

RK06 / RK07

UNIBUS DUAL PORT DRIVE
MD-11-DZR6G-A
DIAGNOSTIC

EP-DZR6G-A-DL
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FICHE 1 OF 2

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This page contains a grid of diagnostic data tables for RK06 and RK07 drives. The grid is organized into columns for different drive parameters and test results. Each cell in the grid contains a small table with columns for drive parameters and test results. The data is presented in a structured, tabular format, likely used for troubleshooting or performance monitoring of the drives.

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IDENTIFICATION

PRODUCT CODE	MAINDEC-11-DZR6G-A-D
PRODUCT NAME	UNIBUS RK06-RK07 DUAL PORT DRIVE DIAGNOSTIC
DATE	AUGUST 1977
MAINTAINER	DIAGNOSTIC ENGINEERING
AUTHOR	GARY PAPAIZIAN

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97
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139
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142 GROUNDS BIT 0 OF THE UNIT SELECT LINES GOING TO THE PORT B
143 INTERFACE & TIMING MODULE (47706)
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145 THE EFFECT OF THIS IS THAT BIT 0 UNIT SELECT IS COMPLEMENTED

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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 ADD-
RESS 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 COMPATIBLE 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 COMPATIBLE 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

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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 FDP 11/50

3 8 FAULT ISOLATION

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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'

POSITION

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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

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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

MAINDEC-11-DZR6G-A-PB

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

MAINDEC-11-DZP6G-A-PB

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/XXDP

NOTES 1 FOR VARIATIONS OF THE ABOVE, SEE XXDP. ACT/APT
CONSIDERATIONS IN SECTIONS 3 2 & 3 3

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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 DEFAULTS 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 INTERACTION 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 AD RETURNS WITH THE 'DRIVE AVAILABLE' BIT NOT SET, IT ASSUMES PORT 'B' HAS SEIZED THE DRIVE

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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 PAGES'

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 INDICATING 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

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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 & ATTENT ON

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'

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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

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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 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

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 FROM SERIAL #

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THIS TEST VERIF'ES THAT CYL 632 (1456 FOR RK07), TRACK 2 CAN BE READ

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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 WRITING

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

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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 HISTOPY IS PROV DED

6 2 ERROR PRINTOUT EXAMPLE

MESSAGE AO ERROR
AFTER START SPINDLE CMD & FWC SET

	TEST NO	PC				
	000014	016530				
	EXPECT					
AO	B0	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, B0, 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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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

DZR6M SUBSYSTEM VERIFICATION PART 1 TEST 22
DZR6P 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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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  STN= 1          ;SET FIRST TEST NO TO 1
1196
1197
1198
1199      TITLE UNIBUS RK06-RK07 DUAL PORT DRIVE DIAGNOSTIC
1200      ;*COPYRIGHT (C) 1976,1977
1201      ;*DIGITAL EQUIPMENT CORP
1202      ;*MAYNARD, MASS 01754
1203      ;*
1204      ;*PROGRAM BY GAR 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 SWP/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 IOT,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 STKLM= 177774 ;,STACK LIMIT REGISTER
1246 177772 PIRQ= 177772 ;,PROGRAM INTERRUPT REQUEST REGISTER
1247 177570 DSWR= 177570 ;,HARDWARE SWITCH REGISTER
1248 177570 ODISP= 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 PRO= 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

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

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	TPTVEC=	14	, TRACE TRAP
1333	000014	BPTVEC=	14	, BREAKPOINT TRAP (BPT)
1334	000020	IOTVEC=	20	, INPUT/OUTPUT TRAP (IOT) **SCOPE**
1335	000024	PHRVEC=	24	, POWER FAIL
1336	000030	EMTVEC=	30	, EMULATOR TRAP (EMT) **EPP0P**
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 P106 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= BIT5   ; SUBSYSTEM CLEAR CONTROLLER AND ALL DRIVES

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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	DTYPE=	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	IDA=	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	WPL=	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

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

SBTTL DEFINITION OF DRIVE STATUS BYTE 00 MESSAGE A (RKMR2 34)

1463	000040	D DRA= BIT5	; DRIVE AVAILABLE
1464	000100	D VV= BIT6	; VOLUME VALID
1465	000200	D DRDY= BIT7	; DRIVE READY
1466	000400	D DDT= BIT8	; DRIVE TYPE (0=RK06, 1=RK07)
1467	001000	D 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

SBTTL DEFINITION OF DRIVE STATUS BYTE 01 MESSAGE A (PKMR2 34)

1476	000020	D SSP= BIT4	; SERVO SIG PRESENT
1477	000040	D HDHM= 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

SBTTL DEFINITION OF DRIVE STATUS BYTE 00 MESSAGE B (PKMR3 36)

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

SBTTL DEFINITION OF DRIVE STATUS BYTE 01 MESSAGE B (PKMR3 36)

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 HDFL= 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

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

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			
1515		SBTTL COMMON MASKS AND OTHER BITS	MESSAGE A (RKMR2 34)
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


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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     @#START ;, JUMP TO STARTING ADDRESS OF PROGRAM
1539          000220          =220
1540 000220 000137 010040  JMP     PARSRT  ;, INPUT PARAMETERS
1541
1542          000240          =240
1543 000240 000137 067302  JMP     0 ODT   ;, ENTER ODT11
1544
1545          SBTTL ACT11 HOOKS
1546
1547          ;,*****
1548          HOOKS REQUIRED BY ACT11
1549          000244          $$VPC=          ;, SAVE PC
1550          000046          =46
1551 000046 042772          $ENDAD          ;,1)SET LOC 46 TO ADDRESS OF SENDAD IN SEOP
1552          000052          =52
1553 000052 100000          WORD 100000          ;,2)SET LOC 52 TO 100000
1554          000244          =$VPC          ;, 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          $X=          ;, SAVE CURRENT LOCATION
1562          000024          =24          ;, SET POWER FAIL TO POINT TO START OF PROGRAM
1563 000024 000200          200          ;, FOR APT START UP
1564          000044          =44          ;, POINT TO APT INDIRECT ADDRESS PNTR
1565 000044 001000          $APTHDR ;, POINT TO APT HEADER BLOCK
1566          001000          = $X          ;, 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          $MADR  WORD $MAIL          ;, ADDRESS OF APT MAILBOX (BITS 0-15)
1574 001004 000430          $STM   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          $UNITM WORD 600          ;, ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
1577 001012 000042          WORD SETEND-$MAIL/2 ;, LENGTH MAILBOX-ETABLE (WORDS)
1578
1579
1580          LIST MD
1581
1582
    
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1583      ,USE LOOP X TO OMIT SUBCLR
1584
1585
1586      MACRO LOOP A
1587          SCOP1
1588          MOV #STACK,SP      ,RESTORE STK PTR
1589
1590      IF B A
1591          JSR PC,SUBCLR
1592          ERROR 24          ,CERR AFTER SCLR
1593
1594      ENDC
1595      ENDM LOOP
1596
1597
1598      ,THIS MACRO FILLS EXPECTED MSG A0, B0, A1, B1, A2, B2 & B3 WITH STANDARD BITS
1599      ,A=0 GSC AFTER ATTN OR 0 AFTER DRIVE CLEAR OR ANY IMPLIED SEEKS
1600      ,NOTE A CAN BE ANY BIT COMBINATION DESIRED & INCLUDES 0 DRA
1601
1602      MACRO F EAB A
1603
1604          MOV #<A'D SPIN'D DRDY'D VV>,E A0 ,EXPECTED MSG A0
1605          CLR E B0          ,EXPECTED MSG B0
1606          MOV #<D.SPOK'D CART'D DOOR'D BRHM'D SSP>,E A1 ,EXPECTED A1
1607          MOV #1,E B1      ,MSG ID FOR EXPECTED MSG B1
1608          CLR E A2          ,EXPECTED MSG A2
1609          MOV #2,E B2      ,MSG ID FOR EXPECTED MSG B2
1610          MOV #3,E B3      ,MSG ID FOR EXPECTED MSG B3
1611      ENDM F EAB
1612
1613
1614      ,THIS MACRO ASSUMES DRIVE MSG A0, B0, A1, B1 WILL ALWAYS BE TESTED
1615      ,USE A,C,D,E FOR MSG A0, B0, A1, B1 ERROR NUMBERS RESP
1616      ,USE G=T A2 TO READ MSG A2 & PUT INFO INTO 'CYLDIF'
1617      ,H=T B2 TO READ MSG B2 & PUT INFO INTO 'CYLADD'
1618      ,I=T B3 TO READ MSG B3 & PUT INFO INTO 'SECTOR' & 'HEADA
1619
1620      ,USE F=<ERROR DESCRIPTION>
1621
1622      MACRO CHECK A,C,D,E,F,G,H,I
1623
1624          JSR PC,CHKMSG      CHECK MSGS A0 B0 A1 B1
1625          ,WORD G'H'I      ,& MSGS SPEC F'IEC HEPE
1626          ERROR A          ,MSG A0 ERROR F
1627          ERROR C          ,MSG B0 ERROR
1628          ERROR D          ,MSG A1 ERROR
1629          ERROR E          ,MSG B1 ERROR
1630      ENDM CHECK
1631
1632      ,A=CYL DIFF/OFFSET ERROR #
1633      ,B=CYL ADDR ERROR #
1634      ,C=<ERROR DESCRIPTION>
1635
1636      MACRO CWD2 A,B,C,?D,?E
1637          MOV #2,RKMR1,R5
1638

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1639          JSR      PC,GSTAT
1640          TST      CYLDIF          ,SEE IF MSG A2=0
1641          BEQ      D              ,BR IF YES
1642          ERROR   A              ,MSG A2 NOT CLEARED C
1643          D       TST      CYLADD          ,SEE IF MSG B2=0
1644          BEQ      E              ,BR IF YES
1645          ERROR   B              ,MSG B2 NOT CLEARED C
1646          E
1647          ENDM    CWD2
1648
1649          MACRO   STDER1  B
1650          F EAB   <D DRA!B>
1651          CHECK   165,166,167,170,<AFTER TIMEOUT>,0,0,0
1652          ENDM    STDER1
1653
1654          MACRO   STDER2  B
1655          F EAB   <D DRA!B>
1656          CHECK   211,212,213,214,<AFTER RELEASE ISSUED>,0,0,0
1657          ENDM    STDER2
1658
1659          MACRO   DRCLR   C,7A
1660
1661          MOV      #CLR,RKCS1(R5)
1662          MOV      $UNIT,RKCS2(R5) ,DRIVE#
1663          ADD      UNITB,RKCS2(R5) ,ADD 1 IF ON PORT B
1664          MOV      #CLEAR,HCS1
1665          JSR      PC,DOCMD          ;DO DRIVE CLEAR CMD & GET CONTR RDY
1666          ERROR   151              ,NO RDY AFTER DRIVE CLEAR CMD
1667          JSR      PC,TSTATN        ,TEST FOR ATTN
1668          BP      A
1669          ERPOP   154              ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
1670
1671          A
1672          IF      B              C
1673          F EAB   D DRA
1674          CHECK   33,34,35,36 <AFTER DRV CLEAR CMD>,T A2,T B2,0
1675          ENDC
1676
1677          ENDM    DRCLR
1678
1679
1680          USE CALIB X TO OMIT CHECKING MSGS A0, B0, A1, B1, A2 & B2
1681
1682          MACRO   CALIB   A,7C
1683
1684          MOV      #CLR,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 AFTEP 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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1695          BNE      C
1696          ERROR   70          ,RTZ NOT SET DURING RECAL CMD
1697          MOV     T10,TEMP2    ,SETUP TIMEOUT
1698          JSR     PC,FATT1      ,FIND ATTN
1699          ERROR   55          ,NO ATTN AFTER RECAL CMD
1700          IF B    A
1701          F EAB   <D DSC'D DRA>
1702          CHECK   221,66,222,67,<AFTER RECAL CMD>,T A2,T B2,T B3
1703          CWD2    47,50,<AFTER RECAL CMD>
1704          ENDC
1705          DRCLR
1706          ENDM    CALIB
1707
1708
1709          ,QUICK START SPINDLE
1710
1711          ,MACRO   QKSRT
1712
1713          JSR     PC,SUBCLR
1714          ERROR   24          ,CERR AFTER SCLR
1715
1716          MOV     #SRTSPL,HCS1
1717          JSR     PC,DOCMD      ,DO START SPINDLE CMD & GET CONTR RDY
1718          ERROR   121         ,RDY NOT SET AFTER ST SPIN CMD
1719
1720          MOV     T100,TEMP2    ,SETUP TIMEOUT
1721          JSR     PC,FATT1      ,FIND ATTN
1722          ERROR   74          ,NO ATTN AFTER ST SPIN CMD
1723
1724          CLR     UNLD
1725
1726          ENDM    QKSRT
1727
1728
1729          , A=WRHEAD/<<CFMT WRHEAD>
1730          , USE WRHDR <A>,X TO OMIT CHECKING A0, B0, A1 & B1
1731
1732          ,MACRO   WRHDR  A,C,?D
1733
1734          MOV     #<A>,HCS1
1735          JSR     PC,DATCMD      ,DO DATA X FOR CMD & GET CONTR RDY
1736          ERROR   200         ,NO RDY AFTER WRITE HEADER CMD
1737          JSP     PC,GSTAT      ,GET FRESH STATUS
1738          BIT     #CERR,HCS1
1739          BEQ     D
1740          ERROR   201         ,CERR AFTER WRITE HEADER CMD
1741          TYPE    ,MSG21        ,ABORTING BALANCE OF TESTS
1742          JMP     SEOP
1743
1744          C
1745          IF B    C
1746          F EAB   D DRA
1747          CHECK   37,40,41,42,<AFTER WRITE HEADER CMD 0,0,0
1748          ENDC
1749          ENDM    WRHDR
1750
    
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J 3

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```

, A=RDHEAD/<<CFMT!RDHEAD>
, USE RDHDR <A>, X TO OMIT CHECKING A0, B0, A1, B1
,
MACRO RDHDR A, C, ?D, ?E
    MOV #RHTAB, RD
    MOV #<A>, HCS1
    JSR PC, DATCMD ; DO DATA X FOR CMD & GET CONTR RDY
    ERROR 171 ; NO RDY AFTER READ HEADER CMD
    BIT #CERR, HCS1
    BEQ D
    ERROR 174 ; CERR AFTER READ HEADER CMD
D
    MOV RKDB(R5), (RD)+ ; 1'ST WORD FROM SILO TO RHTAB
    MOV RKDB(R5), (RD)+ ; 2'ND WORD
    MOV RKDB(R5), (RD)+ ; 3'RD WORD
    BIT #DLT, RKCS2(R5)
    BEQ E
    JSR PC, GSTAT
    ERROR 173 ; DLT AFTER READ HEADER CMD
E
    IF B C
    F EAB D DRA
    CHECK 301, 271, 302, 272, <AFTER READ HEADER CMD>, T A2, T B2, D
ENDC
ENDM RDHDR
,
MACRO HDCHK3 ?A
    RDHDR RDHEAD
    CMP RHTAB, TOCYL ; CHECK WORD 0 ONLY, CYL#
    BEQ A ; BR IF SAME
    ERROR 51 ; WRONG Cyl# ON HEADER
A
ENDM HDCHK3
,
, A=TOCYL /FRCYL , B=HEAD#, C = 0 FOR 22 SECTOR, 1 FOR 20 SECTOR
,
MACRO HDTBL A, B, C
    MOV A, CALADD ; SETUP
    MOV #B, HEAD ; TO FILL
    MOV #C, FORMAT ; HEADER
    JSR PC, FHDTAB ; TABLE
ENDM HDTBL
  
```

```

1807 ; QUICK SEEK ENTER WITH CYL# IN RKDC
1808
1809 MACRO QKSEEK ?A
1810
1811 MOV #SEEK,HCS1
1812 JSR PC,DOCMD ; DO SEEK CMD & GET CONTR READY
1813 ERROR 131 ; NO RDY AFTER SEEK CMD
1814
1815 MOV T5000,TEMP1 ; SETUP TIMEOUT
1816 JSR PC,FATT2 ; FIND ATTN
1817 ERROR 132 ; NO ATTN AFTER SEEK CMD
1818
1819 BIT #CERR,HCS1
1820 BEQ A
1821 ERROR 210 ; CERR AFTER SEEK CMD
1822
1823 A F EAB <D DSC'D DRA>
1824 CHECK 161,162,163,164,<AFTER SEEK CMD>,0,0,0
1825
1826 ENDM QKSEEK
1827
1828
1829
1830 ; A=WRDATA/<<CFMT'WRDATA>
1831 ; C=ADDR TO JMP TO ATTEMPT TO WRITE ON ANOTHER SECTOR
1832 ; D=ADDR TO JMP TO BYPASS TEST
1833 ; E IF BLANK WILL CHECK A0, B0, A1 & B1 AT THE END OF WRITING
1834 ; E IF NON BLANK WILL OMIT CHECKING A0 THRU B1
1835
1836
1837 MACRO WDATA A,C,D,E,?F,?G,?H,?I
1838
1839 MOV #<A>,HCS1
1840 JSR PC,DATA CMD ; IN DATA X FOR CMD & GET CONTR RDY
1841 ERROR 11 ; NO RDY AFTER WRITE DATA CMD
1842 JSR PC,GSTAT ; GET FRESH STATUS
1843 BIT #CERR,HCS1
1844 BEQ I ; BR IF NO ERRORS
1845
1846 BIT #BSE,HER ; SEE IF BAD SECTOR FLAG
1847 BEQ G ; BR IF NO
1848 JSR PC,TRUEP ; ELSE SEE IF SECTOR LISTED IN BSE TABLE
1849 BR H ; RETURN HERE IF NO
1850
1851 INC SECTOR ; RETURN HERE IF YES
1852 CMP SECTOR,#10 ; ARE 10 CONSEC SECTORS BAD
1853 BNE F ; BR IF NO
1854 ERROR 46 ; ABORTING TEST DETECTED 10 BAD SECTORS
1855 JMP D ; BYPASS TEST
1856 F MOV #CCLR,RKCS1(R5) ; TRY ANOTHER SECTOR
1857 JMP C
1858 G ERROR 12 ; CERR WITH WRITE DATA CMD
1859 F EAB D DRA
1860 CHECK 52,23,53,25,<AFTER WRITE DATA CMD>,T A2,T B2,0
1861 TYPE ,MSG21 ; ABORTING BALANCE OF TESTS
1862 JMP SEOP

```

```
1863 H ERROR 43 ,BAD SECTOR NOT LISTED IN TABLE
1864 |
1865 IF B E
1866 F EAB D DRA
1867 CHECK 52, 23, 53, 25, <AFTER WRITE DATA CMD>, T A2, T B2, 0
1868 ENDC
1869 ENDM WDATA
1870
1871
1872
1873 ,A=RDDATA/<<CFMT!RDDATA>
1874 ,USE RDATA <A>,X TO OMIT CHECKING A0, B0, A1 & B1
1875
1876
1877 MACRO RDATA A, C, ?D, ?E, ?F, ?G, ?H
1878
1879 MOV #<A>,HCS1
1880 JSR PC,DATCMD ,DO DATA X FOR CMD & GET CONTR RDY
1881 ERROR 13 ,NO RDY AFTER READ DATA CMD
1882 JSR PC,GSTAT ,GET FRESH STATUS
1883 BIT #CERR,HCS1
1884 BEQ G
1885 BIT #BSE,HER ,SEE IF BAD SECTOR
1886 BEQ E
1887 ERROR 65 ,DETECTED BSE IN READ BUT NOT IN WRITE CMD
1888 BR H
1889
1890 E BIT #DCK,HER ,SEE IF DATA CHECK ERROR
1891 BEQ F
1892 ERROR 21 ,DATA CHECK ERROR AFTER READ CMD (ECC)
1893 BR H
1894
1895 F ERROR 14 ,CERR AFTER READ DATA CMD
1896
1897 H F EAB D, DRA
1898 CHECK 54, 26, 56, 30, <AFTER READ DATA CMD>, T A2, T B2, 0
1899 TYPE MSG21 ,ABORTING BAL OF TESTS
1900 JMP SEOP
1901
1902 G
1903 IF B C
1904 F EAB D DRA
1905 CHECK 54, 26, 56, 30, <AFTER READ DATA CMD>, T A2, T B2, 0
1906 ENDC
1907 ENDM RDATA
1908
1909
1910 ,A=WRTCHK/<<CFMT!WRTCHK>
1911 ,C=EXPECTED DATA FOR TYPEOUT
1912 ,USE WRCHK <A>,DATA0,X TO OMIT CHECKING A0, B0, A1 & B1
1913
1914
1915 MACRO WRCHK A, C, D, ?E, ?F
1916
1917 MOV #<A>,HCS1
1918 JSR PC,DATCMD ,DO DATA X FOR CMD & GET CONTR PDY
```

```

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        RKDB(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        SEOP
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          ENDC
1941          ENDM      WRCHK
1942
1943
1944          MACRO      EOPGM
1945
1946          SCOPE
1947          CLR        $ESCAPE
1948          MOV        #1,$TIMES
1949          MOV        #STACK,$SP
1950          INC        $DEVCT
1951          CMP        DRIVS,$DEVCT  ,INCR COUNT FOR # DRIVES CHECKED
1952          BEQ        SEOP1+2      ,ARE ALL DRIVES PRESENT TESTED?
1953          JMP        NUORV        ,BR IF YES
1954          SEOP1     SCOPE
1955          ENDM      EOPGM
1956
1957
1958          MACRO      QKPACK  ?A
1959          MOV        #CCLR,RKCS1(R5)
1960          MOV        $UNIT,RKCS2(R5)
1961          ADD        UNITB,RKCS2(R5)
1962          MOV        #PACK,HCS1
1963          JSR        PC,DOCMD
1964          ERROR      116          ,DO PACK CMD & GET CONTR RDY
1965          BIT        #D UV,HMR2    ,CONTR NOT RDY AFT PACK CMD
1966          BNE        A
1967          ERROR      27          ,UV NOT SET AFTER PACK CMD
1968
1969          A
1970          ENDM      QKPACK
1971
1972
1973
1974
  
```



```
1975 ;MACRO TO RELEASE PORT A OR B
1976 ;RLS PORT A: RELEAS 0,1,A,B (A,B,C,D IF USED WITH MACROS BELOW)
1977 ;RLS PORT B: RELEAS 1,0,B,A (B,A,D,C IF USED WITH MACROS BELOW)
1978
1979 ;MACRO RELEAS W,X,Y,Z,?J
1980 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT Y
1981 MOV #W,UNITB
1982 ADD UNITB,RKCS2(R5)
1983 MOVB #'Y,MSG19A
1984 ADD #RLS,RKCS2(R5) ;RELEASE PORT Y
1985 MOV #SELDRV,HCS1
1986 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
1987 ERROR 117 ;NO RDY AFTER SEL DRV CMD
1988
1989 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT Z
1990 MOV #X,UNITB
1991 ADD UNITB,RKCS2(R5)
1992 MOVB #'Z,MSG19A
1993 MOV #SELDRV,HCS1
1994 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
1995 ERROR 117 ;NO RKY AFTER SEL DRV CMD
1996
1997 BIT #D DRA,HMP2 ;SEE IF DRIVE AVAIL ON PORT Z
1998 BNE J ;BR IF YES
1999 ERROR 71 ;PORT Z NOT AVAIL AFTER PORT Y RLS
2000 J
2001 ENDM RELEAS
2002
2003
2004
2005
2006 MACRO SETP A,C
2007 MOV #A,UNITB ;SETUP PORT C
2008 MOVB #'C,MSG19A
2009 MOV TIMER,COUNT
2010 JSR PC,TMO ;DO TIMEOUT
2011
2012 ISR PC,SUBCLF
2013 ERROR 24 ;CEPP AFTER SCLP
```

```

2014
2015          JSR      PC,DRAV          ,SEE IF DRIVE AVAIL
2016          ERROR   45              ,PORT C NOT AVAIL AFTER TMO
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      SUNIT,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     #55,$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          MOVB   #'D,MSG19A     ,SETUP ERROR MSG FOR PORT D
2055          CLR    $ESCAPE
2056          JSR    PC,DRAV          ,SEE IF DRIVE AVAIL
2057          BR     1$              ,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 AFTEP SEL DRIVE & DRIVE NOT AVAIL
2063          6$      MOV     #<D SPIN'D.VU>,E A0
2064          MOV     E A0,E A1      ;MSG A & B SHOULD ALWAYS RETURN SAME
2065          BIS    E DDT,E A1
2066          CLR    E B0           ,WORD 0 FOR PORT D
2067          CLR    E B1
2068          MOV     #55,$ESCAPE
2069          CHECK   104,105,106,107,<WHILE PORT D UNAVAILABLE 0 0 0

```

```

2070
2071          TST      $PASS
2072          BEQ      8$          ,BR IF FIRST PASS
2073          JMP      5$          ,ELSE EXIT TEST
2074          CLR      $ESCAPE
2075          MOV      #CLR,RKCS1(R5)
2076          MOV      #A,UNITB    ;SETUP FOR PORT C AGAIN
2077          MOVB    #'C,MSG19A
2078          MOV      #360,COUNT  ;SETUP 4 SEC TIMEOUT
2079          JSR      PC,CLKON    ;TURN ON CLOCK
2080
2081          JSR      PC,DRAW
2082          ERROR   45          ,PORT C NOT AVAIL AFTER TIMEOUT
2083
2084          MOV      #B,UNITB    ,SELECT PORT D BEFORE TIMEOUT OR RELEASE
2085          MOVB    #'D,MSG19A
2086          JSR      PC,DRAW
2087          BR      3$          ,SEE IF PORT D DRIVE AVAIL
2088          ERROR   103        ,BR IF NOT AVAIL
2089                                     ,PORT D AVAIL BEFORE TMO OR RELEASE
2090          MOV      #CLR,RKCS1(R5)
2091          MOV      $UNIT,R4
2092          ADD     UNITB,R4
2093          JSR      PC,FATT3
2094          ERROR   110        ,NO ATTN ON PORT D TO ALLOW SEIZE
2095
2096          JSR      PC,CLKOF
2097          JSR      PC,DRAW
2098          ERROR   45          ,SEE IF PORT D DRIVE AVAIL
2099                                     ,PORT D NOT AVAIL
2100
2101          MOV      #5$, $ESCAPE
2102          F EAB    <D DSC'D DRA>
2103          CHECK   77,100,101,102,<AFTER TIMEOUT>,,0,0,0
2104          CLR      $ESCAPE
2105          MOV      #A,UNITB    ,SETUP FOR PORT C
2106          MOVB    #'C,MSG19A
2107          JSR      PC,TSTATN   ,TEST FOR ATTN ON PORT C
2108          BR      4$          ,PORT C ATTN SET W/O REQUEST PENDING
2109          ERROR   111
2110          MOV      #5$, $ESCAPE
2111          MOV      #B,UNITB    ,SETUP FOR PORT D
2112          MOVB    #'D,MSG19A
2113          DRCLP
2114
2115          MOV      #360,R1
2116          SUB     COUNT,R1     ,R1-COUNT=R1
2117          MULT    #17,R1       ,MULT BY 16 66 MS
2118          TYPE    ,E          ,PORT TIMEOUT
2119          MOV      R1,-(SP)     ,PUSH BINARY ONTO STACK
2120          JSR      PC,$SB2D    ,CONVERT TO ASCII
2121          JSR      PC,$SUPRS   ,TYPE IT
2122          TYPE    ,MSG22      ,MS
2123
2124          CLR      $ESCAPE
2125          JSP     PC,CLKOF

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```
2126 . ENDM TST5
2127
2128
2129 . A & B=0 FOR PORT A OR 1 FOR PORT B
2130 . C & D=A FOR PORT A OR B FOR PORT B
2131
2132 . MACRO TST10 A,B,C,D,E,F,?G
2133 . SETP A,C
2134 . MOV #F,RKDC(R5) ;SEEK TO CYL F
2135 . QKSEEK
2136 . JSR PC,RDCYLA ;READ CYL ADDR
2137 . CMP CYLADD,#F ;SEE IF CYL F
2138 . BEQ G ;BR IF YES
2139 . MOV #E,FRCYL
2140 . MOV #F,TOCYL
2141 . MOV #F,CALDIF
2142 . MOV #F,RKDC(R5) ;REFRESH RKDC
2143 . ERROR 224 ;DID NOT SEEK TO CYL F
2144
2145 G . MOV #150,COUNT
2146 . JSR PC,TMO ;DO 2 5 SEC TIMEOUT
2147 . JSR PC,FATT2
2148 . ERROR 112 ;ATTN CLEARED AFTER TMO
2149 . DRCLR
2150 . JSR PC,DRAV
2151 . ERROR 113 ;PORT C NOT AVAIL AFTER DRIVE CLEAR CMD
2152 . ENDM TST10
2153
2154
2155 . A & B=0 FOR PORT A OR 1 FOR PORT B
2156 . C & D=A FOR PORT A OR B FOR PORT B
2157
2158 . MACRO TST12 A,B,C,D
2159 . SETP A,C
2160 . QKSEEK
2161 . MOV TIMER,COUNT
2162 . JSR PC,TMO ;DO 1 5 SEC TIMEOUT
2163 . MOV #B,UNITB ;SETUP PORT D
2164 . MOVB #'D,MSG19A
2165 . JSR PC,DRAV
2166 . ERROR 45 ;PORT D NOT AVAIL AFTEP TMO
2167
2168 . STDER1 0
2169 . QKSEEK
2170 . MOV TIMER,COUNT
2171 . JSR PC,TMO
2172 . MOV #A,UNITB ;SETUP PORTC
2173 . MOVB #'C,MSG19A
2174 . JSR PC,DRAV
2175 . ERROR 45 ;PORT C NOT AVAIL AFTEP TMO
2176
2177 . STDER1 0 DSC
2178 . DRCLR
2179 . MOV TIMER,COUNT
2180 . JSR PC,TMO ;DO 1 5 SEC TIMEOUT
2181 . MOV #B,UNITB ;SETUP PORT D
```

```
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     !S
2198          ERROR  115          ,ATTN SET IN PORT D AFTER RLS OF PORT C
2199          IS     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
2211          ; A & B=0 FOR PORT A OR 1 FOR PORT B
2212          ; C & D=A FOR PORT A OR B FOR PORT B
2213
2214          MACRO  TST16  A,B,C,D
2215          RELEAS B,A,D,C
2216          STDER2  D DRA
2217          JSR    PC,SUBCLP
2218          ERROR  24          ,CERR AFTER SCLP
2219          QKSEEK
2220
2221          MOV    #B,UNITB      ,SETUP PORT D
2222          MOVB  #'D,MSG19A
2223          JSR    PC,DRAV
2224          BR     !S          ,SEE IF DRIVE AVAIL
2225          ERROR  103         ,PORT D AVAIL BEFORE TMO OR RELEASE
2226
2227          IS     BIT    #CERR,HCS1
2228          BNE    2S
2229          ERROR  130         ,CERR NOT SET AFTEP SEL DRIVE CMD
2230                                     & NO DRA
2231
2232          JSR    PC,TSTATN
2233          BR     3S
2234          ERROR  115          ,ATTN SET IN PORT C AFTER RLS FROM PORT C
2235
2236          IS     MOV    #CCLR,RKCS1(R5)
2237          RELEAS A,B,C,D
```

```

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
2258          , A & B=D FOR PORT A OR 1 FOR PORT B
2259          , C & D=A FOR PORT A OR B FOR PORT B
2260
2261          MACRO    TST20   A, B, C, D
2262                   RELEAS B, A, D, C
2263                   STDER2 D, DRA
2264                   JSR   PC, SUBCLR
2265                   ERROR 24          , CERR AFTER SCLR
2266
2267                   MOV   #B, UNITB          , SETUP PORT D
2268                   MOVB  #'D, MSG19A
2269                   JSR   PC, DRAV          , SEE IF DRIVE AVAIL
2270                   BR   15
2271                   ERROR 103          , PORT D AVAIL BEFORE TMO OR RELEASE
2272
2273          15      BIT   #CERR, HCS1
2274                   BNE  25
2275                   ERROP 130          , CERR NOT SET BY NO DPA
2276
2277          25      JSR   PC, TSTATN
2278                   BR   35
2279                   ERROR 115          , ATTN SET IN PORT D AFTER PLS FROM PORT C
2280
2281          35      MOV   #CCLR, RKCS1(R5)
2282                   RELEAS B, A, D, C
2283                   RELEAS A, B, C, D
2284                   MOV   TIMER, COUNT
2285                   JSR   PC, TMO          , DO 1.5 SEC TIMEOUT ON PORT D
2286                   JSR   PC, TSTATN
2287                   BR   45
2288                   ERROR 115          , ATTN SET ON PORT D AFTER PLS FROM PORT D
2289
2290          45      STDER2 0
2291                   MOV   #A, UNITB          , SETUP PORT C
2292                   MOVB  #'C, MSG19A
2293                   JSR   PC, TSTATN

```

```
2294          SKIP      R, <GOTO NEXT TST>
2295          ERROR     115          ;ATTN SET ON PORT C, AFTER RLS FROM PORT C
2296          ENDM      TST20
2297
2298
2299
2300          ; A & B=0 FOR PORT A OR 1 FOR PORT B
2301          ; C & D=A FOR PORT A OR B FOR PORT E
2302
2303          MACRO      TST22      A, B, C, D
2304                      SETP      A, C
2305                      RELEAS    B, A, D, C
2306                      STDER2   D DRA
2307          ENDM      TST22
2308
2309
2310          ; A & E=0 FOR PORT A OR 1 FOR PORT B
2311          ; C & D=A FOR PORT A OR B FOR PORT B
2312
2313          MACRO      TST24      A, B, C, D, E
2314                      RELEAS    B, A, D, C
2315                      JSR       PC, SUBCLR
2316                      ERROR     24          ;CERR AFTER SCLR
2317
2318                      MOV       #E, PKDC(R5)
2319                      MOV       #SEEK, HCS1
2320                      JSR       PC, DOCMD          ; DO SEEK CMD & GET CONTR READ,
2321                      ERROR     131          ; NO RDY AFTER SEEK CMD
2322                      RELEAS    A, B, C, D
2323                      MOV       T50000, TEMP1
2324                      JSR       PC, FATT2
2325                      ERROR     152          ; NO ATTN ON PORT D AFTER SEEK & RLS FROM PORT C
2326
2327          F EAB      <D DRA'D DSC>
2328          CHECK     145, 146, 147, 150, <AFTER SEEK & RLS FROM PORT C>, 0, 0, 0
2329          RELEAS    B, A, D, C
2330          JSR       PC, TSTATN
2331          BR        15
2332          ERROR     160          ; ATTN ON PORT C AFTER SEEK & RLS FROM PORT C
2333
2334          15        F EAB      D DRA
2335          CHECK     145, 146, 147, 150, <AFTER SEEK & PLS FROM PORT C>, 0, 0, 0
2336          ENDM      TST24
2337
2338
2339          ; A & B=0 FOR PORT A OR 1 FOR PORT B
2340          ; C & D=A FOR PORT A OR B FOR PORT B
2341
2342          MACRO      TST26      A, B, C, D
2343                      JSR       PC, SUBCLR
2344                      ERROR     24          ;CERR AFTER SCLR
2345                      RELEAS    B, A, D, C
2346                      JSR       PC, SUBCLR
2347                      ERROR     24          ;CERR AFTER SCLP
2348
2349                      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       15              ,BR IF NO
2359          ERROR    103             ,PORT C AVAIL BEFORE TMO OR RLS
2360          15      MOVB   #'D,MSG19A
2361          MOV      $UNIT,R4
2362          ADD      UNITB,R4
2363          JSR      PC,FATT3
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
2374
2375          A & B=0 FOR PORT A OR 1 FOR PORT B
2376          C & D=A FOR PORT A OR B FOR PORT B
2377
2378          MACRO   TST30   A,B,C,D
2379          JSR      PC,SUBCLR
2380          ERROR    24              ,CERR AFTER SCLR
2381          RELEAS  B,A,D,C
2382          JSR      PC,SUBCLR
2383          ERROR    24              ,CERR AFTER SCLR
2384
2385          MOV      #B,UNITB        ,SETUP FOR PORT D
2386          MOVB   #'D,MSG19A
2387          JSR      PC,DRAV         ,PORT D TRIES TO SEIZE THE DRIVE
2388          BR       15              ,BR IF NOT AVAIL
2389          ERROR    103             ,PORT D AVAIL BEFORE TMO OR RELEASE
2390
2391          15      MOV      #CCLR,RKCS1(P5)
2392          RELEAS  A,B,C,D
2393          MOV      #A,UNITB        ,SETUP FOR PORT C
2394          MOVB   #'C,MSG19A
2395          JSR      PC,DRAV
2396          BR       25
2397          ERROR    103             ,PORT C AVAIL BEFORE TMO OR RELEASE
2398
2399          25      MOV      #CCLR,RKCS1(R5)
2400          MOV      #-1,COUNT
2401          JSR      PC,CLKON
2402          MOV      $UNIT,R4
2403          ADD      UNITB,R4
2404          JSR      PC,FATT3
2405          ERRGP   110             ,NO ATTN ON PORT C TO ALLOW SEIZE

```



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2406
2407          JSR      PC,CLKOF          ,TURN CLOCK OFF
2408          COM      COUNT            ,GET ACTUAL COUNT OF TIMEOUT
2409          CMP      COUNT,#35        ,COMPARE AGAINST APPROX 1 SEC
2410          SKIP    GE,<GO TO NEXT TST>
2411          ERROR   153              ,TIMEOUT DID NOT RE-TRIGGER
2412          ENDM   TST30
2413
2414
2415
2416          ,A & B=0 FOR PORT A OR 1 FOR PORT B
2417          ,C & D=A FOR PORT A OR B FOR PORT B
2418
2419          MACRO   TST32  A,B,C,D
2420          RELEAS B,A,D,C
2421          JSR    PC,SUBCLR
2422          ERROR  24          ,CERR AFTER SCLR
2423
2424          INC     UNLD          ,USED FOR VALID HALT
2425          MOV    #25,$ESCAPE
2426          MOV    #UNLOAD,HCS1 ,UNLOAD CMD
2427          BIS    $TMP4,HCS1
2428          MOV    HCS1,RKCS1(R5)
2429          MOV    T10,TEMP1     ,SETUP TIMEOUT
2430          JSR    PC,FATT2      ,FIND ATTN
2431          ERROR  73           ,NO ATTN AFTER UNLD CMD
2432
2433          MOV    #300,COUNT
2434          JSR    PC,TMO         ,DO 5 SEC DELAY
2435          MOV    #B,UNITB      ,SETUP FOR PORT D
2436          MOVB  #'D,MSG19A
2437          JSR    PC,DRAW
2438          BR     15
2439          ERROR  155          ,PORT D AVAIL BEFORE RLS WHEN UNLOADED
2440          ,UNLOAD DID NOT INHIBIT TIMERS
2441
2442          15      MOV    #CCLR,RKCS1(R5)
2443          RELEAS A,B,C,D
2444          25      CLR    $ESCAPE
2445          QKSRT
2446          CLR    UNLD
2447          ENDM   TST32
2448
2449
2450          ,A & B=0 FOR PORT A OR 1 FOR PORT B
2451          ,C & D=A FOR PORT A OR B FOR PORT B
2452
2453          MACRO   TST32A  A,B,C,D
2454          RELEAS B,A,D,C
2455          JSR    PC,SUBCLR
2456          ERROR  24          ,CERR AFTER SCLP
2457
2458          MOV    #55,$ESCAPE
2459          MOV    LC,RKDC(R5)     ,SEEK TO LAST CYL
2460          QKSEEK
2461          DRCLP
```

```

2462      MOV      #RECAL,HCS1      ,RECAL COMMAND
2463      BIS      $TMP4,HCS1
2464      MOV      HCS1,RKCS1(R5)
2465      MOV      $UNIT,R4
2466      ADD      UNITB,R4
2467      15      BITB     ATTN(R4),RKASOF+1(R5)  ,SEE IF ATTN SET
2468      BNE      35              ;BR IF YES
2469
2470      MOV      #B,UNITB          ,SETUP FOR PORT D
2471      MOVB     #'D,MSG19A
2472      JSR      PC,DRAV          ;SEE IF DRV AVAIL
2473      BR       25              ,RETURN HERE IF NO
2474      ERROR    177              ,PORT D AVAIL
2475      25      MOV      #CCLR,RKCS1(R5)      ,RECAL DID NOT INHIBIT TIMERS
2476      MOV      #A,UNITB
2477      MOVB     #'C,MSG19A      ,SETUP PORT C
2478      JSR      PC,DRAV          ;SEE IF DRV AVAIL
2479      ERROR    203              ,PORT C NOT REMAIN AVAIL DURING RECAL
2480      BR       15
2481
2482      35      JSR      PC,GSTAT
2483      BIT      #D PIP,HMR2      ,SEE IF ANY MOTION
2484      BEQ      45              ,BR IF NO
2485      ERROR    72              ,PIP SET AFTER ATTN REC'D FROM RECAL
2486      45      MOV      #120.,COUNT
2487      JSP      PC,TMO          ,DO 2 SEC DLY
2488      MOV      #B,UNITB      ,SETUP FOR PORT D
2489      MOVB     #'D,MSG19A
2490      JSP      PC,DRAV          ,SEE IF DRV NOW AVAIL
2491      ERROR    45              ,PORT D NOT AVAIL AFTER TMO
2492
2493      55      CLR      $ESCAPE
2494      ENDM     TST32A
2495
2496
2497      NLIST   MD
2498
2499
  
```

```

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          WORD          0          ;, CONTAINS THE TEST NUMBER
2509          001102          000          $STNM          BYTE          0          ;, CONTAINS ERROR FLAG
2510          001103          000          $ERFLG          BYTE          0          ;, CONTAINS SUBTEST ITERATION COUNT
2511          001104          000000          $ICNT          WORD          0          ;, CONTAINS SCOPE LOOP ADDRESS
2512          001106          000000          $LPADR          WORD          0          ;, CONTAINS SCOPE RETURN FOR ERRORS
2513          001110          000000          $LPERR          WORD          0          ;, CONTAINS TOTAL ERRORS DETECTED
2514          001112          000000          $ERTTL          WORD          0          ;, CONTAINS ITEM CONTROL BYTE
2515          001114          000          $ITEMB          BYTE          0          ;, CONTAINS MAX. ERRORS PER TEST
2516          001115          001          $ERMAX          BYTE          1          ;, CONTAINS PC OF LAST ERROR INSTRUCTION
2517          001116          000000          $ERRPC          WORD          0          ;, CONTAINS ADDRESS OF 'GOOD' DATA
2518          001120          000000          $GDADR          WORD          0          ;, CONTAINS ADDRESS OF 'BAD' DATA
2519          001122          000000          $BDADR          WORD          0          ;, CONTAINS 'GOOD' DATA
2520          001124          000000          $GDDAT          WORD          0          ;, CONTAINS 'BAD' DATA
2521          001126          000000          $BDDAT          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          000377          $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          MSGTY          ;, MESSAGE TYPE CODE
  
```

2556	001212	000000	\$FATAL:	WORD	AFATAL	:: FATAL ERROR NUMBER
2557	001214	000000	\$TESTN:	WORD	ATESTN	:: TEST NUMBER
2558	001216	000' 30	\$PASS:	WORD	APASS	:: PASS COUNT
2559	001220	000 30	\$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

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, USEC 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	000144	T100	100	
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	

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2668 001444 070627 DPAT2: 70627
2669
2670 001446 000000 WORD 0 ;HEADER/DATA WORD
2671 001450 000000 HDWD: 0 ;HEADER WORD FROM RKDB
2672
2673 001452 000000 BSERR. 0 ;CANNOT READ BSE INFO WHEN SET
2674 001454 000000 LIMERR 0 ;LIMIT DETECT ERROR FLAG
2675 001456 000000 BYPCERR 0 ;SET TO 1 TO BYPASS CKCERR IN 'GSTAT1'
2676 001460 000000 CHKFLG 0 ;WORDS TO BE TESTED
2677
2678 001462 000102 HDTAB BLKW 66 ;CALCULATED HEADER WORD TABLE
2679 001666 000102 PHTAB 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 HDC 0
2717 005336 000000 HDB 0
2718 005340 000000 HMR1 0
2719 005342 000000 HMP2 0
2720 005344 000000 HMP3 0
2721 005346 000000 HPOS 0
2722 005350 000000 HPAT 0
2723

