 010446
10133 054414 010546
10134 054416 016646 000022
10135 054422 016646 000022
10136 054426 016646 000022
10137 054432 016646 000022
10138 054436 000002
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10143 054440
10144 054440 012666 000022
10145 054444 012666 000022
10146 054450 012666 000022
10147 054454 012666 000022
10148 054460 012605
10149 054462 012604
10150 054464 012603
10151 054466 012602
10152 054470 012601
10153 054472 012600
10154 054474 000002
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10163 054476 010046
10164 054500 016600 000002
10165 054504 005740

.SBTTL SAVE AND RESTORE RO-R5 ROUTINES

```

*****
;SAVE RO-R5
;CALL:
; SAVREG
;UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
;
;TOP---(+16)
; +2---(+18)
; +4---R5
; +6---R4
; +8---R3
;+10---R2
;+12---R1
;+14---R0

```

\$SAVREG:

```

MOV RO,-(SP)      ;; PUSH RO ON STACK
MOV R1,-(SP)      ;; PUSH R1 ON STACK
MOV R2,-(SP)      ;; PUSH R2 ON STACK
MOV R3,-(SP)      ;; PUSH R3 ON STACK
MOV R4,-(SP)      ;; PUSH R4 ON STACK
MOV R5,-(SP)      ;; PUSH R5 ON STACK
MOV 22(SP),-(SP)  ;; SAVE PS OF MAIN FLOW
MOV 22(SP),-(SP)  ;; SAVE PC OF MAIN FLOW
MOV 22(SP),-(SP)  ;; SAVE PS OF CALL
MOV 22(SP),-(SP)  ;; SAVE PC OF CALL
RTI

```

*RESTORE RO-R5

*CALL:

* RESREG

\$RESREG:

```

MOV (SP)+,22(SP)  ;; RESTORE PC OF CALL
MOV (SP)+,22(SP)  ;; RESTORE PS OF CALL
MOV (SP)+,22(SP)  ;; RESTORE PC OF MAIN FLOW
MOV (SP)+,22(SP)  ;; RESTORE PS OF MAIN FLOW
MOV (SP)+,R5      ;; POP STACK INTO R5
MOV (SP)+,R4      ;; POP STACK INTO R4
MOV (SP)+,R3      ;; POP STACK INTO R3
MOV (SP)+,R2      ;; POP STACK INTO R2
MOV (SP)+,R1      ;; POP STACK INTO R1
MOV (SP)+,R0      ;; POP STACK INTO R0
RTI

```

.SBTTL TRAP DECODER

```

*****
;THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
;AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
;OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
;GO TO THAT ROUTINE.