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```
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      000001      T A2=BIT0      , TEST MSG A2 IF SET
2756      000002      T B2=BIT1
2757      000004      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
```

2780	005456	000000	LCLKF	0	,L-CLOCK FLAG PRESENT FLAG
2781	005450	000000	PCLKF	0	,P-CLOCK FLAG PRESENT FLAG
2782	005462	000000	SIZFLG	0	,SET IF DEFAULT DO SIZING IN TEST 1
2783	005464	000000	UNITB	0	,0 FOR PORT A DRIVES 0,2,4,6
2784					,1 FOR PORT B. DRIVES 1,3,5,7
2785	005466	000132	TIMER	90	,TIMER FOR 1 5 SEC

2786			SBTTL	ERROR POINTER TABLE	
2787					
2788					
2789					
2790					
2791					
2792					
2793					
2794					
2795					
2796					
2797					
2798					
2799					
2800	005470		SERPTB		
2801					
2802					
2803	005470	057127	ERROR 1		
2804	005472	062556		EM2	.DR # IN RKCS2 CANNOT BE READ BACK CORRECTLY IN RKMR2
2805	005474	065530		DH1	
2806	005476	066332		DT1	
2807				DF1	
2808			ERROR 2		
2809	005500	057346		EM5	.DETECTED MDS
2810	005502	062556		DH1	
2811	005504	065530		DT1	
2812	005506	066332		DF1	
2813					
2814			ERROR 3		
2815	005510	057367		EM6	.DETECTED UFE
2816	005512	062556		DH1	
2817	005514	065530		DT1	
2818	005516	066332		DF1	
2819					
2820			ERRCP 4		
2821	005520	057410		EM7	.DETECTED DPA & NED RESET (WRONG PORT SELECTED?)
2822	005522	062556		DH1	
2823	005524	065530		DT1	
2824	005526	066332		DF1	
2825			ERROR 5		
2826	005530	000000		0	
2827	005532	000000		0	
2828	005534	000000		0	
2829	005536	000000		0	
2830					
2831			ERROR 6		
2832	005540	057654		EM9	DP NOT PRESENT BUT SPECIFIED BY OPERATOR
2833	005542	062556		DH1	
2834	005544	065530		DT1	
2835	005546	066332		DF1	
2836					
2837			ERROR 7		
2838	005550	057730		EM10	.ABORT TEST COULD NOT REFERENCE CONTROLLER REGISTER
2839	005552	062556		DH1	
2840	005554	065530		DT1	
2841	005556	066332		DF1	

2842			. ERROR 10	
2843	005560	060013	EM11	. DRA & NED BOTH SET
2844	005562	062556	DH1	
2845	005564	065530	DT1	
2846	005566	066332	DF1	
2847			. ERR 11	
2848	005570	060057	EM12	. NO RDY
2849	005572	064320	DH27	. AFTER WRITE DATA CMD
2850	005574	065530	DT1	
2851	005576	066462	DF10	
2852			. ERR 12	
2853	005600	060453	EM21	. CERR SET
2854	005602	064320	DH27	
2855	005604	065530	DT1	
2856	005606	066462	DF10	
2857			. ERR 13	
2858	005610	060057	EM12	. NO RDY
2859	005612	064270	DH26	. AFTER READ DATA CMD
2860	005614	065530	DT1	
2861	005616	066462	DF10	
2862			. ERR 14	
2863	005620	060453	EM21	. CERR SET
2864	005622	064270	DH26	
2865	005624	065530	DT1	
2866	005626	066462	DF10	
2867			. ERR 15	
2868	005630	060057	EM12	. NO RDY
2869	005632	064450	DH32	. AFTER WRITE CHECK CMD
2870	005634	065530	DT1	
2871	005636	066462	DF10	
2872			. ERR 16	
2873	005640	062236	EM80	. WRITE CHECK ERROR SET
2874	005642	064450	DH32	. AFTER WRITE CHECK CMD
2875	005644	065642	DT6	
2876	005646	066352	DF3	
2877			. ERR 17	
2878	005650	060137	EM14	. UNEXP MEM PARITY TRAP
2879	005652	063214	DH8	. TEST #, TRAP PC
2880	005654	065570	DT3	
2881	005656	066346	DF2	
2882			. ERR 20	
2883	005660	062275	EM82	. READ DATA NOT COMPARE WITH WRITE DATA
2884	005662	064270	DH26	. AFTER READ DATA CMD
2885	005664	065642	DT6	
2886			DF3	
2887	005666	066352		
2888			. ERR 21	
2889	005670	062347	EM83	. DATA CHECK EPROR
2890	005672	064270	DH26	
2891	005674	065530	DT1	
2892			DF10	
2893	005676	066462		
2894			. ERR 22	
2895	005700	060453	EM21	. CERR SET
2896	005702	064450	DH32	. AFTER WRITE CHECK CMD
2897	005704	065530	DT1	

2898	005706	066462		DF10	
2899			.ERR 23		
2900	005710	060370		EM18	.MSG B0 ERROR
2901	005712	064320		DH27	.AFTER WRITE DATA CMD
2902	005714	066066		DT13	
2903	005716	066612		DF21	
2904			.ERROR 24		
2905	005720	060453		EM21	.CERR SET
2906	005722	064070		DH21	.AFTER SCLR
2907	005724	065530		DT1	
2908	005726	066462		DF10	
2909			.ERR 25		
2910	005730	060432		EM20	.MSG B1 ERROR
2911	005732	064320		DH27	
2912	005734	066066		DT13	
2913	005736	066612		DF21	
2914			.ERR 26		
2915	005740	060370		EM18	
2916	005742	064270		DH26	.AFTER READ DATA CMD
2917	005744	066066		DT13	
2918	005746	066612		DF21	
2919					
2920			.ERROR 27		
2921	005750	060702		EM24	.VOL VALID NOT SET
2922	005752	064012		DH19	.AFTER PACK CMD
2923	005754	065530		DT1	
2924	005756	066462		DF10	
2925			.ERR 30		
2926	005760	060432		EM20	.MSG B1 ERROR
2927	005762	064270		DH26	.AFTER READ DATA CMD
2928	005764	066066		DT13	
2929	005766	066612		DF21	
2930			.ERR 31		
2931	005770	060370		EM18	.MSG B0 ERROR
2932	005772	064450		DH32	.AFTER WRITE CHECK CMD
2933	005774	066066		DT13	
2934	005776	066612		DF21	
2935			.ERR 32		
2936	006000	060432		EM20	.MSG B1 ERROR
2937	006002	064450		DH32	
2938	006004	066066		DT13	
2939	006006	066612		DF21	
2940			.ERR 33		
2941	006010	060347		EM17	.AO ERROR
2942	006012	064116		DH22	.AFTER DRIVE CLP CMD
2943	006014	066066		DT13	
2944	006016	066612		DF21	
2945			.ERR 34		
2946	006020	060370		EM18	.B0 ERROR
2947	006022	064116		DH22	
2948	006024	066066		DT13	
2949	006026	066612		DF21	
2950			.ERR 35		
2951	006030	060411		EM19	
2952	006032	064116		DH22	
2953	006034	066066		DT13	

2954	006036	066612		DF 21	
2955			.ERR 36	EM20	
2956	006040	060432		DH22	
2957	006042	064116		DT13	
2958	006044	066066		DF 21	
2959	006046	066612			
2960			.ERR 37	EM17	.AC ERROR
2961	006050	060347		DH39	.AFTER WRITE HEADER CMD
2962	006052	064736		DT13	
2963	006054	066066		DF 21	
2964	006056	066612			
2965			.ERR 40	EM18	
2966	006060	060370		DH39	
2967	006062	064736		DT13	
2968	006064	066066		DF 21	
2969	006066	066612			
2970			.ERR 41	EM19	
2971	006070	060411		DH39	
2972	006072	064736		DT13	
2973	006074	066066		DF 21	
2974	006076	066612			
2975			.ERR 42	EM20	
2976	006100	060432		DH39	
2977	006102	064736		DT13	
2978	006104	066066		DF 21	
2979	006106	066612			
2980			ERR 43	EM26	.BSE ERROR IN WRITE CMD NOT ON BSE TABLE
2981	006110	061007		DH27	.AFTER WRITE DATA CMD
2982	006112	064320		DT1	
2983	006114	065530		DF 10	
2984	006116	066462			
2985			.ERR 44	EM15	WCE AT CYL 411, TRK 2, SEC 21
2986	006120	060175		DH1	
2987	006122	062556		DT1	
2988	006124	065530		DF 4	
2989	006126	066376			
2990			.ERR 45	EM31	.PORT NOT AVAIL
2991	006130	061402		DH5	.AFTER TIMEOUT
2992	006132	062760		DT1	
2993	006134	065530		DF 10	
2994	006136	066462			
2995			ERR 46	EM25	.DETECTED 10 BAD SECTORS
2996	006140	060735		DH27	.AFTER WRITE DATA CMD
2997	006142	064320		DT1	
2998	006144	065530		DF 10	
2999	006146	066462			
3000			ERROR 47	EM39	.CYL DIFF/OFFSET IN RKMP2 NOT CLEARED
3001	006150	061713		DH17	.AFTER RECAL CMD
3002	006152	063741		DT14	
3003	006154	066146		DF 22	
3004	006156	066646			
3005			ERROR 50	EM40	.CYL ADDR IN RKMR3 NOT CLEARED
3006	006160	061762		DH17	.AFTER RECAL CMD
3007	006162	063741		DT14	
3008	006164	066146		DF 22	
3009	006166	066646			

3010			.ERR 51		
3011	006170	062475		EM93	.WRONG CYL# IN HEADER WORD (MISPOSITION)
3012	006172	064245		DH25	.AFTER SEEK CMD
3013	006174	066022		DT9	
3014	006176	066566		DF20	
3015			.ERR 52		
3016	006200	060347		EM17	.MSG AO ERROR
3017	006202	064320		DH27	.AFTER WRITE DATA CMD
3018	006204	066066		DT13	
3019	006206	066612		DF21	
3020			.ERR 53		
3021	006210	060411		EM19	.MSG A1 ERROR
3022	006212	064320		DH27	
3023	006214	066066		DT13	
3024	006216	066612		DF21	
3025			.ERR 54		
3026	006220	060347		EM17	.MSG AO ERROR
3027	006222	064270		DH26	.AFTER READ DATA CMD
3028	006224	066066		DT13	
3029	006226	066612		DF21	
3030			.ERROR 55		
3031	006230	060115		EM13	.NO ATTN
3032	006232	063741		DH17	.AFTER RECAL CMD
3033	006234	065530		DT1	
3034	006236	066462		DF10	
3035			.ERR 56		
3036	006240	060411		EM19	.MSG A1 ERROR
3037	006242	064270		DH26	
3038	006244	066066		DT13	
3039	006246	066612		DF21	
3040			.ERR 57		
3041	006250	060347		EM17	.MSG AO ERROR
3042	006252	064450		DH32	.AFTER WRITE CHECK CMD
3043	006254	066066		DT13	
3044	006256	066612		DF21	
3045			.ERR 60		
3046	006260	060411		EM19	MSG A1 EPPOR
3047	006262	064450		DH32	
3048	006264	066066		DT13	
3049	006266	066612		DF21	
3050			.ERR 61		
3051	006270	060347		EM17	.AO ERROR
3052	006272	064371		DH30	.AFTER READ HEADER CMD
3053	006274	066066		DT13	
3054	006276	066612		DF21	
3055			.ERR 62		
3056	006300	060370		EM18	
3057	006302	064371		DH30	
3058	006304	066066		DT13	
3059	006306	066612		DF21	
3060			.ERR 63		
3061	006310	060411		EM19	
3062	006312	064371		DH30	
3063	006314	066066		DT13	
3064	006316	066612		DF21	
3065			.ERR 64		

3066	006320	060432		EM20	
3067	006322	064371		DH30	
3068	006324	066066		DT13	
3069	006326	066612		DF21	
3070			.ERR 65		
3071	006330	061066		EM27	.DETECTED BSE IN READ BUT NOT IN WRITE CMD
3072	006332	062556		DH1	
3073	006334	065530		DT1	
3074	006336	066332		DF1	
3075			.ERR 66		
3076	006340	060370		EM18	.BO ERROR
3077	006342	063741		DH17	.AFTER RECAL CMD
3078	006344	066066		DT13	
3079	006346	066612		DF21	
3080			.ERR 67		
3081	006350	060432		EM20	
3082	006352	063741		DH17	
3083	006354	066066		DT13	
3084	006356	066612		DF21	
3085			.ERR 70		
3086	006360	062170		EM74	.RTZ NOT SET
3087	006362	065025		DH41	.DURING RECAL CMD
3088	006364	065530		DT1	
3089	006366	066462		DF10	
3090			.ERR 71		
3091	006370	061402		EM31	.PORT NOT AVAIL
3092	006372	064502		DH35	.AFTER RLS
3093	006374	065530		DT1	
3094	006376	066462		DF10	
3095			.ERR 72		
3096	006400	061361		EM30	.PIP SET
3097	006402	062714		DH4	.AFTER ATTN REC'D FROM RECAL
3098	006404	065530		DT1	
3099	006406	066462		DF10	
3100			.ERR 73		
3101	006410	060115		EM13	.NO ATTN
3102	006412	063765		DH18	.AFTER UNLOAD CMD
3103	006414	065530		DT1	
3104	006416	066462		DF10	
3105			.ERR 74		
3106	006420	060115		EM13	.NO ATTN
3107	006422	063310		DH10	.AT END OF HEAD LOADING
3108	006424	065530		DT1	
3109	006426	066462		DF10	
3110			.ERR 75		
3111	006430	060475		EM22	.NO DRIVS IN SCEVM
3112	006432	062556		DH1	
3113	006434	065530		DT1	
3114	006436	066332		DF1	
3115			.ERR 76		
3116	006440	060602		EM23	.NO DRIVS ON BUSS
3117	006442	062556		DH1	
3118	006444	065530		DT1	
3119	006446	066332		DF1	
3120			.ERR 77		
3121	006450	060347		EM17	.NO ERPOP

3122	006452	062760	DH5	. AFTER TMO
3123	006454	066066	DT13	
3124	006456	066612	DF21	
3125			. ERR 100	
3126	006460	060370	EM18	
3127	006462	062760	DH5	
3128	006464	066066	DT13	
3129	006466	066612	DF21	
3130			. ERR 101	
3131	006470	060411	EM19	
3132	006472	062760	DH5	
3133	006474	066066	DT13	
3134	006476	066612	DF21	
3135			. ERR 102	
3136	006500	060432	EM20	
3137	006502	062760	DH5	
3138	006504	066066	DT13	
3139	006506	066612	DF21	
3140			ERR 103	
3141	006510	061425	EM32	. PORT AVAIL
3142	006512	063531	DH14	. BEFORE TMO OR PLS
3143	006514	065530	DT1	
3144	006516	066462	DF10	
3145			. ERR 104	
3146	006520	060347	EM17	. NO ERROR
3147	006522	063563	DH15	. WHILE PORT UNAVAIL
3148	006524	066066	DT13	
3149	006526	066612	DF21	
3150			EPR 105	
3151	006530	060370	EM18	
3152	006532	063563	DH15	
3153	006534	066066	DT13	
3154	006536	066612	DF21	
3155			. ERR 106	
3156	006540	060411	EM19	
3157	006542	063563	DH15	
3158	006544	066066	DT13	
3159	006546	066612	DF21	
3160			. ERR 107	
3161	006550	060432	EM20	
3162	006552	063563	DH15	
3163	006554	066066	DT13	
3164	006556	066612	DF21	
3165			ERR 110	
3166	006560	060115	EM13	. NO ATTN
3167	006562	063612	DH16	. TO ALLOW PORT TO SEIZE
3168	006564	065530	DT1	
3169	006566	066462	DF10	
3170			. EPR 111	
3171	006570	061444	EM33	. ATTN SET
3172	006572	064150	DH23	. W/O REQUEST PENDING
3173	006574	065530	DT1	
3174	006576	066462	DF10	
3175			. EPP 112	
3176	006600	060115	EM13	. NO ATTN
3177	006602	062760	DH5	. AFT TMO

3178	006604	065530		DT1	
3179	006606	066462		DF10	
3180			.ERR 113		
3181	006610	061402		EM31	.PORT NO AVAIL
3182	006612	064116		DH22	.AFTER DRIVE CLEAR CMD
3183	006614	065530		DT1	
3184	006616	066462		DF10	
3185			.ERR 114		
3186	006620	061467		EM34	.ATTN CLEARED
3187	006622	064200		DH24	.BY DR CLR TO OTHER PORT
3188	006624	065530		DT1	
3189	006626	066462		DF10	
3190			.ERR 115		
3191	006630	061444		EM33	.ATTN SET
3192	006632	064502		DH35	.AFT RELEASE ISSUED
3193	006634	065530		DT1	
3194	006636	066462		DF10	
3195			.ERROR 116		
3196	006640	060057		EM12	.CONT NOT RDY
3197	006642	064012		DH19	.AFTER PACK CMD
3198	006644	065530		DT1	
3199	006646	066462		DF10	
3200			.ERROR 117		
3201	006650	060057		EM12	.CONT NOT RDY
3202	006652	064035		DH20	.AFTER SEL DR CMD
3203	006654	065530		DT1	
3204	006656	066462		DF10	
3205			.ERROR 120		
3206	006660	060057		EM12	
3207	006662	064070		DH21	.AFTER SUBSYS CLEAR
3208	006664	065530		DT1	
3209	006666	066462		DF10	
3210			.ERROR 121		
3211	006670	060057		EM12	
3212	006672	063235		DH9	.AFTER START SPINDLE CMD
3213	006674	065530		DT1	
3214	006676	066462		DF10	
3215			.ERR 122		
3216	006700	060115		EM13	.NO ATTN
3217	006702	064610		DH37	.AFT PLS & PEQUEST PENDING
3218	006704	065530		DT1	
3219	006706	066462		DF10	
3220			.ERR 123		
3221	006710	061467		EM34	.ATTN CLEARED
3222	006712	064502		DH35	.AFTER RELEASE
3223	006714	065530		DT1	
3224	006716	066462		DF10	
3225			.ERROR 124		
3226	006720	060057		EM12	
3227	006722	063741		DH17	.AFTER RECAL CMD
3228	006724	065530		DT1	
3229	006726	066462		DF10	
3230			.ERR 125		
3231	006730	062147		EM73	.CTO SET
3232	006732	062404		EM84	.WHILE WAITING FOR OP REC'D CONTR PDY MSG A&B BAD
3233	006734	065530		DT1	

3234	006736	066412	DF5	
3235			:ERR 126	
3236	006740	062215	EM79	, NED SET
3237	006742	062404	EM84	
3238	006744	065530	DT1	
3239	006746	066412	DF5	
3240			:ERR 127	
3241	006750	057346	EM5	, MCS SET
3242	006752	062404	EM84	
3243	006754	065530	DT1	
3244	006756	066412	DF5	
3245			:ERROR 130	
3246	006760	061516	EM35	, CERR NOT SET
3247	006762	064527	DH36	, AFT SEL DRV CMD & NO DRA
3248	006764	065530	DT1	
3249	006766	066462	DF10	
3250			:ERROF 131	
3251	006770	060057	EM12	, NO RDY
3252	006772	064245	DH25	, AFTER SEEK CMD
3253	006774	065530	DT1	
3254	006776	066462	DF10	
3255			:ERROR 132	
3256	007000	060115	EM13	, NO ATTN
3257	007002	064245	DH25	
3258	007004	065530	DT1	
3259	007006	066462	DF10	
3260			:ERR 133	
3261	007010	060347	EM17	, AO ERROR
3262	007012	064502	DH35	, AFTER RLS ISSUED
3263	007014	066066	DT13	
3264	007016	066612	DF21	
3265			:ERR 134	
3266	007020	060370	EM18	
3267	007022	064502	DH35	
3268	007024	066066	DT13	
3269	007026	066612	DF21	
3270			:ERR 135	
3271	007030	060411	EM19	
3272	007032	064502	DH35	
3273	007034	066066	DT13	
3274	007036	066612	DF21	
3275			:ERR 136	
3276	007040	060432	EM20	
3277	007042	064502	DH35	
3278	007044	066066	DT13	
3279	007046	066612	DF21	
3280			:ERROR 137	
3281	007050	061713	EM39	, CYL DIFF/OFFSET IN RAMP2 NOT CLEARED
3282	007052	064245	DH25	
3283	007054	065530	DT1	
3284	007056	066462	DF10	
3285			:ERR 140	
3286	007060	060347	EM17	, MSG AO ERROR
3287	007062	065451	DH51	, AFTER SEEK TO SELF
3288	007064	066066	DT13	
3289	007066	066612	DF21	

3290			.ERR 141	
3291	007070	060370		EM18
3292	007072	065451		DH51
3293	007074	066066		DT13
3294	007076	066612		DF21
3295			.ERR 142	
3296	007100	060411		EM19
3297	007102	065451		DH51
3298	007104	066066		DT13
3299	007106	066612		DF21
3300			.ERR 143	
3301	007110	060432		FM20
3302	007112	065451		DH51
3303	007114	066066		DT13
3304	007116	066612		DF21
3305			.ERR 144	
3306	007120	061607		EM37
3307	007122	062760		DH5
3308	007124	065530		DT1
3309	007126	066462		DF10
3310			.ERR 145	
3311	007130	060347		EM17
3312	007132	064664		DH38
3313	007134	066066		DT13
3314	007136	066612		DF21
3315			.ERR 146	
3316	007140	060370		EM18
3317	007142	064664		DH38
3318	007144	066066		DT13
3319	007146	066612		DF21
3320			.ERR 147	
3321	007150	060411		EM19
3322	007152	064664		DH38
3323	007154	066066		DT13
3324	007156	066612		DF21
3325			.ERR 150	
3326	007160	060432		EM20
3327	007162	064664		DH38
3328	007164	066066		DT13
3329	007166	066612		DF21
3330			.ERROR 151	
3331	007170	060057		EM12
3332	007172	064116		DH22
3333	007174	065530		DT1
3334	007176	066462		DF10
3335			.ERR 152	
3336	007200	060115		EM13
3337	007202	064664		DH38
3338	007204	065530		DT1
3339	007206	066462		DF10
3340			.ERR 153	
3341	007210	061640		EM38
3342	007212	065172		DH43
3343	007214	065530		DT1
3344	007216	066462		DF10
3345			.ERROR 154	

.MULT ATTN
 .AFTER TMO

.NO ERROR
 .AFTER SEEK & IMMED RELEASE

.NO RDY
 .AFTER CLEAR CML

.NO ATTN
 .AFTER SEEK & IMMED RLS

.RE-TRIGGER NO GOOD
 .AFTER RE-SEIZE MIDWAY THRU TMO

3346	007220	062020	EM55	.ATT. NOT CLEARED
3347	007222	064116	DH22	
3348	007224	065530	DT1	
3349	007226	066462	DF10	
3350			.ERR 155	

3351 007230 061313
3352 007232 065330
3353 007234 065530

EM29
DH45
DT1

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

3354	007236	066462		DF10	
3355			.ERR 156		
3356	007240	060115		EM13	.NO ATTN
3357	007242	064245		DH25	.AFTER SEEK CMD
3358	007244	065530		DT1	
3359	007246	066462		DF10	
3360			.ERR 157		
3361	007250	061402		EM31	.PCRT NOT AVAIL
3362	007252	064245		DH25	.AFTER SEEK CMD
3363	007254	065530		DT1	
3364	007256	066462		DF10	
3365			.ERROR 160		
3366	007260	061444		EM33	.ATTN SET
3367	007262	064664		DH38	.AFTER SEEK & IMMED RLS
3368	007264	065530		DT1	
3369	007266	066462		DF10	
3370			.ERR 161		
3371	007270	060347		EM17	.MSG AD ERROR
3372	007272	064245		DH25	.AFTER SEEK CMD
3373	007274	066066		DT13	
3374	007276	066612		DF21	
3375			.ERR 162		
3376	007300	060370		EM18	
3377	007302	064245		DH25	
3378	007304	066066		DT13	
3379	007306	066612		DF21	
3380			.ERR 163		
3381	007310	060411		EM19	
3382	007312	064245		DH25	
3383	007314	066066		DT13	
3384	007316	066612		DF21	
3385			.ERR 164		
3386	007320	060432		EM20	
3387	007322	064245		DH25	
3388	007324	066066		DT13	
3389	007326	066612		DF21	
3390			.ERR 165		
3391	007330	060347		EM17	.MSG AD ERROR
3392	007332	062760		DH5	.AFTER TMO
3393	007334	066066		DT13	
3394	007336	066612		DF21	
3395			.ERR 166		
3396	007340	060370		EM18	
3397	007342	062760		DH5	
3398	007344	066066		DT13	
3399	007346	066612		DF21	
3400			.ERR 167		
3401	007350	060411		EM19	
3402	007352	062760		DH5	
3403	007354	066066		DT13	
3404	007356	066612		DF21	
3405			.ERR 170		
3406	007360	060432		EM20	
3407	007362	062760		DH5	
3408	007364	066066		DT13	
3409	007366	066612		DF21	

3410			. ERROR 171	
3411	007370	060057	EM12	. NO RDY
3412	007372	064371	CH30	. AFTER READ HEADER CMD
3413	007374	065530	DT1	
3414	007376	066462	DF10	
3415			. ERROR 172	
3416	007400	061402	EM31	. PORT NOT AVAIL
3417	007402	064502	DH35	. AFT RELEASE
3418	007404	065530	DT1	
3419	007406	066462	DF10	
3420			. ERROR 173	
3421	007410	062053	EM63	. DLT SET
3422	007412	064371	DH30	
3423	007414	065530	DT1	
3424	007416	066522	DF15	
3425			. ERROR 174	
3426	007420	060453	EM21	. CERR SET
3427	007422	064371	DH30	
3428	007424	065530	DT1	
3429	007426	066522	DF15	
3430			. ERROR 175	
3431	007430	061713	EM39	. CYL DIFF NOT CLEARED
3432	007432	063310	DH10	. AT END OF HEAD LOAD NG
3433	007434	065530	DT1	
3434	007436	066462	DF10	
3435			. ERROR 176	
3436	007440	061762	EM40	. CYL ADDP NOT CLEARED
3437	007442	063310	DH10	
3438	007444	065530	DT1	
3439	007446	066462	DF10	
3440			. ERROR 177	
3441	007450	061313	EM29	. PORT AVAIL-TIMERS NOT INHIB
3442	007452	065025	DH41	. DURING RECAL CMD
3443	007454	065530	DT1	
3444	007456	066462	DF10	
3445			. ERROR 200	
3446	007460	060057	EM12	. NO RDY
3447	007462	064736	DH39	. AFTER WRITE HEADER CMD
3448	007464	065530	DT1	
3449	007466	066522	DF15	
3450			. ERROR 201	
3451	007470	060453	EM21	. CERR SET
3452	007472	064736	DH39	
3453	007474	065530	DT1	
3454	007476	066522	DF15	
3455			. ERROR 202	
3456	007500	062074	EM65	. READ HEADER ERROR
3457	007502	062556	DH1	
3458	007504	065706	DT7	
3459	007506	066502	DF14	
3460			. ERROR 203	
3461	007510	061402	EM31	. PORT NOT AVAIL
3462	007512	065025	DH41	. DURING RECAL CMD
3463	007514	065530	DT1	
3464	007516	066462	DF10	
3465			. ERROR 204	

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	061544	EM36	. CYL ADDR IN RKMR3 INCORRECT
3477	007542	064245	DH25	. AFTER SEEK CMD
3478	007544	065754	DT8	
3479	007546	066436	DF6	
3480			. ERROR 207	
3481	007550	061544	EM36	. CYL ADDR IN RKMR3 INCORRECT
3482	007552	064245	DH25	. AFTER SEEK CMD
3483	007554	065574	DT4	
3484	007556	066436	DF6	
3485			. ERROR 210	
3486	007560	060453	EM21	. CERR SET
3487	007562	064245	DH25	
3488	007564	065530	DT1	
3489	007566	066462	DF10	
3490			. ERR 211	
3491	007570	060347	EM17	. MSG AO ERROR
3492	007572	064502	DH35	. AFTER RLS ISSUED
3493	007574	066066	DT13	
3494	007576	066612	DF21	
3495			. ERR 212	
3496	007600	060370	EM18	
3497	007602	064502	DH35	
3498	007604	066066	DT13	
3499	007606	066612	DF21	
3500			. ERR 213	
3501	007610	060411	EM19	
3502	007612	064502	DH35	
3503	007614	066066	DT13	
3504	007616	066612	DF21	
3505			. ERR 214	
3506	007620	060432	EM20	
3507	007622	064502	DH35	
3508	007624	066066	DT13	
3509	007626	066612	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	

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	060347	EM17	. MSG A0 ERROR
3532	007672	063741	DH17	
3533	007674	066066	DT13	
3534	007676	066612	DF21	
3535			. ERROR 222	
3536	007700	060411	EM19	. MSG A1 ERROR
3537	007702	063741	DH17	
3538	007704	066066	DT13	
3539	007706	066612	DF21	
3540			. ERROR 223	
3541	007710	060453	EM21	. CERR SET
3542	007712	063042	DH7	. AFT SCLP
3543	007714	065530	DT1	
3544	007716	066462	DF10	
3545			. ERR 224	
3546	007720	061544	EM36	CYL ADDR IN RKMR3 BAC
3547	007722	063354	DH12	AFT SEEP CMD
3548	007724	065574	DT4	
3549	007726	066436	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	060057	EM12	NO PDY
3557	007742	064270	DH26	AFTER READ DATA CMD
3558	007744	065530	DT1	
3559	007746	066462	DF10	
3560			. ERROR 227	
3561	007750	060453	EM21	CERR SET
3562	007752	064270	DH26	
3563	007754	065530	DT1	
3564	007756	066522	DF15	
3565			. ERROR 230	
3566	007760	060304	EM16	. CANNOT READ BSE INFO
3567	007762	063445	DH13	ON SEC 10 12 14 16 18 20
3568	007764	065530	DT1	
3569	007766	066542	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
3581 010010 060304      EM16          .CANNOT READ BSE INFO
3582 010012 065121      DH42          .ON SECT 0,2,4,6,8
3583 010014 065530      DT1
3584 010016 066542      DF17
3585                .ERROR 234
3586 010020 000000      0
3587 010022 000000      0
3588 010024 000000      0
3589 010026 000000      0
3590                .ERROR 235
3591 010030 062116      EM69          .ALIGN CARTRIDGE USED
3592 010032 065251      DH44          .WILL BYPASS FORMAT & ALL R/W TESTS
3593 010034 065530      DT1
3594 010036 066462      DF10
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 #PPD,-(SP) .PSW LOADED TO BE
3605 010066 012746 010074 MOV #15,-(SP) .LSI-11 COMPATABLE
3606 010072 000002 RTI .ENABLE ALL INTERRUPTS
3607
3608 010074 004737 052260 15 JSP PC STKINT .SETUP KB VECTOR ADDR, PRIORITY 4
3609                .& TURN ON KB INTERRUPT
3610
3611
3612                *** CPU PRIORITY LEVEL NOW AT 0 ***
3613                *** ANY DEVICE WHICH SETS ITS ***
3614                *** INTERRUPT ENABLE BIT WILL ***
3615                *** SERVICED ***
3616
3617                .CLOCK INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 6 (IN 'ST5')
3618                RK06 CONTROLLER INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 5 IN 'SETINT')
3619                KEYBOARD INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 4 (SEE ABOVE)
3620
3621                .ALL 'SYSMAC' TRAPS WILL CHANGE CPU PRIORITY TO LEVEL 7 (SEE BELOW)
3622
3623                .SYSMAC 'SETUP'
3624                SBTTL INITIALIZE THE COMMON TAGS
3625                .CLEAR THE COMMON TAGS (SCMTAG) AREA
3626 010100 012706 001100 MOV #SCMTAG,R6 .,FIRST LOCATION TO BE CLEARED
3627 010104 005026 CLR (R6)+ .,CLEAR MEMORY LOCATION
3628 010106 022706 001140 CMP #SWR,R6 .,DONE?
3629 010112 001374 BNE -6 .,LOOP BACK IF NO
3630 010114 012706 001100 MOV #STACK,SP .,SETUP THE STACK POINTER
3631                .INITIALIZE A FEW VECTORS
3632 010120 012737 050366 000020 MOV #SCOPE,@#10TVEC .,10T VECTOR FOR SCOPE ROUTINE
3633 010126 012737 000340 000022 MOV #340,@#10TVEC+2 .,LEVEL 7
  
```

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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      #SPWRDN, @#PWRVEC ;; POWER FAILURE VECTOR
3639 010172 012737 000340 000026      MOV      #340, @#PWRVEC+2 ;; LEVEL 7
3640 010200 013737 042740 042732      MOV      $ENDCT, $EOPCT ;; 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      #SWPEG, 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, $ENVM ;; TEST USER SIZE UNDER APT
3664 010340 001403          BEQ     67$ ;; YES, USE NON-APT SWITCH
3665 010342 012737 001232 001140      MOV      #SSWREG, SWR ;; NO, USE APT SWITCH REGISTER
3666 010350          67$
3667 010350 012737 010414 000004 MEMPAR 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 VECTOP 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 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
    
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3690
3691
3692 010456 005737 000042      START1  TST      42
3693 010462 001014              BNE      15          ,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      25
3697 010500 005237 005424      INC      DDUMP      ,SET RK06 DUMP MODE FLAG
3698 010504 104401 055743      TYPE     ,MSG2      ,REPLACE DRO PACK W/SCRATCH & DO<CR>
3699 010510 000137 010524      JMP      ST2
3700 010514 000137 010570      15      JMP      ST3
3701 010520 005237 005432      25      INC      PPTP      ,SET ACT/APT/PTP DUMP MODE FLAG
3702
3703
3704      ,CHECK IF ALL PARAMETERS DEFAULTED IF NOT, BEGIN INPUT DIALOGUE
3705      ,WITH OPERATOR THE REPLY TO 'DRIVES TO BE TESTED' SHOULD BE
3706      ,DRIVE NOS SEPERATED BY COMMAS & TERMINATED BY <CR>
3707      , EX DRIVES TO BE TESTED: 0,2,4<CR>
3708      ,FOR DUAL PORT, ONLY EVEN NUMBERED DRIVES MUST BE TESTED
3709
3710 010524 005737 001336      ST2     TST      PARAM
3711 010530 001002              BNE      15          ,BR IF 220 START
3712 010532 000137 010622      JMP      ST4          ,200 START, DEFAULT & SIZE THE BUSS
3713 010536 104401 056014      15     TYPE     ,MSG3      ,DRIVES TO BE TESTED
3714 010542 004737 043126      JSR      PC,GDRVS   ,GET DR NOS
3715 010546 104401 056067      TYPE     ,MSG4      ,BUSS ADDR
3716 010552 004737 043274      JSR      PC,G8A     ,GET BA
3717 010556 104401 056121      TYPE     ,MSG5      ,CONT INT VECTOR
3718 010562 004737 043322      JSR      PC,GINT   ,GET INT VECTOR
3719 010566 000427      BR      ST5
3720
3721
3722      ,AUTO MODE
3723      ,CHECK IF LOADED BY XXDP OR OTHER SET FLAGS & NO INPUT DIALOGUE
3724      ,DEFAULT ALL PARAMETERS TEST ONLY THOSE DRIVES THAT ARE READY
3725      ,ON THE BUSS
3726
3727
3728 010570 123727 000041 000013  ST3     CMPB     41,#13     ,13=LOADED BY XXDP
3729 010576 001007              BNE      15
3730 010600 005237 005426      INC      DDPCH     ,SET RK06 CHAIN MODE FLAG
3731 010604 004737 043046      JSR      PC,TITLE
3732 010610 104401 056223      TYPE     ,MSG7      ,DRO NOT TSTD
3733 010614 000402              BR      ST4
3734 010616 005237 005430      15     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      SIZFLG    ,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 HALTE
3744 010662 005037 001176      CLR     $ESCAPE
3745 010666 005037 001172      CLR     STMP5      ,CLEAR RK07 FLAG
  
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3746 010672 012737 005436 001342      MOV    #DRIVO, DRVPTR    ; SETUP
3747 010700 005037 001220                CLR    $DEVCT           ; NO. OF DRVS DONE
3748 010704 005037 001222                CLR    $UNIT           ; CURRENT DRV UNDER TEST
3749 010710 005037 005464                CLR    UNITB           ; PORT A TESTING
3750 010714 112737 000101 056576      MOVB   #'A, MSG19A      ; PORT A TESTING
3751 010722 012737 010770 000004      MOV    #1$, 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$, ERRVEC     ; VECTOR ADDR
3756 010752 005777 170342                TST   @PKS             ; SEE IF P-CLOCK THERE
3757 010756 005237 005460                INC   PCLKF            ; PRESENT, SET FLAG
3758 010762 013700 001332                MOV   PCVEC, RO        ; VECTOR ADDR
3759 010766 000412                        BR     3$              ; VECTOR ADDR
3760
3761 010770 022626                1$    CMP   (SP)+, (SP)+    ; L-CLOCK NOT THERE, CLEAR STACK
3762 010772 012737 011032 000004      MOV    #4$, ERRVEC     ; VECTOR ADDR
3763 011000 005777 170314                TST   @PKS             ; SEE IF P-CLOCK THERE
3764 011004 005237 005460                INC   PCLKF            ; PRESENT, SET FLAG
3765 011010 013700 001332                MOV   PCVEC, RO        ; VECTOR ADDR
3766 011014 012720 047154                3$    MOV   #CLOCK, (RO)+ ; SERVICE ROUTINE FOR CLOCKS
3767 011020 012710 000300                MOV   #PR6, (RO)
3768 011024 000407                        BR     TST!           ; 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 056376                TYPE  .MSG13           ; NO CLOCKS PRESENT TESTS BYPASSED
3775 011040 000137 042644                JMP   $EOP
3776
3777

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```
.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'
;*
;*****
TST1. SCOPE
3790 011044 000004
3791 011046 012737 000001 001174 MOV #1,$TIMES ;DO 1 ITERATION
3792 011054 012706 001100 MOV #STACK,SP ;RESTORE STK PTR
3793
3794 011060 012746 000000 MOV #PRO,-(SP) ;RESET PSW TO PRIORITY 0
3795 011064 012746 011072 MOV #55,-(SP) ;& MAKE IT LSI COMPATABLE
3796 011070 000002 RTI
3797 011072 55
3798
3799 011072 012737 011216 000004 MOV #1$,ERRVEC ;SETUP TIMEOUT ERROR VECTOR
3800 011100 013705 001264 MOV $BASE,R5 ;SETUP INDEX REG
3801 011104 005765 000000 TST RKCS1(R5) ;REFERENCE ALL THE
3802 011110 005765 000010 TST RKCS2(R5) ;CONTROLLER REGISTERS
3803 011114 005765 000002 TST RKWC(R5)
3804 011120 005765 000004 TST RKBA(R5)
3805 011124 005765 000006 TST RKDA(R5)
3806 011130 005765 000012 TST RKDS(R5) ;TIMEOUTS IN THIS SECTION
3807 011134 005765 000014 TST RKER(R5) ;INDICATE THAT THE CONTROLLER
3808 011140 005765 000016 TST RKASOF(R5) ;REGISTERS CANNOT BE READ
3809 011144 005765 000020 TST RKDC(R5) ;TESTING SHOULD NOT PROCEED
3810 011150 005765 000024 TST RKDB(R5) ;UNTIL THIS IS REMEDIED
3811 011154 005765 000026 TST RKMR1(R5)
3812 011160 005765 000034 TST RKMR2(R5)
3813 011164 005765 000036 TST RKMR3(R5)
3814 011170 005765 000030 TST RKECPS(R5)
3815 011174 005765 000032 TST RKECPT(R5)
3816
3817 011200 012737 047736 000004 MOV #BADTMO,ERRVEC ;SETUP TIMEOUT HANDLER
3818 011206 012737 000340 000006 MOV #PR7,ERRVEC+2
3819 011214 000404 BR TST2 ;GO TO NEXT TEST
3820
3821 011216 022626 1$ CMP (SP)+,(SP)+ ;RESTORE STACK POINTER
3822 011220 104007 ERROR 7 ;ABORT-COULD NOT REFERENCE CONTROLLER REGISTER
3823 011222 000137 040704 JMP $EOP1
3824
3825
3826 ;*****
3827 ;*TEST 2 SIZE THE BUSS
3828 ;*
3829 ;* THIS TEST IS ENTERED ONLY IF 'DRIVE SELECTION' IS DEFAULTED
3830 ;* EITHER BY RUNNING IN THE AUTO MODE OR A 200 START IN THE
3831 ;* MANUAL MODE.
3832 ;* EVERY EVEN NUMBERED DRIVE (0,2,4,6) IS ADDRESSED
3833 ;* CONTROLLER ERROR (CERR) IS EXAMINED AND IF NOT SET, THE
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3834 ;* DRIVE WILL BE TESTED AS AN RK06. IF SET, THE PROGRAM WILL BYPASS
3835 ;* TESTING THAT DRIVE ONLY IF THE ERROR WAS A RESULT OF
3836 ;* MDS, UFE OR NED BEING SET; OR BOTH NED & DRA RESET IN-
3837 ;* DICATING THE OTHER PORT IS ACCESSED.
3838 ;* IF CERR DUE TO DTYE, DRIVE WILL BE TESTED AS AN RK07.
3839 ;*
3840 ;*****
3841 011226 000004 TST2 SCOPE
3842 011230 012737 000001 001174 MOV #1,$TIMES ;DO 1 ITERATION
3843 011236 012706 001100 MOV #STACK,SP ;RESTORE STK PTR
3844
3845 011242 005237 001456 INC BYPCERR ;DO NOT DO 'CKCERR' ROUTINE
3846
3847
3848 011246 132737 000200 001231 BITB #BIT7,$ENVM ;SEE IF USE APT SELECTED DRIVES
3849 011254 001002 BNE 14$ ;BR IF YES
3850 011256 000137 011420 JMP 12$ ;ELSE DO NORM SIZING OR VERIFY
3851
3852 011262 104401 056311 14$ TYPE ,MSG10 ;WILL TEST DRIVES
3853 011266 005037 005434 CLR DRIVS ;# OF DRIVES PRESENT
3854 011272 005000 CLR RD ;DRV ADDR
3855 011274 012701 005436 MOV #DRIV0,R1 ;DRV FLAG
3856 011300 013702 001266 MOV $DEV0,R2 ;APT DEVICE MAP
3857
3858 011304 032702 000001 15$ BIT #BIT0,R2 ;SEE IF DRV IN DEVICE MAP
3859 011310 001420 BEQ 16$ ;BR IF NO
3860 011312 022700 000001 CMP #BIT0,R0 ;SEE IF ODD # DRIVE
3861 011316 001405 BEQ 11$ ;BR IF NO
3862
3863 011320 104401 061205 TYPE ,EM28 ;ONLY EVEN # ALLOWED IN $DEV0
3864 011324 000000 HALT ;RELOAD $DEV0 & PRESS 'CONTINUE'
3865 011326 000137 010054 JMP PRGSRT ;RESTART
3866 011332 005237 005434 11$ INC DRIVS ;ELSE INCR DRIVE COUNT
3867 011336 005211 INC (R1) ;& SET DRIVE PRESENT FLAG
3868 011340 104401 001205 TYPE ,SCRLF
3869 011344 010046 MOV RD,-(SP) ;SAVE RD FOR TYPEOUT
3870 ;TYPE DRIVE #
3871 011346 104403 TYPOS ;GO TYPE--OCTAL ASCII
3872 011350 001 BYTE 1 ;TYPE 1 DIGIT(S)
3873 011351 000 BYTE 0 ;SUPPRESS LEADING ZEROS
3874
3875 011352 022121 16$ CMP (R1)+,(R1)+ ;ADV PTR TO NEXT EVEN #
3876 011354 062700 000002 ADD #2,R0 ;ADD DRV ADDR TO NEXT EVEN #
3877 011360 022700 000010 CMP #8,R0 ;ALL 4 TESTED?
3878 011364 001402 BEQ 17$ ;BR IF YES
3879
3880 011366 006002 ROR R2 ;ELSE GET NEXT BIT OFF DEVICE MAP
3881 011370 000745 BR 15$ ;& TRY AGAIN
3882
3883 011372 005737 005434 17$ TST DRIVS ;SEE IF MORE DRIVES PRESENT
3884 011376 001402 BEQ 18$ ;BR IF NO
3885 011400 000137 012076 JMP VERIFY ;ELSE EXIT TEST & SETUP FOR RK07'S
3886
3887 011404 104075 18$ ERROR 75 ;NO DRIVES FOUND IN $DEV0
3888 011406 000000 HALT ;SETUP CORRECTLY & PRESS 'CONTINUE'
3889 011410 000137 010646 JMP ST5 ;TO TRY AGAIN

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3890 011414 000137 012076      20$  JMP      VERIFY      ;DO NOT SIZE, GO TO NEXT TEST
3891
3892 011420 012765 000040 000010 12$  MOV      #SCLR,RKCS2(R5) ;SUBSYSTEM CLEAR
3893 011426 013737 001400 005352  MOV      T10,TEMP1      ;SET TIMEOUT
3894 011434 004737 043466      JSR      PC,FRDY        ;FIND RDY
3895 011440 104120      ERROR    120           ;RDY NOT SET BY END OF SCLR
3896 011442 005737 005462      TST      SIZFLG        ;SIZE BUS?
3897 011446 001762      BEQ      20$           ;BR IF NO
3898 011450 104401 056311      TYPE    ,MSG10        ;WILL TEST DRIVES
3899 011454 005037 005434      CLR      DRVS          ;# OF DRIVES PRESENT
3900 011460 005000      CLR      RO            ;DRV ADDR
3901 011462 012701 005436      MOV      #DRIVO,R1     ;DRV FLAG
3902 011466
3903 011466 104415      SCOP1
3904 011470 012706 001100      MOV      #STACK,SP     ;RESTORE STK PTR
3905
3906 011474 012765 000040 000010  MOV      #SCLR,RKCS2(R5) ;SUBSYSTEM CLEAR
3907 011502 013737 001400 005352  MOV      T10,TEMP1      ;SET TIMEOUT
3908 011510 004737 043466      JSR      PC,FRDY        ;FIND RDY
3909 011514 104120      ERROR    120           ;RDY NOT SET BY END OF SCLR
3910 011516 010065 000010  MOV      RO,RKCS2(R5)   ;SELECT THE DRIVE ADDR
3911 011522 012737 000001 005314  MOV      #SELDRV,HCS1
3912 011530 053737 001170 005314  BIS      $TMP4,HCS1     ;ADD CDT IF RK07
3913 011536 013765 005314 000000  MOV      HCS1,RKCS1(R5) ;GET STATUS
3914 011544 013737 001412 005352  MOV      T50000,TEMP1
3915 011552 004737 044242      JSR      PC,DLY        ;DO DELAY TO CATCH MDS
3916 011556 013737 001400 005352  MOV      T10,TEMP1
3917 011564 004737 043466      JSR      PC,FRDY        ;FIND RDY
3918 011570 104117      ERROR    117           ;NO RDY AFTER SELECT DRIVE CMD
3919 011572 032737 100000 005314  BIT      #CERR,HCS1
3920 011600 001053      BNE     2$
3921 011602 013737 005342 005352  MOV      HMR2,TEMP1
3922 011610 042737 177770 005352  BIC      #(DRVMSK),TEMP1
3923 011616 020037 005352      CMP      RO,TEMP1      ;S/B SAME
3924 011622 001020      BNE     3$
3925 011624 005700      TST     RO
3926 011626 001003      BNE     4$
3927 011630 005737 005426      TST     DDPCH          ;SEE IF XXDP CHAIN MODE
3928 011634 001016      BNE     5$
3929 011636 005237 005434      4$      INC      DRVS          ;INC DRIVE COUNT
3930 011642 005211      INC     (R1)           ;SET DRIVE PRESENT FLAG
3931 011644 053711 001170  BIS     $TMP4,(R1)     ;ADD CDT IF RK07
3932 011650 104401 001205      TYPE    ,SCLRF
3933 011654 010046      MOV     RO,-(SP)       ;SAVE RO FOR TYPEOUT
3934
3935 011656 104403      TYPOS
3936 011660 001      .BYTE  1              ;TYPE DR #
3937 011661 000      .BYTE  0              ;TYPE 1 DIGIT(S)
3938 011662 000403      BR     5$             ;SUPPRESS LEADING ZEROS
3939
3940 011664 004737 044260      3$      JSR     PC,BYP        ;TYPE BYPASS DR #
3941 011670 104001      ERROR   1              ;WRITTEN DR # DOES NOT MATCH RKMP2 DR #
3942
3943 011672 022121      5$      CMP     (R1)+,(R1)+   ;ADV PTR TO NEXT EVEN #
3944 011674 062700 000002  ADD     #2,RO          ;ADV DRV ADDR TO NEXT EVEN #
3945 011700 005037 001170  CLR     $TMP4          ;CLEAR FOR NEXT TRY

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3946 011704 022700 000010      CMP      #8 ,R0      ,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      ST5        ;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,STMP4 ,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 056500          TYPE     ,MSG15     ,DRV#
3979 012050 010046              MOV      RD,-(SP)   ,,SAVE RD FOR TYPEOUT
3980                                     ,,TYPE DR#
3981 012052 104403              TYPOS
3982 012054 001              BYTE    1         ,,GO TYPE--OCTAL ASC!!
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 DPA & NO NEL = OTHER PORT SELECTED
3989 012070 000700              BP       5$
3990 012072 000137 010472          10$     JMP      NUDRV

```

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 F1 J-

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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 15
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 MOV 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 #SELDIV,HCS1
4025 012162 053737 001170 005314 BIS $TMP4,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 25
4034 012234 013737 005342 005352 MOV HMR2,TEMP1
4035 012242 042737 177770 005352 BIC #C<DRUMSK>,TEMP1
4036 012250 020037 005352 CMP RO,TEMP1 ;S/B SAME
4037 012254 001015 BNE 35
4038 012256 005711 115 TST (R1)
4039 012260 001402 BEQ 45
4040 012262 053711 001170 BIS $TMP4,(R1) ;SET RK07 FLAG
4041 012266 022121 45 CMP (R1)+,(R1)+ ;ADV PTR TO NEXT EVEN #
4042 012270 062700 000002 ADD #2,RO ;ADV DRV ADDR TO NEXT EVEN #
4043 012274 005037 001170 CLR $TMP4 ;CLEAR FOR NEXT DRIVE
4044 012300 022700 000010 CMP #8,RO
4045 012304 001305 BNE 15 ;MORE LEFT
4046 012306 000475 BR TST4 ;GO TO NEXT TEST
4047
4048 012310 004737 044260 35 JSR PC,BYP ;TRY BYPASS DRIVE#
4049 012314 104001 ERROR 1 ;WRITTEN DR# DOES NOT MATCH RKMP2 DR#
4050 012316 005711 TST (R1)
4051 012320 001762 BEQ 45 ;BRANCH IF NOT SPEC BY INPUT
4052 012322 005337 005434 125 DEC DRIVS ;DECREMENT TOTAL DRIVS
4053 012326 005011 CLR (R1) ;CLEAR DRIVE FLAG
4054 012330 000756 BR 45
4055
4056 012332 032737 000040 005330 25 BIT #DTYE,HER
4057 012340 001405 BEQ 135
  
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4058	012342	012737	002000	001170		MOV	#CDT,\$TMP4	,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			10\$	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	,DPA & NED PESET - OTHER PORT SELECTED
4089	012470	000714				BR	12\$	
4090								
4091								
4092								
4093								
4094								, THIS PART OF THE PROGRAM WILL BE REPEATED FOR EACH
4095								, DRIVE PRESENT
4096								
4097								, 'SUNIT' CONTAINS THE ADDRESS OF THE DRIVE CURRENTLY
4098								, UNDER TEST
4099								
4100	012472	005037	001456			NUDRV	CLR BYPCPR	,ENTER HERE FROM LAST TEST
4101								,ALLOW CHECKING CERR IN 'FRDY'
4102	012476	005037	001170			CLR	\$TMP4	,CLEAR RK07 FLAG
4103								
4104								,, *****
4105								,*TEST 4 FIND NEXT DRIVE TO BE TESTED
4106								,*
4107								,* THIS TEST FINDS THE NEXT DRIVE PRESENT & PUTS THAT
4108								,* ADDRESS IN 'SUNIT' & \$TMP4 IS SET TO CDT IF RK07
4109								,* THROUGHOUT THE FOLLOWING TESTS, THE DRIVE TESTED IS
4110								,* THE DRIVE WHOSE ADDRESS IS IN 'SUNIT'
4111								,*
4112								,, *****
4113	012502	000004				TST4	SCOPE	

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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 056260              TYPE   ,MSG8        ;ALL DRIVES TESTED
4122 012544 000137 042704              JMP    $EOP1        ;NO, GO TO END
4123
4124 012550 005037 005464          4$     CLR    UNITB        ;SETUP PORT A
4125 012554 112737 000101 056576      MOVB   #'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,$TMP4   ;ELSE SET RK07 FLAG
4145 012652 062701 000004          6$     ADD    #4,R1
4146 012656 010137 001342              MOV    R1,DRVPTR    ;STORE PTR OF NEXT EVEN DRIVE FLAG
4147 012662 104401 056500              TYPE   ,MSG15       ;"DRIVE"
4148 012666 013700 001222              MOV    $UNIT,RO     ;SAVE RO FOR TYPEOUT
4149 012672 010046              MOV    RO,-(SP)     ;DRIVE #
4150
4151 012674 104403              TYPOS   ;GO TYPE--OCTAL ASCII
4152 012676 001              BYTE   1           ;TYPE 1 DIGIT(S)
4153 012677 000              BYTE   0           ;SUPPRESS LEADING ZEROS
4154
4155              TYPE   ,SCRLF ,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 PARAMEREPS
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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4170	012766	000406		BR	TST5	..GOTO NEXT TEST
4171						
4172	012770	000000	LC	0		.LAST CYL
4173	012772	000000	MASK	0		
4174	012774	000000	MASK1	0		
4175	012776	000000	E DDT	0		.EXPECTED DRIVE TYPE TO E AD
4176	013000	000000	FC	0		.FIRST CYL
4177	013002	000001	FCP1	1		.FC+1
4178	013004		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 'DR VE
*   AVAILABLE' SET
*
*   C   A SELECT DRIVE COMMAND S 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
*   AD-A3, BD-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 AD
*
*   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'

```

```

*****
TST5  SCOPE
4217 013004 000004          MOV      #1, $TIMES      ..DO 1 ITERATION
4218 013006 012737 000001 001174  MOV      #STACK, SP
4219 013014 012706 001100          MOV      #0, UNITB      .SETUP PORT A
4220 013020 012737 000000 005464  MOVB     #'A, MSG19A
4221 013026 112737 000101 056576  MOV      TIMER, COUNT
4222 013034 013737 005466 001366  JSR      PC, TMO        .DO TIMEOUT
4223 013042 004737 047204          JSR      PC, SUBCLP
4224
4225 013046 004737 045534

```

4226	013052	104024			ERROR	24		;CERR AFTER SCLR
4227								
4228								
4229	013054	004737	044172		JSR	PC, DRAB		;SEE IF DRIVE AVAIL
4230	013060	104045			ERROR	45		;PORT A NOT AVAIL AFTER TMO
4231	013062			75.				
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	645		
4241	013130	104027			ERROR	27		;VV NOT SET AFTER PACK CMD
4242	013132			645				
4243	013132	012737	042644	001176	MOV	#SEOP, \$ESCAPE		
4244	013140	005737	005464		TST	UNITB		
4245	013144	001022			BNE	25		
4246	013146	012737	000001	005464	MOV	#1, UNITB		, SETUP PORT B
4247	013154	112737	000102	056576	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, SUBCLP		
4252	013200	104223			ERROR	223		, CERR AFTER SCLR
4253								
4254	013202	004737	044172		JSR	PC, DRAB		, SEE IF DROVE AVAIL
4255	013206	104045			ERROR	45		, PORT B NOT AVAIL AFTER TMO
4256	013210	000724			BR	75		
4257	013212			25				
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	655		
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

4282									
4283	013356	004737	044774		JSR	PC,CHKMSG		;CHECK MSGS A0, B0, A1, B1	
4284	013362	000007			WORD	T A2'IT. B2'IT. B3		; & MSGS SPECIFIED HERE	
4285	013364	104221			ERROR	221		;MSG A0 ERROR AFTER RECAL CMD	
4286	013366	104066			ERROR	66		;MSH B0 ERROR	
4287	013370	104222			ERROR	222		;MSG A1 ERROR	
4288	013372	104067			ERROR	67		;MSG B1 ERROR	
4289	013374	012765	000002	000026	MOV	#2,RKMR1(R5)			
4290	013402	00477	045146		JSR	PC,GSTAT			
4291	013406	005737	001356		TST	CYLDIF		;SEE IF MSG A2=0	
4292	013412	001401			BEQ	665		;BR IF YES	
4293	013414	104047			ERROR	47		;MSG A2 NOT CLEARED AFTER RECAL CMD	
4294	013416	005737	001360		TST	CYLADD		;SEE IF MSG B2=0	
4295	013422	001401			BEQ	675		;BR IF YES	
4296	013424	104050			ERROR	50		;MSG B2 NOT CLEARED AFTER RECAL CMD	
4297	013426								675
4298									
4299	013426	012765	100000	000000	MOV	#CCLR,RKCS1(R5)			
4300	013434	013765	001222	000010	MOV	SUNIT,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	685			
4307	013472	104154			ERROR	154		;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD	
4308	013474								685
4309									
4310	013474	012737	010340	005404	MOV	#<D DRA'D SPIN'D DRDY'D VV>,E A0		;EXPECTED MSG A0	
4311	013502	005037	005406		CLR	E B0		;EXPECTED MSG B0	
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 A0, B0, A1, B1	
4319	013546	000003			WORD	T A2'IT B2'ID		; & MSGS SPECIFIED HERE	
4320	013550	104033			ERROR	33		;MSG A0 ERROR AFTER DRV CLEAR CMD	
4321	013552	104034			ERROR	34		;MSH B0 ERROR	
4322	013554	104035			ERROR	35		;MSG A1 ERROR	
4323	013556	104036			ERROR	36		;MSG B1 EPROR	
4324									
4325									
4326	013560	012737	000000	005464	MOV	#0,UNITB		;SETUP PORT A	
4327	013566	112737	000101	056576	MOVB	#'A,MSG19A			
4328	013574	013737	005466	001366	MOV	TIMER,COUNT			
4329	013602	004737	047204		JSR	PC,TMO		;DO TIMEOUT	
4330									
4331	013606	004737	045534		JSR	PC,SUBCLP			
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	#55,SESCAPE			

4338											
4339	013630	012737	010340	005404		MOV	#<D. DRA!D. SPIN!D. DRDY!D. VV>,E A0	, EXPECTED MSG A0			
4340	013636	005037	005406			CLR	E B0	; EXPECTED MSG B0			
4341	013642	012737	001720	005410		MOV	#<D. SPOK!D. CART!D. DOOR!D. BRHM!D SSP>,E A1	, EXPECTED A1			
4342	013650	012737	000001	005412		MOV	#1,E B1	; MSG ID FOR EXPECTED MSG B1			
4343	013656	005037	005414			CLR	E A2	; EXPECTED MSG A2			
4344	013662	012737	000002	005416		MOV	#2,E B2	; MSG ID FOR EXPECTED MSG B2			
4345	013670	012737	000003	005422		MOV	#3,E B3	; MSG ID FOR EXPECTED MSG B3			
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	; MSH 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	056576		MOVB	#'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 ODT,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	; MSH 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	#CLR,RKCS1(R5)				
4382	014060	012737	000000	005464		MOV	#0,UNITB	; SETUP FOR PORT A AGAIN			
4383	014066	112737	000101	056576		MOVB	#'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	056576		MOVB	#'B,MSG19A				
4392	014130	004737	044172			JSR	PC,DRAV	; SEE IF PORT B DRIVE AVAIL			
4393	014134	000401				BR	3\$; BR IF NOT AVAIL			

4394	014136	104103				ERROR	103		, PORT B AVAIL BEFORE TMO OR RELEASE
4395									
4396	014140	012765	100000	000000	35	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, DRAW		; 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		, MSH 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	056576		MOVB	#'A, MSG19A		
4425	014310	004737	043750			JSP	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	45	MOV	#5\$, \$ESCAPE		
4430	014326	012737	000001	005464		MOV	#1, UNITB		, SETUP FOR PORT B
4431	014334	112737	000102	056576		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	635		
4441	014406	104154				ERROR	154		, ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4442	014410				695				
4443									
4444	014410	012737	010340	005404		MOV	#<D DRA'D SPIN'D. DRDY'D. VV>, E A0		, EXPECTED MSG A0
4445	014416	005037	005406			CLR	E B0		, EXPECTED MSG B0
4446	014422	012737	001720	005410		MOV	#<D SPOK'D CART'D DOOR'D BRHM'D. SSP>, E A1		, EXPECTED A1
4447	014430	012737	000001	005412		MOV	#1, E B1		, MSG ID FOR EXPECTED MSG B1
4448	014436	005037	005414			CLR	E A2		, EXPECTED MSG A2
4449	014442	012737	000002	005416		MOV	#2, E B2		, MSG ID FOR EXPECTED MSG B2


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4450 014450 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          ;MSH 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      ;R1-COUNT=R1
4461 014500 163701 001366      SUB      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 056602      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 056663      TYPE    ,MSG22        ;MS
4472
4473 014544 005037 001176      SS      CLR      $ESCAPE
4474 014550 004737 047162      JSR      PC,CLKOF
4475
4476                                     ;,*****
4477                                     ;*TEST 6          TEST PORT 'B' SEIZE & TIMEOUT
4478                                     ;*
4479                                     ;*      THE PREVIOUS TEST IS REPEATED FOR PORT 'B'
4480                                     ;*
4481                                     ;,*****
4482 014554 000004                TST6     SCOPE
4483 014556 012737 000001 001174      MOV      #1,$TIMES    ;,DO 1 ITERATION
4484 014564 012706 001100                MOV      #STACK,SP
4485 014570 012737 000001 005464      MOV      #1,UNITB    ;,SETUP PORT B
4486 014576 112737 000102 056576      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      #55,$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
```

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	056576		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 AO	
4523	014774	013737	005404	005410		MOV	E AO,E A1	;MSG 1 & 0 SHOULD ALWAYS RETURN SAME
4524	015002	053737	012776	005410		BIS	E ODT,E A1	
4525	015010	005037	005406			CLR	E BO	;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	056576		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	056576		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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4618  
4619 015504 012701 000360      MOV    #360,R1  
4620 015510 163701 001366      SUB    COUNT,R1      ;R1-COUNT=P1  
4621 015514 012746 000021      MOV    #17,-(SP)     ;;PUT THE MULTIPLIER ON THE STACK  
4622 015520 010146              MOV    R1,-(SP)      ;;PUT THE MULTIPLICAND ON THE STACK  
4623 015522 004737 054270      JSR    PC,@#MULT     ;;CALL THE MULTIPLY ROUTINE  
4624 015526 012616              MOV    (SP)+,(SP)    ;;DISREGARD THE MSB'S  
4625 015530 012601              MOV    (SP)+,R1      ;;GET THE LSB'S OF THE PRODUCT  
4626 015532 104401 056667      TYPE   ,MSG23        ;PORT TIMEOUT  
4627 015536 010146              MOV    R1,-(SP)     ;PUSH BINARY ONTO STACK  
4628 015540 004737 054174      JSR    PC,$S820      ;CONVERT TO ASCII  
4629 015544 004737 054230      JSR    PC,$SUPRS     ;TYPE IT  
4630 015550 104401 056663      TYPE   ,MSG22        ;MS  
4631  
4632 015554 005037 001176      55    CLR    $ESCAPE  
4633 015560 004737 047162      JSR    PC,CLKOF  
4634  
4635      ;,*****  
4636      ;*TEST 7          PRINT DRIVE SERIAL NUMBER  
4637      ;*  
4638      ;*      THIS TEST READS & PRINTS THE DRIVE SERIAL # FROM MSG A3  
4639      ;*      IN BCD ON THE 1'ST PASS ONLY  
4640      ;*      IT ALSO TESTS THAT THE SERIAL # READ THRU BOTH PORTS  
4641      ;*      ARE THE SAME.  
4642      ;*  
4643      ;,*****  
4644 015564 000004              TST7   SCOPE  
4645 015566 012737 000001 001174  MOV    #1,$TIMES     ;,DO 1 ITERATION  
4646 015574 012706 001100      MOV    #STACK,SP  
4647  
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 056512      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    HMR2,R1       ;GET SERIAL #  
4658 015636 012704 053762      MOV    #SOCTVL,R4    ;GET ADDR CHAR BUFF  
4659 015642 010446              MOV    R4,-(SP)     ;STORE ON STACK FOR $SUPRS  
4660 015644 012703 000003      MOV    #3,R3        ;SETUP CHAR COUNT  
4661 015650 006101              ROL    R1            ;INITIALIZE BIT POSITIONS  
4662 015652 006101              ROL    R1  
4663 015654 006101      15    ROL    R1            ;GET NEXT 4 BITS  
4664 015656 006101              ROL    R1  
4665 015660 006101              ROL    R1  
4666 015662 006101              ROL    R1  
4667 015664 010100              MOV    R1,RO        ;GET WORKING COPY  
4668 015666 042700 177760      BIC    #177760,RO    ;CLEAR ALL BUT LOW 4 BITS  
4669 015672 052700 000060      BIS    #60,RO       ;CONVERT TO ASCII DIGIT  
4670 015676 110024              MOVB   RO,(R4)+     ;PUT ASCII DIGIT INTO CHAR BUFF  
4671 015700 005303              DEC    R3  
4672 015702 001364              BNE    15           ;BR IF ALL 3 CHARS NOT DONE  
4673 015704 105014              CLRB   (R4)         ;ELSE INSERT NULL TERMINATOR
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4674
4675 015706 004737 054230 JSR PC,$SUPRS ;TYPE
4676 ; TYPE ,SCLF ;29-SEP-77
4677 ; TYPE ,SCLF ;29-SEP-77
4678
4679 ;*****
4680 ;*TEST 10 TEST PORT 'A' COMMAND SEIZE & ATTENTION
4681 ;*
4682 ;* VERIFY THE OPERATION OF 'DSC' & 'ATTN' BITS AFTER A COMMAND
4683 ;*
4684 ;* A ISSUE A SEEK COMMAND TO CYLINDER 10 THRU PORT 'A'
4685 ;*
4686 ;* B VERIFY SEIZURE & THAT 'DSC' & 'ATTN' SETS FOR PORT 'A'
4687 ;* ONLY AFTER SEEK COMPLETION
4688 ;*
4689 ;* C VERIFY 'ATTN' REMAINS SET BEYOND TIMEOUT
4690 ;*
4691 ;* D. VERIFY A DRIVE CLEAR COMMAND RESETS 'DSC' & 'ATTN'
4692 ;* & DOES NOT RELEASE THE DRIVE FROM PORT 'A'
4693 ;*
4694 ;*****
4695 015712 000004 TST10. SCOPE
4696 015714 012737 000001 001174 MOV #1,$TIMES ;DO 1 ITERATION
4697 015722 012706 001100 MOV #STACK,SP
4698 015726 012737 000000 005464 MOV #0,UNITB ;SETUP PORT A
4699 015734 112737 000101 056576 MOVB #'A,MSG19A
4700 015742 013737 005466 001366 MOV TIMER,COUNT
4701 015750 004737 047204 JSR PC,TMO ;DO TIMEOUT
4702
4703 015754 004737 045534 JSR PC,SUBCLR
4704 015760 104024 ERROR 24 ;CERR AFTER SCLR
4705
4706
4707 015762 004737 044172 JSR PC,DRAW ;SEE IF DRIVE AVAIL
4708 015766 104045 ERROR 45 ;PORT A NOT AVAIL AFTER TMO
4709 015770 012765 000012 000020 MOV #10 ,RKDC(R5) ;SEEK TO CYL 10
4710
4711 015776 012737 000017 005314 MOV #SEEK,HCS1
4712 016004 004737 043372 JSR PC,DOCMD ;DO SEEK CMD & GET CONTR READY
4713 016010 104131 ERROR 131 ;NO RDY AFTER SEEK CMD
4714
4715 016012 013737 001412 005352 MOV T50000,TEMP1 ;SETUP TIMEOUT
4716 016020 004737 044106 JSR PC,FATT2 ;FIND ATTN
4717 016024 104132 ERROR 132 ;NO ATTN AFTER SEEK CMD
4718
4719 016026 032737 100000 005314 BIT #CERR,HCS1
4720 016034 001401 BEQ 655
4721 016036 104210 ERROR 210 ;CERR AFTER SEEK CMD
4722
4723 016040 ;55
4724
4725 016040 012737 050340 005404 MOV #<D DSC'D DRA'D SPIN'D DRDY'D VV,,E A0 ;EXPECTED MSG A0
4726 016046 005037 005406 CLR E B0 ;EXPECTED MSG B0
4727 016052 012737 001720 005410 MOV #<D SPON'D CAP'D DOOR'D BRM'D SSP ,E A1 ;EXPECTED A1
4728 016060 012737 000001 005412 MOV B1,E B1 ;MSG 10 FOR EXPECTED MSG B1
4729 016066 005037 005414 CLR E A2 ;EXPECTED MSG A2

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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 ;MSH 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 #CCLR,RKCS1(R5)
4755 016220 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;DRIVE#
4756 016226 063765 005464 000010 ADD UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
4757 016234 012737 000005 005314 MOV #CLEAR,HCS1
4758 016242 004737 043372 JSR PC,DOCMD ;DO DRIVE CLEAR CMD & GET CONTR RDY
4759 016246 104151 ERROR 151 ;NO RDY AFTER DRIVE CLEAR CMD
4760 016250 004737 043750 JSR PC,TSTATN ;TEST FOR ATTN
4761 016254 000401 BR 66$
4762 016256 104154 ERROR 154 ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4763 016260 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 ;MSH 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 ,*
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4786 ;* THE PREVIOUS TEST IS REPEATED FOR PORT 'B',
4787 ;* BUT THE SEEK IS TO CYLINDER 0
4788 ;*
4789 ;, *****
4790 016352 000004 TST11 SCOPE
4791 016354 012737 000001 001174 MOV #1, $TIMES ; DO 1 ITERATION
4792 016362 012706 001100 MOV #STACK, SP
4793 016366 012737 000001 005464 MOV #1, UNITB ; SETUP PORT B
4794 016374 112737 000102 056576 MOV #B, MSG19A
4795 016402 013737 005466 001366 MOV TIMER, COUNT
4796 016410 004737 047204 JSR PC, TMO ; DO TIMEOUT
4797
4798 016414 004737 045534 JSR PC, SUBCLR
4799 016420 104024 ERROR 24 ; CERR AFTER SCLR
4800
4801
4802 016422 004737 044172 JSR PC, DRAW ; SEE IF DRIVE AVAIL
4803 016426 104045 ERROR 45 ; PORT B NOT AVAIL AFTER TMO
4804 016430 012765 000C00 000020 MOV #0, RKDC(R5) ; SEEK TO CYL 0
4805
4806 016436 012737 000017 005314 MOV #SEEK, HCS1
4807 016444 004737 043372 JSR PC, DOCMD ; DO SEEK CMD & GET CONTR READY
4808 016450 104131 ERROR 131 ; NO RDY AFTER SEEK CMD
4809
4810 016452 013737 001412 005352 MOV T50000, TEMP1 ; SETUP TIMEOUT
4811 016460 004737 044106 JSR PC, FATT2 ; FIND ATTN
4812 016464 104132 ERROR 132 ; NO ATTN AFTER SEEK CMD
4813
4814 016466 032737 100000 005314 BIT #CERR, HCS1
4815 016474 001401 BEQ 655
4816 016476 104210 ERROR 210 ; CERR AFTER SEEK CMD
4817
4818 016500
4819
4820 016500 012737 050340 005404 MOV #<D DSC'D DRA'D SPIN'D DRDY'D VV>, E A0 ; EXPECTED MSG A0
4821 016506 005037 005406 CLR E B0 ; EXPECTED MSG B0
4822 016512 012737 001720 005410 MOV #<D SPOK'D CART'D DOOR'D BRHM'D SSP>, E A1 ; EXPECTED A1
4823 016520 012737 000001 005412 MOV #1, E B1 ; MSG ID FOR EXPECTED MSG B1
4824 016526 005037 005414 CLR E A2 ; EXPECTED MSG A2
4825 016532 012737 000002 005416 MOV #2, E B2 ; MSG ID FOR EXPECTED MSG B2
4826 016540 012737 000003 005422 MOV #3, E B3 ; MSG ID FOR EXPECTED MSG B3
4827
4828 016546 004737 044274 JSR PC, CHKMSG ; CHECK MSGS A0, B0, A1, B1
4829 016552 000000 WORD 0'0'0 ; & MSGS SPECIFIED HERE
4830 016554 104161 ERROR 161 ; MSG A0 ERROR AFTER SEEK CMD
4831 016556 104162 ERROR 162 ; MSH B0 ERROR
4832 016560 104163 ERROR 163 ; MSG A1 ERROR
4833 016562 104164 ERROR 164 ; MSG B1 ERROR
4834
4835 016564 004737 045756 JSR PC, RDCYLA ; READ CYL ADDR
4836 016570 023727 001360 000000 CMP CYLADD, #0 ; SEE IF CYL 0
4837 016576 001415 BEQ 645 ; BR IF YES
4838 016600 012737 000012 001344 MOV #10, FRCYL
4839 016606 012737 000000 001346 MOV #0, TOCYL
4840 016614 012737 000000 001354 MOV #0, CALDIF
4841 016622 012765 000000 000020 MOV #0, RKDC(R5) ; REFRESH RKDC

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4842 016630 104224 ERROR 224 , DID NOT SEEK TO CYL 0
4843
4844 016632 012737 000226 001366 645 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 665
4857 016716 104154 ERROR 154 ; ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4858 016720 665
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. BRHM'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 , MSH 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,DRAV
4876 017010 104113 ERROR 113 , PORT B NOT AVAIL AFTER DRIVE CLEAR CMD
4877
4878 , , *****
4879 , *TEST 12 TEST RESET PORT 'A' ATTENTION BY DRIVE CLEAR COMMAND
4880 , *
4881 , * VERIFY THAT A DRIVE CLEAR COMMAND CLEARS ONLY THE ATTENTION BIT OF
4882 , * THE SEIZING PORT
4883 , *
4884 , * A. SET EACH PORT'S ATTENTION BIT BY PERFORMING SEEK
4885 , * COMMANDS TO CYLINDER 0 & ALLOWING TIMEOUTS
4886 , *
4887 , * B. SEIZE THE DRIVE THRU PORT 'A' & ISSUE A DRIVE CLEAR COMMAND
4888 , * VERIFY THAT 'DSC' & 'ATTN' FOR PORT 'A' HAVE BEEN CLEARED
4889 , *
4890 , * C. SEIZE THE DRIVE THRU PORT 'B' & VERIFY 'DSC' & 'ATTN'
4891 , * HAVE NOT CLEARED
4892 , , *****
4893 017012 000004 TST12 SCOPE
4894 017014 012737 000001 001174 MOV #1,$TIMES , DO 1 ITERATION
4895 017022 012706 001100 MOV #STACK,SP
4896 017026 012737 000000 005464 MOV #0,UNITB , SETUP PORT A
4897 017034 112737 000101 056576 MOVB #'A,MSG19A
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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,FATT2	,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	645	
4918	017130	104210			ERROR	210	,CERR AFTER SEEK CMD
4919							
4920	017132			645			
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	,& 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	056576	MOV	#'B,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'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	005420	MOV	#3,E B3	,MSG ID FOR EXPECTED MSG B3
4952							
4953	017320	004737	044274		JSR	PC,CHKMSG	,CHECK MSGS A0, B0, A1, B1

4954	017324	000000			WORD	0'0'0		, & MSGS SPECIFIED HERE
4955	017326	104165			ERROR	165		, MSG A0 ERROR AFTER TIMEOUT
4956	017330	104166			ERROR	166		, MSH B0 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		, DC 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, FATT2		, 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	655		
4970	017376	104210			ERROR	210		, CERR AFTER SEEK CMD
4971								
4972	017400							
4973								
4974	017400	012737	050340	005404	MOV	#<D DSC'D DRA'D SPIN'D DRDY'D VV>, E A0		, EXPECTED MSG A0
4975	017406	005037	005406		CLR	E B0		, EXPECTED MSG B0
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 A0, B0, A1, B1
4983	017452	000000			WORD	0'0'0		, & MSGS SPECIFIED HERE
4984	017454	104161			ERROR	161		, MSG A0 ERROR AFTER SEEK CMD
4985	017456	104162			ERRPR	162		, MSH B0 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	056576	MOVB	#'A, MSG19A		
4993	017512	004737	044172		JSR	PC, DRAY		
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 A0
4998	017526	005037	005406		CLR	E B0		, EXPECTED MSG B0
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 A0, B0, A1, B1
5006	017572	000000			WORD	0'0'0		, & MSGS SPECIFIED HERE
5007	017574	104165			ERROR	165		, MSG A0 ERROR AFTER TIMEOUT
5008	017576	104166			ERRPR	166		, MSH B0 ERROR
5009	017600	104167			ERRPR	167		, MSG A1 ERROR

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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,DOCMD		;DO DRIVE CLEAR CMD & GET CONTR RDY
5017	017640	104151			ERROR	151		;NC RDY AFTER DRIVE CLEAR CMD
5018	017642	004737	043750		SR	PC,TSTATN		;TEST FOR ATTN
5019	017646	000401			BR	665		
5020	017650	104154			ERROR	154		;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5021	017652			665				
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	056576	MOVB	#'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

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*TEST 13 TEST RESET PORT 'B' ATTENTION BY DRIVE CLEAR COMMAND
*
* THE PREVIOUS TEST IS REPEATED FOR PORT 'B'

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5066 ,*
5067 ,,*****
5068 020056 000004 TST13 SCOPE
5069 020060 012737 000001 001174 MOV #1, $TIMES , DO 1 ITERATION
5070 020066 012706 001100 MOV #STACK, SP
5071 020072 012737 000001 005464 MOV #1, UNITB SETUP PORT B
5072 020100 112737 000102 056576 MOVB #'B, MSG19A
5073 020106 013737 005466 001366 MOV TIMER, COUNT
5074 020114 004737 047204 JSR PC, TMO , DO TIMEOUT
5075
5076 020120 004737 045534 JSR PC, SUBCLR
5077 020124 104024 ERROR 24 , CERR AFTER SCLR
5078
5079
5080 020126 004737 044172 JSR PC, DRAY , SEE IF DRIVE AVAIL
5081 020132 104045 ERROR 45 , PORT B NOT AVAIL AFTER TMO
5082
5083 020134 012737 000017 005314 MOV #SEEK, HCS1
5084 020142 004737 043372 JSR PC, DOCMD , DO SEEK CMD & GET CONTR READY
5085 020146 104131 ERROR 131 , NO RDY AFTER SEEK CMD
5086
5087 020150 013737 001412 005352 MOV T50000, TEMP1 , SETUP TIMEOUT
5088 020156 004737 044106 JSR PC, FATT2 , FIND ATTN
5089 020162 104132 ERROR 132 , NO ATTN AFTER SEEK CMD
5090
5091 020164 032737 100000 005314 BIT #CERR, HCS1
5092 020172 001401 BEG 645
5093 020174 104210 ERROR 210 , CERR AFTER SEEK CMD
5094
5095 020176 645
5096
5097 020176 012737 050340 005404 MOV #<D DSC'D DRA'D. SPIN'D DRDY'D VV>, E A0 , EXPECTED MSG A0
5098 020204 005037 005406 CLR E B0 , EXPECTED MSG B0
5099 020210 012737 001720 005410 MOV #<D SPOK'D CART'D DOOR'D BRHM'D SSP>, E A1 , EXPECTED A1
5100 020216 012737 000001 005412 MOV #1, E B1 , MSG ID FOR EXPECTED MSG B1
5101 020224 005037 005414 CLR E A2 , EXPECTED MSG A2
5102 020230 012737 000002 005416 MOV #2, E B2 , MSG ID FOR EXPECTED MSG B2
5103 020236 012737 000003 005422 MOV #3, E B3 , MSG ID FOR EXPECTED MSG B3
5104
5105 020244 004737 044274 JSR PC, CHMSG , CHECK MSGS A0, B0, A1, B1
5106 020250 000000 WORD 0'0'0 , & MSGS SPECIFIED HERE
5107 020252 104161 ERROR 161 , MSG A0 ERROR AFTER SEEK CMD
5108 020254 104162 ERROR 162 , MSG B0 ERROR
5109 020256 104163 ERROR 163 , MSG A1 ERROR
5110 020260 104164 ERROR 164 , MSG B1 ERROR
5111
5112 020262 013737 005466 001366 MOV TIMER, COUNT
5113 020270 004737 047204 JSR PC, TMO , DO 1 5 SEC TIMEOUT
5114 020274 012737 000000 005464 MOV #0, UNITB , SETUP PORT A
5115 020302 112737 000101 056576 MOVB #'A, MSG19A
5116 020310 004737 044172 JSR PC, DRAY
5117 020314 104045 ERROR 45 , PORT A NOT AVAIL AFTER TMO
5118
5119
5120 020316 012737 010340 005404 MOV #<D DRA'D'D SPIN'D DRDY'D VV> E A0 , EXPECTED MSG A0
5121 020324 005037 005406 CLR E B0 , EXPECTED MSG B0

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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	;MSH 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,FATT2	;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	655	
5145	020442	104210			ERROR	210	;CERR AFTER SEEK CMD
5146							
5147	020444			655			
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		CLP	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		CLP	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	;MSH 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	056576	MOVB	#'B,MSG19A	
5168	020556	004737	044172		JSR	PC,DRAV	
5169	020562	104045			ERROR	45	;PORT B NOT AVAIL AFTEF 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

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	;MSH 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	665	
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'IT B2'0	; & MSGS SPECIFIED HERE
5208	020772	104033			ERROR	33	;MSG A0 ERROR AFTER DRV CLEAR CMD
5209	020774	104034			ERROR	34	;MSH 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	056576	MOV	#'A,MSG19A	
5217	021030	004737	043750		JSR	PC,TSTATN	
5218	021034	104114			ERROR	114	;ATTN RESET ON PORT A AFTER DR CLP 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			ERR	166	;MSH B0 ERROR

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5234 021116 104167
5235 021120 104170
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5247

ERROR 167 ;MSG A1 ERROR
ERROR 170 ;MSG B1 ERROR

```
.,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
,*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 'OSC' OR 'ATTN'  
,*  
.,XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

5248 021122 000004
5249 021124 012737 000001 001174
5250 021132 012706 001100
5251 021136 012737 000000 005464
5252 021144 112737 000101 056576
5253 021152 013737 005466 001366
5254 021160 004737 047204
5255
5256 021164 004737 045534
5257 021170 104024
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 056576
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 056576
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

```
TST14 SCOPE  
MOV #1, $TIMES ;DO 1 ITERATION  
MOV #STACK, SP  
MOV #D, 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, DRAB ;SEE IF DRIVE AVAIL  
ERROR 45 ;PORT A NOT AVAIL AFTER TMO  
MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT A  
MOV #D, UNITB  
ADD UNITB, RKCS2(R5)  
MOVB #'A, MSG19A  
ADD #RLS, RKCS2(R5) ;RELEASE PORT A  
MOV #SELDRV, 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 #SELDRV, 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 645 ;BR IF YES  
ERROR 71 ;PORT B NOT AVAIL AFTER PORT A RLS  
JSP PC, TSTATN  
BR 15  
ERROR 115 ;ATTN SET IN PORT B AFTER RLS OF PORT A  
MOV #<D DRA'D SPIN'D. DRDY'D VU>, E A0 ;EXPECTED MSG A0  
CLR E B0 ;EXPECTED MSG B0
```

```
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 ;MSH 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 056576 MOV #A,MSG19A
5305 021440 004737 043750 JSR PC,TSTATN
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.DRDY!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 ;MSH 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,$TIMES ;DO 1 ITERATION
5332 021536 012737 000001 001174 MOV #STACK,SP
5333 021544 012737 001100 MOV #1,UNITB ;SETUP PORT B
5334 021550 012737 000001 005464 MOV #B,MSG19A
5335 021556 112737 000102 056576 MOV TIMER,COUNT
5336 021564 013737 005466 001366 JSR PC,TMO ;DC TIMEOUT
5337
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
```


5346	021626	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5347	021634	112737	000102	056576	MOVB	#'B,MSG19A	
5348	021642	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
5349	021650	012737	000001	005314	MOV	#SELDRV,HCS1	
5350	021656	004737	043372		JSR	PC,DOCMD	;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	\$UNIT,RKCS2(R5)	;SETUP FOR PORT A
5354	021672	012737	000000	005464	MOV	#D,UNITB	
5355	021700	063765	005464	000010	ADD	UNITB,RKCS2(R5)	
5356	021706	112737	000101	056576	MOVB	#'A,MSG19A	
5357	021714	012737	000001	005314	MOV	#SELDRV,HCS1	
5358	021722	004737	043372		JSR	PC,DOCMD	;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	#D 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	043 2		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	056576	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

5402 022140 104212
5403 022142 104213
5404 022144 104214

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

5405
5406
5407 ;*****
5408 ;*TEST 16 TEST RELEASE FROM PORT 'A' WITH PORT 'B' REQUESTING
5409 ;*
5410 ;* A. PORT 'A' SEIZES THE DRIVE & DOES A SEEK TO SELF COMMAND.
5411 ;* THE PROGRAM VERIFIES 'DSC' & 'ATTN' ON PORT 'A' ONLY
5412 ;* ON COMPLETION
5413 ;*
5414 ;* B PORT 'B' TRIES TO ACCESS THE DRIVE THE PROGRAM VERIFIES
5415 ;* DRIVE NOT AVAILABLE
5416 ;*
5417 ;* C A RELEASE BY PORT 'A' IS ISSUED VERIFY PORT 'B' CAN
5418 ;* ACCESS THE DRIVE IMMEDIATELY & THAT 'DSC' & 'ATTN'
5419 ;* ARE SEEN ON PORT 'B'
5420 ;*
5421 ;* D VERIFY PORT 'A' 'DSC' & 'ATTN' REMAINS SET AFTER RELEASE
5422 ;*
5423 ;* E. THE PROGRAM ISSUES A DRIVE CLEAR COMMAND TO PORT 'B'
5424 ;* & VERIFIES 'DSC' & 'ATTN' RESETS.
5425 ;*
5426 ;* F THE PROGRAM THEN VERIFIES THAT PORT 'B' DOES NOT SEE
5427 ;* FURTHER (MULTIPLE) ATTENTIONS FROM WHAT WOULD HAVE BEEN
5428 ;* NORMAL TIMEOUT FROM PORT 'A'
5429 ;*****