```

\$TRAP:

```

MOV RO,-(SP)      ;; SAVE RO
MOV 2(SP),RO      ;; GET TRAP ADDRESS
TST -(RO)         ;; BACKUP BY 2

```

```

10166 054506 111000          MOV8    (R0),R0          ;;GET RIGHT BYTE OF TRAP
10167 054510 006300          ASL      R0              ;;POSITION FOR INDEXING
10168 054512 016000 054532    MOV      $TRAPD(P0),R0    ;;INDEX TO TABLE
10169 054516 000200          RTS      R0              ;;GO TO ROUTINE
10170
10171
10172          ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
10173
10174 054520 011646 000004 000002 $TRAP2: MOV    (SP),-(SP)      ;;MOVE THE PC DOWN
10175 054522 016666          MOV      4(SP),2(SP)      ;;MOVE THE PSW DOWN
10176 054530 000002          RTI                    ;;RESTORE THE PSW
10177
10178          .SBTTL  TRAP TABLE
10179
10180          ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
10181          ;*BY THE "TRAP" INSTRUCTION.
10182
10183          ;          ROUTINE
10184          ;          -----
10185 054532 054520  $TRAPD: .WORD  $TRAP2
10186 054534 051046  $TYPE      ;;CALL=TYPE      TRAP+1(104401) TTY TYPEOUT ROUTINE
10187 054536 052046  $TYPOC     ;;CALL=TYPOC     TRAP+2(104402) TYPE OCTAL NUMBER (WITH LEADING ZEROS)
10188 054540 052022  $TYPOS     ;;CALL=TYPOS     TRAP+3(104403) TYPE OCTAL NUMBER (NO LEADING ZEROS)
10189 054542 052062  $TYPON     ;;CALL=TYPON     TRAP+4(104404) TYPE OCTAL NUMBER (AS PER LAST CALL)
10190 054544 051330  $TYPDS     ;;CALL=TYPDS     TRAP+5(104405) TYPE DECIMAL NUMBER (WITH SIGN)
10191
10192 054546 052636  $GTSWR      ;;CALL=GTSWR     TRAP+6(104406) GET SOFT-SWR SETTING
10193
10194 054550 052546  $CKSWR      ;;CALL=CKSWR     TRAP+7(104407) TEST FOR CHANGE IN SOFT-SWR
10195 054552 053110  $RDCHR      ;;CALL=RDCHR     TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
10196 054554 053200  $RDLIN      ;;CALL=RDLIN     TRAP+11(104411) TTY TYPEIN STRING ROUTINE
10197 054556 053520  $RDOCT      ;;CALL=RDOCT     TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
10198 054560 054402  $SAVREG     ;;CALL=SAVREG     TRAP+13(104413) SAVE R0-R5 ROUTINE
10199 054562 054440  $RESREG     ;;CALL=RESREG     TRAP+14(104414) RESTORE R0-R5 ROUTINE
10200 054564 047276  $SCOP1$     ;;CALL=SCOP1     TRAP+15(104415) INTERNAL LOOP ON ERROR
10201

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054566 005015 047125 041111
054574 051525 051040 030113
054602 026466 045522 033460
054610 042040 040525 020114
054616 047520 052122 042040
054624 044522 042526 042040
054632 040511 047107 051517
054640 044524 103
054643 015 041412 051132
054650 043466 030102 005015
054656 005015 025011 025052
054664 025052 041440 052501
054672 044524 047117 025040
054700 025052 025052 005015
054706 005015 044124 051511
054714 050040 047522 051107
054722 046501 051440 047510
054730 046125 020104 041040
054736 020105 040510 052114
054744 042105 047440 046116
054752 020131 054502 052040
054760 050131 047111 020107
054766 047503 052116 047522
054774 026514 103
054777 015 047412 044124
055004 051105 044527 042523
055012 020054 040503 052122
055020 044522 043504 020105
055026 047506 046522 052101
055034 044524 043516 040440
055042 042116 020054 051117
055050 052040 042510 042040
055056 044522 042526
055062 005015 040515 020131
055070 042532 046040 043105
055076 020124 047111 040440
055104 020116 047125 042504
055112 042524 046522 047111
055120 042105 051440 040524
055126 042524
055130 005015 047111 052111
055136 040511 046114 026131
055144 042040 044522 042526
055152 020123 047524 041040
055160 020105 042524 052123
055166 042105 051440 047510
055174 046125 020104 040510
055202 042526 006472 012
055207 015 040412 020056
055214 053105 047105 047040
055222 046525 042502 042522
055230 020104 047125 052111
055236 051440 046105 041505

.SBTTL SERVICE MESSAGES

MSG1: .ASCII <CR><LF>/UNIBUS RK06-RK07 DUAL PORT DRIVE DIAGNOSTIC/

.ASCII <CR><LF>/CZR6GB0/<CR><LF>

.ASCII <CR><LF>/ ***** CAUTION *****/<CR><LF>

.ASCII <CR><LF>/THIS PROGRAM SHOULD BE HALTED ONLY BY TYPING CONTROL-C/

.ASCII <CR><LF>/OTHERWISE, CARTRIDGE FORMATTING AND, OR THE DRIVE/

.ASCII <CR><LF>/MAY BE LEFT IN AN UNDETERMINED STATE/

.ASCII <CR><LF>/INITIALLY, DRIVES TO BE TESTED SHOULD HAVE: /<CR><LF>

.ASCII <CR><LF>/A. EVEN NUMBERED UNIT SELECT PLUGS ONLY/

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SEQ 0196

10258	055244	020124	046120	043525	
10259	055252	020123	047117	054514	
10260	055260	005015	027102	044040	.ASCII <CR><LF>/B. HEADS MANUALLY LOADED/
10261	055266	040505	051504	046440	
10262	055274	047101	040525	046114	
10263	055302	020131	047514	042101	
10264	055310	042105			
10265	055312	005015	027103	041040	.ASCII <CR><LF>/C. BOTH PORTS SELECTED/
10266	055320	052117	020110	047520	
10267	055326	052122	020123	042523	
10268	055334	042514	052103	042105	
10269	055342	005015	027104	042040	.ASCII <CR><LF>/D. DUAL PORT TEST SWITCH ENABLED/
10270	055350	040525	020114	047520	
10271	055356	052122	052040	051505	
10272	055364	020124	053523	052111	
10273	055372	044103	042440	040516	
10274	055400	046102	042105		
10275	055404	005015	027105	053440	.ASCII <CR><LF>/E. WRITE LOCK DISABLED/
10276	055412	044522	042524	046040	
10277	055420	041517	020113	044504	
10278	055426	040523	046102	042105	
10279	055434	005015	027106	042040	.ASCII <CR><LF>/F. DRIVE READY INDICATOR ON/<CR><LF>
10280	055442	044522	042526	051040	
10281	055450	040505	054504	044440	
10282	055456	042116	041511	052101	
10283	055464	051117	047440	006516	
10284	055472	012			
10285	055473	015	042012	044522	.ASCII <CR><LF>/DRIVES NOT TO BE TESTED MUST HAVE/
10286	055500	042526	020123	047516	
10287	055506	020124	047524	041040	
10288	055514	020105	042524	052123	
10289	055522	042105	046440	051525	
10290	055530	020124	040510	042526	
10291	055536	005015	047502	044124	.ASCII <CR><LF>/BOTH PORTS DESELECTED/<CR><LF>
10292	055544	050040	051117	051524	
10293	055552	042040	051505	046105	
10294	055560	041505	042524	006504	
10295	055566	012			
10296	055567	015	042012	051511	.ASCII <CR><LF>/DISABLE DUAL PORT TEST SWITCH ON DUAL PORT MODULE/
10297	055574	041101	042514	042040	
10298	055602	040525	020114	047520	
10299	055610	052122	052040	051505	
10300	055616	020124	053523	052111	
10301	055624	044103	047440	020116	
10302	055632	052504	046101	050040	
10303	055640	051117	020124	047515	
10304	055646	052504	042514		
10305	055652	005015	042502	047506	.ASCII2 <CR><LF>/BEFORE PROCEEDING TO ANY OTHER PROGRAM/<CR><LF>
10306	055660	042522	050040	047522	
10307	055666	042503	042105	047111	
10308	055674	020107	047524	040440	
10309	055702	054516	047440	044124	
10310	055710	051105	050040	047522	
10311	055716	051107	046501	005015	
10312	055724	000			
10313	055725	015	041012	020105	MSG2: .ASCII2 <CR><LF>/BE SURE TO PUT SCRATCH PACK IN DRIVE 0/

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SEQ 0197

10314	055732	052523	042522	052040
10315	055740	020117	052520	020124
10316	055746	041523	040522	041524
10317	055754	020110	040520	045503
10318	055762	044440	020116	051104
10319	055770	053111	020105	000060
10320	055776	005015	051104	053111
10321	056004	024105	024523	052040
10322	056012	020117	042502	052040
10323	056020	051505	042524	020104
10324	056026	042450	042526	020116
10325	056034	047516	027123	047440
10326	056042	046116	024531	020072
10327	056050	000		
10328	056051	015	041012	051525
10329	056056	020123	042101	051104
10330	056064	051505	020123	030450
10331	056072	033467	032064	024460
10332	056100	020072	000	
10333	056103	015	041412	047117
10334	056110	051124	046117	042514
10335	056116	020122	047111	042524
10336	056124	051122	050125	020124
10337	056132	042526	052103	051117
10338	056140	024040	030462	024460
10339	056146	020072	000	
10340	056151	015	044412	052116
10341	056156	051105	052522	052120
10342	056164	047440	041503	051125
10343	056172	042522	020104	052101
10344	056200	050040	036503	000
10345	056205	015	042012	044522
10346	056212	042526	030040	053440
10347	056220	046111	020114	047516
10348	056226	020124	042502	052040
10349	056234	051505	042524	000104
10350	056242	005015	005015	046101
10351	056250	020114	051104	053111
10352	056256	051505	052040	051505
10353	056264	042524	006504	005012
10354	056272	000		
10355	056273	015	005012	044527
10356	056300	046114	052040	051505
10357	056306	020124	051104	053111
10358	056314	051505	000072	
10359	056320	005015	050012	053517
10360	056326	051105	052440	020120
10361	056334	042522	052123	051101
10362	056342	020124	047524	052040
10363	056350	051505	020124	006461
10364	056356	000012		
10365	056360	005015	047516	046040
10366	056366	047440	020122	020120
10367	056374	046103	041517	051513
10368	056402	050040	042522	042523
10369	056410	052116		

MSG3: .ASCIZ <CR><LF>/DRIVE(S) TO BE TESTED (EVEN NOS. ONLY): /

MSG4: .ASCIZ <CR><LF>/BUSS ADDRESS (177440): /

MSG5: .ASCIZ <CR><LF>/CONTROLLER INTERRUPT VECTOR (210): /

MSG6: .ASCIZ <CR><LF>/INTERRUPT OCCURRED AT PC= /

MSG7: .ASCIZ <CR><LF>/DRIVE 0 WILL NOT BE TESTED /

MSG8: .ASCIZ <CR><LF><CR><LF>/ALL DRIVES TESTED/<CR><LF><LF>

MSG10: .ASCIZ <CR><LF><LF>/WILL TEST DRIVES: /

MSG11: .ASCIZ <CR><LF><LF>/POWER UP RESTART TO TEST 1/<CR><LF>

MSG13: .ASCIZ <CR><LF>/NO L OR P CLOCKS PRESENT /

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SEQ 0198

10370	056412	005015	046101	020114		.ASCIZ <CR><LF>/ALL TESTS BYPASSED/
10371	056420	042524	052123	020123		
10372	056426	054502	040520	051523		
10373	056434	042105	000			
10374	056437	015	041012	050131	MSG14:	.ASCIZ <CR><LF>/BYPASSING DRIVE /
10375	056444	051501	044523	043516		
10376	056452	042040	044522	042526		
10377	056460	000040				
10378	056462	005015	042012	044522	MSG15:	.ASCIZ <CR><LF><LF>/DRIVE /
10379	056470	042526	000040			
10380	056474	005015	042012	044522	MSG16:	.ASCIZ <CR><LF><LF>/DRIVE SERIAL NO. /
10381	056502	042526	051440	051105		
10382	056510	040511	020114	047516		
10383	056516	020056	000			
10384	056521	015	041412	051101	MSG17:	.ASCIZ <CR><LF>/CARTRIDGE SERIAL NO. /
10385	056526	051124	042111	042507		
10386	056534	051440	051105	040511		
10387	056542	020114	047516	020056		
10388	056550	000				
10389	056551	015	050012	051117	MSG19:	.ASCII <CR><LF>/PORT /
10390	056556	020124				
10391	056560	006440	000012		MSG19A:	.ASCIZ / /<CR><LF>
10392	056564	005015	047520	052122	MSG20:	.ASCIZ <CR><LF>/PORT A TIMEOUT: /
10393	056572	040440	052040	046511		
10394	056600	047505	052125	020072		
10395	056606	000				
10396	056607	015	040412	047502	MSG21:	.ASCIZ <CR><LF>/ABORTING BALANCE OF TESTS/<CR><LF>
10397	056614	052122	047111	020107		
10398	056622	040502	040514	041516		
10399	056630	020105	043117	052040		
10400	056636	051505	051524	005015		
10401	056644	000				
10402	056645	040	051515	000	MSG22:	.ASCIZ / MS/
10403	056651	015	050012	051117	MSG23:	.ASCIZ <CR><LF>/PORT B TIMEOUT: /
10404	056656	020124	020102	044524		
10405	056664	042515	052517	035124		
10406	056672	000040				
10407	056674	005015	051120	043517	MSG74:	.ASCIZ <CR><LF>/PROGRAM ABORT PENDING...PLEASE WAIT/
10408	056702	040522	020115	041101		
10409	056710	051117	020124	042520		
10410	056716	042116	04	027107		
10411	056724	027056	046	040505		
10412	056732	042523	053	044501		
10413	056740	000124				
10414	056742	005015	040510	052114	MSG75:	.ASCIZ <CR><LF>/HALT PENDING...PLEASE WAIT/
10415	056750	050040	047105	044504		
10416	056756	043516	027056	050056		
10417	056764	042514	051501	020105		
10418	056772	040527	052111	000		
10419	056777	015	050012	047522	MSG76:	.ASCIZ <CR><LF>/PROGRAM ABORTED/
10420	057004	051107	046501	040440		
10421	057012	047502	052122	042105		
10422	057020	000				
10423	057021	015	041412	052520	MSG77:	.ASCIZ <CR><LF>/CPU HALTED/
10424	057026	044040	046101	042524		
10425	057034	000104				

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SEQ 0199

.SBTTL ERROR MESSAGES

10426					
10427					
10428					
10429	057036	005015	047523	051122	EM1: .ASCIZ <CR><LF>/SORRY, ONLY 0,2,4,6 ALLOWED, TRY AGAIN/<CR><LF>
10430	057044	026131	047440	046116	
10431	057052	020131	026060	026062	
10432	057060	026064	020066	046101	
10433	057066	047514	042527	026104	
10434	057074	052040	054522	040440	
10435	057102	040507	047111	005015	
10436	057110	000			
10437	057111	104	044522	042526	EM2: .ASCIZ /DRIVE # IN RKCS2 CANNOT BE READ BACK CORRECTLY IN RKMR2/
10438	057116	021440	044440	020116	
10439	057124	045522	051503	020062	
10440	057132	040503	047116	052117	
10441	057140	041040	020105	042522	
10442	057146	042101	041040	041501	
10443	057154	020113	047503	051122	
10444	057162	041505	046124	020131	
10445	057170	047111	051040	046513	
10446	057176	031122	000		
10447	057201	015	040412	047502	EM3: .ASCIZ <CR><LF>/ABORT TESTS...UNEXPECTED TIME OUT AT PC=
10448	057206	052122	052040	051505	
10449	057214	051524	027056	052456	
10450	057222	042516	050130	041505	
10451	057230	042524	020104	044524	
10452	057236	042515	047440	052125	
10453	057244	040440	020124	041520	
10454	057252	000075			
10455	057254	005015	041101	051117	EM4: .ASCIZ <CR><LF>/ABORT TESTS...UNEXPECTED INTERRUPT AT PC=
10456	057262	020124	042524	052123	
10457	057270	027123	027056	047125	
10458	057276	054105	042520	052103	
10459	057304	042105	044440	052116	
10460	057312	051105	052522	052120	
10461	057320	040440	020124	041520	
10462	057326	000075			
10463	057330	042115	020123	042523	EM5: .ASCIZ /MDS SET IN RKCS2/
10464	057336	020124	047111	051040	
10465	057344	041513	031123	000	
10466	057351	125	042506	051440	EM6: .ASCIZ /UFE SET IN RKCS2/
10467	057356	052105	044440	020116	
10468	057364	045522	051503	000062	
10469	057372	047516	042040	040522	EM7: .ASCII /NO DRA IN RKDS & NO NED IN RKCS2/
10470	057400	044440	020116	045522	
10471	057406	051504	023040	047040	
10472	057414	020117	042516	020104	
10473	057422	047111	051040	041513	
10474	057430	031123			
10475	057432	005015	044103	041505	.ASCII <CR><LF>/CHECK 1. THE PORT A USING DRIVE FLOP (DP1)/
10476	057440	020113	027061	052040	
10477	057446	042510	050040	051117	
10478	057454	020124	020101	051525	
10479	057462	047111	020107	051104	
10480	057470	053111	020105	046106	
10481	057476	050117	024040	050104	

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SEQ 0200

10482	057504	024461				
10483	057506	005015	027062	042040		.ASCIZ <CR><LF>/2. DRIVE AVAILABLE TO PORT A STATUS (DP2)/
10484	057514	044522	042526	040440		
10485	057522	040526	046111	041101		
10486	057530	042514	052040	020117		
10487	057536	047520	052122	040440		
10488	057544	051440	040524	052524		
10489	057552	020123	042050	031120		
10490	057560	000051				
10491	057562	051104	053111	020105	EM8:	.ASCIZ /DRIVE PRESENT BUT NOT SPECIFIED BY OPERATOR/
10492	057570	051120	051505	047105		
10493	057576	020124	052502	020124		
10494	057604	047516	020124	050123		
10495	057612	041505	043111	042511		
10496	057620	020104	054502	047440		
10497	057626	042520	040522	047524		
10498	057634	000122				
10499	057636	051104	053111	020105	EM9:	.ASCIZ /DRIVE NOT PRESENT BUT SPECIFIED BY OPERATOR/
10500	057644	047516	020124	051120		
10501	057652	051505	047105	020124		
10502	057660	052502	020124	050123		
10503	057666	041505	043111	042511		
10504	057674	020104	054502	047440		
10505	057702	042520	040522	047524		
10506	057710	000122				
10507	057712	041101	051117	020124	EM10:	.ASCIZ /ABORT TESTS...CANNOT REFERENCE CONTROLLER REGISTER/
10508	057720	042524	052123	027123		
10509	057726	027056	040503	047116		
10510	057734	052117	051040	043105		
10511	057742	051105	047105	042503		
10512	057750	041440	047117	051124		
10513	057756	046117	042514	020122		
10514	057764	042522	044507	052123		
10515	057772	051105	000			
10516	057775	104	040522	044440	EM11:	.ASCIZ /DRA IN RKDS & NED IN RKCS2 BOTH SET/
10517	060002	020116	045522	051504		
10518	060010	023040	047040	042105		
10519	060016	044440	020116	045522		
10520	060024	051503	020062	047502		
10521	060032	044124	051440	052105		
10522	060040	000				
10523	060041	103	047117	051124	EM12:	.ASCIZ /CONTROLLER NOT READY IN RKCS1/
10524	060046	046117	042514	020122		
10525	060054	047516	020124	042522		
10526	060062	042101	020131	047111		
10527	060070	051040	041513	030523		
10528	060076	000				
10529	060077	116	020117	052101	EM13:	.ASCIZ /NO ATTN IN RKASOF/
10530	060104	047124	044440	020116		
10531	060112	045522	051501	043117		
10532	060120	000				
10533	060121	125	042516	050130	EM14:	.ASCIZ /UNEXPECTED MEMORY PARITY TRAP/
10534	060126	041505	042524	020104		
10535	060134	042515	047515	054522		
10536	060142	050040	051101	052111		
10537	060150	020131	051124	050101		

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ERROR MESSAGES

SEQ 0201

10538	060156	000	042113	020103	EM15:	.ASCII	/RKDC & RKDA INDICATE THAT WCE OCCURRED AT/
10539	060157	122	045522	040504			
10540	060164	020046	042116	041511			
10541	060172	044440	020105	044124			
10542	060200	052101	053440	042503			
10543	060206	052101	041503	051125			
10544	060214	047440	020104	052101			
10545	060222	042522	054503	020114		.ASCIIZ	<CR><LF>/CYL 411, TRACK 2, SECTOR 21/
10546	060230	005015	026061	052040			
10547	060236	030464	045503	031040			
10548	060244	040522	042523	052103			
10549	060252	020054	031040	000061			
10550	060260	051117	047116	052117	EM16:	.ASCIIZ	/CANNOT READ BAD SECTOR INFORMATION/
10551	060266	040503	040505	020104			
10552	060274	051040	020104	042523			
10553	060302	040502	051117	044440			
10554	060310	052103	051117	040515			
10555	060316	043116	047117	000			
10556	060324	044524	051505	040523	EM17:	.ASCIIZ	/MESSAGE AD ERROR/
10557	060331	115	040440	020060			
10558	060336	042507	047522	000122			
10559	060344	051105	051523	043501	EM18:	.ASCIIZ	/MESSAGE BD ERROR/
10560	060352	042515	030102	042440			
10561	060360	020105	051117	000			
10562	060366	051122	051505	040523	EM19:	.ASCIIZ	/MESSAGE AI ERROR/
10563	060373	115	040440	020061			
10564	060400	042507	047522	000122			
10565	060406	051105	051523	043501	EM20:	.ASCIIZ	/MESSAGE BI ERROR/
10566	060414	042515	030502	042440			
10567	060422	020105	051117	000			
10568	060430	051122	051105	020122	EM21:	.ASCIIZ	/CERR SET IN RKCS1/
10569	060435	103	020124	047111			
10570	060442	042523	041513	030523			
10571	060450	051040					
10572	060456	000					
10573	060457	116	020117	051104	EM22:	.ASCII	/NO DRIVES FOUND IN DEVICE MAP (\$DEVN)/<CR><LF>
10574	060464	053111	051505	043040			
10575	060472	052517	042116	044440			
10576	060500	020116	042504	044526			
10577	060506	042503	046440	050101			
10578	060514	024040	042044	053105			
10579	060522	024515	005015				
10580	060526	042523	052524	020120		.ASCIIZ	/SETUP CORRECTLY AND RESTART/<CR><LF>
10581	060534	047503	051122	041505			
10582	060542	046124	020131	047101			
10583	060550	020104	042522	052123			
10584	060556	051101	006524	000012			
10585	060564	047516	042040	044522	EM23:	.ASCII	/NO DRIVES FOUND ON BUSS/<CR><LF>
10586	060572	042526	020123	047506			
10587	060600	047125	020104	047117			
10588	060606	041040	051525	006523			
10589	060614	012					
10590	060615	123	052105	050125		.ASCIIZ	/SETUP CORRECTLY AND PRESS 'CONTINUE'<CR><LF>
10591	060622	041440	051117	042522			
10592	060630	052103	054514	040440			
10593	060636	042116	050040	042522			

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ERROR MESSAGES

SEQ 0202

10594	060644	051523	023440	047503	
10595	060652	052116	047111	042525	
10596	060660	006447	000012		
10597	060664	047526	020114	040526	EM24: .ASCIZ /VOL VALID NOT SET IN RKMR2/
10598	060672	044514	020104	047516	
10599	060700	020124	042523	020124	
10600	060706	047111	051040	046513	
10601	060714	031122	000		
10602	060717	015	042012	052105	EM25: .ASCIZ <CR><LF>/DETECTED 10 BAD SECTORS...ABORTING TEST/
10603	060724	041505	042524	020104	
10604	060732	030061	041040	042101	
10605	060740	051440	041505	047524	
10606	060746	051522	027056	040456	
10607	060754	047502	052122	047111	
10608	060762	020107	042524	052123	
10609	060770	000			
10610	060771	104	052105	041505	EM26: .ASCIZ /DETECTED BSE BUT NOT LISTED IN BAD SECTOR FILE/
10611	060776	042524	020104	051502	
10612	061004	020105	052502	020124	
10613	061012	047516	020124	044514	
10614	061020	052123	042105	044440	
10615	061026	020116	040502	020104	
10616	061034	042523	052103	051117	
10617	061042	043040	046111	000105	
10618	061050	042504	042524	052103	EM27: .ASCII /DETECTED BSE IN READ COMMAND/
10619	061056	042105	041040	042523	
10620	061064	044440	020116	042522	
10621	061072	042101	041440	046517	
10622	061100	040515	042116		
10623	061104	005015	052502	020124	.ASCIZ <CR><LF>/BUT NOT IN PREVIOUS WRITE COMMAND TO SAME SECTOR/
10624	061112	047516	020124	047111	
10625	061120	050040	042522	044526	
10626	061126	052517	020123	051127	
10627	061134	052111	020105	047503	
10628	061142	046515	047101	020104	
10629	061150	047524	051440	046501	
10630	061156	020105	042523	052103	
10631	061164	051117	000		
10632	061167	117	046116	020131	EM28: .ASCII /ONLY DRIVES 0,2,4,6 ALLOWED IN \$DEVN/
10633	061174	051104	053111	051505	
10634	061202	030040	031054	032054	
10635	061210	033054	040440	046114	
10636	061216	053517	042105	044440	
10637	061224	020116	042044	053105	
10638	061232	115			
10639	061233	015	051012	046105	.ASCIZ <CR><LF>/RELOAD \$DEVN & PRESS CONTINUE/<CR><LF>
10640	061240	040517	020104	042044	
10641	061246	053105	020115	020046	
10642	061254	051120	051505	020123	
10643	061262	047503	052116	047111	
10644	061270	042525	005015	000	
10645	061275	120	051117	020124	EM29: .ASCIZ /PORT AVAILABLE...TIMERS NOT INHIBITED/
10646	061302	053101	044501	040514	
10647	061310	046102	027105	027056	
10648	061316	044524	042515	051522	
10649	061324	047040	052117	044440	

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SEQ 0203

10650	061332	044116	041111	052111	
10651	061340	042105	000		
10652	061343	120	050111	051440	EM30: .ASCIZ /PIP SET IN RKMR2/
10653	061350	052105	044440	020116	
10654	061356	045522	051115	000062	
10655	061364	047520	052122	047040	EM31: .ASCIZ /PORT NOT AVAILABLE/
10656	061372	052117	040440	040526	
10657	061400	046111	041101	042514	
10658	061406	000			
10659	061407	120	051117	020124	EM32: .ASCIZ /PORT AVAILABLE/
10660	061414	053101	044501	040514	
10661	061422	046102	000105		
10662	061426	052101	047124	051440	EM33: .ASCIZ /ATTN SET IN RKASOF/
10663	061434	052105	044440	020116	
10664	061442	045522	051501	043117	
10665	061450	000			
10666	061451	101	052124	020116	EM34: .ASCIZ /ATTN CLEARED IN RKASOF/
10667	061456	046103	040505	042522	
10668	061464	020104	047111	051040	
10669	061472	040513	047523	000106	
10670	061500	042503	051122	047040	EM35: .ASCIZ /CERR NOT SET IN RKCS1/
10671	061506	052117	051440	052105	
10672	061514	044440	020116	045522	
10673	061522	051503	000061		
10674	061526	054503	020114	042101	EM36: .ASCIZ /CYL ADDR IN RKMR3 NOT SAME AS RKDC/
10675	061534	051104	044440	020116	
10676	061542	045522	051115	020063	
10677	061550	047516	020124	040523	
10678	061556	042515	040440	020123	
10679	061564	045522	041504	000	
10680	061571	115	046125	044524	EM37: .ASCIZ /MULTIPLE ATTENTIONS SEEN/
10681	061576	046120	020105	052101	
10682	061604	042524	052116	047511	
10683	061612	051516	051440	042505	
10684	061620	000116			
10685	061622	044524	042515	052517	EM38: .ASCIZ /TIMEOUT DID NOT RE-TRIGGER FOR FULL SECOND/
10686	061630	020124	044504	020104	
10687	061636	047516	020124	042522	
10688	061644	052055	044522	043507	
10689	061652	051105	043040	051117	
10690	061660	043040	046125	020114	
10691	061666	042523	047503	042116	
10692	061674	000			
10693	061675	103	046131	042040	EM39: .ASCIZ /CYL DIFF & OFFSET IN RKMR2 NOT CLEARED/
10694	061702	043111	020106	020046	
10695	061710	043117	051506	052105	
10696	061716	044440	020116	045522	
10697	061724	051115	020062	047516	
10698	061732	020124	046103	040505	
10699	061740	042522	000104		
10700	061744	054503	020114	042101	EM40: .ASCIZ /CYL ADDR IN RKMR3 NOT CLEARED/
10701	061752	051104	044440	020116	
10702	061760	045522	051115	020063	
10703	061766	047516	020124	046103	
10704	061774	040505	042522	000104	
10705	062002	052101	047124	047040	EM55: .ASCIZ /ATTN NOT CLEARED IN RKASOF/

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SEQ 0204

10706	062010	052117	041440	042514	
10707	062016	051101	042105	044440	
10708	062024	020116	045522	051501	
10709	062032	043117	000		
10710	062035	104	052114	051440	EM63: .ASCIZ /DLT SET IN RKCS2/
10711	062042	052105	044440	020116	
10712	062050	045522	051503	000062	
10713	062056	042522	042101	044040	EM65: .ASCIZ /READ HEADER ERROR/
10714	062064	040505	042504	020122	
10715	062072	051105	047522	000122	
10716	062100	046101	043511	046516	EM69: .ASCIZ /ALIGNMENT CARTRIDGE USED/
10717	062106	047105	020124	040503	
10718	062114	052122	044522	043504	
10719	062122	020105	051525	042105	
10720	062130	000			
10721	062131	103	047524	051440	EM73: .ASCIZ /CTO SET IN RKCS1/
10722	062136	052105	044440	020116	
10723	062144	045522	051503	000061	
10724	062152	052122	020132	047516	EM74: .ASCIZ /RTZ NOT SET IN RKMR2/
10725	062160	020124	042523	020124	
10726	062166	047111	051040	046513	