5430 022146 000004 TST16 SCOPE
5431 022150 012737 000001 001174 MOV #1, \$TIMES ;DO 1 ITERATION
5432 022156 012706 001100 MOV #STACK, SP
5433 022162 013765 001222 000010 MOV \$UNIT, RKCS2(R5) ;SETUP FOR PORT B
5434 022170 012737 000001 005464 MOV #1, UNITB
5435 022176 063765 005464 000010 ADD UNITB, RKCS2(R5)
5436 022204 112737 000102 056576 MOVB #'B, MSG19A
5437 022212 062765 000010 000010 ADD #RLS, RKCS2(R5) ;RELEASE PORT B
5438 022220 012737 000001 005314 MOV #SELDRV, HCS1
5439 022226 004737 043372 JSR PC, DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5440 022232 104117 ERROR 117 ;NO RDY AFTER SEL DRV CMD
5441
5442 022234 013765 001222 000010 MOV \$UNIT, RKCS2(R5) ;SETUP FOR PORT A
5443 022242 012737 000000 005464 MOV #0, UNITB
5444 022250 063765 005464 000010 ADD UNITB, RKCS2(R5)
5445 022256 112737 000101 056576 MOVB #'A, MSG19A
5446 022264 012737 000001 005314 MOV #SELDRV, HCS1
5447 022272 004737 043372 JSR PC, DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5448 022276 104117 ERROR 117 ;NO RKY AFTER SEL DRV CMD
5449
5450 022300 032737 000040 005342 BIT #0 DRA, HMP2 ;SEE IF DRIVE AVAIL ON PORT A
5451 022306 001001 BNE 645 ;OR IF YES
5452 022310 104071 ERROR 71 ;PORT A NOT AVAIL AFTER PORT B PLS
5453 022312
5454
5455 022312 012737 010340 005404 MOV #<D DRA'D DRA'D SPIN'D DROY'D VU'D E AO ;EXPECTED MSG AO
5456 022320 005037 005406 CLR E B0 ;EXPECTED MSG B0
5457 022324 012737 001720 005410 MOV #<D SPO'D CAP'D DGR'D BPH'D ,SCP E A1 ;EXPECTED A1

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	;MSH 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,FATT2	;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	655	
5482	022444	104210			ERROR	210	;CERR AFTER SEEK CMD
5483							
5484	022446			655			
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.BRHM!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	.JV	#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	;MSH B0 ERROR
5498	022526	104163			ERROR	163	;MSG A1 ERROR
5499	022530	104164			ERROR	164	;MSG B1 EPROR
5500							
5501							
5502	022532	012737	000001	005464	MOV	#1, UNITB	;SETUP PORT B
5503	022540	112737	000102	056576	MOVB	#'B, MSG19A	
5504	022546	004737	044172		JSR	PC,DRAV	;SEE IF DRIVE AVAIL
5505	022552	000401			BR	15	
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	25	
5510	022566	104130			ERROR	130	;CERR NOT SET AFTER SEL DRIVE CMD
5511							; & NO DRA
5512	022570	004737	043750	25	JSR	PC,TSTATN	
5513	022574	000401			BR	35	

5514	022576	104115			ERROR	115	,ATTN SET IN PORT B AFTER RLS FROM PORT A
5515							
5516	022600	012765	100000	000000	35	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	056576		MOV	#'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	056576		MOV	#'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	000041	005342		BIT	#0 DRA,HMR2 ; SEE IF DRIVE 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				66\$		
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. BRHM!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 ; MSH B0 ERROR
5554	023024	104213				ERROR	213 ; MSG A1 ERROR
5555	023026	104214				ERROR	214 ; MSG B1 EPROR
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	056576		MOV	#'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	056576		MOV	#'A,MSG19A
5569	023132	012737	000001	005314		MOV	#SELDRV,HCS1

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			67\$			
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, DRDY'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	, MSH 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	056576	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	056576	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 PLS
5615	023402			68\$			
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			ERRGP	154	, ATTN NOT CLEARED AFTER DRIVE CLEAR CMD

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5626 023450 695
5627
5628 023450 012737 010340 005404 MOV #<D.DRA!D.SPIN!D.DRDY!D.VV>,E.A0 ;EXPECTED MSG A0
5629 023456 005037 005406 CLR E.B0 ;EXPECTED MSG B0
5630 023462 012737 001720 005410 MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5631 023470 012737 000001 005412 MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
5632 023476 005037 005414 CLR E.A2 ;EXPECTED MSG A2
5633 023502 012737 000002 005416 MOV #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
5634 023510 012737 000003 005422 MOV #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
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 001306 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 ,*TEST 17 TEST RELEASE FROM PORT 'B' WITH PORT 'A' REQUESTING
5652 ,*
5653 ,* THE PREVIOUS TEST IS REPEATED FOR PORT 'B'
5654 ,*
5655 ,,*****
5656 023556 000004 TST17 SCOPE
5657 023560 012737 000001 001174 MOV #1,$TIMES ;DO 1 ITERATION
5658 023566 012706 001100 MOV #STACK,SP
5659 023572 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
5660 023600 012737 000000 005464 MOV #0,UNITB
5661 023606 063765 005464 000010 ADD UNITB,RKCS2(R5)
5662 023614 112737 000101 056576 MOVB #'A,MSG19A
5663 023622 062765 000010 000010 ADD #RLS,RKCS2(R5) ;RELEASE PORT A
5664 023630 012737 000001 005314 MOV #SELDV,HCS1
5665 023636 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5666 023642 104117 ERROR 117 ;NO RDY AFTER SEL DRV CMD
5667 023644 013765 001222 000010 MOV $UNIT,RKCS2(P5) ;SETUP FOR PORT B
5668 023652 012737 000001 005464 MOV #1,UNITB
5669 023660 063765 005464 000010 ADD UNITB,RKCS2(R5)
5670 023666 112737 000102 056576 MOVB #'B,MSG19A
5671 023674 012737 000001 005314 MOV #SELDV,HCS1
5672 023702 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
5673 023706 104117 ERROR 117 ;NO RKY AFTER SEL DRV CMD
5674
5675 023710 032737 000040 005342 BIT #D.DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT B
5676 023716 001001 BNE 645 ;BR IF YES
5677 023720 104071 ERROR 71 ;PORT B NOT AVAIL AFTER PORT A RLS
5678 023722 645
5679
5680 023722 012737 010340 005404 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
```

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	655	
5707	024054	104210			ERROR	210	;CERR AFTER SEEK CMD
5708							
5709	024056			655			
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	056576	MOV	#'A,MSG19A	
5729	024156	004737	044172		JSR	PC,DRIV	,SEE IF DRIVE AVAIL
5730	024162	000401			BR	15	
5731	024164	104103			ERROR	103	;PORT A AVAIL BEFORE TMO OF RELEASE
5732							
5733	024166	032737	100000	005314	BIT	#CERR,HCS1	
5734	024174	001001			BNE	25	
5735	024176	104130			ERROR	130	;CERR NOT SET AFTER SEL DRIVE CMD
5736							; & NO DPA
5737	024200	004737	043750	25	JSR	PC,TSTATN	

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	056576		MOV	#'B,MSG19A
5746	024246	062765	000010	000010		ADD	#RLS,RKCS2(R5) ,RELEASE PORT B
5747	024254	012737	000001	005314		MOV	#SELDRV,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	056576		MOV	#'A,MSG19A
5755	024320	012737	000001	005314		MOV	#SELDRV,HCS1
5756	024326	004737	043372			JSR	PC,DOCMD ,DO SELDRV (STATUS) CMD & GET CONTR RDY
5757	024332	104117				ERROR	117 ,NO RLY 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	665 ,BR IF YES
5761	024344	104071				ERROR	71 ,PORT A NOT AVAIL AFTER PORT B RLS
5762	024346				665		
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 BRHM'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 ,MSH 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	056576		MOV	#'A,MSG19A
5785	024470	062765	000010	000010		ADD	#RLS,RKCS2(R5) ,RELEASE PORT A
5786	024476	012737	000001	005314		MOV	#SELDRV,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	056576		MOV	#'B,MSG19A

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

SEQ 0111

5794	024542	012737	000001	005314	MOV	#SELDRV, 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	675	, BR IF YES
5800	024566	104071			ERROR	71	, PORT B NOT AVAIL AFTER PORT A RLS
5801	024570			675			
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		CLP	E A2	, EXPECTED MSG A2
5811	024630	012737	000002	005416	MOV	#2, E B2	, MSG ID FOR EXPECTED MSG B2
5812	024636	012737	000003	005418	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	, & MSGS SPECIFIED HERE
5816	024652	104211			ERROR	211	, MSG A0 ERROR AFTER RELEASE ISSUED
5817	024654	104212			ERROR	212	, MSH 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	056576	MOVB	#'B, MSG19A	
5824	024712	062765	000010	000010	ADD	#RLS, RKCS2(R5)	, RELEASE PORT B
5825	024720	012737	000001	005314	MOV	#SELDRV, 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	056576	MOVB	#'A, MSG19A	
5833	024764	012737	000001	005314	MOV	#SELDRV, 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	685	, BR IF YES
5839	025010	104071			ERROR	71	, PORT A NOT AVAIL AFTER PORT B PLS
5840	025012			685			
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			BP	695	

5850 025056 104154 ERROR 154 ,ATTN NOT CLEARED AFTER DR VE CLEAR CMD
5851 025060 695
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 ,MSH 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 PL,TSTATN
5871 025162 000401 BR TST20 ,GOTO NEXT TST
5872 025164 104144 ERROR 144 ,MULT ATTN ON PORT A
5873
5874
5875

*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

5884
5885 025166 000004 TST20 SCOPE
5886 025170 012737 000001 001174 MOV #1,\$TIMES ,DO 1 ITEPATION
5887 025176 012706 001100 MOV #STACK,SP
5888 025202 013765 001222 000010 MOV \$UNIT,RKCS2(R5) ,SETUP FOR PORT B
5889 025210 012737 000001 005464 MOV #1,UNITB
5890 025216 063765 005464 000010 ADD UNITB,RKCS2(R5)
5891 025224 112737 000102 056576 MOVB #'B,MSG19A
5892 025232 062765 000010 000010 ADD #RLS,RKCS2(R5) ,RELEASE PORT B
5893 025240 012737 000001 005314 MOV #SELDRV,HCS1
5894 025246 004737 043372 JSR PC,DOCMD ,DO SELDRV (STATUS) CMD & GET CONTR RDY
5895 025252 104117 ERROR 117 ,NO RDY AFTER SEL DRV CMD
5896
5897 025254 013765 001222 000010 MOV \$UNIT,RKCS2(R5) ,SETUP FOR PORT A
5898 025262 012737 000000 005464 MOV #0,UNITB
5899 025270 063765 005464 000010 ADD UNITB,RKCS2(R5)
5900 025276 112737 000101 056576 MOVB #'A,MSG19A
5901 025304 012737 000001 005314 MOV #SELDRV,HCS1
5902 025312 004737 043372 JSR PC,DOCMD ,DO SELDRV (STATUS) CMD & GET CONTR RDY
5903 025316 104117 ERROR 117 ,NO RKY AFTER SEL DRV CMD
5904
5905 025320 032737 000040 005342 BIT #D DRA,HMR2 SEE IF DRIVE AVAIL ON PORT A

5906	025326	001001				BNE	645		;BR IF YES
5907	025330	104071				ERROR	71		;PORT A NOT AVAIL AFTER PORT B RLS
5908	025332				645				
5909									
5910	025332	012737	010340	005404		MOV		#<D DRA!D DRA!D. SPIN!D. DROY!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	;MSH 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		24	;CERR AFTER SCLR
5926									
5927	025424	012737	000001	005464		MOV		#1,UNITB	;SETUP PORT B
5928	025432	112737	000102	056576		MOVB		#'B,MSG19A	
5929	025440	004737	044172			JSR		PC,DRV	;SEE IF DRIVE AVAIL
5930	025444	000401				BR		15	
5931	025446	104103				ERROR		103	;PORT B AVAIL BEFORE TMO OR RELEASE
5932									
5933	025450	032737	100000	005314	15	BIT		#CERR,HCS1	
5934	025456	001001				BNE		25	
5935	025460	104130				ERROR		130	;CERR NOT SET BY NO DRA
5936									
5937	025462	004737	043750		25	JSR		PC,TSTATN	
5938	025466	000401				BR		35	
5939	025470	104115				ERROR		115	;ATTN SET IN PORT B AFTER PLS FROM PORT A
5940									
5941	025472	012765	100000	000000	35	MOV		#CLR,RKCS1(R5)	
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	056576		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,DOCMD	;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		#J,UNITB	
5953	025566	063765	005464	000010		ADD		UNITB,RKCS2(R5)	
5954	025574	112737	000101	056576		MOVB		#'A,MSG19A	
5955	025602	012737	000001	005314		MOV		#SELDRV,HCS1	
5956	025610	004737	043372			JSR		PC,DOCMD	;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		655	;BR IF YES
5961	025626	104071				ERROR		71	;PORT A NOT AVAIL AFTER PORT B PLS

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5962 025630          65$
5963 025630 013765 001222 000010  MOV    $UNIT,RKCS2(R5) ; SETUP FOR PORT A
5964 025636 012737 000000 005464  MOV    #0,UNITB
5965 025644 063765 005464 000010  ADD    UNITB,RKCS2(R5)
5966 025652 112737 000101 056576  MOVB  #'A,MSG19A
5967 025660 062765 000010 000010  ADD    #RLS,RKCS2(R5) ; RELEASE PORT A
5968 025666 012737 000001 005314  MOV    #SELDRV,HCS1
5969 025674 004737 043372  JSR    PC,DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY
5970 025700 104117  ERROR  117 ; NO RDY AFTER SEL DRV CMD
5971
5972 025702 013765 001222 000010  MOV    $UNIT,RKCS2(R5) ; SETUP FOR PORT B
5973 025710 012737 000001 005464  MOV    #1,UNITB
5974 025716 063765 005464 000010  ADD    UNITB,RKCS2(R5)
5975 025724 112737 000102 056576  MOVB  #'B,MSG19A
5976 025732 012737 000001 005314  MOV    #SELDRV,HCS1
5977 025740 004737 043372  JSR    PC,DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY
5978 025744 104117  ERROR  117 ; NO RKY AFTER SEL DRV CMD
5979
5980 025746 032737 000040 005342  BIT    #D DRA,HMR2 ; SEE IF DRIVE AVAIL ON PORT B
5981 025754 001001  BNE    66$ ; BR IF YES
5982 025756 104071  ERROR  71 ; PORT B NOT AVAIL AFTER PORT A RLS
5983 025760          66$
5984 025760 013737 005466 001366  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  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 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 BRHM'D CSP>,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 ; MSH B0 EPROR
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 056576  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 ,*TEST 21 TEST RELEASE FROM REQUESTING PORT 'A' INHIBITS 'ATTN'
6014 ,*
6015 ,* THE PREVIOUS TEST IS REPEATED FOR PORT 'B'
6016 ,*
6017 ,, *****

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6018	026112	000004			TST21	SCOPE		
6019	026114	012737	000001	001174		MOV	#1, \$TIMES	:: 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	056576		MOVB	#'A, MSG19A	
6025	026156	062765	000010	000010		ADD	#RLS, RKCS2(R5)	; RELEASE PORT A
6026	026164	012737	000001	005314		MOV	#SELDRV, 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	056576		MOVB	#'B, MSG19A	
6034	026230	012737	000001	005314		MOV	#SELDRV, HCS1	
6035	026236	004737	043372			JSR	PC, DOCMD	; DO SELDRV (STATUS) CMD & GET CONTR RDY
6036	026242	104117				ERROR	117	; NO RDY AFTER SEL DRV CMD
6037								
6038	026244	032737	000040	005342		BIT	#0 DRA, HMR2	; SEE IF DRIVE AVAIL ON PORT B
6039	026252	001001				BNE	645	; BR IF YES
6040	026254	104071				ERROR	71	; PORT B NOT AVAIL AFTER PORT A RLS
6041	026256				645			
6042								
6043	026256	012737	010340	005404		MOV	#<D DRA!D. DRA!D. SPIN!D. DRDY!D. VU>, 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	01010	; & MSGS SPECIFIED HERE
6053	026332	104211				ERROR	211	; MSG A0 ERROR AFTER RELEASE ISSUED
6054	026334	104212				ERROR	212	; MSH 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	056576		MOVB	#'A, MSG19A	
6062	026364	004737	044172			JSR	PC, DRAV	; SEE IF DRIVE AVAIL
6063	026370	000401				BR	15	
6064	026372	104103				ERROR	103	; PORT A AVAIL BEFORE TMO OF RELEASE
6065								
6066	026374	032737	100000	005314	15	BIT	#CERR, HCS1	
6067	026402	001001				BNE	25	
6068	026404	104130				ERROR	130	; CERR NOT SET BY NO DPA
6069								
6070	026406	004737	043750		25	JSR	PC, TSTATN	
6071	026412	000401				BR	35	
6072	026414	104115				ERROR	115	; ATTN SET IN PORT A AFTER PLS FROM PORT B
6073								

6074	026416	012765	100000	000000	35:	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	056576		MOVB	#'A,MSG19A	
6079	026454	062765	000010	000010		ADD	#RLS,RKCS2(R5) ; RELEASE PORT A	
6080	026462	012737	000001	005314		MOV	#SELDRV,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	056576		MOVB	#'B,MSG19A	
6088	026526	012737	000001	005314		MOV	#SELDRV,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	655 ; BR IF YES	
6094	026552	104071				ERROR	71 ; PORT B NOT AVAIL AFTER PORT A RLS	
6095	026554				655			
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	056576		MOVB	#'B,MSG19A	
6100	026604	062765	000010	000010		ADD	#RLS,RKCS2(R5) ; RELEASE PORT B	
6101	026612	012737	000001	005314		MOV	#SELDRV,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	056576		MOVB	#'A,MSG19A	
6109	026656	012737	000001	005314		MOV	#SELDRV,HCS1	
6110	026664	004737	043372			JSR	PC,DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY	
6111	026670	104117				ERROR	117 ; NO RKY AFTER SEL DPV CMD	
6112								
6113	026672	032737	000040	005342		BIT	#D DRA,HMR2 ; SEE IF DRIVE AVAIL ON PORT A	
6114	026700	001001				BNE	665 ; BR IF YES	
6115	026702	104071				ERROR	71 ; PORT A NOT AVAIL AFTER PORT B PLS	
6116	026704				665			
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	45	
6121	026724	104115				ERROR	115 ; ATTN SET ON PORT A AFTER RLS FROM PORT A	
6122								
6123	026726				45			
6124								
6125	026726	012737	010340	005404		MOV	#<D DRA'D'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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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 056576 MOVB #'B,MSG19A
6141 027026 004737 043750 JSR PC,TSTATN
6142 027032 000401 BR TST2 ;GOTO NEXT TST
6143 027034 104115 ERROR 115 ;ATTN SET ON PORT B, AFTER RLS FROM PORT B
6144
6145 ,,*****
6146 ,*TEST 22 TEST RELEASE BY PORT 'B' WHEN SEIZED BY PORT 'A'
6147 ,*
6148 ,* VERIFY THAT A RELEASE ISSUED BY ONE PORT IS NOT RECOGNIZED IF
6149 ,* THE DRIVE IS SEIZED BY THE OTHER PORT
6150 ,*
6151 ,* A SEIZE THE DRIVE THRU PORT 'A'
6152 ,*
6153 ,* B. ISSUE A RELEASE THRU PORT 'B' & VERIFY DRIVE STILL SEIZED
6154 ,* BY PORT 'A'.
6155 ,*
6156 ,,*****
6157 027036 000004 TST2 SCOPE
6158 027040 012737 000001 001174 MOV #1,$TIMES ;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 056576 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 AFTEP 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 056576 MOVB #'B,MSG19A
6175 027144 062765 000010 000010 ADD #RLS,RKCS2(R5) ;RELEASE PORT B
6176 027152 012737 000001 005314 MOV #SELDLV,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 056576 MOVB #'A,MSG19A
6184 027216 012737 000001 005314 MOV #SELDLV,HCS1
6185 027224 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
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6186	027230	104117			ERROR	117		;NO RKY AFTER SEL DRV CMD
6187								
6188	027232	032737	000040	005342	BIT	#D, DRA, HMR2		;SEE IF DRIVE AVAIL ON PORT A
6189	027240	001001			BNE	645		;BR IF YES
6190	027242	104071			ERROR	71		;PORT A NOT AVAIL AFTER PORT B RLS
6191	027244			645				
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								
6210								
6211								
6212								
6213								
6214	027330	000004			TST23	SCOPE		
6215	027332	012737	000001	001174	MOV	#1, \$TIMES		;DO 1 ITERATION
6216	027340	012706	001100		MOV	#STACK, SP		
6217	027344	012737	000001	005464	MOV	#1, UNITB		;SETUP PORT B
6218	027352	112737	000102	056576	MOVB	#'B, MSG19A		
6219	027360	013737	005466	001366	MOV	TIMER, COUNT		
6220	027366	004737	047204		JSR	PC, TMO		;DO TIMEOUT
6221								
6222	027372	004737	045534		JSR	PC, SUBCLR		
6223	027376	104024			ERROR	24		;CERR AFTER SCLP
6224								
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	056576	MOVB	#'A, MSG19A		
6232	027436	062765	000010	000010	ADD	#RLS, RKCS2(R5)		;RELEASE PORT A
6233	027444	012737	000001	005314	MOV	#SELDRV, HCS1		
6234	027452	004737	043372		JSR	PC, DOCMD		;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	056576	MOVB	#'B, MSG19A		
6241	027510	012737	000001	005314	MOV	#SELDRV, HCS1		

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	645	,BR IF YES
6247	027534	104071			ERROR	71	,PORT B NOT AVAIL AFTER PORT A RLS
6248	027536			645			
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 (ART!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			ERR0P	214	,MSG B1 ERROR
6264							

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6265 ,, *****
6266 ,*TEST 24 TEST COMMAND FOLLOWED BY IMMEDIATE RELEASE PORT A
6267 ,*
6268 ,* A ISSU E A SEEK COMMAND TO CYL 10 FROM PORT 'A' & AN
6269 ,* IMMEDIATE RELEASE TO PORT 'A'
6270 ,*
6271 ,* B VERIFY THE DRIVE IS AVAILABLE TO PORT 'B' & PORT B SEES ATTN
6272 ,*
6273 ,* C VERIFY PORT A DOES NOT RAISE ATTN WHEN SEEK COMPLETED
6274 ,*
6275 ,, *****
6276 TST24. SCOPE
6277 MOV #1, $TIMES ,, DO 1 ITERATION
6278 MOV #STACK, SP
6279 MOV $UNIT, RKCS2(R5) ;SETLP FOR PORT B
6280 MOV #1, UNITB
6281 ADD UNITB, RKCS2(R5)
6282 MOV #B, MSG19A
6283 MOV #RLS, RKCS2(R5) ,RELEASE PORT B
6284 MOV #SELDRV, HCS1
6285 JSR PC, DOCMD ,DO SELDRV (STATUS) CMD & GET CONTR RDY
6286 ERROR 117 ,NO RDY AFTER SEL DRV CMD
6287
6288 MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT A
6289 MOV #0, UNITB
6290 ADD UNITB, RKCS2(R5)
6291 MOV #A, MSG19A
6292 MOV #SELDRV, HCS1
6293 JSR PC, DOCMD ,DO SELDRV (STATUS) CMD & GET CONTR RDY
6294 ERROR 117 ,NO RKY AFTER SEL DRV CMD
6295
6296 BIT #D DRA, HMP2 ,SEE IF DRIVE AVAIL ON PORT A
6297 BNE 645 ,BR IF YES
6298 ERROR 71 ,PORT A NOT AVA L AFTER PORT B RLS
6299
6300 JSR PC, SUBCLP
6301 ERROR 24 ,CERR AFTER SCLR
6302
6303 MOV #10, RKDC(P5)
6304 MOV #SEEK, HCS1
6305 JSR PC, DOCMD ,DO SEEK CMD & GET CONTR READY
6306 ERROR 131 ,NO RDY AFTER SEEK CMD
6307 MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT A
6308 MOV #0, UNITB
6309 ADD UNITB, RKCS2(P5)
6310 MOV #A, MSG19A
6311 ADD #RLS, RKCS2(R5) ,RELEASE POPT A
6312 MOV #SELDRV, HCS1
6313 JSR PC, DOCMD ,DO SELDRV (STATUS) CMD & GET CONTR RDY
6314 ERROR 117 ,NO RDY AFTER SEL DRV CMD
6315
6316 MOV $UNIT, RKCS2(R5) ;SETUP FOR PORT B
6317 MOV #1, UNITB
6318 ADD UNITB, RKCS2(R5)
6319 MOV #B, MSG19A
6320

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6321	030120	012737	000001	005314	MOV	#SELDRV,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	655	;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,FATT2	
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	;MSH 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	056576	MOVB	#'B,MSG19A	
6352	030276	062765	000010	000010	ADD	#RLS,RKCS2(R5)	,RELEASE PORT B
6353	030304	012737	000001	005314	MOV	#SELDRV,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	056576	MOVB	#'A,MSG19A	
6361	030350	012737	000001	005314	MOV	#SELDRV,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	665	;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	15	
6371	030404	104160			ERROR	160	,ATTN ON PORT A AFTER SEEK & PLS 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

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	; MSH B0 ERROR
6387	030466	104147			ERROR	147	; MSG A1 ERROR
6388	030470	104150			ERROR	150	; MSG B1 ERROR

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*****
*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
*
*****

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TST25 SCOPE
MOV #1, $TIMES ; DO 1 ITERATION
MOV #STACK, SP
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 #SELDRV, 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 #SELDRV, HCS1
JSR PC, DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY
ERROR 117 ; NO RLY AFTER SEL DRV CMD

BIT #D DRA, HMR2 ; SEE IF DRIVE AVAIL ON PORT B
BNE 645 ; BR IF YES
ERROR 71 ; PORT B NOT AVAIL AFTER PORT A RLS

JSR PC, SUBCLR ; CERR AFTER SCLR
ERROR 24

MOV #0, RKDC(R5)
MOV #SEEK, HCS1
JSR PC, DOCMD ; DO SEEK CMD & GET CONTR PEADY
ERROR 131 ; NO RDY AFTER SEEK CMD

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

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6433	030724	012737	000001	005314	MOV	#SELDLV, 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	056576	MOVB	#'A, MSG19A	
6441	030770	012737	000001	005314	MOV	#SELDLV, 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'ID SPIN'ID DRDY'ID VV>, E A0	; EXPECTED MSG A0
6455	031040	005037	005406		CLR	E B0	; EXPECTED MSG B0
6456	031044	012737	001720	005410	MOV	#<D SPOK'ID CART'ID DOOR'ID BRHM'ID 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	056576	MOVB	#'A, MSG19A	
6472	031146	062765	000010	000010	ADD	#RLS, RKCS2(R5)	; RELEASE PORT A
6473	031154	012737	000001	005314	MOV	#SELDLV, 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	056576	MOVB	#'B, MSG19A	
6481	031220	012737	000001	005314	MOV	#SELDLV, 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 PLS
6488	031246						

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6489	031246	004737	043750		JSR	PC, TSTATN	
6490	031252	000401			BR	15	
6491	031254	104160			ERROR	160	;ATTN ON PORT B AFTER SEEK & RLS FROM PORT B
6492							
6493	031256			15			
6494							
6495	031256	012737	010340	005404	MOV	#<D.DRA'D SPIN'D DRDY'D VV>,E A0	;EXPECTED MSG A0
6496	031264	005037	005406		CLR	E, B0	;EXPECTED MSG B0
6497	031270	012737	001720	005410	MOV	#<D SPOK'D CART'D DOOR'D BRHM'D SSP>,E A1	;EXPECTED A1
6498	031276	012737	000001	005412	MOV	#1,E B1	;MSG ID FOR EXPECTED MSG B1
6499	031304	005037	005414		CLR	E A2	;EXPECTED MSG A2
6500	031310	012737	000002	005416	MOV	#2,E B2	;MSG ID FOR EXPECTED MSG B2
6501	031316	012737	000003	005422	MOV	#3,E B3	;MSG ID FOR EXPECTED MSG B3
6502							
6503	031324	004737	044274		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
6504	031330	000000			WORD	0 0'0	; & MSGS SPECIFIED HERE
6505	031332	104145			ERROR	145	;MSG A0 ERROR AFTER SEEK & RLS FROM PORT B
6506	031334	104146			ERROR	146	;MSG B0 ERROR
6507	031336	104147			ERROR	147	;MSG A1 ERROR
6508	031340	104150			ERROR	150	;MSG B1 ERROR
6509							

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*****
*TEST 26 TEST TIMEOUT RETRIGGER THRU PORT 'A'
*
* VERIFY THAT THE PORT TIMEOUT ONE-SHOT CAN BE PETRIGGERED
*
* 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
*
*****

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6523					TST26	SCOPE	
6524	031342	000004			MOV	#1, \$TIMES	; DO 1 ITERATION
6525	031344	012737	000001	001174	MOV	#STACK, SP	
6526	031352	012706	001100		JSR	PC, SUBCLR	
6527	031356	004737	045534		ERROR	24	;ERR AFTER SCLP
6528	031362	104024			MOV	\$UNIT, RKCS2(R5)	; SETUP FOR PORT E
6529	031364	013765	001222	000010	MOV	#1, UNITB	
6530	031372	012737	000001	005464	ADD	UNITB, RKCS2(R5)	
6531	031400	063765	005464	000010	MOVB	#'B, MSG19A	
6532	031406	112737	000102	056576	ADD	#RLS, RKCS2(R5)	; RELEASE PORT B
6533	031414	062765	000010	000010	MOV	#SELDV, HCS1	
6534	031422	012737	000001	005314	JSR	PC, DOCMD	; DO SELDRV (STATUS) CMD & GET CONTR PDY
6535	031430	004737	043372		ERROR	117	; NO PDY AFTER SEL DRV CMD
6536	031434	104117					
6537							
6538	031436	013765	001222	000010	MOV	\$UNIT, RKCS2(R5)	; SETUP FOR PORT A
6539	031444	012737	000000	005464	MOV	#0, UNITB	
6540	031452	063765	005464	000010	ADD	UNITB, RKCS2(R5)	
6541	031460	112737	000101	056576	MOVB	#'A, MSG19A	
6542	031466	012737	000001	005314	MOV	#SELDV, HCS1	
6543	031474	004737	043372		JSR	PC, DOCMD	; DO SELDRV (STATUS) CMD & GET CONTR PDY
6544	031500	104117			ERRGP	117	; NO PDY AFTER SEL DRV CMD

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6545  
6546 031502 032737 000040 005342 BIT #D DRA,HMR2 ,SEE IF DRIVE AVAIL ON PORT A  
6547 031510 001001 BNE 645 ,BR IF YES  
6548 031512 104071 ERROR 71 ,PORT A N. AVAIL AFTER PORT B RLS  
6549 031514 645  
6550 031514 004737 045534 JSR PC,SUBCLR  
6551 031520 104024 ERROR 24 ,CERR AFTER SCLR  
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 TIMEOUT  
6557  
6558 031542 012737 010340 005404 MOV #<D DRA!D. SPIN!D. DRDY!D. VU>,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 000C03 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 ,MSH 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 15 ,BR IF NO  
6577 031654 104103 ERROR 103 ,PORT A AVAIL BEFORE TMO OP RLS  
6578 031656 112737 000102 056576 15 MOV# #'B,MSG19A  
6579 031664 013704 001222 MOV SUNIT,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 ,GET ACTUAL COUNT OF TIMEOUT  
6586 031712 023727 001366 000043 CMP COUNT,#35 ,COMPARE COUNT AGAINST APPPOX 1 SEC  
6587 031720 002001 BGE TST27 ,GO TO NEXT TEST  
6588 031722 104153 ERROR 153 ,TIMEOUT DID NOT PE-TRIGGER  
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,STIMES ,DO 1 ITERATION  
6598 031734 012706 001100 MOV #STACK,SP  
6599 031740 004737 045534 JSR PC,SUBCLR  
6600 031744 104024 ERROR 24 ,CERR AFTER SCLP
```

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	056576	MOVB	#'A,MSG19A	
6605	031776	062765	000010	000010	ADD	#RLS,RKCS2(R5)	; RELEASE PORT A
6606	032004	012737	000001	005314	MOV	#SELDRV,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	056576	MOVB	#'B,MSG19A	
6614	032050	012737	000001	005314	MOV	#SELDRV,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	645	; 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,DRAV	; 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 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	; & MSGS SPECIFIED HERE
6640	032200	104165			ERROR	165	; MSG A0 ERROR AFTER TIMEOUT
6641	032202	104166			ERROR	166	; MSH 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,DRAV	; SEE IF DRV AVAIL
6648	032234	000401			BR	15	; BR IF NO
6649	032236	104103			ERROR	103	; PORT B AVAIL BEFORE TMO OR RLS
6650	032240	112737	000101	056576	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

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TEST TIMEOUT RETRIGGER THRU PORT 'B'

SEQ 0127

6657	032270	005137	001366	
6658	032274	023727	001366	000043
6659	032302	002001		
6660	032304	104153		
6661				

COM	COUNT	;GET ACTUAL COUNT OF TIMEOUT
CMP	COUNT, #35.	;COMPARE COUNT AGAINST APPROX 1 SEC
BGE	TST30	;GO TO NEXT TEST
ERROR	153	;TIMEOUT DID NOT RE-TRIGGER

```
6662 , , *****
6663 , *TEST 30 TEST PORT 'A' TIMER INHIBIT
6664 , *
6665 , * A PORT 'A' SEIZES THE DRIVE
6666 , * B PORT 'B' ATTEMPTS TO SEIZE THE DRIVE
6667 , * C PORT 'A' RELEASES THE DRIVE
6668 , * D PORT 'A' ATTEMPTS TO GET THE DRIVE BACK
6669 , *
6670 , * THE PROGRAM VERIFIES THAT PORT 'A' CANNOT ACCESS
6671 , * THE DRIVE FOR APPROX 1 SEC
6672 , *
6673 , , *****
6674 TST30 SCOPE
6675 032306 000004
6676 032310 012737 000001 001174 MOV #1, $TIMES ; DO 1 ITERATION
6677 032316 012706 001100 MOV #STACK, SP
6678 032322 004737 045534 JSR PC, SUBCLR
6679 032326 104024 ERROR 24 ; CERR AFTER SCLR
6680 032330 013765 001222 000010 MOV $UNIT, RKCS2(R5) ; SETUP FOR PORT B
6681 032336 012737 000001 005464 MOV #1, UNITB
6682 032344 063765 005464 000010 ADD UNITB, RKCS2(R5)
6683 032352 112737 000102 056576 MOVB #'B, MSG19A
6684 032360 062765 000010 000010 ADD #RLS, RKCS2(R5) ; RELEASE PORT B
6685 032366 012737 000001 005314 MOV #SELDRV, HCS1
6686 032374 004737 043372 JSR PC, DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY
6687 032400 104117 ERROR 117 ; NO RDY AFTER SEL DRV CMD
6688
6689 032402 013765 001222 000010 MOV $UNIT, RKCS2(R5) ; SETUP FOR PORT A
6690 032410 012737 000000 005464 MOV #0, UNITB
6691 032416 063765 005464 000010 ADD UNITB, RKCS2(R5)
6692 032424 112737 000101 056576 MOVB #'A, MSG19A
6693 032432 012737 000001 005314 MOV #SELDRV, HCS1
6694 032440 004737 043372 JSR PC, DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY
6695 032444 104117 ERROR 117 ; NO RKY AFTER SEL DRV CMD
6696
6697 032446 032737 000040 005342 BIT #D DPA, HMR2 ; SEE IF DRIVE AVAIL ON PORT A
6698 032454 001001 BNE 645 ; BR IF YES
6699 032456 104071 ERROR 71 ; PORT A NOT AVAIL AFTER PORT B RLS
6700 032460 645
6701 032460 004737 045534 JSR PC, SUBCLR
6702 032464 104024 ERROR 24 ; CERR AFTER SCLR
6703
6704 032466 012737 000001 005464 MOV #1, UNITB ; SETUP FOR PORT B
6705 032474 112737 000102 056576 MOVB #'B, MSG19A
6706 032502 004737 044172 JSR PC, DRVV ; PORT B TRIES TO SEIZE THE DRIVE
6707 032506 000401 BR 15 ; BR IF NOT AVAIL
6708 032510 104103 ERROR 103 ; PORT B AVAIL BEFORE TMO OR RELEASE
6709
6710 032512 012765 100000 000000 15 MOV #CCLR, RKCS1(R5)
6711 032520 013765 001222 000010 MOV $UNIT, RKCS2(R5) ; SETUP FOR PORT A
6712 032526 012737 000000 005464 MOV #0, UNITB
6713 032534 063765 005464 000010 ADD UNITB, RKCS2(R5)
6714 032542 112737 000101 056576 MOVB #'A, MSG19A
6715 032550 062765 000010 000010 ADD #RLS, RKCS2(R5) ; RELEASE PORT A
6716 032556 012737 000001 005314 MOV #SELDRV, HCS1
6717 032564 004737 043372 JSR PC, DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY
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6718 032570 104117 ERROR 117 ;NO RDY AFTER SEL DRV CMD
6719
6720 032572 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT B
6721 032600 012737 000001 005464 MOV #1,UNITB
6722 032606 063765 005464 000010 ADD UNITB,RKCS2(R5)
6723 032614 112737 000102 056576 MOVB #'B,MSG19A
6724 032622 012737 000001 005314 MOV #SELDRV,HCS1
6725 032630 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
6726 032634 104117 ERROR 117 ;NO RKY AFTER SEL DRV CMD
6727
6728 032636 032737 000040 005342 BIT #D.DRA,HMR2 ;SEE IF DRIVE AVAIL ON PORT B
6729 032644 001001 BNE 65$ ;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 056576 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 SCLP
6763 032776 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;SETUP FOR PORT A
6764 033004 012737 000000 005464 MOV #J,UNITB
6765 033012 063765 005464 000010 ADD UNITB,RKCS2(R5)
6766 033020 112737 000101 056576 MOVB #'A,MSG19A
6767 033026 062765 000010 000010 ADD #RLS,RKCS2(R5) ;RELEASE PORT A
6768 033034 012737 000001 005314 MOV #SELDRV,HCS1
6769 033042 004737 043372 JSR PC,DOCMD ;DO SELDRV (STATUS) CMD & GET CONTR RDY
6770 033046 104117 ERROR 117 ;NO RDY AFTEP 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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6774	033064	063765	005464	000010		ADD	UNITB, RKCS2(R5)	
6775	033072	112737	000102	056576		MOVB	#'B, MSG19A	
6776	033100	012737	000001	005314		MOV	#SELDRV, 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	645	; BR IF YES
6782	033124	104071				ERROR	71	; PORT B NOT AVAIL AFTER PORT A RLS
6783	033126				645			
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	056576		MOVB	#'A, MSG19A	
6789	033150	004737	044172			JSR	PC, DRAV	; PORT A TRIES TO SEIZE THE DRIVE
6790	033154	000401				BR	15	; BR IF NOT AVAIL
6791	033156	104103				ERROR	103	; PORT A AVAIL BEFORE TMO OR RELEASE
6792								
6793	033160	012765	100000	000000	15	MOV	#CLR, RKCS1(R5)	
6794	033166	013765	001222	000010		MOV	SUNIT, 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	056576		MOVB	#'B, MSG19A	
6798	033216	062765	000010	000010		ADD	#RLS, RKCS2(R5)	; RELEASE PORT B
6799	033224	012737	000001	005314		MOV	#SELDRV, 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	SUNIT, 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	056576		MOVB	#'A, MSG19A	
6807	033270	012737	000001	005314		MOV	#SELDRV, 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	655	; BR IF YES
6813	033314	104071				ERROR	71	; PORT A NOT AVAIL AFTER PORT B RLS
6814	033316				655			
6815	033316	012737	000001	005464		MOV	#1, UNITB	; SETUP FOR PORT B
6816	033324	112737	000102	056576		MOVB	#'B, MSG19A	
6817	033332	004737	044172			JSR	PC, DRAV	
6818	033336	000401				BR	25	
6819	033340	104103				ERROR	103	PORT B AVAIL BEFORE TMO OR RELEASE
6820								
6821	033342	012765	100000	000000	25	MOV	#CLR, RKCS1(R5)	
6822	033350	012737	177777	001366		MOV	#-1, COUNT	
6823	033356	004737	047114			JSR	PC, CLKON	
6824	033362	013704	001222			MOV	SUNIT, R4	
6825	033366	063704	005464			ADD	UNITB, R4	
6826	033372	004737	044214			JSP	PC, FATT3	
6827	033376	104110				ERROR	110	NO ATTN ON PORT B TO ALLOW SEIZE
6828								
6829	033400	004737	047162			JSP	PC, CLAOFF	TURN CLOCK OFF

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TEST PORT 'B' TIMER INHIBIT

SEQ 0131

8 11

6830 033404 005137 001366
6831 033410 023727 001366 000043
6832 033416 002001
6833 033420 104153
6834

COM COUNT ; GET ACTUAL COUNT OF TIMEOUT
CMP COUNT, #35. ; COMPARE AGAINST APPROX 1 SEC
BGE TST32 ; GO TO NEXT TST
ERROR 153 ; TIMEOUT DID NOT RE-TRIGGER

```

6835 , , *****
6836 , *TEST 32 TEST UNLOAD COMMAND TIMER INHIBIT THRU PORT 'A'
6837 , *
6838 , * VERIFY THAT THE UNLOAD COMMAND THRU A PORT, SEIZES THAT
6839 , * PORT FOR AS LONG HAS HEADS ARE UNLOADED & RELEASE IS NOT
6840
6841 , * ISSUED.
6842 , *
6843 , * A ISSUE AN UNLOAD COMMAND THRU PORT 'A'
6844 , * VERIFY DRIVE UNLOADS & ATTENTION IS SET
6845 , *
6846 , * B DELAY FOR 5 SECONDS & VERIFY DRIVE NOT AVAILABLE
6847 , * TO PORT 'B' TO INSURE TIMERS INHIBITED
6848 , *
6849
6850 , * C ISSUE A RELEASE FROM PORT 'A' VERIFY DRIVE BECOMES
6851 , * AVAILABLE TO PORT 'B'
6852 , *
6853 , * D LOAD HEADS FROM PORT 'B' & VERIFY 'ATTN-B' AT COMPLETION
6854 , *
6855 , , *****

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6856 033422 000004 TST32 SCOPE
6857 033424 012737 000001 001174 MOV #1, $TIMES ; DO 1 ITERATION
6858 033432 004737 045534 JSR PC, SUBCLR ; SUB SYSTEM CLEAR 29-SEP-77
6859 033436 104024 ERROR 24
6860 033440 012706 001100 MOV #STACK, SP
6861 033444 013765 001222 000010 MOV $UNIT, RKCS2(R5) ; SETUP FOR PORT B
6862 033452 012737 000001 005464 MOV #1, UNITB
6863 033460 063765 005464 000010 ADD UNITB, RKCS2(R5)
6864 033466 112737 000102 056576 MOVB #'B, MSG19A
6865 033474 062765 000010 000010 ADD #RLS, RKCS2(R5) ; RELEASE PORT B
6866 033502 012737 000001 005314 MOV #SELDRV, HCS1
6867 033510 004737 043372 JSR PC, DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY
6868 033514 104117 ERROR 117 ; NO RDY AFTER SEL DRV CMD
6869
6870 033516 013765 001222 000010 MOV $UNIT, RKCS2(R5) ; SETUP FOR PORT A
6871 033524 012737 000000 005464 MOV #0, UNITB
6872 033532 063765 005464 000010 ADD UNITB, RKCS2(R5)
6873 033540 112737 000101 056576 MOVB #'A, MSG19A
6874 033546 012737 000001 005314 MOV #SELDRV, HCS1
6875 033554 004737 043372 JSR PC, DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY
6876 033560 104117 ERROR 117 ; NO RKY AFTER SEL DRV CMD
6877
6878 033562 032737 000040 005342 BIT #0 DRA, HMR2 ; SEE IF DRIVE AVAIL ON PORT A
6879 033570 001001 BNE 545 ; BR IF YES
6880 033572 104071 ERROR 71 ; PORT A NOT AVAIL AFTER PORT B PLS
6881 033574 645
6882 033574 004737 045534 JSR PC, SUBCLR
6883 033600 104024 ERROR 24 ; CERR AFTER SCLR
6884
6885 033602 005237 005276 INC UNLD ; USED FOR VALID HALT
6886 033606 012737 034046 001176 MOV #25, $ESCAPE
6887 033614 012737 000007 005314 MOV #UNLOAD, HCS1 ; UNLOAD CMD
6888 033622 053737 001170 005314 BIS $TMP4, HCS1
6889 033630 013765 005314 000000 MOV HCS1, RKCS1(R5)
6890 033636 013737 001400 005352 MOV T10, TEMP1 ; SETUP TIMEOUT

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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	056576		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 ,UNLOAD DID NOT INHIBIT TIMERS
6901								
6902								
6903	033710	012765	100000	000000	15	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	056576		MOVB	#'A,MSG19A	
6908	033746	062765	000010	000010		ADD	#RLS,RKCS2(R5)	,RELEASE PORT A
6909	033754	012737	000001	005314		MOV	#SELDRV,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	056576		MOVB	#'B,MSG19A	
6917	034020	012737	000001	005314		MOV	#SELDRV,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	#0,DRV,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				655			
6925	034046	005037	001176		25	CLR	\$ESCAPE	
6926								
6927	034052	004737	045534			JSR	PC,SUBCLR	
6928	034056	104024				ERROR	24	,CERR AFTER SCLP
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			JSP	PC,FATT1	,FIND ATTN
6936	034106	104074				ERROR	74	,NO ATTN AFTER ST SPIN CMC
6937								
6938	034110	005037	005276			CLR	UNLD	
6939								
6940	034114	005037	005276			CLR	UNLD	

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

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6947      , , *****
6948 034120 000004      TST33 SCOPE
6949 034122 012737 000001 001174 MOV #1, $TIMES      , , DO 1 ITERATION
6950 034130 004737 045534 JSR PC, SUBCLR      , SUB SYSTEM CLEAR 29-SEP-77
6951 034134 104024 ERROR 24
6952 034136 012706 001100 MOV #STACK, SP
6953 034142 013765 001222 000010 MOV $UNIT, RKCS2(R5) ; SETUP FOR PORT A
6954 034150 012737 000000 005464 MOV #0, UNITB
6955 034156 063765 005464 000010 ADD UNITB, RKCS2(R5)
6956 034164 112737 000101 056576 MOVB #'A, MSG19A
6957 034172 062765 000010 000010 ADD #RLS, RKCS2(R5) ; RELEASE PORT A
6958 034200 012737 000001 005314 MOV #SELDV, HCS1
6959 034206 004737 043372 JSR PC, DOCMD      ; DO SELDRV (STATUS) CMD & GET CONTR RDY
6960 034212 104117 ERROR 117      ; NO RDY AFTER SEL DRV CMD
6961
6962 034214 013765 001222 000010 MOV $UNIT, RKCS2(R5) ; SETLP FOR PORT B
6963 034222 012737 000001 005464 MOV #1, UNITB
6964 034230 063765 005464 000010 ADD UNITB, RKCS2(R5)
6965 034236 112737 000102 056576 MOVB #'B, MSG19A
6966 034244 012737 000001 005314 MOV #SELDV, HCS1
6967 034252 004737 043372 JSR PC, DOCMD      ; DO SELDRV (STATUS) CMD & GET CONTR PDY
6968 034256 104117 ERROR 117      ; NO RKY AFTER SEL DRV CMD
6969
6970 034260 032737 000040 005342 BIT #0 DRA, HMP2      ; SEE IF DRIVE AVAIL ON PORT B
6971 034266 001001 BNE 645      ; BR IF YES
6972 034270 104071 ERROR 71      ; PORT B NOT AVAIL AFTER PORT A RLS
6973 034272
6974 034272 004737 045534 b45 JSR PC, SUBCLR
6975 034276 104024 ERROR 24      ; CERR AFTER SCLP
6976
6977 034300 005237 005276 INC UNLD      ; USED FOR VAL D HALT
6978 034304 012737 034544 001176 MOV #25, $ESCAPE
6979 034312 012737 000007 005314 MOV #UNLOAD, HCS1      ; UNLOAD CMD
6980 034320 053737 001170 005314 BIS $TMP4, HCS1
6981 034326 013765 005314 000000 MOV HCS1, RKCS1(R5)
6982 034334 013737 001400 005352 MOV T10, TEMP1      ; SETUP TIMEOUT
6983 034342 004737 044106 JSR PC, FATT2      ; FIND ATTN
6984 034346 104073 ERROR 73      ; NO ATTN AFTEP UNLD CMD
6985
6986 034350 012737 000454 001366 MOV #300, COUNT
6987 034356 004737 047204 JSR PC, TMO      ; DO 5 SEC DELAY
6988 034362 012737 000000 005464 MOV #0, UNITB      ; SETUP FOR PORT A
6989 034370 112737 000101 056576 MOVB #'A, MSG19A
6990 034376 004737 044172 JSR PC, DRAB
6991 034402 000401 BP 15
6992 034404 104155 ERROR 155      ; PORT A AVAIL BEFORE PLS WHEN UNLOADED
6993      ; UNLOAD DID NOT INHIBIT TIMERS
6994
6995 034406 012765 100000 000000 15 MOV #CCLR, RKCS1(R5)
6996 034414 013765 001222 000010 MOV $UNIT, RKCS2(R5) ; SETUP FOR PORT B
6997 034422 012737 000001 005464 MOV #1, UNITB
6998 034430 063765 005464 000010 ADD UNITB, RKCS2(R5)
6999 034436 112737 000102 056576 MOVB #'B, MSG19A
7000 034444 062765 000010 000010 ADD #RLS, RKCS2(R5) ; RELEASE POPT B
7001 034452 012737 000001 005314 MOV #SELDV, HCS1
7002 034460 004737 043372 JSR PC, DOCMD      ; DO SELDRV (STATUS) CMD & GET CONTR PDY

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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	056576	MOVB	#'A,MSG19A		
7009	034516	012737	000001	005314	MOV	#SELDLV,HCS1		
7010	034524	004737	043372		JSR	PC,DOCMD		;DC 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	65\$;BR IF YES
7015	034542	104071			ERROR	71		;PORT A NOT AVAIL AFTER PORT B PLS
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								
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7042								
7043								
7044								
7045								
7046								
7047								
7048	034616	000004			TST34	SCOPE		
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	056576	MOVB	#'B,MSG19A		
7057	034670	062765	000010	000010	ADD	#RLS,RKCS2(R5)		;RELEASE PORT B
7058	034676	012737	000001	005314	MOV	#SELDLV,HCS1		

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	056576	MOVB	# 'A, MSG19A	
7066	034742	012737	000001	005314	MOV	#SELDRV, 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	645	, 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	#55, \$ESCAPE	
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, FATT2	, 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	655	
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	, & 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 POPT B
7113	035162	012737	000005	005314	MOV	#CLEAR, HCS1	
7114	035170	004737	043372		JSR	PC, DOCMD	, DO DRIVE CLEAR CMD & GET CONTR RDY

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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	665		
7118	035204	104154			ERROR	154		,ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
7119	035206			665				
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	BITB	ATTN(R4),RKASOF+1(R5)		,SEE IF ATTN SET
7142	035332	001027			BNE	35		,PR IF YES
7143								
7144	035334	012737	000001	005464	MOV	#1,UNITB		,SETUP FOR PORT B
7145	035342	112737	000102	056576	MOVB	#'B,MSG19A		
7146	035350	004737	044172		JSP	PC,DRAV		,SEE IF DRV AVAIL
7147	035354	000401			BR	25		,RETURN HERE IF NO
7148	035356	104177			ERROR	177		,PORT B AVAIL
7149								,RECAL DID NOT INHIBIT TIMERS
7150	035360	012765	100000	000000	MOV	#CLR,RKCS1(R5)		
7151	035366	012737	000000	005464	MOV	#0,UNITB		
7152	035374	112737	000101	056576	MOVB	#'A,MSG19A		,SETUP PORT A
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	15		
7156								
7157	035412	004737	045146		JSP	PC,GSTAT		
7158	035416	032737	020000	005342	BIT	#D PIP HMP2		,SEE IF ANY MOTION
7159	035424	001401			BEQ	45		,BR IF NO
7160	035426	104072			ERROR	72		,PIP SET AFTER ATTN RECB FROM RECAL
7161	035430	012737	000170	001366	MOV	#120,COUNT		
7162	035436	004737	047204		JSR	PC,TMO		,DO 2 SEC DLY
7163	035442	012737	000001	005464	MOV	#1,UNITB		,SETUP FOR PORT B
7164	035450	112737	000102	056576	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		CLR	\$ESCAPE		
7169								
7170								

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7171 ,*TEST 35 TEST RECAL COMMAND TIMER INHIBIT THRU PORT 'B'  
7172 ,*  
7173 ,* THE PREVIOUS TEST IS REPEATED FOR PORT 'B'  
7174 ,*  
7175 ,,*****  
7176 035470 000004 TST35 SCOPE  
7177 035472 012737 000001 001174 MOV #1, $TIMES ;, DO 1 ITERATION  
7178 035500 004737 045534 JSR PC, SUBCLR ;, SUBSYSTEM CLEAR 29-SEP-77  
7179 035504 104024 ERROR 24 ;, 29-SEP-77  
7180 035506 012706 001100 MOV #STACK, SP  
7181 035512 013765 001222 000010 MOV $UNIT, RKCS2(R5) ;, SETUP FOR PORT A  
7182 035520 012737 000000 005464 MOV #0, UNITB  
7183 035526 063765 005464 000010 ADD UNITB, RKCS2(R5)  
7184 035534 112737 000101 056576 MOVB #'A, MSG19A  
7185 035542 062765 000010 000010 ADD #RLS, RKCS2(R5) ;, RELEASE PORT A  
7186 035550 012737 000001 005314 MOV #SELDIV, HCS1  
7187 035556 004737 043372 JSR PC, DOCMD ;, DO SELDRV (STATUS) CMD & GET CONTR RDY  
7188 035562 104117 ERROR 117 ;, NO RDY AFTER SEL DRV CMD  
7189  
7190 035564 013765 001222 000010 MOV $UNIT, RKCS2(R5) ;, SETUP FOR PORT B  
7191 035572 012737 000001 005464 MOV #1, UNITB  
7192 035600 063765 005464 000010 ADD UNITB, RKCS2(R5)  
7193 035606 112737 000102 056576 MOVB #'B, MSG19A  
7194 035614 012737 000001 005314 MOV #SELDIV, HCS1  
7195 035622 004737 043372 JSR PC, DOCMD ;, DO SELDRV (STATUS) CMD & GET CONTR RDY  
7196 035626 104117 ERROR 117 ;, NO RKY AFTER SEL DRV CMD  
7197  
7198 035630 032737 000040 005042 BIT #0 DRA, HMR2 ;, SEE IF DRIVE AVAIL ON PORT B  
7199 035636 001001 BNE 645 ;, BR IF YES  
7200 035640 104071 ERROR 71 ;, PORT B NOT AVAIL AFTER PORT A RLS  
7201 035642 b45  
7202 035642 004737 045534 JSP PC, SUBCLR  
7203 035646 104024 ERROR 24 ;, CERR AFTER SCLR  
7204  
7205 035650 012737 036336 001176 MOV #55, $ESCAPE  
7206 035656 013765 012770 000020 MOV LC, RKDC(P5) ;, SEEK TO LAST CYL  
7207  
7208 035664 012737 000017 005314 MOV #SEEK, HCS1  
7209 035672 004737 043372 JSP PC, DOCMD ;, DO SEEK CMD & GET CONTR READY  
7210 035676 104131 ERROR 131 ;, NO RDY AFTER SEEK CMD  
7211  
7212 035700 013737 001412 005352 MOV T50000, TEMP1 ;, SETUP TIMEOUT  
7213 035706 004737 044106 JSR PC, FATT2 ;, FIND ATTN  
7214 035712 104132 ERROR 132 ;, NO ATTN AFTER SEEK CMD  
7215  
7216 035714 032737 100000 005014 BIT #CERR, HCS1  
7217 035722 001401 BEQ 655  
7218 035724 104210 ERROR 210 ;, CERR AFTER SEEK CMD  
7219  
7220 035726 b55  
7221  
7222 035726 012737 050340 005404 MOV #<D DSC'D DRA'D SPIN'D DRDY'D VV>, E A0 ;, EXPECTED MSG A0  
7223 035734 005037 005406 CLR E B0 ;, EXPECTED MSG B0  
7224 035740 012737 001720 005410 MOV #<D SPON'D CART'D DOOR'D BRHM'D SSP>, E A1 ;, EXPECTED A1  
7225 035746 012737 000001 005412 MOV #1 E B1 ;, MSG ID FOR EXPECTED MSG B1  
7226 035754 005037 005414 CLR E A2 ;, EXPECTED MSG A2
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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 A0, B0, A1, B1
7231	036000	000000			WORD	0'0'0	,& MSGS SPECIFIED HERE
7232	036002	104161			ERROR	161	,MSG A0 ERROR AFTER SEEK CMD
7233	036004	104162			ERROR	162	,MSH B0 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	665	
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 DROY'D VV>,E A0	,EXPECTED MSG A0
7250	036066	005037	005406		CLR	E B0	,EXPECTED MSG B0
7251	036072	012737	001720	005410	MOV	#<D SPOK'D CART'D DOOR'D BRHM'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 A0, B0, A1, B1
7258	036132	000003			WORD	T A2' T B2' 0	,& MSGS SPECIFIED HERE
7259	036134	104033			ERROR	33	,MSG A0 ERROR AFTER DRV CLEAR CMD
7260	036136	104034			ERROR	34	,MSH B0 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	BITB	ATTN(P4),RKASOF+1(R5)	,SEE IF ATTN SET
7270	036204	001027			BNE	35	,BR IF YES
7271							
7272	036206	012737	000000	005464	MOV	#0,UNITB	,SETUP FOR PORT A
7273	036214	112737	000101	056576	MOVB	#'A,MSG19A	
7274	036222	004737	044172		JSR	PC,DRAV	,SEE IF DRV AVAIL
7275	036226	000401			BR	25	,RETURN HERE IF NC
7276	036230	104177			ERROR	177	,PORT A AVAIL
7277							,RECAL DID NOT INHIBIT TIMEPS
7278	036232	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
7279	036240	012737	000001	005464	MOV	#1,UNITB	
7280	036246	112737	000102	056576	MOVB	#'B,MSG19A	,SETUP PORT B
7281	036254	004737	044172		JSR	PC,DRAV	,SEE IF DRV AVAIL
7282	036260	104203			ERRGP	203	,PORT 3 NOT REMAIN AVAIL DURING RECAL

665

15

25

7283 036262 000745
7284
7285 036264 004737 045146 35
7286 036270 032737 020000 005342
7287 036276 001401
7288 036300 104072
7289 036302 012737 000170 001366 45
7290 036310 004737 047204
7291 036314 012737 000000 005464
7292 036322 112737 000101 056576
7293 036330 004737 044172
7294 036334 104045
7295
7296 036336 005037 001176 55
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7319 036342 000004
7320 036344 012737 000001 001174
7321 036352 012706 001100
7322
7323 036356 004737 045534
7324 036362 104024
7325
7326 036364 013765 001222 000010
7327 036372 012737 000001 005464
7328 036400 063765 005464 000010
7329 036406 112737 000102 056576
7330 036414 062765 000010 000010
7331 036422 012737 000001 005314
7332 036430 004737 043372
7333 036434 104117
7334
7335 036436 013765 001222 000010
7336 036444 012737 000000 005464
7337 036452 063765 005464 000010
7338 036460 112737 000101 056576

BR 15
JSR PC, GSTAT
BIT #D, PIP, HMR2 ;SEE IF ANY MOTION
BEQ 45 ;BR IF NO
ERROR 72 ;PIP SET AFTER ATTN RECA FROM RECAL
MOV #120, COUNT
JSR PC, TMO ;DC 2 SEC DLY
MOV #0, UNITB ;SETUP FOR PORT A
MOVB #'A, MSG19A
JSR PC, DRAB ;SEE IF DRV NOW AVAIL
ERROR 45 ;PORT A NOT AVAIL AFTER TMO
CLR \$ESCAPE
;*****
;TEST 36 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #
;*
;* 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 BAD SEC
;* SECTORS 10, 12, 14, 16, 18, 20 CONTAIN IDENTICAL INFO FOR 22 SECTOR SOFTWARE DETECTED
;*
;* 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 WRITING
;*
;* THE PACK SERIAL # IS TYPED IN OCTAL & FOR THE FIRST PASS ONLY
;*
;*****
TST36 SCOPE
MOV #1, \$TIMES ;DO 1 ITERATION
MOV #STACK, SP ;RESTORE STK PTP
JSR PC, SUBCLP
ERROR 24 ;CERR AFTER SCLP
MOV \$UNIT, RKCS2(R5) ;SETUP FOR PORT B
MOV #1, UNITB
ADD UNITB, RKCS2(R5)
MOVB #'B, MSG19A
ADD #RLS, RKCS2(R5) ;RELEASE POPT B
MOV #SELDRV, 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

7339	036466	012737	000001	005314		MOV	#SELDLV,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	645	;BR IF YES
7345	036512	104071				ERROR	71	;PORT A NOT AVAIL AFTER PORT B RLS
7346	036514				645			
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	15	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	UNITB,RKCS2(R5)	
7364	036612	012737	000021	005314		MOV	#RDDATA,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	85	
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 BRHM'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 SUBCLP
7389								
7390	036736	005237	005354			INC	TEMP2	
7391	036742	023727	005354	000005		CMP	TEMP2,#5	;READ ALL 5 SECTORS?
7392	036750	001007				BNE	55	
7393	036752	005737	005356			TST	TEMP3	
7394	036756	001002				BNE	25	

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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%
7399
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 000006          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     $PASS
7424 037120 001014          BNE     TST37         ;GO TO NEXT TST IF NOT 1'ST PASS
7425 037122 104401 056537          TYPE   ,MSG17        ;CART SERIAL #
7426 037126 012746 002276          MOV     #BSE22H,-(SP)
7427 037132 004737 053660          JSR     PC,$DB20      ;CONVERT DBL BINARY WOPD 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,STIMES    ;DO 1 ITEPATION

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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	056576	MOVB	#'B, MSG19A	
7457	037216	062765	000010	000010	ADD	#RLS, RKCS2(R5)	; RELEASE PORT B
7458	037224	012737	000001	005314	MOV	#SELDRV, 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	056576	MOVB	#'A, MSG19A	
7466	037270	012737	000001	005314	MOV	#SELDRV, 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	645	; 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 SCLP
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	#BA1, RKCS2(P5)	
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	635	; BR IF NO ERRORS
7492							
7493	037430	032737	000200	005330	BIT	#BSE, HER	; SEE IF BAD SECTOR FLAG
7494	037436	001421			BEQ	665	; BR IF NO
7495	037440	004737	047002		JSR	PC, TRUERR	; ELSE SEE IF SECTOR LISTED IN BSE TABLE
7496	037444	000455			BR	675	; 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	655	; BR IF NO
7501	037462	104046			ERROR	46	; ABORTING TEST DETECTED 10 BAD SECTORS
7502	037464	000137	040246		JMP	75	; B/PASS TEST
7503	037470	012765	100000	000000	MOV	#CCLP RACS1 P5)	; TRY ANOTHER SECTOR
7504	037476	000137	037342		JMP	15	
7505	037502	104012			ERROR	12	; CERR WITH WRITE DATA CMD
7506							

7507	037504	012737	010340	005404	MOV	#D, DRA'D, SPIN'D, DRDY'D, VV>, E, AO	; EXPECTED MSG AO
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 AO, BO, A1, B1
7516	037556	000003			WORD	T, A2!T, B2!0	; & MSGS SPECIFIED HERE
7517	037560	104052			ERROR	52	; MSG AO ERROR AFTER WRITE DATA CMD
7518	037562	104023			ERROR	23	; MSH B0 ERROR
7519	037564	104053			ERROR	53	; MSG A1 ERROR
7520	037566	104025			ERROR	25	; MSG B1 ERROR
7521	037570	104401	056625		TYPE	, MSG21	; ABORTING BALANCE OF TESTS
7522	037574	000137	042644		JMP	\$EOP	
7523	037600	104043		675	ERROR	43	; BAD SECTOR NOT LISTED IN TABLE
7524	037602			685			
7525							
7526	037602	012737	010340	005404	MOV	#D, DRA'D, SPIN'D, DRDY'D, VV>, E, AO	; EXPECTED MSG AO
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 AO, BO, A1, B1
7535	037654	000003			WORD	T, A2!T, B2!0	; & MSGS SPECIFIED HERE
7536	037656	104052			ERROR	52	; MSG AO ERROR AFTER WRITE DATA CMD
7537	037660	104023			ERROR	23	; MSH 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		25	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	056576	MOVB	#'B, MSG19A	
7548	037724	062765	000010	000010	ADD	#RLS, RKCS2(R5)	; RELEASE PORT B
7549	037732	012737	000001	005314	MOV	#SELDRV, 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	\$JUNIT, 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	056576	MOVB	#'A, MSG19A	
7557	037776	012737	000001	005314	MOV	#SELDRV, 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	695	; BP IF YES

7563	040022	104071				ERROR	71		, PORT A NOT AVAIL AFTER PORT B RLS
7564	040024				695				
7565	040024	000137	040246			JMP	75		, GO & WRITE CHECK THRU PORT 'A'
7566									
7567	040030	020027	000001		35	CMP	RO, #1		, SEE IF DOING PORT 'B'
7568	040034	001056				BNE	45		, 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	056576		MOVB	# 'A', MSG19A		
7573	040066	062765	000010	000010		ADD	#RLS, RKCS2(R5)		, RELEASE PORT A
7574	040074	012737	000001	005314		MOV	#SELDRV, 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)		, SETLP FOR PORT B
7579	040116	012737	000001	005464		MOV	#1, UNITB		
7580	040124	063765	005464	000010		ADD	UNITB, RKCS2(R5)		
7581	040132	112737	000102	056576		MOVB	# 'B', MSG19A		
7582	040140	012737	000001	005314		MOV	#SELDRV, HCS1		
7583	040146	004737	043372			JSR	PC, DOCMD		, DO SELDRV (STATUS) CMD & GET CONTR RDY
7584	040152	104117				ERROR	117		, NO RKY AFTER SEL DRV CMD
7585									
7586	040154	032737	000040	005342		BIT	#0 DR, HMP2		, SEE IF DRIVE AVAIL ON PORT B
7587	040162	001001				BNE	705		, BR IF YES
7588	040164	104071				ERROR	71		, PORT B NOT AVAIL AFTER PORT A RLS
7589	040166				705				
7590	040166	000137	040246			JMP	75		, GO WRITE CHECK THRU PORT 'B'
7591									
7592	040172	020027	000002		45	CMP	PO, #2		, SEE IF DID WRT CHK THRU PORT A & B
7593	040176	001402				BEQ	55		, BR IF YES
7594	040200	000137	040562			JMP	85		, ELSE RO=3, EXIT TEST
7595									
7596	040204	023727	001436	001434	55	CMP	DATA01, #DATA0		, SEE IF JUST WROTE 0'S ON CYL 0
7597	040212	001010				BNE	65		, BR IF NO
7598	040214	012737	000012	001360		MOV	#10, CYLADD		, ELSE WRITE 1'S ON CYL 10
7599	040222	012737	001440	001436		MOV	#DATA1, DATA01		
7600	040230	000137	037342			JMP	15		, GO DO IT
7601									
7602	040234	005037	001360		65	CLR	CYLADD		, RECHK CYL 0 FOR 0'S
7603	040240	012737	001434	001436		MOV	#DATA0, DATA01		
7604									
7605	040246	052765	000020	000010	75	BIS	#BAI, RKCS2(R5)		, SETUP TO WRITE CHECK
7606	040254	013765	001436	000004		MOV	DATA01, RKBA(R5)		
7607	040262	013765	001360	000020		MOV	CYLADD, RKDC(R5)		
7608	040270	012765	177400	000002		MOV	#-256, RKWC(R5)		
7609	040276	013765	001374	000006		MOV	SECTOR, RKDA(R5)		
7610	040304	013737	001374	001370		MOV	SECTOR, SEC		, COPY FOR FUTURE USE
7611									
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	040340	001453				BEQ	725		
7618	040342	032737	040000	005316		BIT	#WCE, HCS2		, SEE IF WRITE CHECK ERR P

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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 040374 012737 010340 005404  MOV     #<D DRA'D SPIN'D DRDY'D VV>,E A0 ,EXPECTED 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 ,MSH B0 ERROR
7639 040454 104060          ERROR   60 ,MSG A1 ERROR
7640 040456 104032          ERROR   32 ,MSG B1 ERROR
7641 040460 104401 056625          TYPE   ,MSG21 ,ABORTING BALANCE OF TESTS
7642 040464 000137 042644          JMP     SEOP
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 AFTEP WPIE CHECK CMD
7657 040546 104031          ERROR   31 ,MSH 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 040562          SS

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7664
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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7675 ,* PORT 'B' SEES CONTROLLER ERROR & DRIVE NOT AVA LABLE
 7676 ,*
 7677 ,* B PORT 'B' SEIZES THE DRIVE & SEEKS TO THE LAST CYL
 7678 ,* & RELEASES THE DRIVE AFTER 'ATTN' IS RECEIVED
 7679 ,*
 7680 ,* THE PROGRAM VERIFIES THAT UNTIL ATTN IS RECEIVED,
 7681 ,* PORT 'A' SEES CONTROLLER ERROR & DRIVE NOT AVAILABLE
 7682 ,*
 7683 ,* C THE ABOVE IS REPEATED FOR A PATTERN OF CONVERGING SEEKS
 7684 ,* TOWARD THE CENTER OF THE CARTRIDGE
 7685 ,*
 7686 ,* D THE PROGRAM VERIFIES MULTIPLE ATTENTIONS OR ERRORS
 7687 ,* DO NOT OCCUR AS A RESULT OF TIMING PROBLEMS
 7688 ,*

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7689 ,, *****
7690 040562 000004 TST40 SCOPE
7691 040564 012737 000001 001174 MOV #1,STIMES , DO 1 ITERATION
7692 040572 012706 001100 MOV #STACK,SP
7693
7694 040576 004737 045534 JSR PC,SUBCLR
7695 040602 104024 ERROR 24 , CERR AFTER SCLR
7696
7697 040604 013765 001222 000010 MOV $UNIT,RKCS2(R5) , SETUP FOR PORT B
7698 040612 012737 000001 005464 MOV #1,UNITB
7699 040620 063765 005464 000010 ADD UNITB,RKCS2(R5)
7700 040626 112737 000102 056576 MOVB #'B,MSG19A
7701 040634 062765 000010 000010 ADD #RLS,RKCS2(R5) , RELEASE PORT B
7702 040642 012737 000001 005314 MOV #SELDRV,HCS1
7703 040650 004737 043372 JSR PC,DOCMD , DO SELDRV (STATUS) CMD & GET CONTR RDY
7704 040654 104117 ERROR 117 , NO RDY AFTER SEL DRV CMD
7705
7706 040656 013765 001222 000010 MOV $UNIT,RKCS2(R5) , SETJP FOR PORT A
7707 040664 012737 000000 005464 MOV #0,UNITB
7708 040672 063765 005464 000010 ADD UNITB,RKCS2(R5)
7709 040700 112737 000101 056576 MOVB #'A,MSG19A
7710 040706 012737 000001 005314 MOV #SELDRV,HCS1
7711 040714 004737 043372 JSR PC,DOCMD ; DO SELDRV (STATUS) CMD & GET CONTR RDY
7712 040720 104117 ERROR 117 , NO RKY AFTER SEL DRV CMD
7713
7714 040722 032737 000040 005342 BIT #0,DRR,HMR2 , SEE IF DRIVE AVAIL ON PORT A
7715 040730 001001 BNE 645 , BR IF YES
7716 040732 104071 ERROR 71 , PORT A NOT AVAIL AFTER PORT B PLS
7717 040734 645
7718
7719 040734 005037 001414 CLR WD1 , SETUP CONVERGING LIMITS
7720 040740 013737 012770 001416 MOV LC,WD2
7721
7722 040746 012765 100000 000000 105 MOV #CCLR,RKCS1(R5)
7723 040754 013765 001222 000010 MOV $UNIT,RKCS2(R5)
7724 040762 063765 005464 000010 ADD UNITB,RKCS2(R5)
7725 040770 013765 001414 000020 MOV WD1,RKDC(R5)
7726 040776 012737 000017 005314 MOV #SEEK,HCS1
7727 041004 004737 043372 JSR PC,DOCMD , DO SEEK CMD & GET CONTR PEADY
7728 041010 104131 ERROR 131 , NO RDY AFTEP SEE CMD-PORT A
7729
7730 041012 013737 001412 005352 MOV T50000,TEMP1
  
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7731	041020	013704	001222		15	MOV	\$UNIT,R4	
7732	041024	136465	005304	000017		BITB	ATTN(R4),RKASOF+1(R5)	;TEST FOR ATTN ON PORT A
7733	041032	001032				BNE	35	,BR IF THERE
7734	041034	012737	000001	005464		MOV	#1,UNITB	,ELSE VERIFY PORT B NOT AVAIL
7735	041042	112737	000102	056576		MOVB	#'B,MSG19A	
7736	041050	004737	044172			JSR	PC,DRAV	
7737	041054	000403				BR	25	
7738	041056	104103				ERROR	103	,PORT B AVAIL BEFORE TMO OR RELEASE
7739	041060	000137	042644			JMP	115	
7740								
7741	041064	012765	100000	000000	25	MOV	#CCLR,RKCS1(R5)	
7742	041072	005337	005352			DEC	TEMP1	
7743	041076	001350				BNE	15	,SEE IF PORT A HAS ATTN
7744	041100	005037	005464			CLR	UNITB	
7745	041104	112737	000101	056576		MOVB	#'A,MSG19A	
7746	041112	104156				ERROR	156	;NO ATTN ON PORT A AFTER SEEK
7747	041114	000137	042644			JMP	115	,EXIT TEST
7748								
7749	041120	005037	005464		35	CLR	UNITB	,SETUP FOR PORT A
7750	041124	112737	000101	056576		MOVB	#'A,MSG19A	
7751	041132	004737	044172			JSR	PL,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	45	
7756	041150	104210				ERROR	210	,CERR AFTER SEEK CMD ON PORT A
7757								
7758	041152				45			
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 BRHM'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 COPPECT 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 CONTP RDY
7783	041304	104171				ERROR	171	,NO RDY AFTER READ HEADER CMD
7784	041306	032737	100000	005314		BIT	#CERR,HCS1	
7785	041314	001401				BEQ	665	
7786	041316	104174				ERROR	174	,CERR AFTER READ HEADER CMD

7787									
7788	041320	016520	000024		665	MOV	RK0B(R5), (R0)+	, 1'ST WORD FROM SILO TO RHTAB	
7789	041324	016520	000024			MOV	RK0B(R5), (R0)+	, 2'ND WORD	
7790	041330	016520	000024			MOV	RK0B(R5), (R0)+	, 3'RD WORD	
7791									
7792									
7793	041334	032765	100000	000010		BIT	#DLT, RKCS2(R5)		
7794	041342	001403				BEQ	675		
7795	041344	004737	045146			JSR	PC, GSTAT		
7796	041350	104173				ERROR	173	; DLT AFTER READ HEADER CMD	
7797	041352				675				
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'IT B2'ID	, & MSGS SPECIFIED HERE	
7809	041426	104301				ERROR	301	, MSG A0 ERROR AFTER READ HEADER CMD	
7810	041430	104271				ERROR	271	, MSH B0 ERROR	
7811	041432	104302				ERROR	302	, MSG A1 ERROR	
7812	041434	104272				ERROR	272	, MSG B1 ERROR	
7813									
7814	041436	023737	001566	001246		CMP	RHTAB, TOCYL	, CHECK WORD 0 ONLY, CYL#	
7815	041444	001401				BEQ	655	, BR IF SAME	
7816	041446	104051				ERRPOP	51	, WRONG CYL# ON HEADER	
7817	041450				655				
7818									
7819	041450	004737	045534			JSR	PC, SUBCLP		
7820	041454	104024				ERROR	24	, CERR AFTER SCLP	
7821									
7822	041456	013765	001222	000010		MOV	SUNIT, 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	056576		MOVB	#'A, MSG19A		
7826	041506	062765	000010	000010		ADD	#RLS, RKCS2(R5)	, RELEASE PORT A	
7827	041514	012737	000001	005314		MOV	#SELDRV, 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	SUNIT, 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	056576		MOVB	#'B, MSG19A		
7835	041560	012737	000001	005314		MOV	#SELDRV, 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	#0 DRA, HMR2	, SEE IF DRIVE AVAIL ON PORT B	
7840	041602	001001				BNE	685	, BR IF YES	
7841	041604	104071				ERROR	71	, PORT B NOT AVAIL AFTER PORT A PLS	
7842	041606				685				

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		SS	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	75	, BR IF THERE
7856	041676	005037	005464			CLR	UNITB	, ELSE VERIFY PORT A NOT AVAIL
7857	041702	112737	000101	056576		MOVB	#'A, MSG19A	
7858	041710	004737	044172			JSR	PC, DRAW	
7859	041714	000403				BR	65	
7860	041716	104103				ERROR	103	, PORT A AVAIL BEFORE TMO OR RELEASE
7861	041720	000137	042644			JMP	115	
7862								
7863	041724	012765	100000	000000	65	MOV	#CCLR, RKCS1(R5)	
7864	041732	005337	005352			DEC	TEMP1	
7865	041736	001350				BNE	55	SEE IF PORT B HAS ATTN
7866	041740	012737	000001	005464		MOV	#1, UNITB	
7867	041746	112737	000102	056576		MOVB	#'B, MSG19A	
7868	041754	104156				ERROR	156	, NO ATTN ON PORT B AFTER SEEK
7869	041756	000137	042644			JMP	115	EXIT
7870								
7871	041762	012737	000001	005464	75	MOV	#1, UNITB	, SETUP FOR PORT B
7872	041770	112737	000102	056576		MOVB	#'B, MSG19A	
7873	041776	004737	044172			JSR	PC, DRAW	
7874	042002	104157				ERROR	157	, PORT B NOT AVAIL AFTER SEEK
7875	042004	032737	100000	005314		BIT	#CERP, HCS1	
7876	042012	001401				BEQ	55	
7877	042014	104210				ERROR	210	, CERP AFTER SEEK CMD ON PORT B
7878								
7879	042016				SS			
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 SPON'D CART'D DOOR'D BRHM'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	0'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 COPPER T CL
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)	

7899									
7900									
7901	042132	012700	001666			MOV	#RHTAB, RD		
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	705		
7907	042162	104174				ERROR	174	, CERR AFTER READ HEADER CMD	
7908									
7909	042164	016520	000024		705	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	715		
7916	042210	004737	045146			JSR	PC, GSTAT		
7917	042214	104173				ERROR	173	, DLT AFTER READ HEADER CMD	
7918	042216				715				
7919									
7920	042216	012737	010340	005404		MOV	#<D DRAID SPINID DRDYID VV>, E A0	, EXPECTED MSG A0	
7921	042224	005037	005406			CLR	E B0	, EXPECTED MSG B0	
7922	042230	012737	001720	005410		MOV	#<D SPOKID CARTID DOORID BRHMID 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'IT B2'ID	, & 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 TOC'L	, CHECK WORD 0 ONLY, C L#	
7936	042310	001401				BEQ	695	, BR IF SAME	
7937	042312	104051				ERROR	51	, WRONG CIL# ON HEADER	
7938	042314				695				
7939									
7940	042314	004737	045534			JSR	PC, SUBCLP		
7941	042320	104024				ERROR	24	, CERR AFTER SCLP	
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	95	, 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	

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	725	
7960	042416	104210			ERROR	210	;CERR AFTER SEEK CMD
7961							
7962	042420			725			
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.DOR'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	115	;EXIT TEST
7980	042510			95			
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	056576	MOVB	#'B,MSG19A	
7985	042540	062765	000010	000010	ADD	#RLS,RKCS2(R5)	;RELEASE PORT B
7986	042546	012737	000001	005314	MOV	#SELDV,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	056576	MOVB	#'A,MSG19A	
7994	042612	012737	000001	005314	MOV	#SELDV,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 A/AIL ON PORT A
7999	042634	001001			BNE	735	;BP IF YES
8000	042636	104071			ERROR	71	;PORT A NOT AVAIL AFTER PORT B PLS
8001	042640			735			
8002	042640	000137	040746		JMP	105	
8003							
8004	042644			115			
8005							
8006							
8007							
8008							
8009							

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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     SEOP
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          $DEVCT          , INCR COUNT FOR # DRIVES CHECKED
8025 042670 023737 005434 001220  CMP          DRIVS,$DEVCT      , ARE ALL DRIVES PRESENT TESTED?
8026 042676 001403          BEQ          SEOP1+2          , BR IF YES
8027 042700 000137 012472          JMP          NUDRV          , ELSE TEST NEXT DRIVE PRESENT
8028 042704 000004          SEOP1  SCOPE
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          SEOPCT  WORD          1
8035 042734 003022          BGT          $DOAGN          , YES
8036 042736 012737          MOV          (PC)+,@(PC)+    , RESTORE COUNTER
8037 042740 000001          SENDCT  WORD          1
8038 042742 042732          SEOPCT
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  SGET42  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          SENDAD  JSR          PC,(R0)  , GO TO MONITOR
8047 042774 000240          NOP          , SAVE ROOM
8048 042776 000240          NOP          , FOR
8049 043000 000240          NOP          , ACT!!
8050 043002          $DOAGN
8051 043002 000137          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  $ENDMG  ASCII          <15\12>/END PASS #/
8055 043016 050040 051501 020123
8056 043024 000043
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8057          SBTTL  SUBROUTINES
8058
8059          ,SUBROUTINE TO CLEAR ALL FLAGS FROM DDUMP THRU UNITB
8060          ,
8061
8062 043026 012700 005424 CLRFLG MOV #DDUMP,R0
8063 043032 012701 177757 MOV #-17,R1
8064 043036 005020 1$ CLR (R0)+
8065 043040 005201 INC R1
8066 043042 001375 BNE '$
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 SBTTL TYPE ,MSG1 ,PROGRAM ID
8077          SBTTL GET VALUE FOR SOFTWARE SWITCH REGISTER
8078 043064 005737 000042 TST @#42 ,ARE WE RUNNING UNDER XXDP/ACT?
8079 043070 001012 BNE 64$ ,BRANCH IF YES
8080 043072 123727 001230 000001 CMPB $ENV,#1 ,ARE WE RUNNING UNDER APT?
8081 043100 001406 BEQ 64$ ,BRANCH IF YES
8082 043102 023727 001140 000176 CMP SWR,#SWREG ,SOFTWARE SWITCH REG SELECTED?
8083 043110 001005 BNE 65$ ,BRANCH IF NO
8084 043112 104406 GTSWR ,GET SOFT-SWR SETTINGS
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 GDRVS RDL IN
8097 043130 012600 MOV (SP)+,R0 ,GET STARTING ADDR OF ASCII STRING
8098 043132 012701 177774 MOV #-4,R1 ,SET UP COUNT
8099 043136 112002 1$ MOVB (R0)+,R2 ,GET ASCII CHAR
8100 043140 042702 177400 BIC #177400,R2 ,MASK HI BYTE
8101 043144 012703 005436 MOV #DRIVO,R3 ,DRIVE FLAG ADDR
8102 043150 012704 000060 MOV #60,R4
8103
8104 2$ CMP R4,R2 ,WAS TYPED CHAR 0 THRU 6?
8105 043156 001415 BEQ 3$ ,BRANCH IF YES
8106 043160 005723 TST (R3)+ ,NO, INCREMENT DR FLAG ADDR
8107 043162 005204 INC R4
8108 043164 020427 000067 CMP R4,#67
8109 043170 001371 BNE 2$ ,S/B 0-6 OR TERMINATOR
8110 043172 005702 TST R2 ,TERMINATOR=0
8111 043174 001025 BNE 4$
8112 043176 020127 177774 CMP R1,#-4

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8113 043202 001431          BEQ      6$          ;DEFAULT ALL DRIVES
8114 043204 005037 005462   CLR      SIZFLG     ;BYPASS TEST 1 (SIZING)
8115 043210 000207          RTS      PC         ;FOUND TERMINATOR, EXIT
8116
8117 043212 032704 000001   3$      BIT      #BIT0,R4 ;SEE IF ODD #
8118 043216 001014          BNE      4$
8119 043220 005213          INC      @R3       ;SET UP FLAG FOR THE DRIVE
8120 043222 005237 005434   INC      DRIVS     ;INCREMENT TOTAL # DRIVES TO BE TESTED
8121 043226 112002          MOVB    (R0)+,R2   ;GET NEXT ASCII CHAR
8122 043230 042702 177400   BIC     #177400,R2 ;MASK
8123 043234 022702 000054   CMP     #54,R2     ;IS IT A COMMA?
8124 043240 001407          BEQ     5$         ;YES, GO TO NEXT WORD
8125 043242 005702          TST     R2         ;NO, IS IT A TERMINATOR?
8126 043244 001001          BNE     4$         ;IF NOT, SOMETHING WRONG
8127 043246 000756          BR      7$         ;FOUND TERMINATOR, EXIT
8128
8129 043250 104401 057054   4$      TYPE     ,EM1   ;ONLY 0,2,4,6 ALLOWED
8130 043254 000137 010054   JMP     PRGSRT     ;START ALL OVER
8131
8132 043260 005201          5$      INC      R1     ;S/B NO MORE THAN 4 DIFF
8133 043262 001325          BNE     1$         ;DRIVES TYPED IN
8134 043264 000771          BR      4$         ;IF NORE, HAVE ERROR
8135
8136 043266 005237 005462   6$      INC      SIZFLG ;DO TEST 1 (SIZING)
8137 043272 000207          RTS     PC         ;EXIT
8138
8139
8140 ;ROUTINE TO INPUT RKBAS OR DEFAULT
8141 ;
8142
8143 043274 104412          GBA·    RDOCT
8144 043276 012600          MOV     (SP)+,R0   ;GET LOW ORDEP FROM STACK
8145 043300 005700          TST     R0
8146 043302 001403          BEQ     1$         ;BRANCH IF DEFAULT
8147 043304 010037 001264   MOV     R0,SBASE
8148 043310 000207          RTS     PC
8149 043312 012737 177440 001264 1$      MOV     #177440,SBASE ;DEFAULT VALUE
8150 043320 000207          RTS     PC
8151
8152
8153 ;ROUTINE TO INPUT RKVEC OR DEFAULT
8154 ;
8155
8156 043322 104412          GINT   RDOCT
8157 043324 012600          MOV     (SP)+,R0   ;GET LOW ORDER FROM STACK
8158 043326 005700          TST     R0
8159 043330 001405          BEQ     1$         ;BRANCH IF DEFAULT
8160 043332 010037 001314   MOV     R0,RKVEC
8161 043336 004737 043354   2$      JSR     PC,SETINT
8162 043342 000207          RTS     PC
8163 043344 012737 000210 001314 1$      MOV     #210,RKVEC   ;DEFAULT VALUE
8164 043352 000771          BR      2$
8165
8166
8167 ;ROUTINE TO SETUP INTERRUPT VECTOR & PRIORITY
8168