10727	062174	031122	000		
10728	062177	116	042105	051440	EM79: .ASCIZ /NED SET IN RKCS2/
10729	062204	052105	044440	020116	
10730	062212	045522	051503	000062	
10731	062220	051127	052111	020105	EM80: .ASCIZ /WRITE CHECK ERROR SET IN RKCS2/
10732	062226	044103	041505	020113	
10733	062234	051105	047522	020122	
10734	062242	042523	020124	047111	
10735	062250	051040	041513	031123	
10736	062256	000			
10737	062257	122	040505	020104	EM82: .ASCIZ /READ DATA DID NOT COMPARE WITH WRITE DATA/
10738	062264	040504	040524	042040	
10739	062272	042111	047040	052117	
10740	062300	041440	046517	040520	
10741	062306	042522	053440	052111	
10742	062314	020110	051127	052111	
10743	062322	020105	040504	040524	
10744	062330	000			
10745	062331	104	052101	020101	EM83: .ASCIZ /DATA CHECK ERROR SET IN RKER/
10746	062336	044103	041505	020113	
10747	062344	051105	047522	020122	
10748	062352	042523	020124	047111	
10749	062360	051040	042513	000122	
10750	062366	044127	046111	020105	EM84: .ASCIZ /WHILE WAITING FOR CONTR READY OR AFTER CONTR READY REC'D/
10751	062374	040527	052111	047111	
10752	062402	020107	047506	020122	
10753	062410	047503	052116	020122	
10754	062416	042522	042101	020131	
10755	062424	051117	040440	052106	
10756	062432	051105	041440	047117	
10757	062440	051124	051040	040505	
10758	062446	054504	051040	041505	
10759	062454	042047	000		
10760	062457	122	040505	044504	EM93: .ASCIZ /READING WRONG CYLINDER # IN HEADER...MISPOSITION/
10761	062464	043516	053440	047522	

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SEQ 0205

10762	062472	043516	041440	046131
10763	062500	047111	042504	020122
10764	062506	020043	047111	044040
10765	062514	040505	042504	027122
10766	062522	027056	044515	050123
10767	062530	051517	052111	047511
10768	062536	000116		
10769				
10770				
10771				

.SBTTL DATA HEADERS

10772	062540	042524	052123	047040
10773	062546	027117	020040	041520
10774	062554	000		
10775	062555	122	046513	030522
10776	062562	051011	046513	031122
10777	062570	051011	046513	031522
10778	062576	051011	042513	004522
10779	062604	045522	051504	051011
10780	062612	041513	030523	051011
10781	062620	041513	031123	000
10782	062625	122	053513	004503
10783	062632	045522	040502	051011
10784	062640	042113	004501	045522
10785	062646	051501	043117	051011
10786	062654	042113	004503	045522
10787	062662	041505	051520	051011
10788	062670	042513	050103	000124
10789	062676	043101	042524	020122
10790	062704	052101	047124	051040
10791	062712	041505	042047	043040
10792	062720	047522	020115	042522
10793	062726	040503	020114	047503
10794	062734	046515	047101	000104
10795	062742	043101	042524	020122
10796	062750	047523	052106	040527
10797	062756	042522	052040	046511
10798	062764	047505	052125	000
10799	062771	106	047522	020115
10800	062776	054503	020114	052040
10801	063004	020117	054503	020114
10802	063012	041440	046131	042040
10803	063020	043111	000106	
10804	063024	043101	042524	020122
10805	063032	052523	051502	051531
10806	063040	041440	042514	051101
10807	063046	005015	044103	041505
10808	063054	020113	027061	052040
10809	063062	042510	050040	051117
10810	063070	020124	020102	051525
10811	063076	047111	020107	051104
10812	063104	053111	020105	046106
10813	063112	050117	024040	050104
10814	063120	024461		
10815	063122	005015	027062	042040
10816	063130	044522	042526	040440
10817	063136	040526	046111	041101

DH1: .ASCIZ /TEST NO. PC/

DH2: .ASCIZ /RKMR1 RKMR2 RKMR3 RKER RKDS RKCS1 RKCS2/

DH3: .ASCIZ /RKWC RKBA RKDA RKASOF RKDC RKECPS RKECPT/

DH4: .ASCIZ /AFTER ATTN REC'D FROM RECAL COMMAND/

DH5: .ASCIZ /AFTER SOFTWARE TIMEOUT/

DH6: .ASCIZ /FROM CYL TO CYL CYL DIFF/

DH7: .ASCII /AFTER SUBSYS CLEAR/

.ASCII <CR><LF>/CHECK 1. THE PORT B USING DRIVE FLOP (DP1)/

.ASCIZ <CR><LF>/2. DRIVE AVAILABLE TO PORT B STATUS (DP2)/

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DATA HEADERS

SEQ 0206

10818	063144	042514	052040	020117		
10819	063152	047520	052122	041040		
10820	063160	051440	040524	052524		
10821	063166	020123	042050	031120		
10822	063174	000051				
10823	063176	042524	052123	047040	DH8:	.ASCIZ /TEST NO. TRAP PC/
10824	063204	027117	052011	040522		
10825	063212	020120	041520	000		
10826	063217	101	052106	051105	DH9:	.ASCIZ /AFTER START SPINDLE COMMAND REC'D BY DRIVE/
10827	063224	051440	040524	052122		
10828	063232	051440	044520	042116		
10829	063240	042514	041440	046517		
10830	063246	040515	042116	051040		
10831	063254	041505	042047	041040		
10832	063262	020131	051104	053111		
10833	063270	000105				
10834	063272	052101	042440	042116	DH10:	.ASCIZ /AT END OF HEAD LOADING/
10835	063300	047440	020106	042510		
10836	063306	042101	046040	040517		
10837	063314	044504	043516	000		
10838	063321	105	050130	041505	DH11:	.ASCIZ /EXPECTED WAS/
10839	063326	042524	004504	040527		
10840	063334	000123				
10841	063336	043101	042524	020122	DH12:	.ASCII /AFTER SEEK CMD/
10842	063344	042523	045505	041440		
10843	063352	042115				
10844	063354	005015	044103	041505		.ASCIZ <CR><LF>/CHECK STAT ADD SIGNAL BEFORE & AFTER MUX/
10845	063362	020113	052123	052101		
10846	063370	040440	042104	051440		
10847	063376	043511	040516	020114		
10848	063404	042502	047506	042522		
10849	063412	023040	040440	052106		
10850	063420	051105	046440	054125		
10851	063426	000				
10852	063427	117	020116	042523	DH13:	.ASCIZ /ON SECTORS 10, 12, 14, 16, 18 OR 20 CYL 410 TRACK 2/
10853	063434	052103	051117	020123		
10854	063442	030061	020054	031061		
10855	063450	020054	032061	020054		
10856	063456	033061	020054	034061		
10857	063464	047440	020122	030062		
10858	063472	041440	046131	032040		
10859	063500	030061	052040	040522		
10860	063506	045503	031040	000		
10861	063513	102	043105	051117	DH14:	.ASCIZ /BEFORE TIMEOUT OR RELEASE/
10862	063520	020105	044524	042515		
10863	063526	052517	020124	051117		
10864	063534	051040	046105	040505		
10865	063542	042523	000			
10866	063545	127	044510	042514	DH15:	.ASCIZ /WHILE PORT UNAVAILABLE/
10867	063552	050040	051117	020124		
10868	063560	047125	053101	044501		
10869	063566	040514	046102	000105		
10870	063574	047524	044440	042116	DH16:	.ASCII /TO INDICATE THAT REQUESTING PORT CAN SEIZE/
10871	063602	041511	052101	020105		
10872	063610	044124	052101	051040		
10873	063616	050505	042525	052123		

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SEQ 0207

10874	063624	047111	020107	047520	
10875	063632	052122	041440	047101	
10876	063640	051440	044505	042532	
10877	063646	005015	044103	041505	.ASCIZ <CR><LF>/CHECK PORT REQ. FLOPS & 1 SEC SAFETY TIMER/
10878	063654	020113	047520	052122	
10879	063662	051040	050505	020056	
10880	063670	046106	050117	020123	
10881	063676	020046	020061	042523	
10882	063704	020103	040523	042506	
10883	063712	054524	052040	046511	
10884	063720	051105	000		
10885	063723	101	052106	051105	DH17: .ASCIZ /AFTER RECAL COMMAND/
10886	063730	051040	041505	046101	
10887	063736	041440	046517	040515	
10888	063744	042116	000		
10889	063747	101	052106	051105	DH18: .ASCIZ /AFTER UNLOAD COMMAND/
10890	063754	052440	046116	040517	
10891	063762	020104	047503	046515	
10892	063770	047101	000104		
10893	063774	043101	042524	020122	DH19: .ASCIZ /AFTER PACK COMMAND/
10894	064002	040520	045503	041440	
10895	064010	046517	040515	042116	
10896	064016	000			
10897	064017	101	052106	051105	DH20: .ASCIZ /AFTER SELECT DRIVE COMMAND/
10898	064024	051440	046105	041505	
10899	064032	020124	051104	053111	
10900	064040	020105	047503	046515	
10901	064046	047101	000104		
10902	064052	043101	042524	020122	DH21: .ASCIZ /AFTER SUBSYSTEM CLEAR/
10903	064060	052523	051502	051531	
10904	064066	042524	020115	046103	
10905	064074	040505	000122		
10906	064100	043101	042524	020122	DH22: .ASCIZ /AFTER DRIVE CLEAR COMMAND/
10907	064106	051104	053111	020105	
10908	064114	046103	040505	020122	
10909	064122	047503	046515	047101	
10910	064130	000104			
10911	064132	044527	044124	052517	DH23: .ASCIZ /WITHOUT REQUEST PENDING/
10912	064140	020124	042522	052521	
10913	064146	051505	020124	042520	
10914	064154	042116	047111	000107	
10915	064162	054502	042040	044522	DH24: .ASCIZ /BY DRIVE CLEAR COMMAND TO OTHER PORT/
10916	064170	042526	041440	042514	
10917	064176	051101	041440	046517	
10918	064204	040515	042116	052040	
10919	064212	020117	052117	042510	
10920	064220	020122	047520	052122	
10921	064226	000			
10922	064227	101	052106	051105	DH25: .ASCIZ /AFTER SEEK COMMAND/
10923	064234	051440	042505	020113	
10924	064242	047503	046515	047101	
10925	064250	000104			
10926	064252	043101	042524	020122	DH26: .ASCIZ /AFTER READ DATA COMMAND/
10927	064260	042522	042101	042040	
10928	064266	052101	020101	047503	
10929	064274	046515	047101	000104	

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DATA HEADERS

SEQ 0208

10930	064302	043101	042524	020122	DH27:	.ASCIZ	/AFTER WRITE DATA COMMAND/
10931	064310	051127	052111	020105			
10932	064316	040504	040524	041440			
10933	064324	046517	040515	042116			
10934	064332	000					
10935	064333	011	054105	042520	DH28:	.ASCIZ	/ EXPECT/
10936	064340	052103	000				
10937	064343	011	041501	052524	DH29:	.ASCIZ	/ ACTUAL/
10938	064350	046101	000				
10939	064353	101	052106	051105	DH30:	.ASCIZ	/AFTER READ HEADER COMMAND/
10940	064360	051040	040505	020104			
10941	064366	042510	042101	051105			
10942	064374	041440	046517	040515			
10943	064402	042116	000				
10944	064405	101	004460	030102	DH31:	.ASCIZ	/A0 B0 A1 B1 A2 B2 B3/
10945	064412	040411	004461	030502			
10946	064420	040411	004462	031102			
10947	064426	041011	000063				
10948	064432	043101	042524	020122	DH32:	.ASCIZ	/AFTER WRITE CHECK COMMAND/
10949	064440	051127	052111	020105			
10950	064446	044103	041505	020113			
10951	064454	047503	046515	047101			
10952	064462	000104					
10953	064464	043101	042524	020122	DH35:	.ASCIZ	/AFTER RELEASE ISSUED/
10954	064472	042522	042514	051501			
10955	064500	020105	051511	052523			
10956	064506	042105	000				
10957	064511	101	052106	051105	DH36:	.ASCIZ	/AFTER SELECT DRIVE COMMAND & DRIVE NOT AVAILABLE/
10958	064516	051440	046105	041505			
10959	064524	020124	051104	053111			
10960	064532	020105	047503	046515			
10961	064540	047101	020104	020046			
10962	064546	051104	053111	020105			
10963	064554	047516	020124	053101			
10964	064562	044501	040514	046102			
10965	064570	000105					
10966	064572	043101	042524	020122	DH37:	.ASCIZ	/AFTER RELEASE ISSUED & PORT REQUEST PENDING/
10967	064600	042522	042514	051501			
10968	064606	020105	051511	052523			
10969	064614	042105	023040	050040			
10970	064622	051117	020124	042522			
10971	064630	052521	051505	020124			
10972	064636	042520	042116	047111			
10973	064644	000107					
10974	064646	043101	042524	020122	DH38:	.ASCIZ	/AFTER DELAY FROM SEEK & IMMEDIATE RELEASE/
10975	064654	042504	040514	020131			
10976	064662	051106	046517	051440			
10977	064670	042505	020113	020046			
10978	064676	046511	042515	044504			
10979	064704	052101	020105	042522			
10980	064712	042514	051501	000105			
10981	064720	043101	042524	020122	DH39:	.ASCIZ	/AFTER WRITE HEADER COMMAND/
10982	064726	051127	052111	020105			
10983	064734	042510	042101	051105			
10984	064742	041440	046517	040515			
10985	064750	042116	000				

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DATA HEADERS

SEQ 0209

10986	064753	127	051117	021504	DH40:	.ASCIZ	/WORD# HEADER WAS SHOULD BE/
10987	064760	044011	040505	042504			
10988	064766	020122	040527	020123			
10989	064774	051440	047510	046125			
10990	065002	020104	042502	000			
10991	065007	104	051125	047111	DH41:	.ASCII	/DURING RECAL COMMAND/
10992	065014	020107	042522	040503			
10993	065022	020114	047503	046515			
10994	065030	047101	104				
10995	065033	015	041412	042510		.ASCIZ	<CR><LF>/CHECK BUFF1 SIGNAL BEFORE & AFTER MUX/
10996	065040	045503	041040	043125			
10997	065046	030506	051440	043511			
10998	065054	040516	020114	042502			
10999	065062	047506	042522	023040			
11000	065070	040440	052106	051105			
11001	065076	046440	054125	000			
11002	065103	117	020116	042523	DH42:	.ASCIZ	/ON SECTORS 0,2,4,6 OR 8 CYL 410 TRACK 2/
11003	065110	052103	051117	020123			
11004	065116	026060	026062	026064			
11005	065124	020066	051117	034040			
11006	065132	020040	054503	020114			
11007	065140	030464	020060	051124			
11008	065146	041501	020113	000062			
11009	065154	043101	042524	020122	DH43:	.ASCIZ	/AFTER RE-SEIZE PORT MID-WAY IN NORMAL TIMEOUT/
11010	065162	042522	051455	044505			
11011	065170	042532	020040	047520			
11012	065176	052122	046440	042111			
11013	065204	053455	054501	044440			
11014	065212	020116	047516	046522			
11015	065220	046101	052040	046511			
11016	065226	047505	052125	000			
11017	065233	106	051117	040515	DH44:	.ASCIZ	/FORMAT & ALL READ-WRITE TESTS WILL BE BYPASSED/
11018	065240	020124	020046	046101			
11019	065246	020114	042522	042101			
11020	065254	053455	044522	042524			
11021	065262	052040	051505	051524			
11022	065270	053440	046111	020114			
11023	065276	042502	041040	050131			
11024	065304	051501	042523	000104			
11025	065312	042502	047506	042522	DH45:	.ASCIZ	/BEFORE RELEASE WHILE HEADS UNLOADED/
11026	065320	051040	046105	040505			
11027	065326	042523	053440	044510			
11028	065334	042514	044040	040505			
11029	065342	051504	052440	046116			
11030	065350	040517	042504	000104			
11031	065356	051515	020107	020101	DH49:	.ASCIZ	/MSG A & B IN RKMR2 & RKMR3 RESP. ARE INVALID/
11032	065364	020046	020102	047111			
11033	065372	051040	046513	031122			
11034	065400	023040	051040	046513			
11035	065406	031522	051040	051505			
11036	065414	027120	040440	042522			
11037	065422	044440	053116	046101			
11038	065430	042111	000				
11039	065433	101	052106	051105	DH51:	.ASCIZ	/AFTER SEEK TO SELF COMMAND/
11040	065440	051440	042505	020113			
11041	065446	047524	051440	046105			

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DATA HEADERS

SEQ 0210

11042	065454	020106	047503	046515	
11043	065462	047101	000104		
11044	065466	054503	020114	004443	DH56: .ASCIZ /CYL # HEADER WORD 0/
11045	065474	042510	042101	051105	
11046	065502	053440	051117	020104	
11047	065510	000060			
11048					
11049					.SBTTL ERROR OUTPUT DATA
11050					
11051					.EVEN
11052	065512	001214	001116		DT1: \$TESTN,\$ERRPC
11053	065516	005340	005342	005344	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11054	065524	005330	005326	005314	
11055	065532	005316			
11056	065534	005320	005322	005324	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11057	065542	005332	005334	005346	
11058	065550	005350			
11059	065552	001214	001334		DT3: \$TESTN,TRAPPC
11060	065556	001214	001116	001344	DT4: \$TESTN,\$ERRPC,FRCYL,TOCYL,CALDIF
11061	065564	001346	001354		
11062	065570	005340	005342	005344	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11063	065576	005330	005326	005314	
11064	065604	005316			
11065	065606	005320	005322	005324	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11066	065614	005332	005334	005346	
11067	065622	005350			
11068	065624	001214	001116	001416	DT6: \$TESTN,\$ERRPC,WD2,WD1
11069	065632	001414			
11070	065634	005340	005342	005344	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11071	065642	005330	005326	005314	
11072	065650	005316			
11073	065652	005320	005322	005324	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11074	065660	005332	005334	005346	
11075	065666	005350			
11076	065670	001214	001116	001432	DT7: \$TESTN,\$ERRPC,WDcnt,HDWD,TEMP1
11077	065676	001450	005352		
11078	065702	005340	005342	005344	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11079	065710	005330	005326	005314	
11080	065716	005316			
11081	065720	005320	005322	005324	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11082	065726	005332	005334	005346	
11083	065734	005350			
11084	065736	001214	001116	001346	DT8: \$TESTN,\$ERRPC,TOCYL,FRCYL,CALDIF
11085	065744	001344	001354		
11086	065750	005340	005342	005344	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11087	065756	005330	005326	005314	
11088	065764	005316			
11089	065766	005320	005322	005324	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11090	065774	005332	005334	005346	
11091	066002	005350			
11092	066004	001214	001116	001346	DT9: \$TESTN,\$ERRPC,TOCYL,RHTAB
11093	066012	001666			
11094	066014	005340	005342	005344	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11095	066022	005330	005326	005314	
11096	066030	005316			
11097	066032	005320	005322	005324	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT

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SEQ 0211

11098	066040	005332	005334	005346	
11099	066046	005350			
11100	066050	001214	001116	005404	DT13: \$TESTN,\$ERRPC,E.A0,E.B0,E.A1,E.B1,H.A0,H.B0,H.A1,H.B1
11101	066056	005406	005410	005412	
11102	066064	005364	005366	005370	
11103	066072	005372			
11104	066074	005340	005342	005344	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11105	066102	005330	005326	005314	
11106	066110	005316			
11107	066112	005320	005322	005324	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11108	066120	005332	005334	005346	
11109	066126	005350			
11110	066130	001214	001116	005404	DT14: \$TESTN,\$ERRPC,E.A0,E.B0,E.A1,E.B1,E.A2,E.B2
11111	066136	005406	005410	005412	
11112	066144	005414	005416		
11113	066150	005364	005366	005370	H.A0,H.B0,H.A1,H.B1,H.A2,H.B2
11114	066156	005372	005374	005376	
11115	066164	005340	005342	005344	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11116	066172	005330	005326	005314	
11117	066200	005316			
11118	066202	005320	005322	005324	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11119	066210	005332	005334	005346	
11120	066216	005350			
11121	066220	001214	001116	005404	DT15: \$TESTN,\$ERRPC,E.A0,E.B0,E.A1,E.B1,E.A2,E.B2,E.B3
11122	066226	005406	005410	005412	
11123	066234	005414	005416	005422	
11124	066242	005364	005366	005370	H.A0,H.B0,H.A1,H.B1,H.A2,H.B2,H.B3
11125	066250	005372	005374	005376	
11126	066256	005402			
11127	066260	005340	005342	005344	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11128	066266	005330	005326	005314	
11129	066274	005316			
11130	066276	005320	005322	005324	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11131	066304	005332	005334	005346	
11132	066312	005350			
11133					
11134					.SBTTL ERROR DATA FORMATS
11135					
11136	066314	000003			DF1: 3
11137	066316	002	000		.BYTE 2,0
11138	066320	062555			DH2
11139	066322	007	000		.BYTE 7,0
11140	066324	062625			DH3
11141	066326	007	000		.BYTE 7,0
11142					
11143	066330	000001			DF2: 1
11144	066332	002	000		.BYTE 2,0
11145					
11146	066334	000005			DF3: 5
11147	066336	000	000		.BYTE 0,0
11148	066340	062540			DH1
11149	066342	002	000		.BYTE 2,0
11150	066344	063321			DH11
11151	066346	002	000		.BYTE 2,0
11152	066350	062555			DH2
11153	066352	007	000		.BYTE 7,0

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SEQ 0212

11154	066354	062625			DH3
11155	066356	007	000		.BYTE 7,0
11156					
11157	066360	000003		DF4:	3
11158	066362	002	000		.BYTE 2,0
11159	066364	062555			DH2
11160	066366	007	000		.BYTE 7,0
11161	066370	062625			DH3
11162	066372	007	000		.BYTE 7,0
11163					
11164	066374	000005		DF5:	5
11165	066376	000	000		.BYTE 0,0
11166	066400	065356			DH49
11167	066402	000	000		.BYTE 0,0
11168	066404	062540			DH1
11169	066406	002	000		.BYTE 2,0
11170	066410	062555			DH2
11171	066412	007	000		.BYTE 7,0
11172	066414	062625			DH3
11173	066416	007	000		.BYTE 7,0
11174					
11175	066420	000005		DF6:	5
11176	066422	000	000		.BYTE 0,0
11177	066424	062540			DH1
11178	066426	002	000		.BYTE 2,0
11179	066430	062771			DH6
11180	066432	003	000		.BYTE 3,0
11181	066434	062555			DH2
11182	066436	007	000		.BYTE 7,0
11183	066440	062625			DH3
11184	066442	007	000		.BYTE 7,0
11185					
11186					
11187	066444	000004		DF10:	4
11188	066446	000	000		.BYTE 0,0
11189	066450	062540			DH1
11190	066452	002	000		.BYTE 2,0
11191	066454	062555			DH2
11192	066456	007	000		.BYTE 7,0
11193	066460	062625			DH3
11194	066462	007	000		.BYTE 7,0
11195					
11196	066464	000004		DF14:	4
11197	066466	002	000		.BYTE 2,0
11198	066470	064753			DH40
11199	066472	003	000		.BYTE 3,0
11200	066474	062555			DH2
11201	066476	007	000		.BYTE 7,0
11202	066500	062625			DH3
11203	066502	007	000		.BYTE 7,0
11204					
11205					
11206	066504	000004		DF15:	4
11207	066506	000	000		.BYTE 0,0
11208	066510	062540			DH1
11209	066512	002	000		.BYTE 2,0

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SEQ 0213

11210	066514	062555			DH2	
11211	066516	007	000		.BYTE	7,0
11212	066520	062625			DH3	
11213	066522	007	000		.BYTE	7,0
11214						
11215	066524	000005		DF17:	5	
11216	066526	000	000		.BYTE	0,0
11217	066530	065233			DH44	
11218	066532	000	000		.BYTE	0,0
11219	066534	062540			DH1	
11220	066536	002	000		.BYTE	2,0
11221	066540	062555			DH2	
11222	066542	007	000		.BYTE	7,0
11223	066544	062625			DH3	
11224	066546	007	000		.BYTE	7,0
11225	066550	000005		DF20:	5	
11226	066552	000	000		.BYTE	0,0
11227	066554	062540			DH1	
11228	066556	002	000		.BYTE	2,0
11229	066560	065466			DH56	
11230	066562	002	000		.BYTE	2,0
11231	066564	062555			DH2	
11232	066566	007	000		.BYTE	7,0
11233	066570	062625			DH3	
11234	066572	007	000		.BYTE	7,0
11235						
11236	066574	000007		DF21:	7	
11237	066576	000	000		.BYTE	0,0
11238	066600	062540			DH1	
11239	066602	002	000		.BYTE	2,0
11240	066604	064333			DH28	
11241	066606	000	000		.BYTE	0,0
11242	066610	064405			DH31	
11243	066612	004	000		.BYTE	4,0
11244	066614	064343			DH29	
11245	066616	004	000		.BYTE	4,0
11246	066620	062555			DH2	
11247	066622	007	000		.BYTE	7,0
11248	066624	062625			DH3	
11249	066626	007	000		.BYTE	7,0
11250						
11251	066630	000007		DF22:	7	
11252	066632	000	000		.BYTE	0,0
11253	066634	062540			DH1	
11254	066636	002	000		.BYTE	2,0
11255	066640	064333			DH28	
11256	066642	000	000		.BYTE	0,0
11257	066644	064405			DH31	
11258	066646	006	000		.BYTE	6,0
11259	066650	064343			DH29	
11260	066652	006	000		.BYTE	6,0
11261	066654	062555			DH2	
11262	066656	007	000		.BYTE	7,0
11263	066660	062625			DH3	
11264	066662	007	000		.BYTE	7,0
11265						

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SEQ 0214

11266	066664	000007	
11267	066666	000	000
11268	066670	062540	
11269	066672	002	000
11270	066674	064333	
11271	066676	000	000
11272	066700	064405	
11273	066702	007	000
11274	066704	064343	
11275	066706	007	000
11276	066710	062555	
11277	066712	007	000
11278	066714	062625	
11279	066716	007	000
11280			
11281			
11282			
11283			
11284			
11285			
11286			
11287			
11288			
11289			
11290			
11291	066720	104413	
11292	066722	104401	056551
11293	066726	113700	001114
11294	066732	042700	177400
11295	066736	005300	
11296	066740	006300	
11297	066742	006300	
11298	066744	006300	

DF23: 7
.BYTE 0,0
DH1
.BYTE 2,0
DH28
.BYTE 0,0
DH31
.BYTE 7,0
DH29
.BYTE 7,0
DH2
.BYTE 7,0
DH3
.BYTE 7,0

.EVEN

;SMTL TYPE ERROR ROUTINE
;ENTRY JSR PC,TYP ERR
;RETURN RTS PC
;
;THIS ROUTINE USES THE "ITEM CONTROL BYTE" (\$ITEMB) TO DETERMINE WHICH
;ERROR IS TO BE REPORTED. IT THEN USES THE "ERROR TABLE" (\$ERRTB)
;ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
;THE ERROR.

TYPERR: SAVREG
TYPE MSG19 ;PORT A OR B
MOVB \$ITEMB,RO ;ENTER ERROR NUMBER
BIC #177400,RO ;CLEAR SIGN EXTENSION
DEC RO ;FORM INDEX FOR ERROR TABLE
ASL RO
ASL RO
ASL RO

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SEQ 0215

11299	066746	062700	005470	1\$:	ADD	#\$ERRTB,RO	; FORM ADDRESS OF ERROR ENTRY
11300	066752	012037	066766		MOV	(RO)+,2\$	; GET EM POINTER
11301	066756	001404			BEQ	3\$	; BRANCH IF THERE ISN'T ONE
11302	066760	104401	001205		TYPE	,\$CRLF	; TYPE CARRIAGE RETURN LINE FEED
11303	066764	104401			TYPE		; TYPE ERROR MESSAGE (EM)
11304	066766	000000		2\$:	.WORD	0	; EM POINTER GOES HERE
11305	066770	012037	067004	3\$:	MOV	(RO)+,4\$	; GET DH POINTER
11306	066774	001404			BEQ	5\$	; BRANCH IF THERE ISN'T ONE
11307	066776	104401	001205		TYPE	,\$CRLF	; TYPE CR-LF
11308	067002	104401			TYPE		; TYPE DATA HEADER
11309	067004	000000		4\$:	.WORD	0	; DH POINTER GOES HERE
11310	067006	012001		5\$:	MOV	(RO)+,R1	; GET DT POINTER
11311	067010	001455			BEQ	20\$	; BRANCH IF THERE ARE NONE
11312	067012	005004			CLR	R4	; SET INDENT SWITCH
11313	067014	012000			MOV	(RO)+,R0	; GET DF POINTER
11314	067016	012002			MOV	(RO)+,R2	; STORE NUMBER OF DH'S
11315	067020	001446			BEQ	17\$	; DH NUM IS 0-BRANCH
11316	067022	005104			COM	R4	; NO INDENT
11317	067024	104401	001205		TYPE	,\$CRLF	
11318	067030	112003		10\$:	MOVB	(RO)+,R3	; GET & STORE NUMBER OF DATA WORDS
11319	067032	105720			TSTB	(RO)+	; BUMP PAST FORMAT WORD
11320	067034	005703			TST	R3	; TEST IF ANY DATA FOR THIS HEADER
11321	067036	001407			BEQ	14\$	; NO - SKIP DATA PRINT
11322	067040	013146		11\$:	MOV	@(R1)+,-(SP)	; PUT FIRST DATA WORD ON STACK
11323	067042	104402			TYPOC		; TYPE IT
11324	067044	005303			DEC	R3	; MORE DATA WORDS
11325	067046	001403			BEQ	14\$	; NO-BRANCH

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TYPE ERROR ROUTINE

SEQ 0216

```

11326 067050 104401 067200      TYPE      SPACE2      ; TYPE SEPARATORS
11327 067054 000771      BR      11$      ; LOOP
11328 067056 005302      14$: DEC      R2      ; MORE DH'S?
11329 067060 003431      BLE      20$      ; NO-BRANCH
11330 067062 104401 001205      TYPE      $CRLF      ;
11331 067066 005760 000002      TST      2(R0)      ; ONLY A DH IN THIS REQUEST?
11332 067072 001404      BEQ      15$      ; YES-BRANCH BYPASS INDENT
11333 067074 005104      COM      R4      ; INDENT?
11334 067076 001002      BNE      15$      ; NO-BRANCH
11335 067100 104401 067200      TYPE      SPACE2      ; YES-TYPE SPACES
11336 067104 012037 067112      15$: MOV      (R0)+,16$      ; GET NEXT DH POINTER
11337 067110 104401      TYPE      TYPE DH
11338 067112 000000      16$: .WORD      0      ; DH POINTER GOES HERE
11339 067114 105710      TSTB      (R0)      ; TYPE A DT?
11340 067116 001003      BNE      21$      ; YES-BRANCH
11341 067120 062700 000002      ADD      #2,R0      ; INCREMENT DF POINTER
11342 067124 000754      BR      14$      ; SEE IF END OF DF BLOCK
11343 067126 104401 001205      21$: TYPE      $CRLF
11344 067132 005704      TST      R4      ; INDENT?
11345 067134 001335      BNE      10$      ; NO-BRANCH
11346 067136 104401 067200      17$: TYPE      SPACE2      ; YES-TYPE SPACES
11347 067142 000732      BR      10$      ; LOOP
11348 067144 104414      20$: RESREG
11349
11350 067146 032777 010000 111764      BIT      #SW12,2SWR      ; SEE IF ABORT DRV AFTER 20 ERRORS
11351 067154 001410      BEQ      25$      ; BR IF NO
11352 067156 023727 001103 000024      CMP      $ERFLG,#20.      ; ELSE SEE IF HAVE 20 ERRORS
11353 067164 001004      BNE      25$      ; BR IF NO
11354 067166 012706 001100      MOV      #STACK,SP      ; ELSE RESTORE STACK PTR
11355 067172 000137 042644      JMP      $EOP      ; AND GO TO NEXT DRV
11356
11357 067176 000207      25$: RTS      PC
11358 067200 020040      SPACE2: .ASCIZ/ /      ; 2 SPACES
11359
11360      ; ODT-11 -- V005A
11361      ; DEC-11-UODPA-A-LA
11362
11363      ; COPYRIGHT 1969,1970,1972
11364      ; DIGITAL EQUIPMENT CORPORATION
11365      ; MAYNARD, MASSACHUSETTS 01754
11366      .ENABL      ABS,AMA
11367      .EVEN
11368      .=. +60
11369
11370      R0      =      %0      ; REGISTER
11371      R1      =      %1      ; NAMING
11372      R2      =      %2      ; CONVENTIONS
11373      R3      =      %3
11374      R4      =      %4
11375      R5      =      %5
11376      SP      =      %6
11377      PC      =      %7
11378      ST      =      177776      ; STATUS REGISTER
11379
11379      O.TVEC      =      14      ; TRT VECTOR LOCATION
11380      O.STM      =      340      ; PRIORITY MASK - STATUS REGISTER
11381      O.TBT      =      20      ; T-BIT MASK - STATUS REGISTER

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11382      000003      TRT      =      000003      ;TRT INSTRUCTION
11383      000006      RTT      =      000006      ;RTT INSTRUCTION
11384
11385      ; R5 IS USUALLY CONSIDERED SAFE. THE CURRENT ADDRESS WORD
11386      ; RESIDES IN IT. AFTER A BREAKPOINT, IT IS SET TO ZERO, AND SEARCH
11387      ; OPERATIONS LEAVE IT RANDOMLY FILLED. OTHERWISE, IT SHOULD NOT
11388      ; BE USED EXCEPT FOR JSR'S AND THE CURRENT ADDRESS POINTER (CAD).
11389
11390
11391
11392
11393      177562      0.RDB      =      177562      ;R DATA BUFFER
11394      177560      0.RCSR      =      177560      ;R C/SR
11395      177566      0.TDB      =      177566      ;T DATA BUFFER
11396      177564      0.TCSR      =      177564      ;T C/SR
11397
11398
11399      ; INITIALIZE ODT
11400      ; USE 0.ODT FOR A NORMAL ENTRY
11401      ; USE 0.ODT+2 TO RESTART ODT - WIPING OUT ALL BREAKPOINTS
11402      ; USE 0.ODT+4 TO RE-ENTER (I.E. - FAKE A BREAKPOINT)
11403
11404      067264      000413      0.ODT:  BR      0.STRT      ;NORMAL ENTRY
11405      067266      000417      BR      0.RST      ;RESTART
11406      067270      013737      177776      067244      0.ENTR:  MOV      ST,0.UST      ;RE-ENTER -- SAVE STATUS
11407      067276      013737      000016      177776      MOV      0.TVEC+2,ST      ;SET UP LOCAL STATUS
11408      067304      010737      067242      MOV      PC,0.UPC      ;FAKE THE PC
11409      067310      000137      070442      JMP      0.BK1
11410
11411      067314      012706      067224      0.STRT:  MOV      #0.URD,SP      ;SET UP STACK
11412      067320      010637      067240      MOV      SP,0.USD      ;FAKE THE SAVED STACK
11413      067324      000414      BR      0.RST1      ;CLEAR BREAKPOINT TABLES
11414      067326      004037      070650      0.RST:  JSR      0,0.SVR      ;SAVE REGISTERS
11415      067332      013777      067262      177716      MOV      0.UIN,20.ADR1      ;REMOVE THE BREAKPOINT
11416      067340      113704      067246      MOV      0.PRI,R4      ;GET ODT PRIORITY
11417      067344      106004      RORB      R4      ;SHIFT
11418      067346      106004      RORB      R4      ;INTO
11419      067350      106004      RORB      R4      ;POSITION
11420      067352      110437      177776      MOV      R4,ST      ;STORE IN STATUS
11421      067356      000127      0.RST1:  JMP      (PC)+
11422      067360      000403      BR      0.45
11423      067362      012737      000002      070352      MOV      #RTI,0.RTIT      ;SET TO RTI IF 11/20 OR /05
11424      067370      105037      071271      0.45:  CLRB      0.P      ;DISALLOW PROCEED
11425      067374      012737      000340      000016      MOV      #0.STM,0.TVEC+2      ;STATUS WORD TO TRT VECTOR + 2
11426      067402      012737      070432      000014      MOV      #0.BRK,0.TVEC      ;PC TO TRT VECTOR
11427      067410      000447      BR      0.RALL      ;CLEAR BREAKPOINT TABLES
11428
11429      ; SPECIAL NAME HANDLER
11430      ; DEPENDS UPON THE EXPLICIT ORDER OF THE TWO TABLES 0.TL AND 0.URD
11431
11432      067412      004537      071072      0.REGT:  JSR      5,0.GET      ;SPECIAL NAME, GET ONE MORE CHARACTER
11433      067416      012704      071315      MOV      #0.TL,R4      ;TABLE START ADDRESS
11434      067422      120024      CMPB      R0,(R4)+      ;IS THIS THE CORRECT CHARACTER?
11435      067424      001413      BEQ      0.SP      ;JUMP IF YES
11436      067426      022704      071323      CMP      #0.TL+0.LG,R4      ;IS THE SEARCH DONE?
11437      067432      101373      BHI      0.RSP      ;BRANCH IF NOT

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11438 067434 042700 177770      BIC      #177770,R0      ;MASK OFF OCTAL
11439 067440 010004      MOV      R0,R4
11440 067442 006304      0.SP1:  ASL      R4
11441 067444 062704 067224      ADD      #0.URO,R4      ;GENERATE ADDRESS
11442 067450 005202      INC      R2      ;SET FOUND FLAG
11443 067452 000444      BR       0.SCAN      ;GO FIND NEXT CHARACTER
11444 067454 162704 071306      0.SP:  SUB      #0.-L-7,R4      ;CORRECT CONSTANT
11445 067460 000770      BR       0.SP1
11446
11447      ;
11448      ; + HANDLER - OPEN INDEXED ON THE PC
11449      ;
11449 067462 004737 071216      0.0RPC: JSR      PC,0.TCLS
11450 067466 010502      MOV      R5,R2      ;CURRENT ADDRESS IN R2
11451 067470 061202      ADD      #R2,R2      ;COMPUTE
11452 067472 006202      ASR      R2      ;MOVE ONE BIT TO CARRY
11453 067474 103421      BCS      0.ERR      ;ERROR IF ODD NUMBER
11454 067476 006302      ASL      R2      ;RESTORE WORD
11455 067500 005722      TST      (R2)+      ;AND INCREMENT BY TWO
11456 067502 010205      MOV      R2,R5      ;UPDATE CAD
11457 067504 000137 067756      JMP      0.0P2      ;GO FINISH UP
11458
11459      ;
11460      ; B HANDLER - SET AND REMOVE BREAKPOINTS
11461      ;
11461 067510 005702      0.BKPT: TST      R2      ;IF NO NUMBER TYPED
11462 067512 001406      BEQ      0.RALL      ;REMOVE BREAKPOINT
11463 067514 006204      ASR      R4      ;CHECK IF ODD
11464 067516 103410      BCS      0.ERR      ;JUMP IF ODD
11465 067520 006304      ASL      R4      ;RESTORE ONE BIT
11466 067522 010437 067256      MOV      R4,0.ADR1      ;SET A BREAKPOINT
11467 067526 000412      BR       0.DCD
11468 067530 012737 071332 067256 0.RALL: MOV      #0.0,0.ADR1 ;CLEAR BREAKPOINT
11469 067536 000406      BR       0.DCD
11470
11471      ;
11472      ; COMMAND DECODER - ODT11
11473      ;
11474      ;
11475      ;
11476      ;
11476 067540 052705 000001      0.ERR:  BIS      #1,R5      ;CLOSE EVERYTHING
11477 067544 012700 000077      MOV      #1,R0      ;? TO BE TYPED
11478 067550 004537 071150      JSR      5,0.FTYP      ;OUTPUT ?
11479 067554 004537 071250      0.DCD:  JSR      5,0.CRLS      ;TYPE <CR><LF>*
11480 067560 005004      0.DCD1: CLR      R4      ;R4 CONTAINS THE CONVERTED OCTAL
11481 067562 005002      CLR      R2      ;R2 IS THE NUMBER FOUND FLAG
11482 067564 004537 071072      0.SCAN: JSR      5,0.GET      ;GET A CHAR, RETURN IN R0
11483 067570 022700 000060      CMP      #0,R0      ;COMPARE WITH ASCII 0
11484 067574 101013      BHI      0.CLGL      ;CHECK LEGALITY IF NON-NUMERIC
11485 067576 022700 000067      CMP      #7,R0      ;COMPARE WITH ASCII 7
11486 067602 103410      BLO      0.CLGL      ;CHECK LEGALITY IF NOT OCTAL
11487 067604 042700 177770      BIC      #177770,R0      ;CONVERT TO BCD
11488 067610 006304      ASL      R4      ;MAKE ROOM
11489 067612 006304      ASL      R4      ;IN
11490 067614 006304      ASL      R4      ;R4
11491 067616 060004      ADD      R0,R4      ;PACK THREE BITS IN R4
11492 067620 005202      INC      R2      ;R2 HAS NUMERIC FLAG
11493 067622 000760      BR       0.SCAN      ;AND TRY AGAIN

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MO1

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11494 067624 005001
11495 067626 120061 071301
11496 067632 001405
11497 067634 005201
11498 067636 020127 000014
11499 067642 103336
11500 067644 000770
11501 067646 006301
11502 067650 000171 067654
11503
11504 067654 067704
11505 067656 067736
11506 067660 067412
11507 067662 070246
11508 067664 067750
11509 067666 067462
11510 067670 070002
11511
11512 067672 070012
11513 067674 070070
11514 067676 070064
11515 067700 067510
11516 067702 070354
11517 000030
11518
11519
11520
11521 067704 005702
11522 067706 001410
11523 067710 010405
11524 067712 006205
11525 067714 103711
11526 067716 006305
11527 067720 011500
11528 067722 004537 071006
11529 067726 000714
11530 067730 042705 000001
11531 067734 000766
11532
11533
11534
11535 067736 004737 071216
11536 067742 052705 000001
11537 067746 000702
11538
11539
11540
11541 067750 004737 071216
11542 067754 005725
11543 067756 004537 071242
11544 067762 010500
11545 067764 004537 071006
11546 067770 012700 000057
11547 067774 004537 071150
11548 070000 000744
11549

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```

O.CLGL: CLR R1 ; CLEAR INDEX
O.LGL1: CMPB R0,O.LGCH(R1) ; DO THE CODES MATCH?
      BEQ O.LGL2 ; JUMP IF YES
      INC R1 ; SET INDEX FOR NEXT SEARCH
      CMP R1,#O.CLGT ; IS THE SEARCH DONE?
      BHS O.ERR ; OOPS!
      BR O.LGL1 ; RE-LOOP
O.LGL2: ASL R1 ; MULTIPLY BY TWO
      JMP @O.LGDR(R1) ; GO TO PROPER ROUTINE

O.LGDR: O.WRD ; / OPEN WORD
      O.CRET ; CARRIAGE RETURN CLOSE
      O.REGT ; $ REGISTER OPS
      O.GO ; G GO TO ADDRESS K
      O.OP1 ; <LF> MODIFY CLOSE OPEN NEXT
      O.ORPC ; + OPEN RELATED INDEX - PC
      O.BACK ; + OPEN PREVIOUS

      O.OFST ; O OFFSET
      O.WSCH ; W SEARCH WORD
      O.EFF ; E SEARCH EFFECTIVE ADDRESS
      O.BKPT ; B BREAKPOINTS
      O.PROC ; P PROCEED

O.LGL = -O.LGDR ; LGL MUST EQUAL 2X CHLGT ALWAYS

; PROCESS / - OPEN WORD
O.WRD: TST R2 ; GET VALUE IF R2 IS NON-ZERO
      BEQ O.WRDA ; SKIP OTHERWISE
      MOV R4,R5 ; PUT VALUE IN CAD
O.WRD1: ASR R5 ; MOVE ONE BIT TO CARRY
O.ERR2: BCS O.ERR ; JUMP IF ODD ADDRESS
      ASL R5 ; RESTORE THE CARRY BIT
      MOV @R5,R0 ; GET CONTENTS OF WORD
      JSR S,O.CADV ; GO GET AND TYPE OUT @CAD
      BR O.DCD1 ; GO BACK TO DECODER
O.WRDA: BIC #1,R5 ; CLEAR CLOSED BIT
      BR O.WRD1 ; GO BACK TO MAIN-LINE

; PROCESS CARRIAGE RETURN
O.CRET: JSR PC,O.TCLS ; CLOSE LOCATION
      BIS #1,R5 ; CLOSE EVERYTHING
      BR O.DCD ; RETURN TO DECODER

; PROCESS <LF>, OPEN NEXT WORD
O.OP1: JSR PC,O.TCLS ; CLOSE PRESENT CELL
      TST (R5)+ ; GENERATE NEW ADDRESS
O.OP2: JSR S,O.CRLF ; <CR><LF>
      MOV R5,R0 ; NUMBER TO TYPE
      JSR S,O.CADV ; TYPE OUT ADDRESS
      MOV #/,R0 ; TYPE A /
      JSR S,O.FTYP
      BR O.WRD1 ; GO PROCESS IT

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NO1

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11550 ; PROCESS 1, OPEN PREVIOUS WORD
11551
11552 070002 004737 071216 0.BACK: JSR PC,0.TCLS ;GENERATE NEW ADDRESS
11553 070006 005745 TST -(R5) ;GO DO THE REST
11554 070010 000762 BR 0.OP2
11555
11556 ; PROCESS 0, COMPUTE OFFSET
11557
11558 070012 006205 0.OFST: ASR R5 ;GET LOW ORDER BIT
11559 070014 103737 BCS 0.ERR2 ;ERROR IF CLOSED
11560 070016 006305 ASL R5 ;RESTORE WORD
11561 070020 012700 000040 MOV #',R0 ;TYPE ONE BLANK
11562 070024 004537 071150 JSR 5,0.FTYP ; AS A SEPARATOR
11563 070030 160504 SUB R5,R4 ;COMPUTE
11564 070032 005304 DEC R4 ;
11565 070034 005304 DEC R4 ; 16 BIT OFFSET
11566 070036 010400 MOV R4,R0 ;TYPE A
11567 070040 010402 MOV R4,R2 ;SAVE R4
11568 070042 004537 071006 JSR 5,0.CADV ;NUMBER IN R0 - WORD MODE
11569 070046 010200 MOV R2,R0 ;
11570 070050 006200 ASR R0 ;DIVIDE BY TWO
11571 070052 103402 BCS 0.OF1 ;BRANCH IF ODD
11572 070054 004537 071006 JSR 5,0.CADV ;NUMBER IN R0 - BYTE MODE
11573 070060 000137 067560 0.OF1: JMP 0.DCD1 ;ALL DONE
11574
11575 ; SEARCHES - $MSK HAS THE MASK
11576 ; $MSK+2 HAS THE FWA
11577 ; $MSK+4 HAS THE LWA
11578
11579
11580
11581
11582
11583 070064 005201 0.EFF: INC R1 ;SET EFFECTIVE SEARCH
11584 070066 000401 BR 0.WDS ;
11585 070070 005001 0.WSCH: CLR R1 ;SET WORD SEARCH
11586 070072 005702 0.WDS: TST R2 ;CHECK FOR OBJECT FOUND
11587 070074 001621 0.ERR1: BEQ 0.ERR ;ERROR IF NO OBJECT
11588 070076 013702 067252 MOV 0.MSK+2,R2 ;SET ORIGIN
11589 070102 013705 067250 MOV 0.MSK,R5 ;SET MASK
11590 070106 005105 COM R5 ;AND COMPLEMENT IT
11591 070110 020237 067254 0.WDS2: CMP R2,0.MSK+4 ; IS THE SEARCH ALL DONE?
11592 070114 101217 BHI 0.DCD ; YES
11593 070116 011200 MOV @R2,R0 ; GET OBJECT
11594 070120 005701 TST R1 ;NO
11595 070122 001027 BNE 0.EFF1 ;BRANCH IF EFFECTIVE SEARCH
11596 070124 010046 MOV R0,-(SP) ;EXCLUSIVE OR
11597 070126 010403 MOV R4,R3 ; IS DONE
11598 070130 040400 BIC R4,R0 ;
11599 070132 042603 BIC (SP)+,R3 ; IN A VERY
11600 070134 050003 BIS R0,R3 ; FANCY MANNER HERE
11601 070136 040503 BIC R5,R3 ;AND RESULT WITH MASK
11602 070140 001016 0.WDS3: BNE 0.WDS4 ;RE-LOOP IF NO MATCH
11603 070142 010446 MOV R4,-(SP) ;REGISTERS R2,R4, AND R5 ARE SAFE
11604 070144 004537 JSR 5,0.CRLF ;TYPE <CR,LF>
11605 070150 010200 MOV R2,R0 ;GET READY TO TYPE