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8169
8170 043354 013700 001314 SETINT: MOV RKVEC,RO
8171 043360 012720 050066 MOV #INTER,(RO)+ ,INTER ADDR TO RKVEC
8172 043364 013710 001316 MOV RKPRI,(RO) ,PRS TO RKVEC+2
8173 043370 000207 RTS PC
8174
8175
8176 ; THIS ROUTINE SETS CDT IN RKCS1 IF DRIVE UNDER TEST IS AN RK07
8177 ; ENTER WITH COMMAND IN HCS1
8178
8179 043372 053737 001170 005314 DOCMD BIS $TMP4,HCS1 ,ADD CDT IF RK07
8180 043400 013765 005314 000000 MOV HCS1,RKCS1(R5) ,DO COMMAND
8181 043406 013737 001400 005352 MOV T10,TEMP1
8182 043414 004737 043466 JSR PC,FRDY ,FIND CONTR READY
8183 043420 000207 RTS PC ,SET HERE IF NOT RDY
8184 043422 062716 000002 ADD #2,(SP) ,ELSE SKIP OVER ERROR
8185 043426 000207 RTS PC
8186
8187 ; THIS ROUTINE IS SIMILAR TO THE ABOVE BUT IS USED FOR DATA TRANSFERS
8188 ; & REQUIRES A LONGER TIMEOUT
8189
8190 043430 053737 001170 005314 DATCMD BIS $TMP4,HCS1 ,ADD CDT IF RK07
8191 043436 013765 005314 000000 MOV HCS1,RKCS1(R5) ,DO CMD
8192 043444 013737 001412 005352 MOV T50000,TEMP1
8193 043452 004737 043466 JSR PC,FRDY ,FIND CONTR RDY
8194 043456 000207 RTS PC
8195 043460 062716 000002 ADD #2,(SP)
8196 043464 000207 RTS PC
8197
8198
8199 ; ROUTINE TO FIND CONTROLLER READY (RDY) DURING A DELAY
8200 ; ENTER WITH A COUNT IN TEMP1
8201 ; RETURN IF RDY NOT PRESENT (ERROR CONDITION)
8202 ; RETURN +2 IF RDY PRESENT (SKIP OVER ERROR)
8203 ; STATUS IS OBTAINED BEFORE THE RETURN FOR EITHER CASE
8204
8205 043466 032765 000200 000000 FRDY BIT #RDY,RKCS1(R5)
8206 043474 001010 BNE 1$
8207 043476 005337 005352 DEC TEMP1
8208 043502 001371 BNE FRDY
8209 043504 004737 043622 JSR PC,HOLD ,STORE ALL RK611 REGS IN HOLDING PEGS
8210 043510 004737 045064 JSR PC,CKCERR ,CHECK FOR SPECIAL CERR
8211 043514 000207 RTS PC ,NO RDY, EXIT
8212 043516 062716 000002 1$ ADD #2,(SP) ,SKIP OVER ERROR
8213 043522 004737 043622 JSR PC,HOLD
8214 043526 004737 045064 JSR PC,CKCERR ,CHECK FOR SPECIAL CERR
8215 043532 000207 RTS PC
8216
8217 ; ROUTINE TO FIND CONTROLLER READY AND STOPE DRIVE PEGS ONLY
8218
8219 043534 032765 000200 000000 FRDY1 BIT #RDY,RKCS1(P5)
8220 043542 001014 BNE 1$
8221 043544 005337 005352 DEC TEMP1
8222 043550 001371 BNE FRDY1
8223 043552 016537 000034 005342 MOV RKMP2(R5),HMP2
8224 043560 016537 000036 005344 MOV RKMP3(P5),HMP3

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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          15:   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
8234          ,STORE ALL RK611 REGISTERS IN HOLDING REGS
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),HPOS
8250 043740 016537 000032 005350    MOV    RKECPT(R5),HPAT
8251 043746 000207                    RTS    PC
8252
8253
8254          ,ROUTINE TO CHECK FOR CORRECT ATTN
8255          ,RETURN IF ATTN NOT PRESENT (ERROR CONDITION)
8256          ,RETURN +2 IF ATTN PRESENT (SKIP OVER ERROR)
8257
8258 043750 010446                    TSTATN 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    15              ,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          15:   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  35:   MOV    #-1,TEMP1
8279 044016 013704 001222                    MOV    $UNIT,R4
8280 044022 063704 005464                    ADD    UNITB,R4        ,ADD 1 IF ON PORT B

```

```

8281 044026 136465 005304 000017 15 BITB ATTN(R4),RKASOF+1(R5) ;FIND CORRECT ATTN
8282 044034 001014 BNE 25
8283 044036 005337 005352 DEC TEMP1
8284 044042 001371 BNE 15
8285 044044 005337 005354 DEC TEMP2
8286 044050 001357 BNE 35
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 25 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 25 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 15
8310 044130 005337 005352 DEC TEMP1
8311 044134 001365 BNE 25
8312 044136 005065 000026 CLP 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 15 CLP 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 ;THIS ROUTINE CHECKS 'DRIVE AVAILABLE' IN MSG AD AFTER A SELECT COMMAND
8323 ;IF NOT SET, IT DOES A NORMAL RETURN
8324 ;IF SET, IT DOES A RETURN+2
8325

```

```

8326 044172 004737 045146 005342 DRAV JSR PC,GSTAT
8327 044176 032737 000040 BIT #0 DRA,HMR2 ;SEE IF DRIVE AVAILABLE SET
8328 044204 001402 BEQ 15 ;BR IF NO & RETURN
8329 044206 062716 000002 ADD #2,(SP) ;ELSE RETURN+2
8330 044212 000207 15 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

```



```

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 RO
8357
8358
8359 044260 104401 056455 BYP TYPE ;MSG14 ;BYPASS DRIVE
8360 044264 010046 MOV RO -(SP) ;SAVE RO 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 017637 000000 001460 CHMSG 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 AO ;SET UNIT #
8374 044320 063737 005464 005404 ADD UNITB,E AO ;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 DDT,E AO ;SET CDT IF PORT
8382
8383 044400 013746 005352 MOV TEMP1,-(SP) ;SAVE TEMP1
8384
8385 044404 013737 005404 005352 MOV E AO,TEMP1
8386 044412 004737 047224 JSR PC,SBPAR ;GET PARITY FOR MSG AO
8387 044416 013737 005352 005404 MOV TEMP1,E AO
8388
8389 044424 013737 005410 005352 MOV E A1,TEMP1
8390 044432 004737 047224 JSR PC,SBPAR ;GET PARITY FOR MSG A1
8391 044436 013737 005352 005410 MOV TEMP1,E A1
8392

```

8393	044444	013737	005414	005352		MOV	E A2, TEMP1	
8394	044452	004737	047224			JSR	PC, SBPAR	, 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, SBPAR	, 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, SBPAR	, 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, SBPAR	, 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, SBPAR	, 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	001176		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	134212	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	, ELSE SETUP ESCAPE
8439	044710	011646				MOV	(SP), -(SP)	, COPY RET ADDR
8440	044712	000207				RTS	PC	, & RETURN TO MAINLINE ERROR
8441								
8442	044714	032777	001000	134216	7\$	BIT	#SW9, \$SWR	, RETURN HERE FROM MAINLINE ERROR
8443	044722	001051				BNE	20\$, & BR IF LOOP ON ERROR
8444	044724	062716	000002		5\$	ADD	#2, (SP)	, BUMP RET ADDR TO NEXT ERROR
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	

```

8449 044746 011646          MOV    (SP), -(SP)
8450 044750 000207          RTS    PC
8451
8452 044752 032777 001000 134160 10$  BIT    #SW9, @SWR
8453 044760 001032          BNE    20$
8454 044762 062716 000002          ADD    #2, (SP)
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$
8465 045026 004737 046136          JSR    PC, RSEC , PUT INFO IN SECTOR, DO NOT CHECK
8466 045032 004737 046174          JSR    PC, RHEAD , PUT INFO IN HEADR, DO NOT CHECK
8467
8468 045036 013737 001172 001176 15$  MOV    STMP5, $ESCAPE , RESTORE
8469 045044 000207          RTS    PC
8470
8471 045046 012706 001100          MOV    #STACK, SP , RESET STACK PTR
8472 045052 013737 001172 001176          MOV    STMP5, $ESCAPE , RESTORE
8473 045060 000177 134024          JMP    @SLPERR
8474
8475
8476
8477
8478 045064 005737 001456          CKCERR TST    BYPCERR
8479 045070 001025          BNE    4$
8480 045072 032737 100000 005314          BIT    #CERR, HCS1
8481 045100 001001          BNE    1$ BP 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          RTS    PC
8498
8499
8500
8501
8502
8503
8504
  
```

THIS ROUTINE CHECKS FOR CERTAIN ERROR CONDITIONS ONLY
 I E IF NED, CTO OR MDS SET MESSAGE A & B ARE INVALID

THIS ROUTINE DOES THE SELECT DRIVE COMMAND TO GET STATUS
 IT THEN WAITS FOR CONTROLLER READY
 IF RDY NOT RECEIVED BY THE TIMEOUT, AN ERROR IS FLAGGED

```

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          ; THIS ROUTINE GETS STATUS OF ALL DRIVE REGISTERS (MSG A0-A3, B0-B3)
8515          ; & ALL CONTROLLER REGISTERS
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 DRU 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 045300 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 DRU 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 DRU 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 DRU CMC
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    (P)+, TEMP1    ; RESTORE TEMP1
8555 045466 000207          RTS    P
8556
8557 045470 012737 000001 005314      GSTAT2 MOV    #SELDIV, HCS1
8558 045476 053737 001170 005314      BIS    $TMP4, HCS1     ; ADD CDT IF RKO
8559 045504 013765 005314 000000      MOV    HCS1, RKCS1(R5) ; GET STATUS
8560 045512 013737 001400 005352          MOV    T10, TEMP1

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8561 045520 004737 043534 JSR PC,FRDY1 ;FIND CONTR RDY & STORE DR VE 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
8567 ; THIS ROUTINE DOES A SUBSYSTEM CLEAR & WAITS FOR CONTROLLER READY
8568 ; IF RDY IS NOT RECEIVED BY THE END OF THE TIMEOUT, AN ERROR IS FLAGGED
8569 ; THE ROUTINE THEN GETS CURRENT STATUS & CHECKS FOR CONTROLLER ERROR (CERR)
8570 ; RETURN IF CERR SET
8571 ; RETURN +2 IF CERR CLEAR
8572
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 $UNIT,RKCS2(R5) ;CURRENT DRIVE #
8578 045564 063765 005464 000010 ADD UNITB,RKCS2(R5) ;ADD 1 IF ON PORT B
8579 045572 005065 000026 CLR RKMR1(R5) ;SELECT WORD 0
8580 045576 004737 045146 JSR PC,GSTAT ;GET STATUS
8581 045602 032737 100000 005314 BIT #CERR,HCS1 ;CHECK FOR CONT ERROR
8582 045610 001401 BEQ 1$
8583 045612 000207 RTS PC
8584 045614 062716 000002 1$ ADD #2 (SP) ;SKIP OVER ERROR
8585 045620 000207 RTS PC
8586
8587
8588 ; READ THE SECTOR COUNT IN RKMR3, RIGHT JUSTIFY IT & STORE IT IN 'SECTOR'
8589
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 #(<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 ; READ THE CYL DIFF/OFFSET IN RKMR2, RIGHT JUSTIFY IT & STORE IT IN 'CYLDIF'
8601
8602 045672 012765 000002 000026 RDCYLD 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
8614
8615
8616 ; READ THE CYL ADDR IN RKMR3, RIGHT JUSTIFY IT & STORE IT IN 'CYLADD'
    
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```

8617
8618 045756 012765 000002 000026 RDCYLA MOV #2,RKMR1(R5) ,WORD 2
8619 045764 004737 045146 JSR PC,GSTAT
8620 045770 013737 005344 001360 MOV HMR3,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 N COMPL FORM
8637 046070 001002 BNE 15 ,BR IF NO
8638 046072 005037 001356 CLR CYLDIF ,ELSE CLEAR
8639 046076 000207 15 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 # C<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 'HEADR'
8662
8663 046174 013737 005402 001422 RHEAD MOV H B3,HEADR
8664 046202 042737 170777 001422 BIC # C<M HEAD>,HEADR ,CLEAR UNWANTED INFO
8665 046210 006237 001422 ASR HEADR ,RIGHT JUSTIFY IT
8666 046214 000337 001422 SWAB HEADR
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

```

```

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 1$ 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 1$ 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 FHDTAB MOV R0,-(SP) ;SAV R0
8708 046346 010146 MOV R1,-(SP) ;SAV R1
8709 046350 012700 001462 MOV #HDTAB,R0 ;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,(R0)+ ;HEADER WORD 1-CYL ADDR
8722 046432 010110 MOV R1,(R0) ;HEADER WORD 2-SECTOR NO
8723 046434 053710 001424 BIS HD1,(R0) ; -HEAD NO
8724 046440 053710 001430 BIS FMT1,(R0) ; -FORMAT
    
```

UNIBUS RK06-RK07 DUAL PORT DRIVE DIAGNOSTIC K 13
DZP6GA P11 29-SEP-77 09 55 MACY11 30(1046) 29-SEP-77 10 08 PAGE 166
GET VALUE FOR SOFTWARE SWITCH REGISTER

SEQ 0166

8725 046444 004737 046524

JSR PC, SECFLG


```
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
S735 046510 020127 000026      CMP    R1, #22           ; ALL 22 SECTORS DONE? (66 WORDS)
8736 046514 001344              BNE    1$                ; BR IF NO
S737
S738 046516 012601              MOV    (SP)+, R1         ; RESTOR R1
8739 046520 012600              MOV    (SP)+, R0         ; RESTOR R0
S740 046522 000207              RTS    PC
S741
S742
S743
S744
```

THIS ROUTINE GETS INFORMATION FROM THE BAD SECTOR TABLE FILLED BY A PREVIOUS
TEST & SETS BITS 14 & 15 APPROPRIATLY

```

8745 046524 010246 SECFLG: MOV R2, -(SP) ,SAVE R2
8746 046526 005737 001426 TST FORMAT
8747 046532 001016 BNE 1$ ,BR IF 20 SECTOR FORMAT
8748 ,NOTE ONLY 22 SECTOR PERFORMED
8749 046534 012702 002306 MOV #BSE22H+8, R2
8750 046540 004737 046574 JSR PC, FLGTST ;GET HARDWARE DETECTED FLAG
8751 046544 052710 100000 BIS #BIT15, (R0) ;RETURN HERE IF GOOD SECTOR
8752
8753 046550 012702 003306 MOV #BSE22S+8, R2 ;ELSE RETURN HERE
8754 046554 004737 046574 JSR PC, FLGTST ;GET SOFTWARE DETECTED FLAG
8755 046560 052710 040000 BIS #BIT14, (R0) ;RETURN HERE IF GOOD SECTOR
8756
8757 046564 012602 MOV (SP)+, R2 ,ELSE RETURN HERE
8758 046566 000207 RTS PC
8759
8760 046570 012602 1$ MOV (SP)+, R2 ,RESTORE R2
8761 046572 000207 RTS PC
8762
8763
8764 ,THIS ROUTINE DOES THE ACTUAL SCANNING OF THE BAD SECTOR TABLES
8765 ,ENTER WITH THE ADDRESS OF TABLE (BSE22H, BSE22S, ETC ) IN TEMP1
8766 ,RETURN IF NO COMPARE
8767 ,RETURN+4 IF COMPARE
8768
8769 046574 010346 FLGTST MOV R3, -(SP) ,SAVE R3
8770
8771 046576 021227 177777 1$ CMP (R2), #-1 ,SEE IF ALL 1'S
8772 046602 001002 BNE 2$ ,BR IF NO
8773 046604 012603 MOV (SP)+, R3 ,RESTORE R3
8774 046606 000207 RTS PC
8775
8776 046610 022237 001362 2$ CMP (R2)+, CALADD ,SEE IF=CYL # & ADP PTR TO TRK/SECTOR WORD
8777 046614 001403 BEQ 3$
8778 046616 062702 000002 ADD #2, R2 ,GO TO NEXT CYL WORD IN TABLE
8779 046622 000765 BR 1$
8780
8781 046624 013703 001420 3$ MOV HEAD, R3 ,GET HEAD # FROM FHDTAB ROUTINE
8782 046630 000303 SWAB R3
8783 046632 050103 BIS R1, R3 ,ADD SECTOR # FROM FHDTAB ROUTINE
8784 046634 022203 CMP (R2)+, P3 ,SEE IF SECTOR/HEAD COMPARE
8785 ,& INCR PTR TO NEXT CYL WORD
8786 046636 001401 BEQ 4$ ,BR IF COMPARE
8787 046640 000756 BR 1$ ,ELSE TRY NEXT CYL
8788
8789 046642 012603 4$ MOV (SP)+, R3 ,RESTORE R3
8790 046644 062716 000004 ADD #4 (SP) ,INCREMENT RET ADDR
8791 046650 000207 RTS PC
8792
8793
8794 ,THIS ROUTINE SORTS THE RHTAB TABLE FROM WHATEVER SECTOR IT BEGINS
8795 ,WITH AND RE-WITES THE INFO IN SRTTAB TABLE TO BEGIN WITH SECTOR 0
8796
8797 046652 010046 SORT MOV R0, -(SP) ,SAVE R0
8798 046654 010146 MOV R1, -(SP) ,SAVE R1
8799 046656 004737 045622 JSR PC, RDSEC
8800 046662 062737 000001 001374 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 #RHTAB, 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 15 MOV (R0)+, (R1)+ ;PUT BOTTOM OF RHTAB TO TOP OF SRTTAB
8812 046730 020027 002072 CMP R0, #RHTAB+132
8813 046734 001374 BNE 15
8814
8815 046736 012700 001666 MOV #RHTAB, R0 ;PUT TOP OF RHTAB TO BOT OF SRTTAB
8816 046742 012021 25 MOV (R0)+, (R1)+
8817 046744 020037 001374 CMP R0, SECTOR
8818 046750 001374 BNE 25
8819
8820 046752 012601 MOV (SP)+, R1 ;RESTOR R1
8821 046754 012600 MOV (SP)+, R0 ;RESTOR R0
8822 046756 000207 RTS PC
8823
8824
8825 ;MULT BY 6 ENTER WITH DESIRED # IN 'SECTOR'
8826
8827 046760 006337 001374 MULT6 ASL SECTOR ;2 X SECTOR
8828 046764 013746 001374 MOV SECTOR, -(SP)
8829 046770 006337 001374 ASL SECTOR ;4 X SECTOR
8830 046774 062637 001374 ADD (SP)+, SECTOR ;(4 X S)+(2 X S) = 6 X SECTOR
8831 047000 000207 RTS PC
8832
8833
8834 ; THIS ROUTINE IS ENTERED ONLY IF THERE IS A BSE ERROR AFTER A WRITE DATA
8835 ; CMD IT VERIFIES THAT THE BAD SECTOR IS LISTED IN THE BSE INFORMATION
8836 ; CYLINDER AT CYL 410, TRACK 2
8837
8838 ; RETURN IF SECTOR NOT LISTED IN BSE TABLE, ERROR CONDITION
8839 ; RETURN+2 IF LISTED, SKIP OVER ERROR
8840
8841 047002 010446 TRUERR MOV R4, -(SP) ;SAVE R4
8842
8843 047004 032737 010000 005314 BIT #CFMT, HCS1 ;CHECK FORMAT
8844 047012 001014 BNE 35 ;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 ;SEE IF ON HARDWARE DETECTED TABLE
8849 047024 000407 BR 35 ;RETURN HERE IF YES
8850
8851 047026 012704 003306 MOV #BSE22S+8, R4 ;ELSE RETURN HERE
8852 047032 004737 047054 JSR PC, TERR1 ;& SEE IF ON SOFTWARE DETECTED TABLE
8853 047036 000402 BR 35 ;RETURN HERE IF YES
8854
8855 047040 012604 15 MOV (SP)+, R4 ;RESTORE R4
8856 047042 000207 RTS PC ;RETURN WITHOUT JUMPING TO EPP JP

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8857
8858 047044 012604          35      MOV      (SP)+,R4      ,RESTORE R4
8859 047046 062716 000G02    ADD      #2,(SP)      ,SKIP OVER ERROR ON RETURN
8860 047052 000207          RTS      PC
8861
8862
8863 ; THIS ROUTINE DOES THE ACTUAL COMPARING OF CYLINDER, HEAD & TRACK AGAINST
8864 ; THE BSE TABLE FOR THE ABOVE SUBROUTINE
8865 ; RETURN IF FOUND ON TABLE
8866 ; RETURN+2 IF NOT FOUND
8867
8868 047054 021427 177777    TERR1.  CMP      (R4), #-1      ,SEE IF ALL 1'S
8869 047060 001405          BEQ      15              ,BR IF YES, NOT ON TABLE
8870 047062 022437 005334    CMP      (R4)+,HDC      ,SEE IF CYL MATCH
8871 047066 001405          BEQ      25              ,BR IF YES
8872 047070 005724          TST      (R4)+          ,ELSE ADV TO NEXT CYL WORD
8873 047072 000770          BR       TERR1         , & TRY AGAIN
8874
8875 047074 062716 000002    15      ADD      #2,(SP)
8876 047100 000207          RTS      PC
8877
8878 047102 022437 005324    25      CMP      (R4)+,HDA      ,SEE IF SECTOR & TRACK MATCH
8879 047106 001401          BEQ      35              ,BR IF YES
8880 047110 000761          BR       TERR1         ,OR TRY AGAIN
8881
8882 047112 000207          35      RTS      PC
8883
8884
8885
8886 ; ROUTINE TO TURN L OR P CLOCK INTERRUPT ON
8887
8888 047114 005037 001372    CLKON  CLR      TIMUP
8889 047120 005737 005460    TST      PCLKF
8890 047124 001004          BNE      15              ,BRANCH IF P-CLOCK PRESENT
8891 047126 012777 000100 132172  MOV      #100, @LKS      ,L-CLOCK, ENABLE INT
8892 047134 000207          RTS      PC
8893 047136 012777 177777 132156  15      MOV      #-1, @PKSB      ,P-CLOCK, ALL 1'S
8894 047144 012777 000135 132146    MOV      #135, @PKS      ,ENABLE INT, CT UP, PEP INT
8895 047152 000207          RTS      PC              ,LINE FREQ & RUN
8896
8897 ; KW11-L & KW11-P INTERRUPT HANDLER
8898
8899 047154 005337 001366    CLOCK  DEC      COUNT
8900 047160 000002          RTI
8901
8902 ; ROUTINE TO TURN L OR P CLOCK INTERRUPT OFF
8903
8904 047162 005737 005460    CLKOF  TST      PCLKF
8905 047166 001003          BNE      15              ,BRACH IF P-CLOCK PRESENT
8906 047170 005077 132132    CLR      @LKS          ,L-CLOCK, CLEAR INTERRUPT
8907 047174 000207          RTS      PC
8908 047176 005077 132116    15      CLR      @PKS          ,P-CLOCK, CLEAR INTERRUPT
8909 047202 000207          RTS      PC
8910
8911
8912 ; THIS ROUTINE DOES A TIMEOUT DEPENDING ON THE VALUE IN 'COUNT' WHICH THE

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8913      , 'CLOCK' HANDLER DECREASES EVERY 1/60 SEC
8914
8915      047204 004737 047114      TMO      JSR      PC,CLKON      ,TURN CLOCK ON
8916      047210 005737 001366      15      TST      COUNT      ,TIME UP?
8917      ,      BNE      TMO      ,BR IF NO  S9-SEP-77
8918      047214 001375      ,      BNE      15      ,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,RO      ,SHIFT COUNTER
8935      047234 005001      CLR      R1      ,COUNT # OF 1'S IN TEMP1
8936      047236 000241      CLC      ,CLEAR CARRY
8937
8938      047240 006137 005352      15      ROL      TEMP1
8939      047244 103001      BCC      25      BR IF CARRY CLEAR
8940      047246 005201      NC      R1      ,COUNT # OF 1'S
8941      047250 005300      25      DEC      RO      ,SHIFT COUNTER
8942      047252 001372      BNE      15
8943
8944      047254 032701 000001      BIT      #BIT0,R1
8945      047260 001003      BNE      35      ,BR IF ODD # IN R1
8946      047262 052737 100000 005352      B S      #M PAR,TEMP1      ,SET PARITY BIT
8947      047270 012601      35      MOV      (SP)+,R1      ,RESTORE R1
8948      047272 012600      MOV      (SP)+,RO      ,RESTORE RO
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      SCOP15  BIT      #SW9,@SWP      ,LOOP ON ERROR?
8957      047304 001406      BEQ      15      ,BR IF NO
8958      047306 105737 001103      TSTB     $ERFLG      ,HAD ERROR?
8959      047312 001403      BEQ      15      ,BR IF NO
8960      047314 013716 001110      MOV      $LPERR,(SP)
8961      047320 000002      RTI
8962
8963      047322 011637 001110      15      MOV      (SP), $LPERR      ,SET LOOP ADDR FOR TIGHT SCOPE LOOP
8964      047326 000002      RTI
8965
8966
8967
8968
  
```

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8969
8970
8971
8972
8973
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 056712
8985 047360 000402
8986 047362 104401 056760
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 005254
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
  
```

, THIS ROUTINE IS ENTERED BY TYPING A CONTROL-C
 , IT IS USED TO ALLOW THE OPERATOR TO HALT THE CPU WHILE INSURING
 , THAT HEADS ARE LOADED & FORMATTING IS VALID BEFORE ACTUALLY HALTING
 , THE CPU
 ,
 , RESTORE STACK FROM INTERRUPT
 , CERR AFTER
 , SEE IF HEADS UNLOADED
 , BR IF NO
 , SEE IF MANUAL OR AUTO MODE
 , BR IF MANUAL MODE
 , PGM ABORT PENDING
 , HALT PENDING
 , CERR AFTER SCLR
 , DC START SPINDLE CMD & GET CONTR RDY
 , RDY NOT SET AFTER ST SPIN CMD
 , SETUP TIMEOUT
 , FIND ATTN
 , NO ATTN AFTER ST SPIN CMD
 , SEE IF HEADERS VALID
 , BR IF YES
 , ADD 1 IF ON PORT B
 , DO RECAL CMD & GET CONTR RDY
 , RDY NOT SET AFTER RECAL CMD
 , SELECT WORD 1
 , RTZ NOT SET DURING RECAL CMD
 , SETUP TIMEOUT
 , FIND ATTN
 , NO ATTN AFTER RECAL CMD
 , DPIVE#

```

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      ERROR   151           ,NO RDY AFTER DRIVE CLEAR CMD
9029 047576 004737 043750      JSR      PC,TSTATN     ,TEST FOR ATTN
9030 047602 000401      BR      65$
9031 047604 104154      ERROR   154           ,ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
9032 047606      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      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      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      JSR      PC,CHKMSG     ,CHECK MSGS A0, B0, A1, B1
9043 047660 000003      WORD    T A2:T B2:0   , & MSGS SPECIFIED HERE
9044 047662 104033      ERROR   33           ,MSG A0 ERROR AFTER DRV CLEAR CMD
9045 047664 104034      ERROR   34           ,MSG B0 ERROR
9046 047666 104035      ERROR   35           ,MSG A1 ERROR
9047 047670 104036      ERROR   36           ,MSG B1 ERROR
9048
9049
9050 047672 000137 047736      JMP      FORM          WRITE VALID FORMATS
9051
9052 047676 005737 000042      4$      TST      42           ,SEE IF MANUAL OR AUTO MODE
9053 047702 001410      BEQ     5$           ,BR IF MANUAL MODE
9054 047704 104401 057015      TYPE    ,MSG76       ,PGM ABORTED
9055 047710 005037 042732      CLR     SEOPCT      ,SET UP EOP TO EXIT TO MON TOR
9056 047714 005037 001176      CLP     %ESCAPE
9057 047720 000137 042704      JMP     SEOP1       ,ABORT PGM
9058
9059 047724 104401 057037      5$      TYPE    ,MSG77       ,CPU HALTED
9060 047730 000000      HALT
9061 047732 000137 010646      JMP     ST5         ,START OVER IF CONTINUE PRESSED
9062 047736
9063
9064
9065
9066
9067
9068
9069
9070
9071
9072 047736 011600      BADTMO MOV      (SP),RO     ,SAVE PC WHERE TIMEOUT OCCUPED
9073 047740 005740      TST     -(RO)        ,GET PC BEFORE UPDATE
9074 047742 032777 020000 131170      BIT     #SW13,%SWR   ,INHIBIT EPR TYP0UT?
9075 047750 001005      BNE     1$           ,YES, DON'T TYPE
9076 047752 104401 057217      TYPE    ,EM3         ,ABORT TESTS,UNEXP T 0 @ PC=
9077 047756 010046      MOV     RO,-(SP)     ,SAVE RO FOR TYPEOUT
9078
9079 047760 104403      TYPOS  ,GO TYPE--OCTAL ASCII
9080 047762 006      BYTF   6           ,TYPE 6 DIGIT(S)

```

FORM
SBTTL UNEXPECTED TIMEOUT HANDLER

. THIS ROUTINE IS ENTERED IF THERE IS
A NON EXISTANT MEMORY (NO SSYN
B BOUNDARY ERROR
C STACK OVERFLOW

```

9081 047763 000          BYTE 0          ;, SUPPRESS LEADING ZEROS
9082 047764 032777 001000 131146 1$    BIT  #SW9, @SWR ;, LOOP ON ERROR?
9083 047772 001403          BEQ  2$          ;, NO, BRANCH
9084 047774 022626          CMP  (SP)+, (SP)+ ;, YES, RESTORE STACK
9085 047776 000177 131104          JMP  @SLPADR ;, GO TO STARTING ADDR OF TEST
9086                                     ;, THAT GAVE BAD TIMEOUT
9087 050002 032777 040000 131130 2$    BIT  #SW14, @SWR ;, 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 TYPEOUT 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  #15, $ESCAPE ;, STORE PC
9103 050032 011637 001334          MOV  (SP), TRAPPC ;, UNEXP MEM PARITY TRAP
9104 050036 104017          ERROR 17
9105 050040 005037 001176 1$    CLR  $ESCAPE ;, CHECK IF LOOP ON ERROR
9106 050044 032777 001000 131066    BIT  #SW9, @SWP ;, YES, FORCE STACK AND TRY AGAIN
9107 050052 001001          BNE  2$          ;, ELSE RETURN
9108 050054 000002          RTI
9109
9110 050056 012706 001100 2$    MOV  #STACK, SP ;, INIT STACK
9111 050062 000177 131022          JMP  @SLPERR ;, 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), RO ;, SAVE PC WHERE INT OCCURRED
9120 050076 005740          TST  -(RO) ;, GET PC BEFORE UPDATE
9121 050100 104401 056167          TYPE .MSG6 ;, INT AT PC=
9122 050104 010046          MOV  RO, -(SP) ;, SAVE RO FOR TYPEOUT
9123                                     ;, TYPE PC
9124 050106 104403          TYPOS ;, 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 SPWRDN MOV  #SPWRUP, PWRVEC SET UP VECTOR
  
```



```

9137 050130 000000          HALT
9138 050132 000776          BR          -2          ,HANG UP
9139
9140          ,POWER UP ROUTINE
9141
9142 050134 005037 050206    SPWRUP CLR      SPWRCT    ,WAIT LOOP FOR TTY
9143 050140 005237 050206    15     INC      SPWRCT    ,WAIT FOR THE INCR
9144 050144 001375          BNE      15           ;OF WORD
9145 050146 012737 050122 000024  MOV     #SPWRDN,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 056336          TYPE    ,MSG11        ;REPORT POWER FAIL
9150 050200 000005          RESET
9151 050202 000137 013004    JMP     PFSRT
9152
9153 050206 000000          SPWRCT  0          ,WAIT COUNT FOR TTY
9154
9155          ,
9156          ,DIVISION UTILITY ROUTINE
9157          ,
9158          ,R0-R1-R2-R3=DIVIDEND
9159          ,R4-R5=DIVISOR
9160          ,R0-R1=REMAINDER AFTER DIVISION
9161          ,R2-R3=QUOTIENT AFTER DIVISION
9162          ,ENTER WITH JSR PC,M DPID
9163
9164 050210 012746 000040    M DPID MOV     #40,-(SP)  ,COUNTER FOR DIVISION CYCLES
9165 050214 010446          MOV     R4,-(SP)      ,HI ORDER
9166 050216 010546          MOV     P5,-(SP)      ,LO ORDER TO THE STACK
9167 050220 005466 000002    NEG     2(SP)         ,FORM NEGATIVE
9168 050224 005416          NEG     @SP           ,VERSION OF DIVISOR
9169 050226 005666 000002    SBC     2(SP)
9170 050232 061601          ADD     @SP,R1
9171 050234 005500          ADC     R0
9172 050236 066600 000002    ADD     2(SP),R0
9173 050242 103445          BCS     M DP50        ,IF CARRY THEN OVERFLOW HAS OCCURRED
9174 050244 005046          CLR     -(SP)        ,THIS IS A LONGER LASTING CARRY BIT
9175 050246 006103    M DP40 ROL     R3
9176 050250 006102          ROL     R2
9177 050252 006101          ROL     R1
9178 050254 006100          ROL     R0
9179 050256 005716          TST     @SP
9180 050260 001410          BEQ     M DP41        ,TEST CARRY INDICATOR
9181 050262 005016          CLR     @SP           ,IF TO CARRY THEN ADD, ELSE SUBT
9182 050264 066601 000002    ADD     2(SP),R1     ,CLEAR UP FOR NEXT TIME
9183 050270 005500          ADC     R0
9184 050272 005516          ADC     @SP           ,ADD -(DIVISOR)
9185 050274 066600 000004    ADD     4(SP),R0     ,SET CARRY
9186 050300 000404          BR      M DP42
9187
9188 050302 060501    M DP41 ADD     R5,R1
9189 050304 005500          ADC     R0
9190 050306 005516          ADC     @SP           ,ADD +(DIVISOR)
9191 050310 060400          ADD     R4,R0        ,SET CAPRY
9192 050312 005516    M DP42 ADC     @SP           ,SET CARRY
    
```

9193	050314	005716			TST	@SP		; 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 DP44		
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								

```

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=10T
9227
9228          $SCOPE
9229          050366      104407      CKSWR          , , TEST FOR CHANGE IN SOFT-SWR
9230          050370      032777      040000      130542      1$      BIT      #BIT14,@SWR      , , LOOP ON PRESENT TEST?
9231          050376      001114      BNE          $OVER          , , YES IF SW14=1
9232          , , *****START OF CODE FOR THE XOR TESTER*****
9233          050400      000416      $XTSTR      BR          6$          , , IF RUNNING ON THE "XOR" TESTER CHANGE
9234          , , THIS INSTRUCTION TO A "NOP" (NOP=240)
9235          050402      013746      000004      MOV          @#ERRVEC, -(SP)      , , SAVE THE CONTENTS OF THE ERROR VECTOR
9236          050406      012737      050426      000004      MOV          #5$, @#ERRVEC      , , SET FOR TIMEOUT
9237          050414      005737      177060      TST          @#177060          , , TIME OUT ON XOR?
9238          050420      012637      000004      MOV          (SP)+, @#ERRVEC      , , RESTORE THE ERROR VECTOR
9239          050424      000463      BR          $SVLAD          , , GO TO THE NEXT TEST
9240          050426      022626      5$          CMP          (SP)+, (SP)+      , , CLEAR THE STACK AFTER A TIME OUT
9241          050430      012637      000004      MOV          (SP)+, @#ERRVEC      , , RESTORE THE ERROR VECTOR
9242          050434      000423      BR          7$          , , LOOP ON THE PRESENT TEST
9243          050436      6$          , , *****END OF CODE FOR THE XOR TESTER*****
9244          050436      032777      000400      130474      BIT          #BIT08,@SWR      , , LOOP ON SPEC TEST?
9245          050444      001404      BEQ          2$          , , BR IF NO
9246          050446      127737      130466      001102      CMPB        @SWR, $TSTNM      , , ON THE RIGHT TEST?      SWR<7 0>
9247          050454      001465      BEQ          $OVER          , , BR IF YES
9248          050456      105737      001103      2$          TSTB        $ERFLG          , , HAS AN ERROR OCCURRED?
9249          050462      001421      BEQ          3$          , , BR IF NO
9250          050464      123737      001115      001103      CMPB        $ERMAX, $ERFLG      , , MAX ERRORS FOR THIS TEST OCCURRED?
9251          050472      101015      BHI          3$          , , BR IF NO
9252          050474      032777      001000      130436      BIT          #BIT09,@SWR      , , LOOP ON ERROR?
9253          050502      001404      BEQ          4$          , , BR IF NO
9254          050504      013737      001110      001106      7$          MOV          $LPERR, $LPADR      , , SET LOOP ADDRESS TO LAST SCOPE
9255          050512      000446      BR          $OVER          , ,
9256          050514      105037      001103      4$          CLRB        $ERFLG          , , ZERO THE ERROR FLAG
9257          050520      005037      001174      CLR          $TIMES          , , CLEAR THE NUMBER OF ITERATIONS TO MAKE
9258          050524      000415      BR          1$          , , ESCAPE TO THE NEXT TEST
9259          050526      032777      004000      130404      3$          BIT          #BIT11,@SWR      , , INHIBIT ITERATIONS?
9260          050534      001011      BNE          1$          , , BR IF YES
9261          050536      005737      001216      TST          $PASS          , , IF FIRST PASS OF PROGRAM
9262          050542      001406      BEQ          1$          , , INHIBIT ITERATIONS
9263          050544      005237      001104      INC          $ICNT          , , INCREMENT ITERATION COUNT
9264          050550      023737      001174      001104      CMP          $TIMES, $ICNT      , , CHECK THE NUMBER OF ITERATIONS MADE
9265          050556      002024      BGE          $OVER          , , BR IF MORE ITERATION REQUIRED
9266          050560      012737      000001      001104      1$          MOV          #1, $ICNT          , , REINITIALIZE THE ITERATION COUNTER
9267          050566      013737      050644      001174      MOV          $MXCNT, $TIMES      , , SET NUMBER OF ITERATIONS TO DO
9268          050574      105237      001102      $SVLAD      INCB          $TSTNM          , , COUNT TEST NUMBERS
9269          050600      113737      001102      001214      MOVB       $TSTNM, $TESTN      , , SET TEST NUMBER IN APT MAILBOX
    
```

```
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 001115  MOVVB   #1, $ERMAX        ;; ONLY ALLOW ONE(1) ERROR ON NEXT TEST
9274 050630 013777 001102 130304 $OVER   MOV      $TSTNM, @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              $BTTL  ERROR HANDLER ROUTINE
9279
9280      ;; *****
9281      ;; *THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT.
9282      ;; *SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
9283      ;; *AND GO TO TYPERR ON ERROR
9284      ;; *THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE
9285      ;; *$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      $ERROR
9293 050646 104407      CKSWR              ;; TEST FOR CHANGE IN SOFT-SWR
9294 050650 105237 001103 7$      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      $TSTNM, @DISPLAY ;; DISPLAY TEST NUMBER AND ERROR FLAG
9297 050664 032777 002000 130246  BIT      #BIT10, @SWR    ;; BELL ON ERROR?
9298 050672 001402      BEQ      1$           ;; NO - SKIP
9299 050674 104401 001200      TYPE     , $BELL        ;; RING BELL
9300 050700 005237 001112 1$      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  MOVVB   @ $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 066736      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  MOVVB   $ITEMB, 21$     ;; 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      21$      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
9319 051002 104407      CKSWR              ;; TEST FOR CHANGE IN SOFT-SWP
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     $LPERR, (SP)    ;; FUDGE RETURN FOR LOOPING
9323 051020 005737 001176 4$      TST     $ESCAPE        ;; CHECK FOR AN ESCAPE ADDRESS
9324 051024 001402      BEQ     5$           ;; BR IF NONE
9325 051026 013716 001176      MOV     $ESCAPE, (SP)  ;; FUDGE RETURN ADDRESS FOR ESCAPE
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9326 051032          5$
9327 051032 022737 042772 000042      CMP    #SENDAD, @#42    ;,ACT-11 AUTO-ACCEPT?
9328 051040 001001          BNE    6$              ;,BRANCH IF NO
9329 051042 000000          HALT                   ;,YES
9330 051044          6$
9331 051044 000002          RTI                      ;,RETURN
9332          SBTTL   TYPE ROUTINE
9333
9334          ;,*****
9335          ;,*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE
9336          ;,*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED
9337          ;,*NOTE1          $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER
9338          ;,*NOTE2          $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED
9339          ;,*NOTE3          $FILLC CONTAINS THE CHARACTER TO FILL AFTER
9340          ;,*
9341          ;,*CALL
9342          ;,*1) USING A TRAP INSTRUCTION
9343          ;,*      TYPE      ,MESADR          ;,MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
9344          ;,*OR
9345          ;,*      TYPE
9346          ;,*      MESADR
9347          ;,*
9348
9349 051046 105737 001157      $TYPE  TSTB      $T$FLG    ;, 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      3$          ;,LEAVE
9353 051060 010046          1$      MOV      RD, -(SP)    ;,SAVE RD
9354 051062 017600 000002      MOV      @2(SP), RD    ;,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    #APTSPool, $ENVM ;,SPOOL MESSAGE TO APT
9358 051104 001405          BEQ    62$         ;,NO, GO CHECK FOR CONSOLE
9359 051106 010037 051116      MOV      RD, 61$     ;,SETUP MESSAGE ADDRESS FOR APT
9360 051112 004737 051562      JSR     PC, $ATY3    ;,SPOOL MESSAGE TO APT
9361 051116 000000          WORD   0           ;,MESSAGE ADDRESS
9362 051120 132737 000040 001231 62$      BITB    #APTC$UP, $ENVM ;,APT CONSOLE SUPPRESSED
9363 051126 001003          BNE    60$         ;,YES, SKIP TYPE OUT
9364 051130 112046          2$      MOVB    (RD)+, -(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)+, RD    ;,RESTORE RD
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$          ;,
9372 051154 122716 000200      CMPB    #CRLF, (SP)   ;,BRANCH IF NOT <CRLF>
9373 051160 001006          BNE    5$          ;,
9374 051162 005726          TST    (SP)+       ;,POP <CR><LF> EQUIV
9375 051164 104401          TYPE                   ;,TYPE A CR AND LF
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      5$      JSR     PC, $TYPEC    ;,GO TYPE THIS CHARACTER
9380 051202 123726 001156      6$      CMPB    $FILLC, (SP)+ ;,IS IT TIME FOR FILLER CHARS?
9381 051206 001350          2$      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$      MOV      #' ,(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      $TYPEC
9400 051266 116677 000002 127656  MOV      2(SP),@STPB      ;; LOAD CHAR TO BE TYPED INTO DATA REG
9401 051274 122766 000015 000002  CMPB      #CR,2(SP)      ;; IS CHARACTER A CARRIAGE RETURN?
9402 051302 001003                BNE      1$                ;; BRANCH IF NO
9403 051304 105037 051324      CLR      $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                                $TYPDS
9424                                MOV      R0,-(SP)      ;; PUSH R0 ON STACK
9425                                MOV      R1,-(SP)      ;; PUSH R1 ON STACK
9426                                MOV      R2,-(SP)      ;; PUSH R2 ON STACK
9427                                MOV      R3,-(SP)      ;; PUSH R3 ON STACK
9428                                MOV      R5,-(SP)      ;; PUSH R5 ON STACK
9429 051342 012746 020200      MOV      #20200,-(SP)    ;; SET BLANK SWITCH AND SIGN
9430 051346 016605 000020      MOV      20(SP),R5      ;; GET THE INPUT NUMBER
9431 051352 100004                BPL      1$                ;; BR IF INPUT IS POS
9432 051354 005405                NEG      R5                ;; MAKE THE BINARY NUMBER POS
9433 051356 112766 000055 000001  MOV      #'-,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      MOV      #' ,(R3)+      ;; SET THE FIRST CHARACTER TO A BLANK
9437 051376 005002                CLR      R2                ;; CLEAR THE BCD NUMBER

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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     ,SDBLK         ;;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
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 EPROP
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     #APTPOOL,$ENV  ;;SHOULD SPOOL MESSAGES?
9493 051630 001425      BEQ      3$              ;;IF NOT BR
    
```