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11606	070152	004537	071006	JSR	5,0.CADV	: TYPE ADDRESS
11607	070156	012700	000057	MOV	#1/R0	: SLASH TO R0
11608	070162	004537	071150	JSR	5,0.FTYP	: TYPE IT
11609	070166	011200		MOV	R2,R0	: GET CONTENTS
11610	070170	004537	071006	JSR	5,0.CADV	: TYPE CONTENTS
11611	070174	012604		MOV	(SP)+,R4	: RESTORE R4
11612	070176	005722		0.WDS4: TST	(R2)+	: INCREMENT TO NEXT CELL AND
11613	070200	000743		BR	0.WDS2	: RETURN
11614	070202	020004		0.EFF1: CMP	R0,R4	: IS (X)=K?
11615	070204	001755		BEQ	0.WDS3	: TYPE IF EQUAL
11616	070206	010003		MOV	R0,R3	: (X) TO R3
11617	070210	060203		ADD	R2,R3	: (X)+X
11618	070212	005203		INC	R3	
11619	070214	005203		INC	R3	: (X)+X+2
11620	070216	020304		CMP	R3,R4	: IS (X)+X+2=K?
11621	070220	001747		BEQ	0.WDS3	: BRANCH IF EQUAL
11622	070222	042700	177400	BIC	#177400,R0	: WIPE OUT EXTRANEIOUS BITS
11623	070226	110000		MOV	R0,R0	: EXTEND SIGN
11624	070230	000257		CCC		
11625	070232	006300		ASL	R0	: MULTIPLY BY TWO
11626	070234	005200		INC	R0	: ADD TWO
11627	070236	005200		INC	R0	
11628	070240	060200		ADD	R2,R0	: ADD PC
11629	070242	020004		CMP	R0,R4	: IS THE RESULT A PROPER REL. BRANCH?
11630	070244	000735		BR	0.WDS3	
11631						
11632				: PROCESS G - GO		
11633						
11634	070246	105037	071271	0.GO: CLRB	0.P	: DISALLOW PROCEED
11635	070252	006204		ASR	R4	: CHECK LOW ORDER BIT
11636	070254	103617		BCS	0.ERR2	: ERROR IF ODD NUMBER
11637	070256	006304		ASL	R4	: RESTORE WORD
11638	070260	010437	067242	MOV	R4,0.UPC	: SET UP NEW PC
11639	070264	112737	000340	MOV	#0,ST	: SET HIGH PRIORITY
11640	070272	004537	070740	JSR	5,0.RST	: RESTORE TELETYPE
11641	070276	105037	071270	0.TBIT: CLRB	0.T	: CLEAR BOTH
11642	070302	042737	000020	BIC	#0,TBIT,0.UST	: T-BIT FLAGS
11643	070310	017737	176742	MOV	20.ADR1,0.UIN	: SAVE INSTRUCTION
11644	070316	013777	071332	MOV	0.TRTC,20.ADR1	: REPLACE WITH TRAP
11645	070324	012600		0.G02: MOV	(SP)+,R0	: RESTORE
11646	070326	012601		MOV	(SP)+,R1	: R0
11647	070330	012602		MOV	(SP)+,R2	: THRU
11648	070332	012603		MOV	(SP)+,R3	
11649	070334	012604		MOV	(SP)+,R4	
11650	070336	012605		MOV	(SP)+,R5	
11651	070340	012606		MOV	(SP)+,SP	: R5
11652	070342	013746	067244	MOV	0.UST,-(SP)	: AND SP
11653	070346	013746	067242	MOV	0.UPC,-(SP)	: AND STATUS
11654	070352	000006		0.RTIT: RTT		: AND PC
11655						: CHANGED TO RTI FOR 11/20 AND /05
11656				: PROCESS P - PROCEED		
11657				: ONLY ALLOWED AFTER A BREAKPOINT		
11658						
11659	070354	105737	071271	0 PROC: TSTB	0.P	: CHECK LEGALITY OF PROCEED
11660	070360	001645		BEQ	0.ERR1	: NOT LEGAL
11661	070362	105037	071271	CLRB	0.P	: CLEAR PROCEED FLAG

C02

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TYPE ERROR ROUTINE

SEQ 0222

11662	070366	005702		TST	R2		; WAS COUNT SPECIFIED?
11663	070370	001402		BEQ	0.PRI		; NO
11664	070372	010437	067260	MOV	R4,0,CT		; YES PUT AWAY COUNT
11665	070376	112737	000340	177776	0.PRI: MOV	#0,STM,ST	; FORCE HIGH PRIORITY
11666	070404	004537	070740		JSR	5,0,RST	; RESTORE TTY
11667	070410	112737	000340	177776	0.C1: MOV	#0,STM,ST	; SET HIGH PRIORITY
11668	070416	105237	071270		INCB	0,T	; SET T-BIT FLAG
11669	070422	052737	000020	067244	BIS	#0,TBT,0,UST	; SET T-BIT
11670	070430	000735			BR	0.G02	
11671							
11672							
11673							
11674							
11675							
11676							
11677	070432	012637	067242	0.BRK:	MOV	(SP)+,0,UPC	; PRIORITY IS 7 UPON ENTRY
11678	070436	012637	067244		MOV	(SP)+,0,UST	; SAVE STATUS AND PC
11679	070442	004037	070650	0.BK1:	JSR	0,0,SVR	; SAVE VARIOUS REGISTERS
11680	070446	105737	071270		TSTB	0,T	; CHECK FOR T-BIT SET
11681	070452	001311			BNE	0,TBIT	; JUMP IF SET
11682	070454	013777	067262	176574	MOV	0,UIIN,20,ADR1	; REMOVE BREAKPOINTS
11683	070462	105737	067246		TSTB	0,PRI	; CHECK IF PRIORITY
11684	070466	100003			BPL	0,BK2	; IS AS SAME AS USER PGM
11685	070470	113705	067244		MOV	0,UST,R5	; PICK UP USER UST IF SO
11686	070474	000407			BR	0,BK3	; AND DON'T COMPUTE THE PRIORITY
11687	070476	113705	067246	0.BK2:	MOV	0,PRI,R5	; OTHERWISE PICK UP ACTUAL PRIORITY
11688	070502	000257			CCC		; CLEAR CARRY
11689	070504	106005			RORB	R5	; SHIFT LOW ORDER BITS
11690	070506	106005			RORB	R5	; INTO
11691	070510	106005			RORB	R5	; HIGH ORDER
11692	070512	106005			RORB	R5	; POSITION
11693	070514	110537	177776	0.BK3:	MOV	R5,ST	; PUT THE STATUS AWAY WHERE IT BELONGS
11694	070520	013705	067242		MOV	0,UPC,R5	; GET PC, IT POINTS TO THE TRT
11695	070524	005745			TST	-(R5)	; SUBTRACT TWO
11696	070526	010537	067242		MOV	R5,0,UPC	; FROM THE USER'S PC
11697	070532	020537	067256		CMP	R5,0,ADR1	; COMPARE WITH LIST
11698	070536	001417			BEQ	0,B2	; JUMP IF FOUND
11699	070540	004537	070706		JSR	5,0,SVTT	; SAVE TELETYPE STATUS
11700	070544	004537	071242		JSR	5,0,CRLF	
11701	070550	012704	071274		MOV	#0,BD,R4	; ERROR, NOTHING FOUND
11702	070554	012703	071275		MOV	#0,BD+1,R3	
11703	070560	004537	071134		JSR	5,0,TYPE	; OUTPUT "BE" FOR BAD ENTRY
11704	070564	010500			MOV	R5,R0	
11705	070566	042737	000020	067244	BIC	#0,TBT,0,UST	; CLEAR OUT ANY POSSIBLE FAKE T-BIT
11706	070574	000420			BR	0,B3	; AND CONTINUE
11707	070576	005337	067260	0.B2:	DEC	0,CT	
11708	070602	003302			BGT	0,C1	; JUMP IF REPEAT
11709	070604	012737	000001	067260	MOV	#1,0,CT	; RESET COUNT TO 1
11710	070612	105237	071271		INCB	0,P	; ALLOW PROCEED
11711	070616	004537	070706		JSR	5,0,SVTT	; SAVE TELETYPE STATUS, R4 IS SAFE
11712	070622	012700	000102		MOV	#B,R0	
11713	070626	004537	071150		JSR	5,0,FTYP	; TYPE "B"
11714	070632	013700	067256		MOV	0,ADR1,R0	; GET ADDRESS OF BREAK
11715	070636	004537	071006	0.B3:	JSR	5,0,CADV	; TYPE ADDRESS
11716	070642	005005			CLR	R5	; CLEAR CAD
11717	070644	000137	067554		JMP	0,DCD	; GO TO DECODER

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TYPE ERROR ROUTINE

SEQ 0223

```

11718
11719
11720
11721 070650 012637 071266
11722 070654 010637 067240
11723 070660 012706 067240
11724 070664 010546
11725 070666 010446
11726 070670 010346
11727 070672 010246
11728 070674 010146
11729 070676 013746 071266
11730 070702 005746
11731 070704 000200
11732
11733
11734
11735 070706 113737 177560 071272
11736 070714 113737 177564 071273
11737 070722 105037 177560
11738 070726 105037 177564
11739 070732 004537 071242
11740 070736 000205
11741
11742
11743
11744 070740 004537 071242
11745 070744 105737 177564
11746 070750 100375
11747 070752 032737 004000 177560
11748 070760 001403
11749 070762 105737 177560
11750 070766 100375
11751 070770 113737 071272 177560
11752 070776 113737 071273 177564
11753 071004 000205
11754
11755
11756
11757
11758 071006 010246
11759 071010 012704 071331
11760 071014 012746 000060
11761 071020 010002
11762 071022 042702 177770
11763 071026 061602
11764 071030 110244
11765 071032 006200
11766 071034 006200
11767 071036 006200
11768 071040 020427 071324
11769 071044 101365
11770 071046 042700 177776
11771 071052 062600
11772 071054 110044
11773 071056 012703 071331

; SAVE REGISTERS R0-R6 IN INTERNAL STACK
0.SVR: MOV (SP)+,0.XXX ; PICK REGISTER FROM STACK AND SAVE
        MOV SP,0.USP ; SAVE USER STACK ADDRESS
        MOV #0.USP,SP ; SET TO INTERNAL STACK
        MOV R5,-(SP) ; SAVE
        MOV R4,-(SP) ; REGISTERS
        MOV R3,-(SP) ; 1
        MOV R2,-(SP) ; THRU
        MOV R1,-(SP) ; 5
        MOV 0.XXX,-(SP) ; PUT SAVED REGISTER ON STACK
        TST -(SP)
        RTS R0

; SAVE TELETYPE STATUS
0.SVTT: MOVB 0.RCSR,0.CSR1 ; SAVE R C/SR
        MOVB 0.TCSR,0.CSR2 ; SAVE T C/SR
        CLRB 0.RCSR ; CLEAR ENABLE AND MAINTENANCE
        CLRB 0.TCSR ; BITS IN BOTH C/SR
        JSR 5,0.CRLF ; TYPE <CR,LF>
        RTS R5

; RESTORE TELETYPE STATUS
0.RSTT: JSR 5,0.CRLF ; <CR,LF> BEFORE RESTORING
        TSTB 0.TCSR ; WAIT READY ON PRINTER
        BPL -4
        BIT #4000,0.RCSR ; CHECK BUSY FLAG ON READER
        BEQ 0.RSE1 ; SKIP READY LOOP IF NOT BUSY
        TSTB 0.RCSR ; WAIT READY
        BPL -4 ; ON READER
        MOVB 0.CSR1,0.RCSR ; RESTORE
        MOVB 0.CSR2,0.TCSR ; THE STATUS REGISTERS
        RTS R5

; TYPE OUT CONTENTS OF WORD OR BYTE WITH ONE TRAILING SPACE
; WORD IS IN R0
0.CADV: MOV R2,-(SP) ; SAVE R2
        MOV #0.BUF+6,R4 ; BUFFER START ADDRESS
        MOV #0,-(SP) ; CONSTANT ASCII 0
0.SPC: MOV R0,R2 ; GET
        BIC #177770,R2 ; OCTAL CHARACTER
        ADD #SP,R2 ; CONVERT TO ASCII
        MOVB R2,-(R4) ; STORE IN BUFFER
        ASR R0 ; SHIFT THIS MESS
        ASR R0 ; RIGHT
        ASR R0 ; THREE WHOLE PLACES
        CMP R4,#0.BUF+1 ; DONE?
        BHI 0.SPC ; NO
        BIC #177776,R0 ; GET LAST BIT
        ADD (SP)+,R0 ; CONVERT TO ASCII
        MOVB R0,-(R4) ; AND PUT IT AWAY
        MOV #0.BUF+6,R3 ; LWA

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TYPE ERROR ROUTINE

SEQ 0224

11774 071062 004537 071134
11775 071066 012602
11776 071070 000205
11777
11778
11779
11780
11781 071072 105737 177560
11782 071076 100375
11783 071100 113700 177562
11784 071104 004537 071150
11785 071110 042700 177600
11786 071114 001766
11787 071116 122700 000040
11788 071122 001763
11789 071124 122700 000073
11790 071130 001760
11791 071132 000205
11792
11793
11794
11795
11796
11797 071134 020304
11798 071136 103426
11799 071140 112400
11800 071142 004537 071150
11801 071146 000772
11802
11803
11804
11805 071150 105737 177564
11806 071154 100375
11807 071156 110037 177566
11808 071162 120037 000045
11809 071166 001012
11810 071170 113746 000044
11811 071174 105737 177564
11812 071200 100375
11813 071202 105037 177566
11814 071206 105316
11815 071210 003371
11816 071212 005726
11817 071214 000205
11818
11819
11820
11821
11822 071216 006205
11823 071220 103405
11824 071222 006305
11825 071224 005702
11826 071226 001401
11827 071230 010415
11828 071232 000207
11829 071234 005746

```

      JSR      5,0,TYPE      ;TYPE WHOLE STRING OF CHARACTERS
      MOV      (SP)+,R2      ;RESTORE R2
      RTS      R5

;
; GENERAL CHARACTER INPUT ROUTINE
; CHARACTER INPUT GOES TO R0
;
0.GET:  TSTB    0,RCSR      ;WAIT FOR
      BPL      -4           ;INPUT FROM KEYBOARD
      MOVB     0,RDB,R0     ;GET A CHARACTER
      JSR      5,0,FTYP     ;ECHO CHARACTER
      BIC      #177600,R0   ;STRIP OFF PARITY FROM CHARACTER
      BEQ      0,GET        ;IGNORE NULLS
      CMPB     #40,R0       ;CHECK FOR SPACES
      BEQ      0,GET        ;IGNORE NULLS
      CMPB     #'',R0       ;CHECK FOR SEMI-COLON
      BEQ      0,GET        ;IGNORE THEM IF FOUND
      RTS      R5

;
; GENERAL CHARACTER OUTPUT ROUTINE
; ADDRESS OF FIRST BYTE IN R4,
; ADDRESS OF LAST BYTE IN R3, (R3)>(R4)
;
0.TYPE:  CMP     R3,R4      ;CHECK FOR COMPLETION
      BLO      0,TYP1      ;EXIT WHEN DONE
      MOVB     (R4)+,R0     ;GET A CHARACTER
      JSR      5,0,FTYP     ;TYPE ONE CHARACTER
      BR       0,TYPE       ;LOOP UNTIL DONE

;
; TYPE ONLY ONE CHARACTER (CONTAINED IN R0)
;
0.FTYP:  TSTB    0,TCR      ;CHECK STATUS
      BPL      -4           ;WAIT UNTIL READY
      MOVB     R0,0,TDB     ;TYPE ONE CHARACTER
      CMPB     R0,#45       ;IS CHAR TO BE FILLED?
      BNE      0,TYP1      ;NO
      MOVB     #44,-(SP)    ;YES, INIT THE COUNT
      TSTB     0,TCR        ;
      BPL      0,TYP2      ;
      CLRB     0,TDB        ;GENERATE NULL FILLER
      DECB     #SP          ;
      BGT      0,TYP2      ;
      TST      (SP)+        ;POP STACK
      RTS      R5

;
; CLOSE WORD OR BYTE AND EXIT
; UPON ENTERING, R2 HAS NUMERIC FLAG, R4 HAS CONTENTS
;
0.TCLS:  ASR     R5         ;GET LOW ORDER BIT
      BCS      0,TC        ;JUMP IF ALREADY CLOSED
      ASL      R5
      TST      R2          ;IF NO NUMBER WAS TYPED THERE IS
      BEQ      0,CLS1      ;NO CHANGE TO THE OPEN CELL
      MOV      R4,#R5      ;STORE WORD
      RTS      PC

0.CLS1:  RTS
0.TC:    TST      -(SP)     ;POP EXTRA CELL FROM STACK

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TYPE ERROR ROUTINE

SEQ 0225

```

11830 071236 000137 067540      JMP      0.ERR          ;AND SCREAM BLOODY MURDER
11831
11832      O.CRLF - TYPE <CR,LF>
11833      O.CRLS - TYPE <CR,LF>*
11834
11835 071242 012703 071277      O.CRLF: MOV      #0.CR+1,R3      ;LWA <CR,LF>
11836 071246 000402              BR          0.CRS
11837 071250 012703 071300      O.CRLS: MOV      #0.CR+2,R3      ;LWA <CR,LF>*
11838 071254 012704 071276      O.CRS:  MOV      #0.CR,R4        ;FWA
11839 071260 004537 071134      JSR          5,0.TYPE      ;TYPE SOMETHING
11840 071264 000205              RTS          R5
11841
11842 071266 000000      O.XXX:  .WORD      0          ;TEMPORARY STORAGE
11843 071270          .BYTE      0          ;T-BIT FLAG
11844 071271          .BYTE      0          ;PROCEED FLAG = 0 IF PROCEED NOT ALLOWED
11845          .BYTE      0          ;= 1 IF PROCEED ALLOWED
11846 071272          .BYTE      0          ;SAVE CELL - R C/SR
11847 071273          .BYTE      0          ;SAVE CELL - T C/SR
11848
11849      .EVEN
11850 071274 042502      O.BD:    .WORD      "BE
11851
11852 071276          .BYTE      015          ; <CR>
11853 071277          .BYTE      012          ; <LF>
11854 071300          .BYTE      '*'          ; *
11855
11856 071301          .BYTE      '/'          ; /
11857 071302          .BYTE      015          ; CARRIAGE RETURN
11858 071303          .BYTE      '$'          ; $
11859 071304          .BYTE      'G'          ; G
11860 071305          .BYTE      012          ; <LF>
11861 071306          .BYTE      '+'          ; +
11862 071307          .BYTE      '↑'          ; ↑
11863 071310          .BYTE      'O'          ; O
11864 071311          .BYTE      'W'          ; W
11865 071312          .BYTE      'E'          ; E
11866 071313          .BYTE      'B'          ; B
11867 071314          .BYTE      'P'          ; P
11868          000014      O.CLGT  =      -O.LGCH          ;TABLE LENGTH
11869
11870 071315          .BYTE      'S'          ; DO
11871 071316          .BYTE      'P'          ; NOT
11872 071317          .BYTE      'M'          ; CHANGE
11873 071320          .BYTE      0          ; THE
11874 071321          .BYTE      0          ; ORDER
11875 071322          .BYTE      'B'          ; HERE
11876          000006      O.LG      =      -O.TL
11877
11878 071323      O.BUF:      =      +6          ;6 CHAR. BUFFER WITH
11879          .BYTE      ;+6          ;TRAILING BLANK
11880 071331          .EVEN
11881
11882 071332 000003      O.TRTC: TRT          ;TRACE TRAP PROTOTYPE
11883
11884      ;THE ORDER OF THE FOLLOWING ENTRIES IS CRITICAL
11885

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G02

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TYPE ERROR ROUTINE

SEQ 0226

11886
11887
11888 067224 000000
11889 067226 000000
11890 067230 000000
11891 067232 000000
11892 067234 000000
11893 067236 000000
11894 067240 000000
11895 067242 000000
11896 067244 000000
11897 067246 000007
11898 067250 000000
11899 067252 000000
11900 067254 000000
11901
11902
11903
11904
11905 067256 000000
11906 067260 000000
11907 067262 000000
11908 000001

;
O.URD: = O.GDT-40
USER RC
R1
R2
R3
R4
R5
O.USP: USER SP
O.UPC: USER PC
O.UST: USER ST
O.PRI: 7 ODT PRIORITY
O.MSK: 0 MASK
0 LOW LIMIT
0 HIGH LIMIT
;
BREAK POINT LISTS, ADR1 = ADDRESS OF BREAKPOINT, CT = COUNT,
UIN = CONTENTS
O.ADR1: 0
O.CT: 0
O.UIN: 0
.END

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0227

ABASE = 177440	2553	2594	2608#						
ACDW1 = 000000	2553	2596							
ACDW2 = 000000	2553	2597							
ACLO = 000010	1434#								
ACPUOP = 000000	2553	2568							
ACT11 = 005430	2763#	3734*							
ADDW0 = 000000	2553	2598							
ADDW1 = 000000	2553	2599							
ADDW10 = 000000	2553								
ADDW11 = 000000	2553								
ADDW12 = 000000	2553								
ADDW13 = 000000	2553								
ADDW14 = 000000	2553								
ADDW15 = 000000	2553								
ADDW2 = 000000	2553	2600							
ADDW3 = 000000	2553	2601							
ADDW4 = 000000	2553	2602							
ADDW5 = 000000	2553	2603							
ADDW6 = 000000	2553	2604							
ADDW7 = 000000	2553	2605							
ADDW8 = 000000	2553								
ADDW9 = 000000	2553								
ADEVCT = 000000	2553	2559							
ADEVN = 000000	2553	2595							
AENV = 000000	2553	2564							
AENVN = 000000	2553	2565							
AFATAL = 000000	2553	2556							
AMADR1 = 000000	2553	2581							
AMADR2 = 000000	2553	2585							
AMADR3 = 000000	2553	2588							
AMADR4 = 000000	2553	2591							
AMAMS1 = 000000	2553	2575							
AMAMS2 = 000000	2553	2583							
AMAMS3 = 000000	2553	2586							
AMAMS4 = 000000	2553	2589							
AMSGAD = 000000	2553	2561							
AMSGLG = 000000	2553	2562							
AMSGTY = 000000	2553	2555							
AMTYP1 = 000000	2553	2576							
AMTYP2 = 000000	2553	2584							
AMTYP3 = 000000	2553	2587							
AMTYP4 = 000000	2553	2590							
APASS = 000000	2553	2558							
APRIOR = 000000	2553								
APTCSU = 000040	9362	9534#							
APTENV = 000001	9309	9355	9490	9532#					
APTSIZ = 000200	3663	9531#							
APTSP0 = 000100	9357	9492	9533#						
ASWREG = 000000	2553	2566							
ATESTN = 000000	2553	2557							
ATTN = 005304	2698#	7141	7269	7732	7854	8261	8281	8308	8337
AUNIT = 000000	2553	2560							
AUSWR = 000000	2553	2567							
AVECT1 = 000000	2553	2592							
AVECT2 = 000000	2553	2593							
BADHDR = 005300	2688#	3742*	9003						

[illegible]

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CZR6GB.P11 03-JAN-78 08:46 CROSS REFERENCE TABLE -- USER SYMBOLS

CKCERR	=	045064	8210	8214	8225	8230	8478#								
CKSWR	=	104407	9229	9293	9319	10194#									
CLEAR	=	000005	1368#	4302	4436	4595	4757	4852	5015	5190	5620	5845	7113	7241	9026
CLKOF	=	047162	4402	4474	4561	4633	6584	6656	6746	6829	8904#	8919			
CLKON	=	047114	4385	4544	6573	6645	6740	6823	8888#	8915					
CLOCK	=	047154	3766	8899#											
CLRFLG	=	043026	3684	8062#											
COE	=	001000	1421#												
COUNT	=	001366	2640#	4222*	4248*	4328*	4384*	4461	4487*	4543*	4620	4700*	4749*	4795*	4844*
			4898#	4937*	4989*	5038*	5073*	5112*	5164*	5213*	5253*	5335*	5643*	5868*	5984*
			6117*	6162*	6219*	6553*	6572*	6585*	6586	6625*	6644*	6657*	6658	6739*	6747*
			6748	6822*	6830*	6831	6894*	6986*	7161*	7289*	8339	8899*	8916		
CR	=	000015	1241#	9401	9411	10205	10213	10215	10219	10229	10238	10245	10253	10260	10265
			10269	10275	10279	10285	10291	10296	10305	10313	10320	10328	10333	10340	10345
			10350	10355	10359	10365	10370	10374	10378	10380	10384	10389	10391	10392	10396
			10403	10407	10414	10419	10423	10429	10447	10455	10475	10483	10546	10573	10580
			10585	10590	10602	10623	10639	10807	10815	10844	10877	10995			
			1242#	9372	9411										
CRLF	=	000200	1386#	8484											
CTO	=	004000	2635#	4294	4741	4836	7478*	7482	7598*	7602*	7607	8620*	8621*	8622*	8623*
CYLADD	=	001360	8624*	8625*	8643*	8644*	8645*	8646*	8647*	8648*					
			2634#	4291	8604*	8605*	8606*	8607*	8608*	8609*	8610	8612*	8630*	8631*	8632*
CYLDIF	=	001356	8633*	8634*	8635*	8636	8638*								
			2664#	7479	7596	7603	7621								
DATAD	=	001434	2665#	7479*	7481	7596	7599*	7603*	7606						
DATAD1	=	001436	2666#	7599											
DATAD1	=	001440	7365	7487	7613	7782	7903	8190#							
DATCMD	=	043430	1427#												
DCK	=	100000	1435#												
DCLO	=	000020	1388#												
DCPAR	=	020000	1248#	2528	3651										
DDISP	=	177570	2762#	3730*	3927	4135									
DDPCH	=	005426	1439#												
DDT	=	000400	2761#	3697*	8062										
DDUMP	=	005424	2806	2812	2818	2824	2835	2841	2846	3074	3114	3119	11136#		
DF1	=	066314	2851	2856	2861	2866	2871	2893	2898	2908	2924	2984	299		

SEQ 0230

[illegible]

L02

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0231

DOCMD	043372	4236	4263	4303	4437	4596	4712	4758	4807	4853	4909	4961	5016	5084
		5136	5191	5268	5276	5350	5358	5439	5447	5473	5523	5531	5562	5570
		5601	5609	5621	5664	5672	5698	5748	5756	5787	5795	5826	5834	5846
		5894	5902	5948	5956	5969	5977	6027	6035	6081	6089	6102	6110	6177
		6185	6234	6242	6286	6294	6306	6314	6322	6354	6362	6406	6414	6426
		6434	6442	6474	6482	6535	6543	6607	6615	6686	6694	6717	6725	6769
		6777	6800	6808	6867	6875	6910	6918	6931	6959	6967	7002	7010	7023
		7059	7067	7081	7114	7187	7195	7209	7242	7332	7340	7459	7467	7550
		7558	7575	7583	7703	7711	7727	7828	7836	7848	7951	7987	7995	8179*
		8509	8993	9011	9027									
DPAT1	001442	2667*												
DPAT2	001444	2668*												
DRA	= 000001	1431*	3962	4065										
DRAV	044172	4229	4254	4335	4356	4387	4392	4403	4494	4515	4546	4551	4562	4707
		4780	4802	4875	4905	4941	4993	5080	5116	5168	5260	5342	5504	5729
		5929	6062	6169	6226	6555	6575	6627	6647	6706	6734	6789	6817	6898
		6990	7146	7153	7165	7274	7281	7293	7736	7751	7858	7873	8326*	
DRDY	= 000200	1438*												
DRIVS	005434	2765*	3853*	3866*	3883	3899*	3929*	3948	4052*	4119	8025	8120*		
DRIVO	005436	2771*	3746	3855	3901	4014	8101							
DRIV1	005440	2772*												
DRIV2	005442	2773*												
DRIV3	005444	2774*												
DRIV4	005446	2775*												
DRIV5	005450	2776*												
DRIV6	005452	2777*												
DRIV7	005454	2778*												
DROT	= 000040	1436*												
DRPAR	= 000010	1415*												
DRVMSK	= 000007	1395*	3922	4035										
DRVPTR	001342	2626*	3746*	4126	4146*									
DSC	= 040000	1442*												
DSWR	= 177570	1247*	2527	3650										
DTE	= 010000	1424*												
DTYPE	= 000040	1417*	3954	4056										
DT1	065512	2805	2811	2817	2823	2834	2840	2845	2850	2855	2860	2865	2870	2891
		2897	2907	2923	2983	2988	2993	2998	3033	3073	3088	3093	3098	3103
		3108	3113	3118	3143	3168	3173	3178	3183	3188	3193	3198	3203	3208
		3213	3218	3223	3228	3233	3238	3243	3248	3253	3258	3283	3308	3333
		3338	3343	3348	3353	3358	3363	3368	3413	3418	3423	3428	3433	3438
		3443	3448	3453	3463	3488	3543	3558	3563	3568	3583	3593	11052*	
DT13	066050	2902	2912	2917	2928	2933	2938	2943	2948	2953	2958	2963	2968	2973
		2978	3018	3023	3028	3038	3043	3048	3053	3058	3063	3068	3078	3083
		3123	3128	3133	3138	3148	3153	3158	3163	3263	3268	3273	3278	3288
		3293	3298	3303	3313	3318	3323	3328	3373	3378	3383	3388	3393	3398
		3403	3408	3493	3498	3503	3508	3533	3538	11100*				
DT14	066130	3003	3008	11110*										
DT15	066220	11121*												
DT3	065552	2880	11059*											
DT4	065556	3483	3548	11060*										
DT6	065624	2875	2885	11068*										
DT7	065670	3458	11076*											
DT8	065736	3478	11084*											
DT9	066004	3013	11092*											
D.ACLO=	000100	1491*												
D.BRHM=	000100	1478*	4277	4312	4341	4410	4446	4500	4569	4605	4727	4767	4822	4862

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	4924	4947	4976	4999	5025	5049	5099	5122	5151	5174	5200	5224	5290
	5311	5372	5393	5457	5488	5544	5583	5630	5682	5713	5769	5808	5855
	5912	5994	6045	6127	6195	6252	6336	6377	6456	6497	6560	6632	7096
	7123	7224	7251	7374	7509	7528	7629	7648	7762	7801	7883	7922	7966
D.CART= 000400	9036												
	1480#	4277	4312	4341	4410	4446	4500	4569	4605	4727	4767	4822	4862
	4924	4947	4976	4999	5025	5049	5099	5122	5151	5174	5200	5224	5290
	5311	5372	5393	5457	5488	5544	5583	5630	5682	5713	5769	5808	5855
	5912	5994	6045	6127	6195	6252	6336	6377	6456	6497	6560	6632	7096
	7123	7224	7251	7374	7509	7528	7629	7648	7762	7801	7883	7922	7966
	9036												
D.DDT = 000400	1466#												
D.DOOR= 000200	1479#	4167											
	4924	4947	4976	4999	5025	5049	5099	5122	5151	5174	5200	5224	5290
	5311	5372	5393	5457	5488	5544	5583	5630	5682	5713	5769	5808	5855
	5912	5994	6045	6127	6195	6252	6336	6377	6456	6497	6560	6632	7096
	7123	7224	7251	7374	7509	7528	7629	7648	7762	7801	7883	7922	7966
	9036												
D.DRA = 000040	1463#	4275	4310	4339	4408	4444	4498	4567	4603	4725	4765	4820	4860
	4922	4945	4974	4997	5023	5047	5097	5120	5149	5172	5198	5222	5279
	5288	5309	5361	5370	5391	5450	5455	5486	5534	5542	5573	5581	5612
	5628	5675	5680	5711	5759	5767	5798	5806	5837	5853	5905	5910	5959
	5980	5992	6038	6043	6092	6113	6125	6188	6193	6245	6250	6297	6325
	6334	6365	6375	6417	6445	6454	6485	6495	6546	6558	6618	6630	6697
	6728	6780	6811	6878	6921	6970	7013	7070	7094	7121	7198	7222	7249
	7343	7372	7470	7507	7526	7561	7586	7627	7646	7714	7760	7799	7839
	7881	7920	7964	7998	8327	9034							
D.DRDY= 000200	1465#	4275	4310	4339	4408	4444	4498	4567	4603	4725	4765	4820	4860
	4922	4945	4974	4997	5023	5047	5097	5120	5149	5172	5198	5222	5288
	5309	5370	5391	5455	5486	5542	5581	5628	5680	5711	5767	5806	5853
	5910	5992	6043	6125	6193	6250	6334	6375	6454	6495	6558	6630	7094
	7121	7222	7249	7372	7507	7526	7627	7646	7760	7799	7881	7920	7964
	9034												
D.DROT= 020000	1498#												
D.DSC = 040000	1472#	4275	4408	4567	4725	4820	4922	4974	4997	5047	5097	5149	5172
	5222	5486	5542	5581	5711	5767	5806	6334	6454				

N02

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SEQ 0233

D.SPIN= 010000

1470#	4275	4310	4339	4363	4408	4444	4498	4522	4567	4603	4725	4765
4820	4860	4922	4945	4974	4997	5023	5047	5097	5120	5149	5172	5198
5222	5288	5309	5370	5391	5455	5486	5542	5581	5628	5680	5711	5767
5806	5853	5910	5992	6043	6125	6193	6250	6334	6375	6454	6495	6558
6630	7094	7121	7222	7249	7372	7507	7526	7627	7646	7760	7799	7881
7920	7964	9034										

D.SPLS= 010000
D.SPOK= 001000

1497#	4277	4312	4341	4410	4446	4500	4569	4605	4727	4767	4822	4862
1481#	4947	4976	4999	5025	5049	5099	5122	5151	5174	5200	5224	5290
4924	5372	5393	5457	5488	5544	5583	5630	5682	5713	5769	5808	5855
5311	5994	6045	6127	6195	6252	6336	6377	6456	6497	6560	6632	7096
5912	7224	7251	7374	7509	7528	7629	7648	7762	7801	7883	7922	7966
7123												
9036												

D.SSP = 000020

1476#	4277	4312	4341	4410	4446	4500	4569	4605	4727	4767	4822	4862
4924	4947	4976	4999	5025	5049	5099	5122	5151	5174	5200	5224	5290
5311	5372	5393	5457	5488	5544	5583	5630	5682	5713	5769	5808	5855
5912	5994	6045	6127	6195	6252	6336	6377	6456	6497	6560	6632	7096
7123	7224	7251	7374	7509	7528	7629	7648	7762	7801	7883	7922	7966
9036												

D.SUNS= 040000
D.TIB = 002000
D.UNLD= 040000
D.UNS = 040000
D.VV = 000100

1513#	4239	4275	4310	4339	4363	4408	4444	4498	4522	4567	4603	4725
1509#	4820	4860	4922	4945	4974	4997	5023	5047	5097	5120	5149	5172
1486#	5222	5288	5309	5370	5391	5455	5486	5542	5581	5628	5680	5711
1499#	5767	5806	5853	5910	5992	6043	6125	6193	6250	6334	6375	6495
1464#	6558	6630	7094	7121	7222	7249	7372	7507	7526	7627	7646	7799
4765	7881	7920	7964	9034								

D.WCUR= 000040
D.WGAT= 000100
D.WLE = 004000
D.WRL = 004000
D.XERR= 001000
ECCW = 020000
ECH = 000100
EMTVEC= 000030
EM1 = 057036
EM10 = 057712
EM11 = 057775
EM12 = 060041

1504#												
1505#												
1496#												
1469#												
1508#												
1457#												
1418#												
1336#	3634*	3635*										
8129	10429#											
2838	10507#											
2843	10516#											
2848	2858	2868	3196	3201	3206	3211	3226	3251	3331	3411	3446	3556
10523#												

EM13 = 060077
EM14 = 060121
EM15 = 060157
EM16 = 060266
EM17 = 060331

3031	3101	3106	3166	3176	3216	3256	3336	3356	10529#			
2878	10533#											
2986	10539#											
3566	3581	10551#										
2941	2961	3016	3026	3041	3051	3121	3146	3261	3286	3311	3371	3391
3491	3531	10557#										

EM18 = 060352

2900	2915	2931	2946	2966	3056	3076	3126	3151	3266	3291	3316	3376
3396	3496	10560#										

EM19 = 060373

2951	2971	3021	3036	3046	3061	3131	3156	3271	3296	3321	3381	3401
3501	3536	10563#										

EM2 = 057111
EM20 = 060414

2803	10437#											
2910	2926	2936	2956	2976	3066	3081	3136	3161	3276	3301	3326	3386
3406	3506	10566#										

EM21 = 060435

2853	2863	2895	2905	3426	3451	3486	3541	3561	10569#			
------	------	------	------	------	------	------	------	------	--------	--	--	--

EM22	060457	3111	10573#											
EM23	060564	3116	10585#											
EM24	060664	2921	10597#											
EM25	060717	2996	10602#											
EM26	060771	2981	10610#											
EM27	061050	3071	10618#											
EM28	061167	3863	10632#											
EM29	061275	3351	3441	10645#										
EM3	057201	9076	10447#											
EM30	061343	3096	10652#											
EM31	061364	2991	3091	3181	3361	3416	3461	10655#						
EM32	061407	3141	10659#											
EM33	061426	3171	3191	3366	10662#									
EM34	061451	3186	3221	10666#										
EM35	061500	3246	10670#											
EM36	061526	3476	3481	3546	10674#									
EM37	061571	3306	10680#											
EM38	061622	3341	10685#											
EM39	061675	3001	3281	3431	10693#									
EM4	057254	10455#												
EM40	061744	3006	3436	10700#										
EM5	057330	2809	3241	10463#										
EM55	062002	3346	10705#											
EM6	057351	2815	10466#											
EM63	062035	3421	10710#											
EM65	062056	3456	10713#											
EM69	062100	3591	10716#											
EM7	057372	2821	10469#											
EM73	062131	3231	10721#											
EM74	062152	3086	10724#											
EM79	062177	3236	10728#											
EM8	057562	10491#												
EM80	062220	2873	10731#											
EM82	062257	2883	10737#											
EM83	062331	2889	10745#											
EM84	062366	3232	3237	3242	10750#									
EM9	057636	2832	10499#											