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9494 051632 017600 000004      MOV    @4(SP),R0      ;; GET MESSAGE ADDR
9495 051636 062766 000002 000004  ADD    #2,4(SP)      ;; BUMP RETURN ADDR
9496 051644 005737 001210      TST    $MSGTYPE     ;; SEE IF DONE W/ LAST XMISSION?
9497 051650 001375              BNE    1$           ;; IF NOT: WAIT
9498 051652 010037 001224      MOV    R0,$MSGAD     ;; PUT ADDR IN MAILBOX
9499 051656 105720              TSTB   (R0)+        ;; FIND END OF MESSAGE
9500 051660 001376              BNE    2$           ;;
9501 051662 163700 001224      SUB    $MSGAD,R0     ;; SUB START OF MESSAGE
9502 051666 006200              ASR    R0           ;; GET MESSAGE LNGTH IN WORDS
9503 051670 010037 001226      MOV    R0,$MSGLGT   ;; PUT LENGTH IN MAILBOX
9504 051674 012737 000004 001210  MOV    #4,$MSGTYPE   ;; TELL APT TO TAKE MSG.
9505 051702 000413              BR     5$           ;;
9506 051704 017637 000004 051730 3$  MOV    @4(SP),4$     ;; PUT MSG ADDR IN JSR LINKAGE
9507 051712 062766 000002 000004  ADD    #2,4(SP)      ;; BUMP RETURN ADDRESS
9508 051720 013746 177776      MOV    177776,-(SP) ;; PUSH 177776 ON STACK
9509 051724 004737 051046      JSR    PC,$TYPE     ;; CALL TYPE MACRO
9510 051730 000000              WORD  0
9511 051732              4$
9512 051732 105737 052020      5$
10$  TSTB   $FFLG        ;; SHOULD REPORT FATAL ERPOR?
9513 051736 001416              BEQ    12$         ;; 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 001212  MOV    @4(SP),$FATAL ;; GET ERROR #
9519 051762 062766 000002 000004  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      ;; *$TYPON---ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
    
```



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9550      ,*STYPOS OR STYPOC
9551      ,*CAL'
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      @ (SP),-(SP)      ;;PICKUP THE MODE
9561      052026  116637  000001      052245  MOVB     1(SP),%OFILL      ;;LOAD ZERO FILL SWITCH
9562      052034  112637  052247      MOVB     (SP)+,%OMODE+1    ;;NUMBER OF DIGITS TO TYPE
9563      052040  062716  000002      ADD      #2,(SP)          ;;ADJUST RETURN ADDRESS
9564      052044  000406      BR       $TYPON
9565      052046  112737  000001      052245  STYPOC. MOVB     #1,%OFILL      ;;SET THE ZERO FILL SWITCH
9566      052054  112737  000006      052247  MOVB     #6,%OMODE+1      ;;SET FOR SIX(6) DIGITS
9567      052062  112737  000005      052244  STYPON. MOVB     #5,%OCNT      ;;SET THE ITERATION COUNT
9568      052070  010346      MOV      R3,-(SP)         ;;SAVE R3
9569      052072  010446      MOV      R4,-(SP)         ;;SAVE R4
9570      052074  010546      MOV      R5,-(SP)         ;;SAVE R5
9571      052076  113704  052247      MOVB     %OMODE+1,R4      ;;GET THE NUMBER OF DIGITS TO TYPE
9572      052102  005404      NEG      R4
9573      052104  062704  000006      ADD      #6,R4           ;;SUBTRACT IT FOR MAX ALLOWED
9574      052110  110437  052246      MOVB     R4,%OMODE        ;;SAVE IT FOR USE
9575      052114  113704  052245      MOVB     %OFILL,R4        ;;GET THE ZERO FILL SWITCH
9576      052120  016605  000012      MOV      12(SP),R5        ;;PICKUP THE INPUT NUMBER
9577      052124  005003      CLR      R3              ;;CLEAR THE OUTPUT WORD
9578      052126  006105      1$      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      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      5$      BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
9594      052176  110337  052242      MOVB     R3,8$          ;;SAVE FOR TYPING
9595      052202  104401  05224_      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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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          $TKQSR:  BLKB 1 ;,TTY KEYBOARD QUEUE
9620          $TKQEND=.
9621          EVEN
9622
9623          ;*TK INITIALIZE ROUTINE
9624          ;*THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
9625          ;*SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT
9626          ;
9627          ;*CALL
9628          ;* JSR PC,$TKINT
9629          ;* RETURN
9630          ;
9631 052260 005037 052250          $TKINT CLR $TKCNT ;,CLEAR COUNT OF ITEMS IN QUEUE
9632 052264 012737 052256 052252          MOV #,$TKQSR,$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 012737 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          2$
9661 052402 022737 000001 052250          CMP #1,$TKCNT ;,IS THE QUEUE FULL?
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9662 052410 001004 BNE 3$ ;, BRANCH IF NO
9663 052412 104401 001200 TYPE , $BELL ;, RING THE TTY BELL
9664 052416 005726 TST (SP)+ ;, CLEAN CHARACTER OFF OF STACK
9665 052420 000451 BR 5$ ;, 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 # (177, (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 STKCNT ;, 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 STKQIN ;, UPDATE THE POINTER
9686 052526 023727 052252 052257 CMP STKQIN, #STKQEND ;, GO OFF THE END?
9687 052534 001003 BNE 5$ ;, BRANCH IF NO
9688 052536 012737 052256 052252 MOV #STKQSR, STKQIN ;, 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 # (177, (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, STKINT ;, 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 , $CNTLG ;, ECHO THE CONTROL-G ( G
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Address	Hex 1	Hex 2	Hex 3	Hex 4	Label	Op	Op Arg 1	Op Arg 2	Comments
9718	052636	104401	053475		SGTSWR	TYPE	, \$MSWR		:: TYPE CURRENT CONTENTS
9719	052642	013746	000176			MOV	SWREG, -(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	@\$TKS		:: CHAR THERE?
9725	052664	100375				BPL	7\$:: IF NOT TRY AGAIN
9726									
9727	052666	117746	126254			MOVB	@\$TKB, -(SP)		:: PICK UP CHAR
9728	052672	042716	177600			BIC	# C177, (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	126214		MOV	#100, @\$TKS		:: 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, @\$TKS		:: 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 > ??
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          ,,*XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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          SRDCHR  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      #645, -(SP)  ,,*PUT NEW PC ON STACK
9790 053132 000002          RTI          ,,*POP NEW PC AND PS
9791 053134          645
9792 053134 005737 052250          15      TST      STKCNT    ,,*WAIT ON A CHARACTER
9793 053140 001775          BEQ      15
9794 053142 005337 052250          DEC      STKCNT    ,,*DECREMENT THE COUNTER
9795 053146 117766 177102 000004          MOVB    @STKQOUT,4(SP) ,,*GET ONE CHARACTER
9796 053154 005237 052254          INC      STKQOUT    ,,*UPDATE THE POINTER
9797 053160 023727 052254 052257          CMP      STKQOUT,#STKQEND ,,*DID IT GO OFF OF THE END?
9798 053166 001003          BNE      25        ,,*BRANCH IF NO
9799 053170 012737 052256 052254          MOV      #STKQSR,STKQOUT ,,*RESET THE POINTER
9800 053176 000002          25      RTI          ,,*RETURN
9801          ,,*XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
9802          ,*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
9803          ,*CALL
9804          ,*      RDLIN          ,,*INPUT A STRING FROM THE TTY
9805          ,*      RETURN HERE    ,,*ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
9806          ,*                    ,,*TERMINATOR WILL BE A BYTE OF ALL 0'S
9807
9808 053200 010346          SRDLIN  MOV      R3, -(SP)    ,,*SAVE R3
9809 053202 005046          CLR      -(SP)      ,,*CLEAR THE RUBOUT KEY
9810 053204 012703 053434          15      MOV      #TTYIN,R3    ,,*GET ADDRESS
9811 053210 022703 053456          25      CMP      #TTYIN+22,R3  ,,*BUFFER FULL?
9812 053214 101456          BLOS    45          ,,*BR IF YES
9813 053216 104410          RDCHR   ,,*GO READ ONE CHARACTER FROM THE TTY
9814 053220 112613          MOVB    (SP)+,(R3)   ,,*GET CHARACTER
9815 053222 122713 000177          105     CMPB    #177,(R3)    ,,*IS IT A RUBOUT
9816 053226 001022          BNE     55          ,,*BR IF NO
9817 053230 005716          TST     (SP)        ,,*IS THIS THE FIRST RUBOUT?
9818 053232 001007          BNE     65          ,,*BR IF NO
9819 053234 112737 000134 053432          MOVB    #' ,95      ,,*TYPE A BACK SLASH
9820 053242 104401 053432          TYPE    ,95
9821 053246 012716 177777          MOV     #-1,(SP)    ,,*SET THE RUBOUT KEY
9822 053252 005303          65     DEC     R3        ,,*BACKUP BY ONE
9823 053254 020327 053434          CMP     R3,#TTYIN   ,,*STACK EMPTY?
9824 053260 103434          BLO    45          ,,*BR IF YES
9825 053262 111337 053432          MOVB    (R3),95     ,,*SETUP TO TYPEOUT THE DELETED CHAR
9826 053266 104401 053432          TYPE    ,95        ,,*GO TYPE
9827 053272 006746          BR     25          ,,*GO READ ANOTHER CHAR
9828 053274 005716          55     TST     (SP)        ,,*RUBOUT KEY SET?
9829 053276 001406          BEQ    75          ,,*BR IF NO
    
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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    ,%CRLF     ..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
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  ASCIIZ / C/<15><12> ..CONTROL "C"
9861 053463 0136 006525 000012  $CNTLU  ASCIIZ / U/<15><12> ..CONTROL "U"
9862 053470 043536 005015 000      $CNTLG  ASCIIZ / G/<15><12> ..CONTROL "G"
9863 053475 015 051412 051127  $MSWR   ASCIIZ <15><12>/SWR = /
9864 053502 036440 000040
9865 053506 020040 042516 020127  $MNEW   ASCIIZ / NEW = /
9866 053514 020075 000
9867 053520      EVEN
9868      SBTTL  READ AN OCTAL NUMBER FROM THE TTY
9869
9870      ..*****
9871      ..*THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
9872      ..*CHANGE IT TO BINARY
9873      ..*THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
9874      ..*OCTAL DIGITS IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
9875      ..*FOLLOWED BY A CARRIAGE RETURN-LINE FEED THE COMPLETE NUMBER MUST
9876      ..*THEN BE RETYPED THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN
9877      ..*CALL
9878      ..*      RDOCT      ..READ AN OCTAL NUMBER
9879      ..*      RETURN HERE ..LOW ORDER BITS ARE ON TOP OF THE STACK
9880      ..*      ..HIGH ORDER BITS ARE IN $HIOCT
9881
9882 053520 011646 000004 000002  $RDOCT  MOV     (SP),-(SP) ..PROVIDE SPACE FOR THE
9883 053522 016666 000004 000002      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

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9886 053534 010246          MOV     R2, -(SP)          ;; PUSH R2 ON STACK
9887 053536 104411          RDLIN          ;; READ AN ASCIZ LINE
9888 053540 012600          MOV     (SP)+, R0        ;; GET ADDRESS OF 1ST CHARACTER
9889 053542 010037 053646      MOV     R0, 5$          ;; AND SAVE IT
9890 053546 005001          CLR     R1              ;; CLEAR DATA WORD
9891 053550 005002          CLR     R2
9892 053552 112046          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          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          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          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          ;; *THIS ROUTINE WILL CONVERT A 32-BIT UNSIGNED BINARY NUMBER TO AN
9925          ;; *UNSIGNED OCTAL ASCIZ NUMBER
9926          ;; *CALL
9927          ;; * MOV     #PNTR, -(SP)          ;; POINTER TO LOW WORD OF BINARY NUMBER
9928          ;; * JSR     PC, @#$0B20        ;; CALL THE ROUTINE
9929          ;; * RETURN          ;; THE ADDRESS OF THE FIRST ASCIZ CHAR IS ON THE STACK
9930
9931
9932 053660 104413          $0B20 SAVREG          ;; SAVE ALL REGISTERS
9933 053662 016601 000002      MOV     2(SP), R1      ;; PICKUP THE POINTER TO LOW WORD
9934 053666 012705 053777      MOV     #$OCTVL+13, R5 ;; POINTER 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          MOVB   R2, -(R5)       ;; PUT CHARACTER IN DATA TABLE
9941 053712 010002          MOV     R0, R2        ;; GET THIS DIGIT
    
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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)    ..ASCIZ 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 000060   BIC      R3,R2          ..MASK OUT ALL JUNK
9957 053754 062702          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,@#SDB2D
9969          ..*      RETURN                    ..THE FIRST ADDRESS OF ASCII
9970          ..*      IS ON THE STACK
9971
9972
9973 054000 104413          $CB2D  SAVREG                    ..SAVE REGISTERS
9974 054002 016602 000002   MOV      2(SP),R2    ..PICKUP THE DATA POINTER
9975 054006 012700 054160   MOV      #SDECVL,R0  ..GET ADDRESS OF "SDECVL" STRING
9976 054012 010066 000002   MOV      R0,2(SP)    ..PUT ADDRESS OF ASCII STRING ON STACK
9977 054016 012201          MOV      (R2)+,R1    ..PICKUP THE BINARY NUMBER
9978 054020 012202          MOV      (R2)+,R2
9979 054022 012737 000012 054076   MOV      #10,R4      ..SET UP TO DO 10 CONVERSIONS
9980 054030 012704 054110   MOV      #STNPNW,R4  ..ADDRESS OF TEN POWER
9981 054034 012705 054112   MOV      #STNPNW+2,R5
9982 054040 005003          1$      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 TOO 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   BIS      #'0,R3      ..CHANGE PARTIAL TO ASCII
9994 054072 110320          MOVW    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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9998 054102 105020          CLRB      (R0)+      ,, TERMINATOR
9999 054104 104414          RESREG                     ,, RESTORE REGISTERS
10000 054106 000207          RTS        PC        ,, RETURN
10001 054110 145000          $TNPWR 145000         ,, 1 OE09
10002 054112 035632          35632
10003 054114 160400          160400         ,, 1 OE08
10004 054116 002765          2765
10005 054120 113200          113200         ,, 1 OE07
10006 054122 000230          230
10007 054124 041100          041100         ,, 1 OE06
10008 054126 000017          17
10009 054130 103240          103240         ,, 1 OE05
10010 054132 000001          1
10011 054134 023420          23420         ,, 1 OE04
10012 054136 000000          0
10013 054140 001750          1750         ,, 1 OE03
10014 054142 000000          0
10015 054144 000144          144         ,, 1 OE02
10016 054146 000000          0
10017 054150 000012          12         ,, 1 OE01
10018 054152 000000          0
10019 054154 000001          1         ,, 1 OE00
10020 054156 000000          0
10021 054160 000014          $DECVL  BLKB  12      ,, RESERVE STORAGE FOR ASCIZ STRING
10022          SBTTL  SINGLE LENGTH BINARY TO DECIMAL ASCII ROUTINE
10023
10024          ,, *****
10025          *THIS ROUTINE WILL CONVERT A 16-BIT UNSIGNED BINARY NUMBER TO AN
10026          *UNSIGNED DECIMAL ASCII NUMBER
10027          *CALL
10028          *      MOV      NUMBER, -(SP)      ,, PUT BINARY NUMBER ON THE STACK
10029          *      JSR      PC, @#$SB2D        ,, CALL
10030          *      RETURN                      ,, ADDRESS OF THE 1ST ASCII CHAR IS ON THE STACK
10031
10032
10033 054174 016637 000002 054224  $SB2D  MOV      2(SP), 1$      ,, SAVE BINARY NUMBER
10034 054202 012746 054224          MOV      #1$, -(SP)    ,, SET POINTER
10035 054206 004737 054000          JSR      PC, @#$DB2D   ,, CALL DOUBLE LENGTH CONVERT
10036 054212 062716 000005          ADD      #5, (SP)      ,, ONLY ALLOW FIVE CHARACTERS
10037 054216 012666 000002          MOV      (SP)+, 2(SP)  ,, PICKUP POINTER
10038 054222 000207          RTS        PC        ,, RETURN
10039 054224 000000 000000          1$      WORD  0, 0
10040          SBTTL  TYPE NUMERICAL ASCII STRING SUPPRESS LEADING ZEROS
10041
10042          ,, *****
10043          *THIS ROUTINE IS USED TO TYPE AN ASCII NUMBER SUPPRESSING THE
10044          *LEADING NUMBERS
10045          *CALL
10046          *      MOV      #NUMADR, -(SP)      ,, FIRST ADDRESS OF ASCII STRING
10047          *      JSR      PC, @#$SUPRS
10048
10049
10050          $SUPRS  MOV      R0, -(SP)          ,, SAVE R0
10051 054232 016600 000004          MOV      4(SP), R0     ,, PICKUP THE POINTER
10052 054236 105710          1$      TSTB      (R0)      ,, TERMINATEOR?
10053 054240 001403          BEQ      2$           ,, BR IF YES

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10054 054242 122720 000060          CMPB  #'0,(RO)+      ;; IS THIS AN ASCII '0' ?
10055 054246 001773                BEQ   1$             ;; BR IF YES
10056 054250 005300          2$   DEC  RO        ;; BACKUP BY "1"
10057 054252 010037 054260          MOV  RO,3$         ;; SAVE FOR TYPING
10058 054256 104401                TYPE                ;; GO TYPE
10059 054260 000000          3$   .WORD 0        ;; ASCIZ POINTER GOES HERE
10060 054262 012600          MOV  (SP)+,RO      ;; RESTORE RO
10061 054264 012616          MOV  (SP)+,(SP)    ;; RESTORE THE STACK
10062 054266 000207          RTS   PC           ;; RETURN
10063          SBTTL  INTEGER MULTIPLY ROUTINE
10064
10065          ;; *****
10066          ;*CALL
10067          ;*   MOV   MULTIPLER,-(SP)
10068          ;*   MOV   MULTIPLICAND,-(SP)
10069          ;*   JSR   PC,@#$MULT
10070          ;*   RETURN  ;; PRODUCT IS ON THE STACK
10071          ;*
10072          ;*   STACK  PRODUCT
10073          ;*   -----
10074          ;*   TOP    LSB'S
10075          ;*   +2     MSB'S
10076
10077          $MULT
10078 054270 010046          MOV  RO,-(SP)      ;; PUSH RO ON STACK
10079 054272 010146          MOV  R1,-(SP)      ;; PUSH R1 ON STACK
10080 054274 010246          MOV  R2,-(SP)      ;; PUSH R2 ON STACK
10081 054276 005046          CLR  -(SP)         ;; CLEAR THE SIGN KEY
10082 054300 016601 000012          MOV  12(SP),R1     ;; GET THE MULTIPLICAND
10083 054304 100002          BPL  1$            ;; BR IF PLUS
10084 054306 005216          INC  (SP)          ;; SET THE SIGN KEY
10085 054310 005401          NEG  R1            ;; MAKE THE MULTIPLICAND POSTIVE
10086 054312 016602 000014          1$   MOV  14(SP),R2  ;; GET THE MULTIPLIER
10087 054316 100002          BPL  2$            ;; BR IF PLUS
10088 054320 005316          DEC  (SP)          ;; UPDATE THE SIGN KEY
10089 054322 005402          NEG  R2            ;; MAKE THE MULTIPLIER POSTIVE
10090 054324 012746 000021          2$   MOV  #17,-(SP)  ;; SET THE LOOP COUNT
10091 054330 005000          CLR  RO            ;; SETUP FOR THE MULTIPLY LOOP
10092 054332 103001          3$   BCC  4$         ;; DON'T ADD IF MULTIPLICAND = 0
10093 054334 060200          ADD  R2,RO
10094 054336 006000          4$   ROR  RO        ;; POSITION THE PARITIAL PRODUCT AND
10095 054340 006001          ROR  R1            ;; THE MULTIPLICAND
10096 054342 005316          DEC  (SP)          ;; HAS ALL BITS OF THE MULTIPLICAND BEEN DONE?
10097 054344 001372          BNE  3$            ;; BR IF NO
10098 054346 022616          CMP  (SP)+,(SP)    ;; SHOULD PRODUCT BE NEGATIVE?
10099 054350 001403          BEQ  5$            ;; GO TO EXIT IF NO
10100 054352 005400          NEG  RO            ;; YES--SO MAKE IT SO
10101 054354 005401          NEG  R1
10102 054356 005600          SBC  RO
10103 054360 005726          5$   TST  (SP)+        ;; CLEAR SIGN INFO OFF OF STACK
10104 054362 010066 000012          MOV  RO,12(SP)     ;; PUT THE PRODUCT ON THE STACY (MSB'S)
10105 054366 010166 000010          MOV  R1,10(SP)     ;; LSB'S
10106 054372 012602          MOV  (SP)+,R2      ;; POP STACK INTO R2
10107 054374 012601          MOV  (SP)+,R1      ;; POP STACK INTO R1
10108 054376 012600          MOV  (SP)+,RO      ;; POP STACK INTO RO
10109 054400 000207          RTS   PC

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10110          SBTTL  SAVE AND RESTORE RO-R5 ROUTINES
10111
10112          ,, *****
10113          ,*SAVE RO-R5
10114          ,*CALL
10115          ,*   SAVREG
10116          ;*UPON RETURN FROM $$SAVREG THE STACK WILL LOOK LIKE
10117          ,*
10118          ,*TOP---(+16)
10119          ,* +2---(+18)
10120          ,* +4---R5
10121          ,* +6---R4
10122          ,* +8---R3
10123          ,*+10---R2
10124          ,*+12---R1
10125          ,*+14---R0
10126
10127          $$SAVREG
10128          054402 010046      MOV      RO, -(SP)          ;; PUSH RO ON STACK
10129          054404 010146      MOV      R1, -(SP)          ;; PUSH R1 ON STACK
10130          054406 010246      MOV      R2, -(SP)          ;; PUSH R2 ON STACK
10131          054410 010346      MOV      R3, -(SP)          ;; PUSH R3 ON STACK
10132          054412 010446      MOV      R4, -(SP)          ;; PUSH R4 ON STACK
10133          054414 010546      MOV      R5, -(SP)          ;; PUSH R5 ON STACK
10134          054416 016646 000022 MOV      22(SP), -(SP)      ;; SAVE PS OF MAIN FLOW
10135          054422 016646 000022 MOV      22(SP), -(SP)      ;; SAVE PC OF MAIN FLOW
10136          054426 016646 000022 MOV      22(SP), -(SP)      ;; SAVE PS OF CALL
10137          054432 016646 000022 MOV      22(SP), -(SP)      ;; SAVE PC OF CALL
10138          054436 000002      RTI
10139
10140          ,*RESTORE RO-R5
10141          ,*CALL
10142          ,*   RESREG
10143          054440          $$RESREG
10144          054440 012666 000022 MOV      (SP)+, 22(SP)      ;; RESTORE PC OF CALL
10145          054444 012666 000022 MOV      (SP)+, 22(SP)      ;; RESTORE PS OF CALL
10146          054450 012666 000022 MOV      (SP)+, 22(SP)      ;; RESTORE PC OF MAIN FLOW
10147          054454 012666 000022 MOV      (SP)+, 22(SP)      ;; RESTORE PS OF MAIN FLOW
10148          054460 012605      MOV      (SP)+, R5          ;; POP STACK INTO R5
10149          054462 012604      MOV      (SP)+, R4          ;; POP STACK INTO R4
10150          054464 012603      MOV      (SP)+, R3          ;; POP STACK INTO R3
10151          054466 012602      MOV      (SP)+, R2          ;; POP STACK INTO R2
10152          054470 012601      MOV      (SP)+, R1          ;; POP STACK INTO R1
10153          054472 012600      MOV      (SP)+, R0          ;; POP STACK INTO R0
10154          054474 000002      RTI
10155          SBTTL  TRAP DECODER
10156
10157          ,, *****
10158          ,*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
10159          ,*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
10160          ,*OF THE DESIRED ROUTINE THEN USING THE ADDRESS OBTAINED IT WILL
10161          ,*GO TO THAT ROUTINE
10162
10163          054476 010046          $TRAP  MOV      RO, -(SP)          ;; SAVE RO
10164          054500 016600 000002 MOV      2(SP), RO          ;; GET TRAP ADDRESS
10165          054504 005740          TST      -(RO)              ;; BACKJP BY 2
    
```

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10166 054506 111000          MOVB   (RO),RO          ;;GET RIGHT BYTE OF TRAP
10167 054510 006300          ASL    RO              ;;POSITION FOR INDEXING
10168 054512 016000 054532  MOV    $TRPAD(RO),RO   ;;INDEX TO TABLE
10169 054516 000200          RTS    RO              ;;GO TO ROUTINE
10170
10171
10172                      ;; THIS IS USE TO HANDLE THE "GETPRI" MACRO
10173
10174 054520 011646          $TRAP2 MOV   (SP),-(SP)  ;;MOVE THE PC DOWN
10175 054522 016666 000004 000002  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          $TRPAD  WORD   $TRAP2
10186 054534 051046          STYPE   ; CALL=TYPE   TRAP+1(104401) TTY TYPEOUT ROUTINE
10187 054536 052046          STYPOC ;; CALL=TYPOC  TRAP+2(104402) TYPE OCTAL NUMBER (WITH LEADING ZEROS)
10188 054540 052022          STYPOS ;; CALL=TYPOS  TRAP+3(104403) TYPE OCTAL NUMBER (NO LEADING ZEROS)
10189 054542 052062          STYPON ;; CALL=TYPON  TRAP+4(104404) TYPE OCTAL NUMBER (AS PER LAST CALL)
10190 054544 051330          STYPDS ;; 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
    