EM93	062457	3011	10760#											
ERRVEC=	000004	1329#	3648	3649#	3660#	3667#	3668#	3681#	3682#	3751#	3755#	3762#	3799#	3817#
E.A0	005404	3818#	9235	9236#	9238#	9241#								
		2744#	4275#	4310#	4339#	4363#	4364	4408#	4444#	4498#	4522#	4523	4567#	4603#
		4725#	4765#	4820#	4860#	4922#	4945#	4974#	4997#	5023#	5047#	5097#	5120#	5149#
		5172#	5198#	5222#	5288#	5309#	5370#	5391#	5455#	5486#	5542#	5581#	5628#	5680#
		5711#	5767#	5806#										

SEQ 0235

[illegible]

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HOLD      043622
HPAT      005350
HPEND     005302
HPOS      025346
HT         = 000011
HVRC      = 000400
HWC       005320
HZ        001364
H.A0      005364
H.A1      005370
H.A2      005374
H.A3      005400
H.B0      005366
H.B1      005372
H.B2      005376

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[illegible]

F03

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0238

MSG4	056051	3715	10328#						
MSG5	056103	3717	10333#						
MSG6	056151	9121	10340#						
MSG7	056205	3732	10345#						
MSG74	056674	8984	10407#						
MSG75	056742	8986	10414#						
MSG76	056777	9054	10419#						
MSG77	057021	9059	10423#						
MSG8	056242	4121	10350#						
MSP =	000100	1450#							
MULT6	046760	8801	8827#						
M.ALGN=	040000	1523#							
M.DPID	050210	9164#							
M.DP40	050246	9175#	9197						
M.DP41	050302	9180	9188#						
M.DP42	050312	9186	9192#						
M.DP44	050344	9199	9205#						
M.DP50	050356	9173	9210#						
M.DRV =	000007	1517#							
M.HEAD=	007000	1525#	8664						
M.ID =	000003	1522#							
M.PAR =	100000	1526#	8946						
M.SECT=	000760	1524#	8593	8654					
M.SER =	077770	1518#							
NED =	010000	1405#	3964	3976	4057	4070	8489		
NEM =	004000	1404#							
NUDRV	012472	3990	4100#	8027					
NXF =	000004	1414#							
OFFSET=	000015	1372#							
OFST =	000004	1433#							
OPI =	020000	1425#							
OR =	000200	1400#							
O.ADR1	067256	11415#	11466#	11468#	11643	11644#	11682#	11697	11714
O.BACK	070002	11510	11552#						11905#
O.BO	071274	11701	11702	11850#					
O.BKPT	067510	11461#	11515						
O.BK1	070442	11409	11679#						
O.BK2	070476	11684	11687#						
O.BK3	070514	11686	11693#						
O.BRK	070432	11426	11677#						
O.BUF	071323	11759	11768	11773	11878#				
O.B2	070576	11698	11707#						
O.B3	070636	11706	11715#						
O.CADV	071006	11528	11545	11568	11572	11606	11610	11715	11758#
O.CLGL	067624	11484	11486	11494#					
O.CLGT=	000014	11498	11868#						
O.CLS1	071232	11826	11828#						
O.CR	071276	11835	11837	11838	11852#				
O.CRET	067736	11505	11535#						
O.CRLF	071242	11543	11604	11700	11739	11744	11835#		
O.CRLS	071250	11479	11837#						
O.CRS	071254	11836	11838#						
O.CSR1	071272	11735#	11751	11846#					
O.CSR2	071273	11736#	11752	11847#					
O.CT	067260	11664#	11707#	11709#	11906#				
O.C1	070410	11667#	11708						

G03

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SEQ 0239

O.DCD	067554	11467	11469	11479#	11537	11592	11717		
O.DCD1	067560	11480#	11529	11573					
O.EFF	070064	11514	11583#						
O.EFF1	070202	11595	11614#						
O.ENTR	067270	11406#							
O.ERR	067540	11453	11464	11476#	11499	11525	11587	11830	
O.ERR1	070074	11587#	11660						
O.ERR2	067714	11525#	11559	11636					
O.FTYP	071150	11478	11547	11562	11608	11713	11784	11800	11805#
O.GET	071072	11432	11482	11781#	11786	11788	11790		
O.GO	070246	11507	11634#						
O.GO2	070324	11645#	11670						
O.LG =	000006	11436	11876#						
O.LGCH	071301	11495	11856#	11868					
O.LGDR	067654	11502	11504#	11517					
O.LGL =	000030	11517#							
O.LGL1	067626	11495#	11500						
O.LGL2	067646	11496	11501#						
O.MSK	067250	11588	11589	11591	11898#				
O.ODT	067264	1543	11404#	11887					
O.OFST	070012	11512	11558#						
O.OF1	070060	11571	11573#						
O.OP1	067750	11508	11541#						
O.OP2	067756	11457	11543#	11554					
O.ORPC	067462	11449#	11509						
O.P	071271	11424#	11634#	11659	11661*	11710*	11844#		
O.PRI	067246	11416	11683	11687	11897#				
O.PROC	070354	11516	11659#						
O.PR1	070376	11663	11665#						
O.RALL	067530	11427	11462	11468#					
O.RCSR=	177560	11394#	11735	11737*	11747	11749	11751*	11781	
O.RDB =	177562	11393#	11783						
O.REGT	067412	11432#	11506						
O.RSE1	070770	11748	11751#						
O.RSP	067422	11434#	11437						
O.RST	067326	11405	11414#						
O.RSTT	070740	11640	11666	11744#					
O.RST1	067356	11413	11421#						
O.RTIT	070352	11423#	11654#						
O.SCAN	067564	11443	11482#	11493					
O.SP	067454	11435	11444#						
O.SPC	071020	11761#	11769						
O.SP1	067442	11440#	11445						
O.STM =	000340	11380#	11425	11639	11665	11667			
O.STRT	067314	11404	11411#						
O.SVR	070650	11414	11679	11721#					
O.SVTT	070706	11699	11711	11735#					
O.T	071270	11641#	11668#	11680	11843#				
O.TBIT	070276	11641#	11681						
O.TBT =	000020	11381#	11642	11669	11705				
O.TC	071234	11823	11829#						
O.TCLS	071216	11449	11535	11541	11552	11822#			
O.TCSR=	177564	11396#	11736	11738*	11745	11752*	11805	11811	
O.TDB =	177566	11395#	11807*	11813*					
O.TL	071315	11433	11436	11444	11870#	11876			
O.TRTC	071332	11468	11644	11883#					

H03

CZR6GB0 RK611 DU PORT LGC TST
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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0240

O.TVEC=	000014	11379#	11407	11425*	11426*				
O.TYPE	071134	11703	11774	11797#	11801	11839			
O.TYP1	071214	11798	11809	11817#					
O.TYP2	071174	11811#	11812	11815					
O.UIN	067262	11415	11643*	11685	11907#				
O.UPC	067242	11408*	11638*	11653	11677*	11694	11696*	11895#	
O.UR0	067224	11411	11441	11888#					
O.USP	067240	11412*	11722*	11723	11894#				
O.UST	067244	11406*	11642*	11652	11669*	11678*	11685	11705*	11896#
O.WDS	070072	11584	11586#						
O.WDS2	070110	11591#	11613						
O.WDS3	070140	11602#	11615	11621	11630				
O.WDS4	070176	11602	11612#						
O.WRD	067704	11504	11521#						
O.WROA	067730	11522	11530#						
O.WRD1	067712	11524#	11531	11548					
O.WSCH	070070	11513	11585#						
O.XXX	071266	11721*	11729	11842#					
O.45	067370	11422	11424#						
PACK =	000003	1367#	4235						
PARAM	001336	2623#	3598*	3601*	3710				
PARSRT	010040	1540	3598#						
PAT =	000020	1448#							
PCA =	004000	1455#							
PCD =	010000	1456#							
PCLKF	005460	2781#	3757*	3764*	8889	8904			
PCVEC	001332	2617#	3758	3765					
PCYL	001352	2632#							
PFSRT	013004	4178#	9151						
PGE =	002000	1403#							
PIP =	020000	1441#							
PIRQ =	177772	1246#							
PIRQVE=	000240	1340#							
PKRB	001324	2613#							
PKS	001320	2611#	3756	3763	8894*	8908*			
PKSB	001322	2612#	8893*						
PPTP	005432	2764#	3701*						
PRGSRT	010054	3599	3602#	3865	8130				
PRO =	000000	1263#	3604	3794					
PR1 =	000040	1264#							
PR2 =	000100	1265#							
PR3 =	000140	1266#							
PR4 =	000200	1267#							
PR5 =	000240	1268#	2610						
PR6 =	000300	1269#	3767						
PR7 =	000340	1270#	3668	3674	3818	9146	9147		
PS =	177776	1243#	1244						
PSW =	177776	1244#							
PWRVEC=	000024	1335#	3638*	3639*	9136*	9145*	9146*		
RCYLA	046100	8461	8643#						
RCYLD	046026	8458	8630#						
RDCRA	104410	9813	10195#						
RDCYLA	045756	4740	4835	8618#					
RDCYLD	045672	8602#							
RDDATA=	000021	1374#	7364						
RDGATE=	100000	1459#							

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0241

RDHEAD= 000025	1376*	7781	7902																
RDLIN = 104411	8096	9887	10196*																
RDOCT = 104412	8143	8156	10197*																
ROSEC = 045622	8590*	8799																	
ROTAB = 004276	2684*																		
RDY = 000200	1382*	8205	8219																
RECAL = 000013	1371*	4262	7136	7264	9010														
RESREG= 104414	9947	9999	10199*	11348															
RESVEC= 000010	1330*																		
RHEAD = 046174	8466	8663*																	
RHTAB = 001666	2679*	7780	7814	7901	7935	8806	8808	8812	8815	11092									
RKASOF= 000016	1353*	3808	7141	7269	7732	7854	8244	8281	8308	8337									
RKBA = 000004	1348*	3804	7356*	7400*	7418*	7481*	7606*	8240											
RKCS1 = 000000	1346*	3801	3913*	4026*	4232*	4259*	4299*	4381*	4396*	4433*	4540*	4555*	4592*						
	4754*	4849*	5012*	5187*	5516*	5617*	5741*	5842*	5941*	6074*	6710*	6738*	6793*						
	6821*	6889*	6903*	6981*	6995*	7110*	7138*	7150*	7238*	7266*	7278*	7503*	7722*						
	7741*	7843*	7863*	8180*	8191*	8205	8219	8237	8519*	8528*	8537*	8546*	8559*						
	9007*	9023*																	
RKCS2 = 000010	1350*	3802	3892*	3906*	3910*	4019*	4023*	4233*	4234*	4260*	4261*	4300*	4301*						
	4434*	4435*	4593*	4594*	4755*	4756*	4850*	4851*	5013*	5014*	5188*	5189*	5262*						
	5264*	5266*	5271*	5273*	5344*	5346*	5348*	5353*	5355*	5433*	5435*	5437*	5442*						
	5444*	5517*	5519*	5521*	5526*	5528*	5556*	5558*	5560*	5565*	5567*	5595*	5597*						
	5599*	5604*	5606*	5618*	5619*	5658*	5660*	5662*	5667*	5669*	5742*	5744*	5746*						
	5751*	5753*	5781*	5783*	5785*	5790*	5792*	5820*	5822*	5824*	5829*	5831*	5843*						
	5844*	5888*	5890*	5892*	5897*	5899*	5942*	5944*	5946*	5951*	5953*	5963*	5965*						
	5967*	5972*	5974*	6021*	6023*	6025*	6030*	6032*	6075*	6077*	6079*	6084*	6086*						
	6096*	6098*	6100*	6105*	6107*	6171*	6173*	6175*	6180*	6182*	6228*	6230*	6232*						
	6237*	6239*	6280*	6282*	6284*	6289*	6291*	6308*	6310*	6312*	6317*	6319*	6348*						
	6350*	6352*	6357*	6359*	6400*	6402*	6404*	6409*	6411*	6428*	6430*	6432*	6437*						
	6439*	6468*	6470*	6472*	6477*	6479*	6529*	6531*	6533*	6538*	6540*	6601*	6603*						
	6605*	6610*	6612*	6680*	6682*	6684*	6689*	6691*	6711*	6713*	6715*	6720*	6722*						
	6763*	6765*	6767*	6772*	6774*	6794*	6796*	6798*	6803*	6805*	6861*	6863*	6865*						
	6870*	6872*	6904*	6906*	6908*	6913*	6915*	6953*	6955*	6957*	6962*	6964*	6996*						
	6998*	7000*	7005*	7007*	7053*	7055*	7057*	7062*	7064*	7111*	7112*	7181*	7183*						
	7185*	7190*	7192*	7239*	7240*	7326*	7328*	7330*	7335*	7337*	7362*	7363*	7453*						
	7455*	7457*	7462*	7464*	7483*	7544*	7546*	7548*	7553*	7555*	7569*	7571*	7573*						
	7578*	7580*	7605*	7697*	7699*	7701*	7706*	7708*	7723*	7724*	7776*	7777*	7793						
	7822*	7824*	7826*	7831*	7833*	7844*	7845*	7897*	7898*	7914	7947*	7948*	7981*						
	7983*	7985*	7990*	7992*	8238	8506*	8507*	8520*	8521*	8529*	8530*	8538*	8539*						
	8547*	8548*	8573*	8577*	8578*	9008*	9009*	9024*	9025*										
RKDA = 000006	1349*	3805	7358*	7402*	7420*	7480*	7609*	8241											
RKDB = 000024	1355*	3810	7620	7788	7789	7790	7909	7910	7911										
RKDC = 000020	1354*	3809	4709*	4746*	4804*	4841*	6304*	6424*	7078*	7206*	7360*	7482*	7607*						
	7725*	7775*	7846*	7896*	8245														
RKDS = 000012	1351*	3806	8242																
RKECPS= 000030	1359*	3814	8249																
RKECPT= 000032	1360*	3815	8250																
RKER = 000014	1352*	3807	8243																
RKMR1 = 000026	1356*	3811	4266*	4289*	4655*	8246	8287*	8291*	8312*	8316*	8522*	8531*	8540*						
	8579*	8590*	8602*	8618*	8675*	8692*	9014*												
RKMR2 = 000034	1357*	3812	8223	8228	8247														
RKMR3 = 000036	1358*	3813	8224	8229	8248														
RKPRI = 001316	2610*	8172																	
RKVEC = 001314	2609*	3737*	8160*	8163*	8170														
RKWC = 000002	1347*	3803	7361*	7484*	7608*	8239													
RLS = 000010	1396*	5266	5348	5437	5521	5560	5599	5662	5746	5785	5824	5892	5946						

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CZR6GB.P11 03-JAN-78 08:46 CROSS REFERENCE TABLE -- USER SYMBOLS

CZR6GBD RK611 DU PORT LGC TST
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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0242

		5967	6025	6079	6100	6175	6232	6284	6312	6352	6404	6432	6472	6533
		6605	6684	6715	6767	6798	6865	6908	6957	7000	7057	7185	7330	7457
		7548	7573	7701	7826	7985								
RSEC	046136	8465	8653#											
RTT	= 000006	11383#												
SAVREG	= 104413	9932	9973	10198#	11291									
SBPAR	047224	8386	8390	8394	8398	8402	8406	8410	8932#					
SCLR	= 000040	1398#	3892	3906	4019	8573								
SCOP1	= 104415	3903	4016	10200#										
SCOP15	047276	8956#	10200											
SEC	001370	2642#	7610*											
SECFLG	046524	8725	8745#											
SECTOR	001374	2644#	7477*	7480	7498*	7499	7609	7610	8592*	8593*	8594*	8595*	8596*	8597*
		8653*	8654*	8655*	8656*	8657*	8658*	8800*	8804	8805*	8806*	8817	8827*	8828
		8829*	8830*											
SEEK	= 000017	1373#	4711	4806	4908	4960	5083	5135	5472	5697	6305	6425	7080	7208
		7726	7847	7950										
SELDRV	= 000001	1366#	3911	4024	5267	5275	5349	5357	5438	5446	5522	5530	5561	5569
		5600	5608	5663	5671	5747	5755	5786	5794	5825	5833	5893	5901	5947
		5955	5968	5976	6026	6034	6080	6088	6101	6109	6176	6184	6233	6241
		6285	6293	6313	6321	6353	6361	6405	6413	6433	6441	6473	6481	6534
		6542	6606	6614	6685	6693	6716	6724	6768	6776	6799	6807	6866	6874
		6909	6917	6958	6966	7001	7009	7058	7066	7186	7194	7331	7339	7458
		7466	7549	7557	7574	7582	7702	7710	7827	7835	7986	7994	8508	8557
SETINT	043354	3738	8161	8170#										
SIZFLG	005462	2782#	3739*	3896	8114*	8136*								
SKI	= 000002	1413#												
SORT	046652	8797#												
SPACE2	067200	11326	11335	11346	11358#									
SPBAR	= 000040	2628#												
SRTSPL	= 000011	1370#	6930	7022	8992									
SRTTAB	002072	2680#	8809											
ST	= 177776	11377#	11406	11407*	11420*	11639*	11665*	11667*	11693*					
STACK	= 001100	1234#	3603	3630	3792	3843	3904	4012	4017	4115	4219	4484	4646	4697
		4792	4895	5070	5250	5332	5432	5657	5887	6020	6159	6216	6279	6399
		6526	6598	6677	6760	6860	6952	7052	7180	7321	7451	7692	8023	8471
		9110	9148	11354										
START	010050	1538	3601#											
START1	010456	3692#												

K03

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0243

[illegible]

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CZR6GB.P11 03-JAN-78 08:46 CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

M03

CZR6GB0 RK611 DU PORT LGC TST
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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0245

UNITB 005464

2783*	3749*	4124*	4220*	4234	4244	4246*	4261	4301	4326*	4353*	4382*	4390*
4398	4423*	4430*	4435	4485*	4512*	4541*	4549*	4557	4582*	4589*	4594	4698*
4756	4793*	4851	4896*	4939*	4991*	5014	5040*	5071*	5114*	5166*	5189	5215*
5251*	5263*	5264	5272*	5273	5303*	5333*	5345*	5346	5354*	5355	5385*	5434*
5435	5443*	5444	5502*	5518*	5519	5527*	5528	5557*	5558	5566*	5567	5596*
5597	5605*	5606	5619	5659*	5660	5668*	5669	5727*	5743*	5744	5752*	5753
5782*	5783	5791*	5792	5821*	5822	5830*	5831	5844	5889*	5890	5898*	5899
5927*	5943*	5944	5952*	5953	5964*	5965	5973*	5974	6006*	6022*	6023	6031*
6032	6060*	6076*	6077	6085*	6086	6097*	6098	6106*	6107	6139*	6160*	6172*
6173	6181*	6182	6217*	6229*	6230	6238*	6239	6281*	6282	6290*	6291	6309*
6310	6318*	6319	6349*	6350	6358*	6359	6401*	6402	6410*	6411	6429*	6430
6438*	6439	6469*	6470	6478*	6479	6530*	6531	6539*	6540	6574*	6580	6602*
6603	6611*	6612	6646*	6652	6681*	6682	6690*	6691	6704*	6712*	6713	6721*
6722	6732*	6742	6764*	6765	6773*	6774	6787*	6795*	6796	6804*	6805	6815*
6825	6862*	6863	6871*	6872	6896*	6905*	6906	6914*	6915	6954*	6955	6963*
6964	6988*	6997*	6998	7006*	7007	7054*	7055	7063*	7064	7112	7140	7144*
7151*	7163*	7182*	7183	7191*	7192	7240	7268	7272*	7279*	7291*	7327*	7328
7336*	7337	7363	7454*	7455	7463*	7464	7545*	7546	7554*	7555	7570*	7571
7579*	7580	7698*	7699	7707*	7708	7724	7734*	7744*	7749*	7777	7823*	7824
7832*	7833	7845	7856*	7866*	7871*	7898	7948	7982*	7983	7991*	7992	8260
8280	8307	8374	8376	8378	8380	8507	8521	8530	8539	8548	8578	9009
9025												
2686*	3741*	6985*	6938*	6940*	6977*	7030*	7032*	8980	9000*			
1369*	6887	6979										
1426*												
1406*												
3885	3890	3992*										
1437*												
1407*	7618											
2662*	11076											
2655*	7620*	7719*	7725	7774	7775	7943*	7945	11068				
2656*	7621*	7720*	7846	7895	7896	7944*	7945	11068				
1423*												
2670*												
1375*	7486											
1377*												
1440*												
1378*	7612											
1458*												
1565	1571*											
9512	9527											
9483	9485*											
9481*												
9360	9482*											
9312	9484*											
2524*	8086*	9710	9867									
2594*	3736*	3800	8147*	8149*								
2519*												
2521*												
2545*	9299	9332	9663	9860								
2596*												
2597*												
9377*	9387*	9394	9403*	9408*								
9696*	10194											
2507*	3625	3626	3634	3640	3641	3642						
2537*												

UNLD 005276
 UNLOAD= 000007
 UNS = 040000
 UPE = 020000
 VERIFY 012076
 VV = 000100
 WCE = 040000
 WDCNT 001432
 WD1 001414
 WD2 001416
 WLE = 004000
 WORD 001446
 WRDATA= 000023
 WRHEAD= 000027
 WRL = 004000
 WRTCHK= 000031
 WRTGAT= 040000
 SAPTHD 001000
 SASTAT= ***** U
 SATYC 051600
 SATY1 051554
 SATY3 051562
 SATY4 051572
 SAUTOB 001134
 \$BASE 001264
 \$BDADR 001122
 \$BDDAT 001126
 \$BELL 001200
 \$CDW1 001270
 \$CDW2 001272
 \$CHARC 051324
 \$CKSWR 052546
 \$CMTAG 001100
 \$CM3 = 000000

N03

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0246

[illegible]

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CZR6GB.P11 03-JAN-78 08:46 CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

CZR6GB0 RK611 DU PORT LGC TST MACY11 30A(1052) 03-JAN-78 08:56 PAGE 249
CZR6GB.P11 03-JAN-78 08:46 CROSS REFERENCE TABLE -- USER SYMBOLS

```

SSCOPE 050366
SSETUP= 000137

SSTUP = 177777
SSUPRS 054230
SSVLAD 050574
SSVPC = 000244
SSWR = 167400

```

```

$SWREG 001232
$SWRMK= 000000
$TESTN 001214
$TIMES 001174

```

STKB	001146
STKCN	052250
STKIN	052260
STKQEN=	052257
STKQIN	052252
STKQOU	052254
STKQSR	052256
STKS	001144
STKSRV	052330
STMP0	001160
STMP1	001162
STMP2	001164
STMP3	001166
STMP4	001170

STMP5 001172
STN = 000041

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$TNPWR      054110
$TPB        001152
$TPFLG      001157
$TPS        001150
$TRAP       054476
$TRAP2      054520
$TRP      = 000016

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STRPAD      054532
STSTM       001004
STSTM       001102
STTYIN      053434
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3632	9228#											
3595#	3631	3632	3634	3636	3638	3640	3641	3642	3644	8029	8077	9229
9293	9319	9327	9655	9660	9661	9691	9867					
3595#												
4470	4629	4675	7428	10050#								
9239	9268#											
1549#	1554											
1194#	1209	1214	1215	1216	1217	1218	1219	1220	1221	2543	2544	2545
3641	3642	3644	3645	3791	3842	4011	4114	4218	4483	4645	4696	4791
4894	5069	5249	5331	5431	5656	5886	6019	6158	6215	6278	6398	6525
6597	6676	6759	6857	6949	7049	7177	7320	7450	7691	8015	8030	8045
8051	8053	9220	9221	9222	9223	9224	9230	9242	9244	9245	9248	9249
9250	9257	9258	9259	9271	9274	9277	9284	9285	9286	9287	9288	9297
9304	9316	9320	9332									
2566#	3665											
1221	1222	9224	9225	9246								
2557#	4116#	9269#	11052	11059	11060	11068	11076	11084	11092	11100	11110	11121
2543#	3641#	3791#	3842#	4011#	4114#	4218#	4483#	4645#	4696#	4791#	4894#	5069#
5249#	5331#	5431#	5656#	5886#	6019#	6158#	6215#	6278#	6398#	6525#	6597#	6676#
6759#	6857#	6949#	7049#	7177#	7320#	7450#	7691#	8022#	8030#	9257#	9264	9267#
9277												
2530#	9615	9636	9647	9672	9700	9727						
9616#	9631#	9661	9678#	9792	9794#							
3608	9631#	9652	9713									
9620#	9686	9797										
9617#	9632#	9633	9684#	9685#	9686	9688#						
9618#	9633#	9795	9796#	9797	9799#							
9619#	9632	9688	9799									
2529#	9615	9637#	9668#	9670	9676#	9698	9714#	9724	9736#	9756#		
9634	9647#											
2537#												
2538#												
2539#												
2540#												
2541#	3912	3931	3945#	3956#	4025	4040	4043#	4058#	4102#	4144#	4158	6888
6980	7137	7265	8179	8190	8558							
2542#	3745#	8414#	8468	8472								
1195#	1209	3768	3780	3791#	3819	3826	3842#	3995	4011#	4046	4104	4114#
4116	4117	4164	4170	4182	4218#	4476	4483#	4635	4645#	4649	4679	4696#
4783	4791#	4878	4894#	5062	5069#	5237	5249#	5306	5324	5331#	5388	5406
5431#	5646	5649	5656#	5871	5875	5886#	6009	6012	6019#	6142	6145	6158#
6208	6215#	6265	6278#	6390	6398#	6511	6525#	6587	6590	6597#	6659	6662
6676#	6749	6752										

004

CZR6GB0 RK611 DL PORT LGC TST
CZR6GB.P11 03-JAN-78 08:46MACY11 30A(1052) 03-JAN-78 08:56 PAGE 250
CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0249

\$STYPBN= ***** U
\$STYPOS 051330
\$STYPE 051046
\$STYPEC 051260
\$STYPEX 051326
\$STYPOC 052046
\$STYPON 052062
\$STYPOS 052022
\$UNIT 001222

10191	10190												
9423#	9509	10178	10186										
9349#	9386	9393	9398#	9399	9758								
9379	9406	9409#											
9565#	10187												
9564	9567#	10189											
9560#	10188												
2560#	3686#	3748#	4129#	4137	4148	4233	4260	4300	4397	4434	4556	4593	
4755#	4850	5013	5188	5262	5271	5344	5353	5433	5442	5517	5526	5556	
5565	5595	5604	5618	5658	5667	5742	5751	5781	5790	5820	5829	5843	
5888	5897	5942	5951	5963	5972	6021	6030	6075	6084	6096	6105	6171	
6180	6228	6237	6280	6289	6308	6317	6348	6357	6400	6409	6428	6437	
6468	6477	6529	6538	6579	6601	6610	6651	6680	6689	6711	6720	6741	
6763	6772	6794	6803	6824	6861	6870	6904	6913	6953	6962	6996	7005	
7053	7062	7111	7139	7181	7190	7239	7267	7326	7335	7362	7453	7462	
7544	7553	7569	7578	7697	7706	7723	7731	7776	7822	7831	7844	7852	
7897	7947	7981	7990	8259	8279	8306	8373	8375	8377	8379	8506	8520	
8529	8538	8547	8577	9008	9024								

\$UNITM 001010
\$USWR 001234
\$VECT1 001260
\$VECT2 001262
\$XTSTR 050400
\$GET4= 000000
\$OFILL 052245
\$4OCAT= ***** U
= 067264

1576#													
2567#													
2592#													
2593#													
9233#													
8045#													
9561#	9565#	9575	9610#										
9230	9306												
1530#	1534#	1539#	1542#	1549	1550#	1552#	1554#	1555#	1561	1562#	1564#	1566#	
2506#	2549	2678#	2679#	2680#	2682#	2683#	2684#	3629	3644	3645	8053	3057	
9138	9194	9277	9278	9332	9411	9477#	9530#	9615	9619#	9620	9621#	9859#	
9860	9867#	9921	9959#	10021#	11367#	11368#	11517	11746	11750	11782	11806	11868	
11876	11879#	11887#											
9482	9485												
1561#	1566												

.\$ASTA= ***** U
.\$X = 001000

E04

CZR6GB0 RK611 DU PORT LGC TST MACY11 30A(1052) 03-JAN-78 08:56 PAGE 252
 CZR6GB.P11 03-JAN-78 08:46 CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0250

CALIB	1683#	4257	9006												
CHECK	1622#	4282	4317	4346	4369	4415	4451	4505	4528	4574	4610	4732	4772	4827	4867
	4929	4952	4981	5004	5030	5054	5104	5127	5156	5179	5205	5229	5295	5316	5377
	5398	5462	5493	5549	5588	5635	5687	5718	5774	5813	5860	5917	5999	6050	6132
	6200	6257	6341	6382	6461	6502	6565	6637	7101	7128	7229	7256	7379	7514	7533
	7634	7653	7767	7806	7888	7927	7971	9041							
COMMEN	1341#														
CWD2	1637#	4289													
DRCLR	1660#	4298	4432	4591	4753	4848	5011	5186	5616	5841	7109	7237	9022		
ENDCOM	1341#														
EOPGM	1945#	8019													
ERROR	1235#	3822	3887	3895	3909	3918	3941	3950	3969	3973	3984	3988	4022	4031	4049
	4076	4080	4084	4088	4226	4230	4237	4241	4252	4255	4264	4270	4273	4285	4286
	4287	4288	4293	4296	4304	4307	4320	4321	4322	4323	4332	4336	4349	4350	4351
	4352	4358	4362	4372	4373	4374	4375	4388	4394	4400	4404	4418	4419	4420	4421
	4427	4438	4441	4454	4455	4456	4457	4491	4495	4508	4509	4510	4511	4517	4521
	4531	4532	4533	4534	4547	4553	4559	4563	4577	4578	4579	4580	4586	4597	4600
	4613	4614	4615	4616	4652	4704	4708	4713	4717	4721	4735	4736	4737	4738	4747
	4752	4759	4762	4775	4776	4777	4778	4781	4799	4803	4808	4812	4816	4830	4831
	4832	4833	4842	4847	4854	4857	4870	4871	4872	4873	4876	4902	4906	4910	4914
	4918	4932	4933	4934	4935	4942	4955	4956	4957	4958	4962	4966	4970	4984	4985
	4986	4987	4994	5007	5008	5009	5010	5017	5020	5033	5034	5035	5036	5043	5057
	5058	5059	5060	5077	5081	5085	5089	5093	5107	5108	5109	5110	5117	5130	5131
	5132	5133	5137	5141	5145	5159	5160	5161	5162	5169	5182	5183	5184	5185	5192
	5195	5208	5209	5210	5211	5218	5232	5233	5234	5235	5257	5261	5269	5277	5281
	5285	5298	5299	5300	5301	5307	5319	5320	5321	5322	5339	5343	5351	5359	5363
	5367	5380	5381	5382	5383	5384	5401	5402	5403	5404	5440	5448	5452	5465	5466
	5467	5468	5470	5474	5478	5482	5496	5497	5498	5499	5506	5510	5514	5524	5532
	5536	5539	5552	5553	5554	5555	5563	5571	5575	5578	5591	5592	5593	5594	5602
	5610	5614	5622	5625	5638	5639	5640	5641	5647	5665	5673	5677	5690	5691	5692
	5693	5695	5699	5703	5707	5721	5722	5723	5724	5731	5735	5739	5749	5757	5761
	5764	5777	5778	5779	5780	5788	5796	5800	5803	5816	5817	5818	5819	5827	5835
	5839	5847	5850	5863	5864	5865	5866	5872	5895	5903	5907	5920	5921	5922	5923
	5925	5931	5935	5939	5949	5957	5961	5970	5978	5982	5988	6002	6003	6004	6005
	6010	6028	6036	6040	6053	6054	6055	6056	6058	6064	6068	6072	6082	6090	6094
	6103	6111	6115	6121	6135	6136	6137	6138	6143	6166	6170	6178	6186	6190	6203
	6204	6205	6206	6223	6227	6235	6243	6247	6260	6261	6262	6263	6287	6295	6299
	6302	6307	6315	6323	6327	6331	6344	6345	6346	6347	6355	6363	6367	6371	6385
	6386	6387	6388	6407	6415	6419	6422	6427	6435	6443	6447	6451	6464	6465	6466
	6467	6475	6483	6487	6491	6505	6506	6507	6508	6528	6536	6544	6548	6551	6556
	6568	6569	6570	6571	6577	6582	6588	6600	6608	6616	6620	6623	6628	6640	6641
	6642	6643	6649	6654	6660	6679	6687	6695	6699	6702	6708	6718	6726	6730	6736
	6744	6750	6762	6770	6778	6782	6785	6791	6801	6809	6813	6819	6827	6833	6859
	6868	6876	6880	6883	6892	6900	6911	6919	6923	6928	6932	6936	6951	6960	6968
	6972	6975	6984	6992	7003	7011	7015	7020	7024	7028	7051	7060	7068	7072	7075
	7082	7086	7090	7104	7105	7106	7107	7115	7118	7131	7132	7133	7134	7148	7154
	7160	7166	7179	7188	7196	7200	7203	7210	7214	7218	7232	7233	7234	7235	7243
	7246	7259	7260	7261	7262	7276	7282	7288	7294	7324	7333	7341	7345	7349	7366
	7370	7382	7383	7384	7385	7388	7395	7397	7409	7460	7468	7472	7475	7488	7501
	7505	7517	7518	7519	7520	7523	7536	7537	7538	7539	7551	7559	7563	7576	7584
	7588	7614	7622	7625	7637	7638	7639	7640	7656	7657	7658	7659	7695	7704	7712
	7716	7728	7738	7746	7752	7756	7770	7771	7772	7773	7783	7786	7796	7809	7810
	7811	7812	7816	7820	7829	7837	7841	7849	7860	7868	7874	7877	7891	7892	7893
	7894	7904	7907	7917	7930	7931	7932	7933	7937	7941	7952	7955	7960	7974	7975
	7976	7977	7988	7996	8000	8486	8491	8495	8510	8524	8533	8542	8550	8576	8978
	8990	8994	8998	9012	9018	9021	9028	9031	9044	9045	9046	9047	9104		

CZR6GB0 RK611 DU PORT LGC TST MACY11 3DA(1052) 03-JAN-78 08:56 PAGE 253
CZR6GB.P11 03-JAN-78 08:46 CROSS REFERENCE TABLE -- MACRO NAMES

ESCAPE	1341#														
F.EAB	1602#	4274	4309	4338	4407	4443	4497	4566	4602	4723	4764	4818	4859	4920	4944
	4972	4996	5022	5046	5095	5119	5147	5171	5197	5221	5286	5308	5368	5390	5454
	5484	5541	5580	5627	5679	5709	5766	5805	5852	5909	5991	6042	6124	6192	6249
	6333	6373	6453	6493	6557	6629	7092	7120	7220	7248	7371	7506	7525	7626	7645
	7758	7798	7879	7919	7962	9033									
GETPRI	1341#														
GETSWR	1341#	8077													
HDCHK3	1784#	7778	7899												
HDTBL	1797#														
HEADER	2032#	2044	2128	2154	2190	2211	2257	2299	2309	2338	2374	2415	2449		
LOOP	1586#	3902	4015												
MSG	3780#	3782	3826#	3828	3995#	3997	4104#	4106	4182#	4184	4635#	4637	4679#	4681	4878#
	4880	5237#	5239	5406#	5408	5875#	5877	6145#	6147	6265#	6267	6511#	6513	6662#	6664
	6835#	6837	7035#	7037	7299#	7301	7433#	7435	7665#	7667					
MULT	1341#	4462	4621												
NEWTST	1341#	3780	3826	3995	4104	4182	4476	4635	4679	4783	4878	5062	5237	5324	5406
	5649	5875	6012	6145	6208	6265	6390	6511	6590	6662	6752	6835	6942	7035	7170
	7299	7433	7665												
OWNTAG	1579#	2608													
POP	1341#	9464	9524	9525	9910	10106	10148								
PUSH	1341#	9423	9485	9487	9508	9884	10077	10128							
QKPACK	1959#	4231													
QKSEEK	1809#	4710	4805	4907	4959	5082	5134	5471	5696	7079	7207	7949			
QKSRT	1712#	6926	7018	8987											
RDATA	1877#														
RDHDR	1756#	7779	7900												
RELEAS	1979#	5262	5344	5433	5517	5556	5595	5658	5742	5781	5820	5888	5942	5963	6021
	6075	6096	6171	6228	6280	6308	6348	6400	6428	6468	6529	6601	6680	6711	6763
	6794	6861	6904	6953	6996	7053	7181	7326	7453	7544	7569	7697	7822	7980	
REPORT	1341#														
REPTA	2025#	4785	6392												
REPTST	2019#	4478	5064	5326	5651	6014	6210	6592	6754	6944	7172				
SCOPE	1236#	3790	3841	4010	4113	4217	4482	4644	4695	4790	4893	5068	5248	5330	5430
	5655	5885	6018	6157	6214	6277	6397	6524	6596	6675	6758	6856	6948	7048	7176
	7319	7449	7690	8020	8028										
SETP	2006#	4220													

CZR6GBC RK611 DU PORT LGC TST
CZR6GB.P11 03-JAN-78 08:46

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CROSS REFERENCE TABLE -- MACRO NAMES

TST10	2132#	4698	4793
TST12	2158#	4896	5071
TST14	2194#	5251	5333
TST16	2215#	5433	5658
TST20	2261#	5888	6021
TST22	2303#	6160	6217
TST24	2313#	6280	6400
TST26	2342#	6527	6599
TST30	2378#	6678	6761
TST32	2419#	6861	6953
TST32A	2453#	7053	7181
TST5	2048#	4326	4485

TYPBIN	1341#		
TYPDEC	1341#	8040	
TYPNAM	1341#		
TYPNUM	1341#		
TYPOCS	1341#	3869	3933
TYPOCT	1341#	9719	
TYPTXT	1341#		

WDATA	1837#	7485
WRCHK	1915#	7611

WRHQR 1733#
SSCMRE 2500#

SSCMTM	2500#	2537	2538
SSESCA	1341#		
SSCMTM	1341#	2537	2538

SSNEWT	1341*	3780	3826
	5649	5875	6012
	3288	3422	3665

	7299	7433	7665
SSSET	10178*	10187	10188
SSSETM	7663*		

SSSEIM	3662#		
SSSKIP	1341#	3768	3819
	6749	6832	7406

	8749	8832	7406
.EQUAT	1194#	1231	
.HEADE	1194#	1199	

. HEAD	1194#	1199
. SETUP	1194#	3595
. SWRHI	1194#	1210

.SWR11	1194#	1218
.SWRLO	1194#	1222#
.SACT1	1194#	1545

SAPTB	2550	1556
SAPTH	1194	1556

. SPTY	11948	9478
. SCATC	11948	1528
. SCATO	11948	2528

. \$CMTA	1194#	2500
. \$DB2D	1194#	9960
. \$DB2Q	1194#	8821

.SDB20	1194#	9921
.SEOP	1194#	8010
SFRRO	1194#	9278

SRRO	1194#	9278
SMULT	1194#	10063
SRDOC	1194#	9868

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.SADOC      1194#      9888
.SREAD      1194#      9612
.SSAVE      1194#      10110

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.SSB2D	1194#	10022
.SSCOP	1194#	9214

SSUPR	1194#	10040
SRAP	1194#	10155

.STYPD 1194# 9411

3979	4149	8360	9077	9122							
2539	2540	2541	2542								
3995 6145	4104 6208	4182 6265	4476 6390	4635 6511	4679 6590	4783 6662	4878 6752	5062 6835	5237 6942	5324 7035	5406 7170
10189	10190	10192	10194	10195	10196	10197	10198	10199	10200		
4046 7424	4164	4170	4649	5306	5388	5646	5871	6009	6142	6587	6659

	8749	8832	7406
.EQUAT	1194*	1231	
.HEADE	1194*	1199	

. HEAD	1194#	1199
. SETUP	1194#	3595
. SWRHI	1194#	1210

.SWR11	1194#	1218
.SWRLO	1194#	1222#
.SACT1	1194#	1545

SAPTB	2550	1556
SAPTH	1194	1556

. SPTY	11948	9478
. SCATC	11948	1528
. SCATO	11948	2528

. \$CMTA	1194#	2500
. \$DB2D	1194#	9960
. \$DB2Q	1194#	8821

.SDB20	1194#	9921
.SEOP	1194#	8010
SERR0	1194#	9278

SRRO	1194#	9278
SMULT	1194#	10063
SRDOC	1194#	9868

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.SADOC      1194#      9888
.SREAD      1194#      9612
.SSAVE      1194#      10110

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.SSB2D	1194#	10022
.SSCOP	1194#	9214

SSUPR	1194#	10040
SRAP	1194#	10155

.STYPD 1194# 9411

H04

CZR6GB0 RK611 DU PORT LGC TST MACY11 30A(1052) 03-JAN-78 08:56 PAGE 255
CZR6GB.P11 03-JAN-78 08:46 CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0253

.STYPE 1194# 9332
.STYPC 1194# 9535

. ABS. 071334 000

ERRORS DETECTED: 0

RM03:CZR6GB, RM03:CZR6GB.SEQ/SOL/CRF/NL:TOC/DOC=RM03:CZR6GB.P11
RUN-TIME: 36 32 4 SECONDS
RUN-TIME RATIO: 302/72=4.1
CORE USED: 33K (65 PAGES)

DOCUMENT PAGES: 253