```

Address	Hex 1	Hex 2	Hex 3	Hex 4	Text
10202					
10203					SBTTL SERVICE MESSAGES
10204					
10205	054566	005015	047125	041111	MSG1 ASCII <CR><LF>/UNIBUS RK06-RK07 DUAL PORT DRIVE DIAGNOSTIC/
10206	054574	051525	051040	030113	
10207	054602	026466	045522	033460	
10208	054610	042040	040525	020114	
10209	054616	047520	052122	042040	
10210	054624	044522	042526	042040	
10211	054632	040511	047107	051517	
10212	054640	044524	103		
10213	054643	015	046412	044501	ASCII <CR><LF>/MAINDEC-11-CZR6G-A-PB/<CR><LF>
10214	054650	042116	041505	030455	
10215	054656	026461	055104	033122	
10216	054664	026507	026501	041120	
10217	054672	005015			
10218	054674	005015	025011	025052	ASCII <CR><LF>/ ***** CAUTION *****/<CR><LF>
10219	054702	025052	041440	052501	
10220	054710	044524	047117	025040	
10221	054716	025052	025052	005015	
10222	054724	005015	044124	051511	ASCII <CR><LF>/THIS PROGRAM SHOULD BE HALTED ONLY BY TYPING CONTROL-C/
10223	054732	050040	047522	051107	
10224	054740	046501	051440	047510	
10225	054746	046125	020104	041040	
10226	054754	020105	040510	052114	
10227	054762	042105	047140	046116	
10228	054770	020131	054502	052040	
10229	054776	050131	047111	020107	
10230	055004	047503	052116	047522	
10231	055012	026514	103		
10232	055015	015	047412	044124	ASCII <CR><LF>/OTHERWISE. CAPTRIDGE FORMATTING AND, OR THE DRIVE/
10233	055022	051105	044527	042523	
10234	055030	020054	040503	052122	
10235	055036	044522	043504	020105	
10236	055044	047506	046522	052101	
10237	055052	044524	043516	040440	
10238	055060	042116	020054	051117	
10239	055066	042040	042510	042040	
10240	055074	044522	042526		
10241	055100	005015	040515	020131	ASCII <CR><LF>/MAY BE LEFT IN AN UNDETERMINED STATE/
10242	055106	042502	046040	043105	
10243	055114	020124	047111	040440	
10244	055122	020116	047125	042504	
10245	055130	042524	046522	047111	
10246	055136	042105	051440	040524	
10247	055144	042524			
10248	055146	005015	047111	052111	ASCII <CR><LF>/INITIALLY DRIVES TO BE TESTED SHOULD HAVE /<CR><LF>
10249	055154	040511	046114	026131	
10250	055162	042040	044522	042526	
10251	055170	020123	047524	041040	
10252	055176	020105	042524	052123	
10253	055204	042105	051440	047510	
10254	055212	046125	020104	040510	
10255	055220	042526	006472	012	
10256	055225	015	040412	020056	ASCII <CR><LF>/A EVEN NUMBERED UNIT SELECT PLUGS ONLY
10257	055232	053105	047105	047040	

10258	055240	046525	042502	042522	
10259	055246	020104	047125	052111	
10260	055254	051440	046105	041505	
10261	055262	020124	046120	043525	
10262	055270	020123	047117	054514	
10263	055276	005015	027102	044040	ASCII <CR><LF>/B HEADS MANUALLY LOADED/
10264	055304	040505	051504	046440	
10265	055312	047101	040525	046114	
10266	055320	020131	047514	042101	
10267	055326	042105			
10268	055330	005015	027103	041040	ASCII <CR><LF>/C BOTH PORTS SELECTED/
10269	055336	052117	020110	047520	
10270	055344	052122	020123	042523	
10271	055352	042514	052103	042105	
10272	055360	005015	027104	042040	ASCII <CR><LF>/D DUAL PORT TEST SWITCH ENABLED/
10273	055366	040525	020114	047520	
10274	055374	052122	052040	051505	
10275	055402	020124	053523	052111	
10276	055410	044103	042440	040516	
10277	055416	046102	042105		
10278	055422	005015	027105	053440	ASCII <CR><LF>/E WRITE LOCK DISABLED/
10279	055430	044522	042524	046040	
10280	055436	041517	020113	044504	
10281	055444	040523	046102	042105	
10282	055452	005015	027106	042040	ASCII <CR><LF>/F DRIVE READY INDICATOR ON/<CR><LF>
10283	055460	044522	042526	051040	
10284	055466	040505	044504	044440	
10285	055474	042116	041511	052101	
10286	055502	051117	047440	006516	
10287	055510	012			
10288	055511	015	042012	044522	ASCII <CR><LF>/DRIVES NOT TO BE TESTED MUST HAVE/
10289	055516	042526	020123	047516	
10290	055524	020124	047524	041040	
10291	055532	020105	042524	052123	
10292	055540	042105	046440	051525	
10293	055546	020124	040510	042526	
10294	055554	005015	047502	044124	ASCII <CR><LF>/BOTH PORTS DESELECTED/<CR><LF>
10295	055562	050040	051117	051524	
10296	055570	042040	051505	046105	
10297	055576	041505	042524	006504	
10298	055604	012			
10299	055605	015	042012	051511	ASCII <CR><LF>/DISABLE DUAL PORT TEST SWITCH ON DUAL PORT MODULE/
10300	055612	041101	042514	042040	
10301	055620	040525	020114	047520	
10302	055626	052122	052040	051505	
10303	055634	020124	053523	052111	
10304	055642	044103	047440	020116	
10305	055650	052504	046101	050040	
10306	055656	051117	020124	047515	
10307	055664	052504	042514		
10308	055670	005015	042502	047506	ASCII <CR><LF>/BEFORE PROCEEDING TO ANY OTHER PROGRAM /CP LF
10309	055676	042522	050040	047522	
10310	055704	042503	042105	047111	
10311	055712	020107	047524	040440	
10312	055720	054516	047440	044124	
10313	055726	051105	050040	047522	

10314	055734	051107	046501	005015		
10315	055742	000				
10316	055743	015	041012	020105	MSG2	ASCIZ <CR><LF>/BE SURE TO PUT SCRATCH PACK IN DRIVE 0/
10317	055750	052523	042522	052040		
10318	055756	020117	052520	020124		
10319	055764	041523	040522	041524		
10320	055772	020110	040520	045503		
10321	056000	044440	020116	051:04		
10322	056006	053111	020105	000060		
10323	056014	005015	051:04	053111	MSG3	ASCIZ <CR><LF>/DRIVE(S) TO BE TESTED (EVEN NOS ONLY) /
10324	056022	024105	024523	052040		
10325	056030	020117	042502	052040		
10326	056036	051505	042524	020104		
10327	056044	042450	042526	020116		
10328	056052	047516	027123	047440		
10329	056060	046116	024531	020072		
10330	056066	000				
10331	056067	015	041012	051525	MSG4	ASCIZ <CR><LF>/BUSS ADDRESS (177440) /
10332	056074	020123	042101	051104		
10333	056102	051505	020123	030450		
10334	056110	033467	032064	024460		
10335	056116	020072	000			
10336	056121	015	041412	047117	MSG5	ASCIZ <CR><LF>/CONTROLLER INTEPRUPT VECTOR (210)
10337	056126	051124	046117	042514		
10338	056134	020122	047111	042524		
10339	056142	051122	050125	020124		
10340	056150	042526	052103	051117		
10341	056156	024040	030462	024460		
10342	056164	020072	000			
10343	056167	015	044412	052116	MSG6	ASCIZ <CR><LF>/INTERRUPT OCCURRED AT PC=
10344	056174	051105	052522	052120		
10345	056202	047440	041503	051125		
10346	056210	042522	020104	052101		
10347	056216	050040	036503	000		
10348	056223	015	042012	044522	MSG7	ASCIZ <CR><LF>/DRIVE 0 WILL NOT BE TESTED
10349	056230	042526	030040	053440		
10350	056236	046111	020114	047516		
10351	056244	020124	042502	052040		
10352	056252	051505	042524	000104		
10353	056260	005015	005015	046101	MSG8	ASCIZ <CR><LF><CR><LF>/ALL DRIVES TESTED<CR><LF><LF>
10354	056266	020114	051104	053111		
10355	056274	051505	052040	051505		
10356	056302	042524	006504	005012		
10357	056310	000				
10358	056311	015	005012	044527	MSG10	ASCIZ <CR><LF><LF>/WILL TEST DRIVES /
10359	056316	046114	052040	051505		
10360	056324	020124	051104	053111		
10361	056332	051505	000072			
10362	056336	005015	050012	053517	MSG11	ASCIZ <CR><LF><LF>/POWER UP RESTART TO TEST 1<CR><LF>
10363	056344	051105	052440	020120		
10364	056352	042522	052123	051101		
10365	056360	020124	047524	052040		
10366	056366	051505	020124	006461		
10367	056374	000012				
10368	056376	005015	047516	046040	MSG13	ASCIZ <CR><LF>/NO L OR P CLOCKS PRESENT.
10369	056404	047440	020122	020120		

10370	056412	046103	041517	051513		
10371	056420	050040	042522	042523		
10372	056426	052116				
10373	056430	005015	046101	020114		ASCIZ <CR><LF>/ALL TESTS BYPASSED/
10374	056436	042524	052123	020123		
10375	056444	054502	040520	051523		
10376	056452	042105	000			
10377	056455	015	041012	050131	MSG14	ASCIZ <CR><LF>/BYPASSING DRIVE /
10378	056462	051501	044523	043516		
10379	056470	042040	044522	042526		
10380	056476	000040				
10381	056500	005015	042012	044522	MSG15	ASCIZ <CR><LF><LF>/DRIVE /
10382	056506	042526	000040			
10383	056512	005015	042012	044522	MSG16	ASCIZ <CR><LF><LF>/DRIVE SERIAL NO /
10384	056520	042526	051440	051105		
10385	056526	040511	020114	047516		
10386	056534	020056	000			
10387	056537	015	041412	051101	MSG17	ASCIZ <CR><LF>/CARTRIDGE SERIAL NO /
10388	056544	051124	042111	042507		
10389	056552	051440	051105	040511		
10390	056560	020114	047516	020056		
10391	056566	000				
10392	056567	015	050012	051117	MSG19	ASCII <CR><LF>/PORT /
10393	056574	020124				
10394	056576	006440	000012		MSG19A	ASCIZ / /<CR><LF>
10395	056602	005015	047520	052122	MSG20	ASCIZ <CR><LF>/PORT A TIMEOUT /
10396	056610	040440	052040	046511		
10397	056616	047505	052125	020072		
10398	056624	000				
10399	056625	015	040412	047502	MSG21	ASCIZ <CR><LF>/ABORTING BALANCE OF TESTS/<CR><LF>
10400	056632	052122	047111	020107		
10401	056640	040502	040514	041516		
10402	056646	020105	043117	052040		
10403	056654	051505	051524	005015		
10404	056662	000				
10405	056663	040	051515	000	MSG22	ASCIZ / MS/
10406	056667	015	050012	051117	MSG23	ASCIZ <CR><LF>/PORT B TIMEOUT /
10407	056674	020124	020102	044524		
10408	056702	042515	052517	035124		
10409	056710	000040				
10410	056712	005015	051120	043517	MSG74	ASCIZ <CR><LF>/PROGRAM ABORT PENDING PLEASE WAIT/
10411	056720	040522	020115	041101		
10412	056726	051117	020124	042520		
10413	056734	042116	047111	027107		
10414	056742	027056	046120	040505		
10415	056750	042523	053440	044501		
10416	056756	000124				
10417	056760	005015	040510	052114	MSG75	ASCIZ <CR><LF>/HALT PENDING. PLEASE WAIT/
10418	056766	050040	047105	044504		
10419	056774	043516	027056	050056		
10420	057002	042514	051501	020105		
10421	057010	040527	052111	000		
10422	057015	015	050012	047522	MSG76	ASCIZ <CR><LF>/PROGRAM ABORTED/
10423	057022	051107	046501	040440		
10424	057030	047502	052122	042105		
10425	057036	000				

10426	057037	015	041412	052520	MSG77	ASCIZ	<CR><LF>/CPU HALTED/
10427	057044	044040	046101	042524			
10428	057052	000104					
10429							
10430					SBTTL	ERROR MESSAGES	
10431							
10432	057054	005015	047523	051122	EM1	ASCIZ	<CR><LF>/SORRY, ONLY 0,2,4,6 ALLOWED, TRY AGAIN/<CR><LF>
10433	057062	026131	047440	046116			
10434	057070	020131	026060	026062			
10435	057076	026064	020066	046101			
10436	057104	047514	042527	026104			
10437	057112	052040	054522	040440			
10438	057120	040507	047111	005015			
10439	057126	000					
10440	057127	104	044522	042526	EM2	ASCIZ	/DRIVE # IN RKCS2 CANNOT BE READ BACK CORRECTLY IN RKMR2/
10441	057134	021440	044440	020116			
10442	057142	045522	051503	020062			
10443	057150	040503	047116	052117			
10444	057156	041040	020105	042522			
10445	057164	042101	041040	041501			
10446	057172	020113	047503	051122			
10447	057200	041505	046124	020131			
10448	057206	047111	051040	046513			
10449	057214	031122	000				
10450	057217	015	040412	047502	EM3	ASCIZ	<CR><LF>/ABORT TESTS UNEXPECTED TIME OUT AT PC=/'
10451	057224	052122	052040	051505			
10452	057232	051524	027056	052456			
10453	057240	042516	050130	041505			
10454	057246	042524	020104	044524			
10455	057254	042515	047440	052125			
10456	057262	040440	020124	041520			
10457	057270	000075					
10458	057272	005015	041101	051117	EM4	ASCIZ	<CR><LF>/ABORT TESTS UNEXPECTED INTEPPUPT AT PC=/'
10459	057300	020124	042524	052123			
10460	057306	027123	027056	047125			
10461	057314	054105	042520	052103			
10462	057322	042105	044440	052116			
10463	057330	051105	052522	052120			
10464	057336	040440	020124	041520			
10465	057344	000075					
10466	057346	042115	020123	042523	EM5	ASCIZ	/MDS SET IN RKCS2/'
10467	057354	020124	047111	051040			
10468	057362	041513	031123	000			
10469	057367	125	042506	051440	EM6	ASCIZ	/UFE SET IN RKCS2/'
10470	057374	052105	044440	020116			
10471	057402	045522	051503	000062			
10472	057410	047516	042040	040522	EM7	ASCIZ	/NO DPA IN RKDS & NO NED IN RKCS2/'
10473	057416	044440	020116	045522			
10474	057424	051504	023040	047040			
10475	057432	020117	042516	020104			
10476	057440	047111	051040	041513			
10477	057446	031123					
10478	057450	005015	044103	041505		ASCIZ	<CR><LF>/CHECK 1 THE PORT A USING DRIVE FLOP (DP1)/
10479	057456	020113	027061	052040			
10480	057464	042510	050040	051117			
10481	057472	020124	020101	051525			

10482	057500	047111	020107	051104		
10483	057506	053111	020105	046106		
10484	057514	050117	024040	050104		
10485	057522	024461				
10486	057524	005015	027062	042040		ASCIZ <CR><LF>/2 DRIVE AVAILABLE TO PORT A STATUS (DP2)/
10487	057532	044522	042526	040440		
10488	057540	040526	046111	041101		
10489	057546	042514	052040	020117		
10490	057554	047520	052122	040440		
10491	057562	051440	040524	052524		
10492	057570	020123	042050	031120		
10493	057576	000051				
10494	057600	051104	053111	020105	EM8	ASCIZ /DRIVE PRESENT BUT NOT SPECIFIED BY OPERATOR/
10495	057606	051120	051505	047105		
10496	057614	020124	052502	020124		
10497	057622	047516	020124	050123		
10498	057630	041505	043111	042511		
10499	057636	020104	054502	047440		
10500	057644	042520	040522	047524		
10501	057652	000122				
10502	057654	051104	053111	020105	EM9	ASCIZ /DRIVE NOT PRESENT BUT SPECIFIED BY OPERATOR/
10503	057662	047516	020124	051120		
10504	057670	051505	047105	020124		
10505	057676	052502	020124	050123		
10506	057704	041505	043111	042511		
10507	057712	020104	054502	047440		
10508	057720	042520	040522	047524		
10509	057726	000122				
10510	057730	041101	051117	020124	EM10	ASCIZ /ABORT TESTS CANNOT REFERENCE CONTROLLER REGISTER/
10511	057736	042524	052123	027123		
10512	057744	027056	040503	047116		
10513	057752	052117	051040	043105		
10514	057760	051105	047105	042503		
10515	057766	041440	047117	051124		
10516	057774	046117	042514	020122		
10517	060002	042522	044507	052123		
10518	060010	051105	000			
10519	060013	104	040522	044440	EM11	ASCIZ DRA IN RADS & NED IN RKCS2 BOTH SET
10520	060020	020116	017522	051504		
10521	060026	023040	047040	042105		
10522	060034	044440	020116	045522		
10523	060042	051503	020062	047502		
10524	060050	044124	051440	052105		
10525	060056	000				
10526	060057	103	047117	051124	EM12	ASCIZ /CONTROLLER NOT READY IN RKCS1/
10527	060064	046117	042514	020122		
10528	060072	047516	020124	042522		
10529	060100	042101	020131	047111		
10530	060106	051040	041513	030523		
10531	060114	000				
10532	060115	116	020117	052101	EM13	ASCIZ /NO ATTN IN RKASOF/
10533	060122	047124	044440	020116		
10534	060130	045522	051501	043117		
10535	060136	000				
10536	060137	125	042516	050130	EM14	ASCIZ /UNEXPECTED MEMORY PARITY TRAP/
10537	060144	041505	042524	020104		

10538	060152	042515	047515	054522			
10539	060160	050040	051101	052111			
10540	060166	020131	051124	050101			
10541	060174	000					
10542	060175	122	042113	020103	EM15	ASCII	/RKDC & RKDA INDICATE THAT WCE OCCURRED AT/
10543	060202	020046	045522	040504			
10544	060210	044440	042116	041511			
10545	060216	052101	020105	044124			
10546	060224	052101	053440	042503			
10547	060232	047440	041503	051125			
10548	060240	042522	020104	052101			
10549	060246	005015	054503	020114		ASCII	<CR><LF>/CYL 411, TRACK 2, SECTOR 21/
10550	060254	030464	026061	052040			
10551	060262	040522	045503	031040			
10552	060270	020054	042523	052103			
10553	060276	051117	031040	000061			
10554	060304	040503	047116	052117	EM16	ASCII	/CANNOT READ BAD SECTOR INFORMATION/
10555	060312	051040	040505	020104			
10556	060320	040502	020104	042523			
10557	060326	052103	051117	044440			
10558	060334	043116	051117	040515			
10559	060342	044524	047117	000			
10560	060347	115	051505	040523	EM17	ASCII	/MESSAGE A0 ERROR/
10561	060354	042507	040440	020060			
10562	060362	051105	047522	000122			
10563	060370	042515	051523	043501	EM18	ASCII	/MESSAGE B0 ERROR/
10564	060376	020105	030102	042440			
10565	060404	051122	051117	000			
10566	060411	115	051505	040523	EM19	ASCII	/MESSAGE A1 ERROR/
10567	060416	042507	040440	020061			
10568	060424	051105	047522	000122			
10569	060432	042515	051523	043501	EM20	ASCII	/MESSAGE B1 ERROR/
10570	060440	020105	030502	042440			
10571	060446	051122	051117	000			
10572	060453	103	051105	020122	EM21	ASCII	/CERR SET IN RKCS1/
10573	060460	042523	020124	047111			
10574	060466	051040	041513	030523			
10575	060474	000					
10576	060475	116	020117	051104	EM22	ASCII	NO DRIVES FOUND IN DEVICE MAP (SDEUM)/<CR><LF>
10577	060502	053111	051505	043040			
10578	060510	052517	042116	044440			
10579	060516	020116	042504	044526			
10580	060524	042503	046440	050101			
10581	060532	024040	042044	053105			
10582	060540	024515	005015				
10583	060544	042523	052524	020120		ASCII	/SETUP CORRECTLY AND RESTART <CR><LF>
10584	060552	047503	051122	041505			
10585	060560	046124	020131	047101			
10586	060566	020104	042522	052123			
10587	060574	051101	006524	000012			
10588	060602	047516	042040	044522	EM23	ASCII	/NO DRIVES FOUND ON BUSS./<CR><LF>
10589	060610	042526	020123	047506			
10590	060616	047125	020104	047117			
10591	060624	041040	051525	006523			
10592	060632	012					
10593	060633	123	052105	050125		ASCII	/SETUP CORRECTLY AND PPESS 'CONTINUE' <CR><LF>

10594	060640	041440	051117	042522		
10595	060646	052103	054514	040440		
10596	060654	042116	050040	042522		
10597	060662	051523	023440	047503		
10598	060670	052116	047111	042525		
10599	060676	006447	000012			
10600	060702	047526	020114	040526	EM24	ASCIZ /VOL VALID NOT SET IN RKMR2/
10601	060710	044514	020104	047516		
10602	060716	020124	042523	020124		
10603	060724	047111	051040	046513		
10604	060732	031122	000			
10605	060735	015	042012	052105	EM25	ASCIZ <CR><LF>/DETECTED 10 BAD SECTORS ABOPTING TEST/
10606	060742	041505	042524	020104		
10607	060750	030061	041040	042101		
10608	060756	051440	041505	047524		
10609	060764	051522	027056	040456		
10610	060772	047502	052122	047111		
10611	061000	020107	042524	052123		
10612	061006	000				
10613	061007	104	052105	041505	EM26	ASCIZ DETECTED BSE BUT NOT LISTED IN BAD SECTOR FILE/
10614	061014	042524	020104	051502		
10615	061022	020105	052502	020124		
10616	061030	047516	020124	044514		
10617	061036	052123	042105	044440		
10618	061044	020116	040502	020104		
10619	061052	042523	052103	051117		
10620	061060	043040	046111	000105		
10621	061066	042504	042524	052103	EM27	ASCIZ DETECTED BSE IN READ COMMAND/
10622	061074	042105	041040	042523		
10623	061102	044440	020116	042522		
10624	061110	042101	041440	046517		
10625	061116	040515	042116			
10626	061122	005015	052502	020124		ASCIZ <CR><LF>/BUT NOT IN PREVIOUS WRITE COMMAND TO SAME SECTOR/
10627	061130	047516	020124	047111		
10628	061136	050040	042522	044526		
10629	061144	052517	020123	051127		
10630	061152	052111	020105	047503		
10631	061160	046515	047101	020104		
10632	061166	047524	051440	046501		
10633	061174	020105	042523	052103		
10634	061202	051117	000			
10635	061205	117	046116	020131	EM28	ASCIZ ONLY DRIVES 0,2,4,6 ALLOWED IN SDEVN/
10636	061212	051104	053111	051505		
10637	061220	030040	031054	032054		
10638	061226	033054	040440	046114		
10639	061234	053517	042105	044440		
10640	061242	020116	042044	053105		
10641	061250	115				
10642	061251	015	051012	046105		ASCIZ <CR><LF>/PELOAD SDEVN & PRESS CONTINUE/ <CR><LF>
10643	061256	040517	020104	042044		
10644	061264	053105	020115	020046		
10645	061272	051120	051505	020123		
10646	061300	047503	052116	047111		
10647	061306	042525	005015	000		
10648	061313	120	051117	020124	EM29	ASCIZ /PORT AVAILABLE ... TIMERS NOT INHIBITED
10649	061320	053101	044501	040514		

10650	061326	046102	027105	027056			
10651	061334	044524	042515	051522			
10652	061342	047040	052117	044440			
10653	061350	044116	041111	052111			
10654	061356	042105	000				
10655	061361	120	050111	051440	EM30	ASCIZ	/PIP SET IN RKMR2/
10656	061366	052105	044440	020116			
10657	061374	045522	051115	000062			
10658	061402	047520	052122	047040	EM31	ASCIZ	/PORT NOT AVAILABLE/
10659	061410	052117	040440	040526			
10660	061416	046111	041101	042514			
10661	061424	000					
10662	061425	120	051117	020124	EM32	ASCIZ	/PORT AVAILABLE/
10663	061432	053101	044501	040514			
10664	061440	046102	000105				
10665	061444	052101	047124	051440	EM33	ASCIZ	/ATTN SET IN RKASOF/
10666	061452	052105	044440	020116			
10667	061460	045522	051501	043117			
10668	061466	000					
10669	061467	101	052124	020116	EM34	ASCIZ	/ATTN CLEARED IN RKASOF/
10670	061474	046103	040505	042522			
10671	061502	020104	047111	051040			
10672	061510	040513	047523	000106			
10673	061516	042503	051122	047040	EM35	ASCIZ	CERR NOT SET IN PKCS1/
10674	061524	052117	051440	052105			
10675	061532	044440	020116	045522			
10676	061540	051503	000061				
10677	061544	054503	020114	042101	EM36	ASCIZ	/CYL ADDR IN RKMP3 NOT SAME AS RKDC/
10678	061552	051104	044440	020116			
10679	061560	045522	051115	020063			
10680	061566	047516	020124	040523			
10681	061574	042515	040440	020123			
10682	061602	045522	041504	000			
10683	061607	115	046125	044524	EM37	ASCIZ	/MULTIPLE ATTENTIONS SEEN
10684	061614	046120	020105	052101			
10685	061622	042524	052116	047511			
10686	061630	051516	051440	042505			
10687	061636	000116					
10688	061640	044524	042515	052517	EM38	ASCIZ	/TIMEOUT DID NOT RE-TRIGGER FOR FULL SECOND/
10689	061646	020124	044504	020104			
10690	061654	047516	020124	042522			
10691	061662	052055	044522	043507			
10692	061670	051105	043040	051117			
10693	061676	043040	046125	020114			
10694	061704	042523	047503	042116			
10695	061712	000					
10696	061713	103	046131	042040	EM39	ASCIZ	/CYL DIFF & OFFSET IN RKMR2 NOT CLEARED/
10697	061720	043111	020106	020046			
10698	061726	043117	051506	052105			
10699	061734	044440	020116	045522			
10700	061742	051115	020062	047516			
10701	061750	020124	046103	040505			
10702	061756	042522	000104				
10703	061762	054503	020114	042101	EM40	ASCIZ	/CYL ADDR IN RKMP3 NOT CLEARED
10704	061770	051104	044440	020116			
10705	061776	045522	051115	020063			

10706	062004	047516	020124	046103			
10707	062012	040505	042522	000104			
10708	062020	052101	047124	047040	EM55	ASCIZ	/ATTN NOT CLEPED IN RKASOF/
10709	062026	052117	041440	042514			
10710	062034	051101	042105	044440			
10711	062042	020116	045522	051501			
10712	062050	043117	000				
10713	062053	104	052114	051440	EM63	ASCIZ	/DLT SET IN RKCS2/
10714	062060	052105	044440	020116			
10715	062066	045522	051503	000062			
10716	062074	042522	042101	044040	EM65	ASCIZ	/READ HEADER ERROR/
10717	062102	040505	042504	020122			
10718	062110	051105	047522	000122			
10719	062116	046101	043511	046516	EM69	ASCIZ	/ALIGNMENT CARTRIDGE USED/
10720	062124	047105	020124	040503			
10721	062132	052122	044522	043504			
10722	062140	020105	051525	042105			
10723	062146	000					
10724	062147	103	047524	051440	EM73	ASCIZ	/CTO SET IN RKCS1/
10725	062154	052105	044440	020116			
10726	062162	045522	051503	000061			
10727	062170	052122	020132	047516	EM74	ASCIZ	/RTZ NOT SET IN RKMR2/
10728	062176	020124	042523	020124			
10729	062204	047111	051040	046513			
10730	062212	031122	000				
10731	062215	116	042105	051440	EM79	ASCIZ	/NED SET IN RKCS2/
10732	062222	052105	044440	020116			
10733	062230	045522	051503	000062			
10734	062236	051127	052111	020105	EM80	ASCIZ	/WRITE CHECK ERROP SET IN RKCS2/
10735	062244	044103	041505	020113			
10736	062252	051105	047522	020122			
10737	062260	042523	020124	047111			
10738	062266	051040	041513	031123			
10739	062274	000					
10740	062275	122	040505	020104	EM82	ASCIZ	/READ DATA DID NOT COMPARE WITH WRITE DATA/
10741	062302	040504	040524	042040			
10742	062310	042111	047040	052117			
10743	062316	041440	046517	040520			
10744	062324	042522	053440	052111			
10745	062332	020110	051127	052111			
10746	062340	020105	040504	040524			
10747	062346	000					
10748	062347	104	052101	020101	EM83	ASCIZ	/DATA CHECK ERROR SET IN PREP/
10749	062354	044103	041505	020113			
10750	062362	051105	047522	020122			
10751	062370	042523	020124	047111			
10752	062376	051040	042513	000122			
10753	062404	044127	046111	020105	EM84	ASCIZ	/WHILE WAITING FOR CONTR READY OR AFTEP CONTR READY REC'D/
10754	062412	040527	052111	047111			
10755	062420	020107	047506	020122			
10756	062426	047503	052116	020122			
10757	062434	042522	042101	020131			
10758	062442	051117	040440	052106			
10759	062450	051105	041440	047117			
10760	062456	051124	051040	040505			
10761	062464	054504	051040	041505			

10818	063140	005015	027062	042040		ASCIZ	<CR><LF>/2 DRIVE AVAILABLE TO PORT B STATUS (DP2)/
10819	063146	044522	042526	040440			
10820	063154	040526	046111	041101			
10821	063162	042514	052040	020117			
10822	063170	047520	052122	041040			
10823	063176	051440	040524	052524			
10824	063204	020123	042050	031120			
10825	063212	000051					
10826	063214	042524	052123	047040	DH8	ASCIZ	/TEST NO TRAP PC/
10827	063222	027117	052011	040522			
10828	063230	020120	041520	000			
10829	063235	101	052106	051105	DH9	ASCIZ	/AFTER START SPINDLE COMMAND REC'D BY DRIVE/
10830	063242	051440	040524	052122			
10331	063250	051440	044520	042116			
10832	063256	042514	041440	046517			
10833	063264	040515	042116	051040			
10834	063272	041505	042047	041040			
10835	063300	020131	051104	053111			
10836	063306	000105					
10837	063310	052101	042440	042116	DH10	ASCIZ	/AT END OF HEAD LOADING/
10838	063316	047440	020106	042510			
10839	063324	042101	046040	040517			
10840	063332	044504	043516	000			
10841	063337	105	050130	041505	DH11	ASCIZ	/EXPECTED WAS/
10842	063344	042524	004504	040527			
10843	063352	000123					
10844	063354	043101	042524	020122	DH12	ASCIZ	/AFTER SEEK CMD/
10845	063362	042523	045505	041440			
10846	063370	042115					
10847	063372	005015	044103	041505		ASCIZ	<CR><LF> 'CHECK STAT ADD SIGNAL BEFORE & AFTER MUX/
10848	063400	020113	052123	052101			
10849	063406	040440	042104	051440			
10850	063414	043511	040516	020114			
10851	063422	042502	047506	042522			
10852	063430	023040	040440	052106			
10853	063436	051105	046440	054125			
10854	063444	000					
10855	063445	117	020116	042523	DH13	ASCIZ	ON SECTORS 10, 12, 14, 16, 18 OR 20 CYL 410 TRACK 2/
10856	063452	052103	051117	020123			
10857	063460	030061	020054	031061			
10858	063465	020054	032061	020054			
10859	063474	033061	020054	034061			
10860	053502	047440	020122	030062			
10861	063510	041440	046131	032040			
10862	063516	030061	052040	040522			
10863	063524	045503	031040	000			
10864	063531	102	043105	051117	DH14	ASCIZ	/BEFORE TIMEOUT OR RELEASE/
10865	063536	020105	044524	042515			
10866	063544	052517	020124	051117			
10867	063552	051040	046105	040505			
10868	063560	042523	000				
10869	063563	127	044510	042514	DH15	ASCIZ	/WHILE PORT UNAVAILABLE/
10870	063570	050040	051117	020124			
10871	063576	047125	053101	044501			
10872	063604	040514	046102	000105			
10873	063612	047524	044440	042116	DH16	ASCIZ	/TO INDICATE THAT REQUESTING PORT CAN SEIZE/

10874	063620	041511	052101	020105		
10875	063626	044124	052101	051040		
10876	063634	050505	042525	052123		
10877	063642	047111	020107	047520		
10878	063650	052122	041440	047101		
10879	063656	051440	044505	042532		
10880	063664	005015	044103	041505		ASCIZ <CR><LF>/CHECK PORT REQ FLOPS & 1 SEC SAFETY TIMER/
10881	063672	020113	047520	052122		
10882	063700	051040	050505	020056		
10883	063706	046106	050117	020123		
10884	063714	020046	020061	042523		
10885	063722	020103	040523	042506		
10886	063730	054524	052040	046511		
10887	063736	051105	000			
10888	063741	101	052106	051105	DH17	ASCIZ /AFTEP RECAL COMMAND/
10889	063746	051040	041505	046101		
10890	063754	041440	046517	040515		
10891	063762	042116	000			
10892	063765	101	052106	051105	DH18	ASCIZ /AFTER UNLOAD COMMAND/
10893	063772	052440	046116	040517		
10894	064000	020104	047503	046515		
10895	064006	047101	000104			
10896	064012	043101	042524	020122	DH19	ASCIZ /AFTER PACK COMMAND/
10897	064020	040520	045503	041440		
10898	064026	046517	040515	042116		
10899	064034	000				
10900	064035	101	052106	051105	DH20	ASCIZ /AFTER SELECT DRIVE COMMAND/
10901	064042	051440	046105	041505		
10902	064050	020124	051104	053111		
10903	064056	020105	047503	046515		
10904	064064	047101	000104			
10905	064070	043101	042524	020122	DH21	ASCIZ /AFTER SUBSYSTEM CLEAR/
10906	064076	052523	051502	051531		
10907	064104	042524	020115	046103		
10908	064112	040505	000122			
10909	064116	043101	042524	020122	DH22	ASCIZ /AFTER DRIVE CLEAR COMMAND/
10910	064124	051104	053111	020105		
10911	064132	046103	040505	020122		
10912	064140	047503	046515	047101		
10913	064146	000104				
10914	064150	044527	044124	052517	DH23	ASCIZ /WITHOUT REQUEST PENDING/
10915	064156	020124	042522	052521		
10916	064164	051505	020124	042520		
10917	064172	042116	047111	000107		
10918	064200	054502	042040	044522	DH24	ASCIZ /BY DRIVE CLEAR COMMAND TO OTHER PORT
10919	064206	042526	041440	042514		
10920	064214	051101	041440	046517		
10921	064222	040515	042116	052040		
10922	064230	020117	052117	042510		
10923	064236	020122	047520	052122		
10924	064244	000				
10925	064245	101	052106	051105	DH25	ASCIZ /AFTER SEEK COMMAND/
10926	064252	051440	042505	020113		
10927	064260	047503	046515	047101		
10928	064266	000104				
10929	064270	043101	042524	020122	DH26	ASCIZ /AFTER READ DATA COMMAND/

10986	064752	042510	042101	051105				
10987	064760	041440	046517	040515				
10988	064766	042116	000					
10989	064771	127	051117	021504	DH40	ASCIZ	/WORD#	HEADER WAS SHOULD BE/
10990	064776	044011	040505	042504				
10991	065004	020122	040527	020123				
10992	065012	051440	047510	046125				
10993	065020	020104	042502	000				
10994	065025	104	051125	047111	DH41	ASCII	/DURING RECAL	COMMAND/
10995	065032	020107	042522	040503				
10996	065040	020114	047503	046515				
10997	065046	047101	104					
10998	065051	015	041412	042510		ASCIZ	<CR><LF>/CHECK	BUFF1 SIGNAL BEFORE & AFTER MUX/
10999	065056	045503	041040	043125				
11000	065064	030506	051440	043511				
11001	065072	040516	020114	042502				
11002	065100	047506	042522	023040				
11003	065106	040440	052106	051105				
11004	065114	046440	054125	000				
11005	065121	117	020116	042523	DH42	ASCIZ	'ON SECTORS 0,2,4,6	OR 8 CYL 410 TRACK 2/
11006	065126	052103	051117	020123				
11007	065134	026060	026062	026064				
11008	065142	020066	051117	034040				
11009	065150	020040	054503	020114				
11010	065156	030464	020060	051124				
11011	065164	041501	020113	000062				
11012	065172	043101	042524	020122	DH43	ASCIZ	'AFTER RE-SEIZE	PORT MID-WAY IN NORMAL TIMEOUT/
11013	065200	042522	051455	044505				
11014	065206	042532	020040	047520				
11015	065214	052122	046440	042111				
11016	065222	053455	054501	044440				
11017	065230	020116	047516	046522				
11018	065236	046101	052040	046511				
11019	065244	047505	052125	000				
11020	065251	106	051117	040515	DH44	ASCIZ	'FORMAT & ALL READ-WRITE	TESTS WILL BE BYPASSED/
11021	065256	020124	020046	046101				
11022	065264	020114	042522	042101				
11023	065272	053455	044522	042524				
11024	065300	052040	051505	051524				
11025	065306	053440	046111	020114				
11026	065314	042502	041040	050131				
11027	065322	051501	042523	000104				
11028	065330	042502	047506	042522	DH45	ASCIZ	'BEFORE RELEASE	WHILE HEADS UNLOADED/
11029	065336	051040	046105	040505				
11030	065344	042523	053440	044510				
11031	065352	042514	044040	040505				
11032	065360	051504	052440	046116				
11033	065366	040517	042504	000104				
11034	065374	051515	020107	020101	DH49	ASCIZ	'MSG A & B IN RKMP2	& RKMR3 RESP ARE INVALID/
11035	065402	020046	020102	047111				
11036	065410	051040	046513	031122				
11037	065416	023040	051040	046513				
11038	065424	031522	051040	051505				
11039	065432	027120	040440	042522				
11040	065440	044440	053116	046101				
11041	065446	042111	000					

Line No	Address	Offset	Value	Label	Description
11042	065451	101	052106	DH51	.ASCIZ /AFTER SEEK TO SELF COMMAND/
11043	065456	051440	042505		
11044	065464	047524	051440		
11045	065472	020106	047503		
11046	065500	047101	000104		
11047	065504	054503	020114	DH56	.ASCIZ /CYL # HEADER WORD 0/
11048	065512	042510	042101		
11049	065520	053440	051117		
11050	065526	000060			
11051					
11052					.SBTTL ERROR OUTPUT DATA
11053					
11054					EVEN
11055	065530	001214	001116	DT1	\$TESTN, \$ERRPC
11056	065534	005340	005342		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11057	065542	005330	005326		
11058	065550	005316			
11059	065552	005320	005322		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11060	065560	005332	005334		
11061	065566	005350			
11062	065570	001214	001334	DT3	\$TESTN, TRAPPC
11063	065574	001214	001116	DT4	\$TESTN, \$ERRPC, FRCYL, TOCYL, CALDIF
11064	065602	001346	001354		
11065	065606	005340	005342		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11066	065614	005330	005326		
11067	065622	005316			
11068	065624	005320	005322		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11069	065632	005332	005334		
11070	065640	005350			
11071	065642	001214	001116	DT6	\$TESTN, \$ERRPC, WD2, WD1
11072	065650	001414			
11073	065652	005340	005342		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11074	065660	005330	005326		
11075	065666	005316			
11076	065670	005320	005322		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11077	065676	005332	005334		
11078	065704	005350			
11079	065706	001214	001116	DT7	\$TESTN, \$ERRPC, WDCNT, HOWD, TEMP1
11080	065714	001450	005352		
11081	065720	005340	005342		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11082	065726	005330	005326		
11083	065734	005316			
11084	065736	005320	005322		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11085	065744	005332	005334		
11086	065752	005350			
11087	065754	001214	001116	DT8	\$TESTN, \$ERRPC, TOCYL, FRCYL, CALDIF
11088	065762	001344	001354		
11089	065766	005340	005342		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11090	065774	005330	005326		
11091	066002	005316			
11092	066004	005320	005322		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11093	066012	005332	005334		
11094	066020	005350			
11095	066022	001214	001116	DT9	\$TESTN, \$ERRPC, TOCYL, RHTAB
11096	066030	001666			
11097	066032	005340	005342		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2

11098	066040	005330	005326	005314		
11099	066046	005316				
11100	066050	005320	005322	005324		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11101	066056	005332	005334	005346		
11102	066064	005350				
11103	066066	001214	001116	005404	DT13	STESTN, \$ERRPC, E. AO, E. BO, E. A1, E. B1, H. AO, H. BO, H. A1, H. B1
11104	066074	005406	005410	005412		
11105	066102	005364	005366	005370		
11106	066110	005372				
11107	066112	005340	005342	005344		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11108	066120	005330	005326	005314		
11109	066126	005316				
11110	066130	005320	005322	005324		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11111	066136	005332	005334	005346		
11112	066144	005350				
11113	066146	001214	001116	005404	DT14	STESTN, \$ERRPC, E. AO, E. BO, E. A1, E. B1, E. A2, E. B2
11114	066154	005406	005410	005412		
11115	066162	005414	005416			
11116	066166	005364	005366	005370		H AO, H BO, H A1, H. B1, H. A2, H. B2
11117	066174	005372	005374	005376		
11118	066202	005340	005342	005344		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11119	066210	005330	005326	005314		
11120	066216	005316				
11121	066220	005320	005322	005324		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11122	066226	005332	005334	005346		
11123	066234	005350				
11124	066236	001214	001116	005404	DT15	STESTN, \$ERRPC, E. AO, E. BO, E. A1, E. B1, E. A2, E. B2, E. B3
11125	066244	005406	005410	005412		
11126	066252	005414	005416	005422		
11127	066260	005364	005366	005370		H AO, H BO, H. A1, H. B1, H. A2, H. B2, H. B3
11128	066266	005372	005374	005376		
11129	066274	005402				
11130	066276	005340	005342	005344		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11131	066304	005330	005326	005314		
11132	066312	005316				
11133	066314	005320	005322	005324		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11134	066322	005332	005334	005346		
11135	066330	005350				

SBTTL ERROR DATA FORMATS

11136						
11137						
11138						
11139	066332	000003			DF1	3
11140	066334	002	000			BYTE 2, 0
11141	066336	062573				DH2
11142	066340	007	000			BYTE 7, 0
11143	066342	062643				DH3
11144	066344	007	000			BYTE 7, 0
11145						
11146	066346	000001			DF2	1
11147	066350	002	000			BYTE 2, 0
11148						
11149	066352	000005			DF3	5
11150	066354	000	000			BYTE 0, 0
11151	066356	062556				DH1
11152	066360	002	000			BYTE 2, 0
11153	066362	063337				DH11

11154	066364	002	000		BYTE	2.0
11155	066366	062573			DH2	
11156	066370	007	000		BYTE	7.0
11157	066372	062643			DH3	
11158	066374	007	000		BYTE	7.0
11159						
11160	066376	000003		DF4	3	
11161	066400	002	000		BYTE	2.0
11162	066402	062573			DH2	
11163	066404	007	000		BYTE	7.0
11164	066406	062643			DH3	
11165	066410	007	000		BYTE	7.0
11166						
11167	066412	000005		DF5	5	
11168	066414	000	000		BYTE	0.0
11169	066416	065374			DH49	
11170	066420	000	000		BYTE	0.0
11171	066422	062556			DH1	
11172	066424	002	000		BYTE	2.0
11173	066426	062573			DH2	
11174	066430	007	000		BYTE	7.0
11175	066432	062643			DH3	
11176	066434	007	000		BYTE	7.0
11177						
11178	066436	000005		CF6	5	
11179	066440	000	000		BYTE	0.0
11180	066442	062556			DH1	
11181	066444	002	000		BYTE	2.0
11182	066446	063007			DH6	
11183	066450	003	000		BYTE	3.0
11184	066452	062573			DH2	
11185	066454	007	000		BYTE	7.0
11186	066456	062643			DH3	
11187	066460	007	000		BYTE	7.0
11188						
11189						
11190	066462	000004		DF10	4	
11191	066464	000	000		BYTE	0.0
11192	066466	062556			DH1	
11193	066470	002	000		BYTE	2.0
11194	066472	062573			DH2	
11195	066474	007	000		BYTE	7.0
11196	066476	062643			DH3	
11197	066500	007	000		BYTE	7.0
11198						
11199	066502	000004		CF14	4	
11200	066504	002	000		BYTE	2.0
11201	066506	064771			DH40	
11202	066510	003	000		BYTE	3.0
11203	066512	062573			DH2	
11204	066514	007	000		BYTE	7.0
11205	066516	062643			DH3	
11206	066520	007	000		BYTE	7.0
11207						
11208						
11209	066522	000004		DF15	4	

11210	066524	000	000	BYTE	0.0
11211	066526	062556		DH1	
11212	066530	002	000	BYTE	2.0
11213	066532	062573		DH2	
11214	066534	007	000	BYTE	7.0
11215	066536	062643		DH3	
11216	066540	007	000	BYTE	7.0
11217					
11218	066542	000005		DF 17	5
11219	066544	000	000	BYTE	0.0
11220	066546	065251		DH44	
11221	066550	000	000	BYTE	0.0
11222	066552	062556		DH1	
11223	066554	002	000	BYTE	2.0
11224	066556	062573		DH2	
11225	066560	007	000	BYTE	7.0
11226	066562	062643		DH3	
11227	066564	007	000	BYTE	7.0
11228	066566	000005		DF 20	5
11229	066570	000	000	BYTE	0.0
11230	066572	062556		DH1	
11231	066574	002	000	BYTE	2.0
11232	066576	065504		DH56	
11233	066600	002	000	BYTE	2.0
11234	066602	062573		DH2	
11235	066604	007	000	BYTE	7.0
11236	066606	062643		DH3	
11237	066610	007	000	BYTE	7.0
11238					
11239	066612	000007		DF 21	7
11240	066614	000	000	BYTE	0.0
11241	066616	062556		DH1	
11242	066620	002	000	BYTE	2.0
11243	066622	064351		DH28	
11244	066624	000	000	BYTE	0.0
11245	066626	064423		DH31	
11246	066630	004	000	BYTE	4.0
11247	066632	064361		DH29	
11248	066634	004	000	BYTE	4.0
11249	066636	062573		DH2	
11250	066640	007	000	BYTE	7.0
11251	066642	062643		DH3	
11252	066644	007	000	BYTE	7.0
11253					
11254	066646	000007		DF 22	7
11255	066650	000	000	BYTE	0.0
11256	066652	062556		DH1	
11257	066654	002	000	BYTE	2.0
11258	066656	064351		DH28	
11259	066660	000	000	BYTE	0.0
11260	066662	064423		DH31	
11261	066664	006	000	BYTE	6.0
11262	066666	064361		DH29	
11263	066670	006	000	BYTE	6.0
11264	066672	062573		DH2	
11265	066674	007	000	BYTF	7.0

11266 066676 062643
 11267 066700 007 000
 11268
 11269 066702 000007 DF23 7
 11270 066704 000 000
 11271 066706 062556
 11272 066710 002 000
 11273 066712 064351
 11274 066714 000 000
 11275 066716 064423
 11276 066720 007 000
 11277 066722 064361
 11278 066724 007 000
 11279 066726 062573
 11280 066730 007 000
 11281 066732 062643
 11282 066734 007 000
 11283
 11284
 11285
 11286
 11287
 11288
 11289
 11290
 11291
 11292
 11293
 11294 066736 104413
 11295 066740 104401 056567
 11296 066744 113700 001114
 11297 066750 042700 177400
 11298 066754 005300
 11299 066756 006300
 11300 066760 006300
 11301 066762 006300

DH3
 BYTE 7.0
 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
, *****
SBTTL TYPE ERROR ROUTINE
*ENTRY JSR PC, TYP ERR
*RETURN RTS PC
*
*THIS ROUTINE USES THE "ITEM CONTROL BYTE" (SITEMB) TO DETERMINE WHICH
*ERROR IS TO BE REPORTED IT THEN USES THE "ERPOR TABLE" (SERRTB)
*ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
*THE ERROR
, *****
TYPERR SAVREG
TYPE , MSG19 , PORT A OR B
MOVB SITEMB, R0 , ENTER ERROR NUMBER
BIC #177400, R0 , CLEAR SIGN EXTENSION
DEC R0 , FORM INDEX FOR ERROR TABLE
ASL R0
ASL R0
ASL R0
    
```


11302	066764	062700	005470	15	ADD	#\$ERRTB,RO	,FORM ADDRESS OF ERROR ENTRY
11303	066770	012037	067004		MOV	(RO)+,25	,GET EM POINTER
11304	066774	001404			BEQ	35	,BRANCH IF THERE ISN'T ONE
11305	066776	104401	001205		TYPE	,\$CRLF	,TYPE CARRIAGE RETURN LINE FEED
11306	067002	104401			TYPE		,TYPE ERROR MESSAGE (EM)
11307	067004	000000		25	WORD	0	,EM POINTER GOES HERE
11308	067006	012037	067022	35	MOV	(RO)+,45	,GET DH POINTER
11309	067012	001404			BEQ	55	,BRANCH IF THERE ISN'T ONE
11310	067014	104401	001205		TYPE	,\$CRLF	,TYPE CR-LF
11311	067020	104401			TYPE		,TYPE DATA HEADER
11312	067022	000000		45	WORD	0	,DH POINTER GOES HERE
11313	067024	012001		55	MOV	(RO)+,R1	,GET DT POINTER
11314	067026	001455			BEQ	205	,BRANCH IF THERE ARE NONE
11315	067030	005004			CLR	R4	,SET INDENT SWITCH
11316	067032	012000			MOV	(RO)+,RO	,GET DF POINTER
11317	067034	012002			MOV	(RO)+,R2	,STORE NUMBER OF DH'S
11318	067036	001446			BEQ	175	,DH NUM IS 0-BRANCH
11319	067040	005104			COM	R4	,NO INDENT
11320	067042	104401	001205		TYPE	,\$CRLF	
11321	067046	112003		105	MOVB	(RO)+,R3	,GET & STORE NUMBER OF DATA WORDS
11322	067050	105720			TSTB	(RO)+	,BUMP PAST FORMAT WORD
11323	067052	005703			TST	R3	,TEST IF ANY DATA FOR THIS HEADER
11324	067054	001407			BEQ	145	,NO - SKIP DATA PRINT
11325	067056	013146		115	MOV	@(R1)+,-(SP)	,PUT FIRST DATA WORD ON STACK
11326	067060	104402			TYPOC		,TYPE IT
11327	067062	005303			DEC	R3	,MORE DATA WORDS
11328	067064	001403			BEQ	145	,NO-BRANCH

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11329 067066 104401 067216          TYPE      ,SPACE2      ,TYPE SEPARATORS
11330 067072 000771                BR          11$         ;LOOP
11331 067074 005302          14$      DEC          R2         ;MORE DH'S?
11332 067076 003431                BLE         20$         ;NO-BRANCH
11333 067100 104401 001205          TYPE      , $CRLF
11334 067104 005760 000002          TST        2(R0)      ; ONLY A DH IN THIS REQUEST?
11335 067110 001404                BEQ         15$         ;YES-BRANCH BYPASS INDENT
11336 067112 005104                COM         R4         ;INDENT?
11337 067114 001002                BNE         15$         ;NO-BRANCH
11338 067116 104401 067216          TYPE      ,SPACE2      ;YES-TYPE SPACES
11339 067122 012037 067130          15$      MOV        (R0)+,16$   ;GET NEXT DH POINTER
11340 067126 104401                TYPE
11341 067130 000000          16$      WORD        0         ;DH POINTER GOES HERE
11342 067132 105710                TSTB       (R0)      ;TYPE A DT?
11343 067134 001003                BNE         21$         ;YES-BRANCH
11344 067136 062700 000002          ADD        #2,R0     ;INCREMENT OF POINTER
11345 067142 000754                BR          14$         ;SEE IF END OF DF BLOCK
11346 067144 104401 001205          21$      TYPE      , $CRLF
11347 067150 005704                TST        R4         ;INDENT?
11348 067152 001335                BNE         10$         ;NO-BRANCH
11349 067154 104401 067216          17$      TYPE      ,SPACE2      ;YES-TYPE SPACES
11350 067160 000732                BR          10$         ;LOOP
11351 067162 104414          20$      RESREG
11352
11353 067164 032777 010000 111746          BIT        #SW12,DSWR ;SEE IF ABORT DRV AFTER 20 ERRORS
11354 067172 001410                BEQ         25$         ;BR IF NO
11355 067174 023727 001103 000024          CMP        $ERFLG,#20 ;ELSE SEE IF HAVE 20 ERRORS
11356 067202 001004                BNE         25$         ;BR IF NO
11357 067204 012706 001100          MOV        #STACK,SP ;ELSE RESTORE STACK PTR
11358 067210 000137 042644          JMP        $EOP       ;AND GO TO NEXT DRV
11359
11360 067214 000207          25$      RTS          PC
11361 067216 020040          000      SPACE2  ASCIZ/ /      ; 2 SPACES
11362          ; ODT-11 -- V005A
11363
11364          ; DEC-11-UODPA-A-LA
11365
11366          ; COPYRIGHT 1969,1970,1972
11367          ; DIGITAL EQUIPMENT CORPORATION
11368          ; MAYNARD, MASSACHUSETTS 01754
11369          ENABL  ABS,AMA
11370          EVEN
11371          = +60
11372          R0      =      %0      ; REGISTER
11373          R1      =      %1      ; NAMING
11374          R2      =      %2      ; CONVENTIONS
11375          R3      =      %3
11376          R4      =      %4
11377          R5      =      %5
11378          SP      =      %6
11379          PC      =      %7
11380          ST      =      177776 ; STATUS REGISTER
11381
11382          0 TVEC =      14      ; TRT VECTOR LOCATION
11383          0 STM  =      340     ; PRIORITY MASK - STATUS REGISTER
11384          0 TBT  =      20      ; T-BIT MASK - STATUS REGISTER

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11385      000003      TRT      =      000003      ,TRT INSTRUCTION
11386      000006      RTT      =      000006      ,RTT INSTRUCTION
11387
11388      /
11389      ; RS IS USUALLY CONSIDERED SAFE, THE CURRENT ADDRESS WORD
11390      ; RESIDES IN IT. AFTER A BREAKPOINT, IT IS SET TO ZERO, AND SEARCH
11391      ; OPERATIONS LEAVE IT RANDOMLY FILLED OTHERWISE, IT SHOULD NOT
11392      ; BE USED EXCEPT FOR JSR'S AND THE CURRENT ADDRESS POINTER (CAD).
11393      /
11394
11395
11396      177562      0 RDB      =      177562      ,R DATA BUFFER
11397      177560      0 RCSR     =      177560      ,R C/SR
11398      177566      0 TDB      =      177566      ,T DATA BUFFER
11399      177564      0 TCSR     =      177564      ,T C/SR
11400
11401      /
11402      ; INITIALIZE ODT
11403      ; USE 0 ODT FOR A NORMAL ENTRY
11404      ; USE 0 ODT+2 TO RESTART ODT - WIPING OUT ALL BREAKPOINTS
11405      ; USE 0 ODT+4 TO RE-ENTER (I E - FAKE A BREAKPOINT)
11406      /
11407      067302 000413 0 ODT    BR      0 STRT    ,NORMAL ENTRY
11408      067304 000417          BR      0 RST     ,RESTART
11409      067306 013737 177776 067262 0 ENTR  MOV     ST,0 UST  ,RE-ENTER -- SAVE STATUS
11410      067314 013737 000016 177776          MOV     0 TVEC+2,ST ,SET UP LOCAL STATUS
11411      067322 010737 067260          MOV     PC,0 UPC   ,FAKE THE PC
11412      067326 000137 070460          JMP      0 BK1
11413      /
11414      067332 012706 067242 0 STRT  MOV     #0 URO,SP ,SET UP STACK
11415      067336 010637 067256          MOV     SP,0 USP   ,FAKE THE SAVED STACK
11416      067342 000414          BR      0 RST1   ,CLEAR BREAKPOINT TABLES
11417      067344 004037 070666 0 RST   JSR     0,0 SVR   ,SAVE REGISTERS
11418      067350 013777 067300 177716          MOV     0 UIN,20 ADR1 ,REMOVE THE BREAKPOINT
11419      067356 113704 067264          MOV     0 PRI,R4   ,GET ODT PRIORITY
11420      067362 106004          RORB    R4         ,SHIFT
11421      067364 106004          RORB    R4         ,INTO
11422      067366 106004          RORB    R4         ,POSITION
11423      067370 110437 177776          MOV     R4,ST     ,STORE IN STATUS
11424      067374 000127 0 RST1  JMP     (PC)+
11425      067376 000403          BR      0 45
11426      067400 012737 000002 070370 0 45  MOV     #RTI,0 RTIT ,SET TO RTI IF 11/20 OR /05
11427      067406 105037 071307          CLR    0 P        ,DISALLOW PROCEED
11428      067412 012737 000340 000016  MOV     #0 STM,0 TVEC+2 ,STATUS WORD TO TRT VECTOR + 2
11429      067420 012737 070450 000014  MOV     #0 BRK,0 TVEC ,PC TO TRT VECTOR
11430      067426 000447          BR      0 RALL    ,CLEAR BREAKPOINT TABLES
11431      /
11432      ; SPECIAL NAME HANDLER
11433      ; DEPENDS UPON THE EXPLICIT ORDER OF THE TWO TABLES 0 TL AND 0 URO
11434      /
11435      067430 004537 071110 0 REGT  JSR     5,0 GET   ,SPECIAL NAME, GET ONE MORE CHARACTER
11436      067434 012704 071333          MOV     #0 TL,R4   ,TABLE START ADDRESS
11437      067440 120024 0 RSP   CMP    R0,(R4)+ ,IS THIS THE CORRECT CHARACTER?
11438      067442 001413          BEQ    0 SP        ,JUMP IF YES
11439      067444 022704 071341          CMP    #0 TL+0 LG,R4 ,IS THE SEARCH DONE?
11440      067450 101373          BHI    0 RSP      ,BRANCH IF NOT

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11441 067452 042700 177770      BIC      #177770,R0      ,MASK OFF OCTAL
11442 067456 010004              MOV      R0,R4
11443 067460 006304      0 SP1    ASL      R4
11444 067462 062704 067242      ADD      #0,URO,R4      ;GENERATE ADDRESS
11445 067466 005202              INC      R2              ;SET FOUND FLAG
11446 067470 000444              BR       0 SCAN         ;GO FIND NEXT CHARACTER
11447 067472 162704 071324      0 SP     SUB      #0,TL-7,R4 ;CORRECT CONSTANT
11448 067476 000770              BR       0.SP1
11449
11450      ; - HANDLER - OPEN INDEXED ON THE PC
11451
11452 067500 004737 071234      0 ORPC   JSR      PC,0.TCLS
11453 067504 010502              MOV      R5,R2          ;CURRENT ADDRESS IN R2
11454 067506 061202              ADD      @R2,R2          ;COMPUTE
11455 067510 006202              ASR      R2              ;MOVE ONE BIT TO CARRY
11456 067512 103421              BCS     0 ERR           ;ERROR IF ODD NUMBER
11457 067514 006302              ASL      R2              ;RESTORE WORD
11458 067516 005722              TST     (R2)+           ; AND INCREMENT BY TWO
11459 067520 010205              MOV      R2,R5          ;UPDATE CAD
11460 067522 000137 067774              JMP      0 OP2          ;GO FINISH UP
11461
11462      ; B HANDLER - SET AND REMOVE BREAKPOINTS
11463
11464 067526 005702      0 BKPT   TST      R2          ; IF NO NUMBER TYPED
11465 067530 001406              BEQ     0 RALL          ; REMOVE BREAKPOINT
11466 067532 006204              ASR      R4              ;CHECK IF ODD
11467 067534 103410              BCS     0 ERR           ;JUMP IF ODD
11468 067536 006304              ASL      R4              ;RESTORE ONE BIT
11469 067540 010437 067274              MOV      R4,0 ADR1     ;SET A BREAKPOINT
11470 067544 000412              BR       0 DCD
11471 067546 012737 071350 067274 0 RALL    MOV      #0 TRTC,0 ADR1 ;CLEAR BREAKPOINT
11472 067554 000406              BR       0 DCD
11473
11474      ; COMMAND DECODER - ODT11
11475
11476      ; REGISTERS R0-R4 MAY BE USED,
11477      ; REGISTER R5 WILL BE CONSIDERED SAFE
11478
11479 067556 052705 000001      0 ERR    BIS      #1,R5          ;CLOSE EVERYTHING
11480 067562 012700 000077              MOV      #'?,R0        ; ? TO BE TYPED
11481 067566 004537 071166              JSR     5,0 FTYP        ; OUTPUT ?
11482 067572 004537 071266      0 DCD    JSR     5,0 CRLS ;TYPE <CR><LF>*
11483 067576 005004      0 DCD1   CLR      R4              ; R4 CONTAINS THE CONVERTED OCTAL
11484 067600 005002              CLR      R2              ; R2 IS THE NUMBER FOUND FLAG
11485 067602 004537 071110      0 SCAN   JSR     5,0 GET        ;GET A CHAR, RETURN IN R0
11486 067606 022700 000060              CMP     #'0,R0          ;COMPARE WITH ASCII 0
11487 067612 101013              BHI     0 CLGL          ;CHECK LEGALITY IF NON-NUMERIC
11488 067614 022700 000067              CMP     #'7,R0          ;COMPARE WITH ASCII 7
11489 067620 103410              BLO     0 CLGL          ;CHECK LEGALITY IF NOT OCTAL
11490 067622 042700 177770      BIC     #177770,R0     ;CONVERT TO BCD
11491 067626 006304              ASL      R4              ; MAKE ROOM
11492 067630 006304              ASL      R4              ; IN
11493 067632 006304              ASL      R4              ; R4
11494 067634 060004              ADD     R0,R4          ;PACK THREE BITS IN R4
11495 067636 005202              INC     R2              ;R2 HAS NUMERIC FLAG
11496 067640 000760              BR       0 SCAN         ; AND TRY AGAIN
    
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11497 067642 005001      0. CLGL CLR R1 ;CLEAR INDEX
11498 067644 120061 071317 0 LGL1 CMPB RO,0.LGCH(R1) ;DO THE CODES MATCH?
11499 067650 001405      BEQ 0 LGL2 ;JUMP IF YES
11500 067652 005201      INC R1 ; SET INDEX FOR NEXT SEARCH
11501 067654 020127 000014  CMP R1,#0. CLGT ; IS THE SEARCH DONE?
11502 067660 103336      BHIS 0 ERR ; OOPS!
11503 067662 000770      BR 0 LGL1 ;RE-LOOP
11504 067664 006301      0 LGL2 ASL R1 ;MULTIPLY BY TWO
11505 067666 000171 067672  JMP @0 LGDR(R1) ;GO TO PROPER ROUTINE
11506
11507 067672 067722      0 LGDR 0 WPD ; / OPEN WORD
11508 067674 067754      0 CRET ; CARRIAGE RETURN CLOSE
11509 067676 067430      0 REGT ; $ REGISTER OPS
11510 067700 070264      0 GO ; G GO TO ADDRESS K
11511 067702 067766      0 OP1 ; <LF> MODIFY, CLOSE, OPEN NEXT
11512 067704 067500      0 ORPC ; - OPEN RELATED, INDEX - PC
11513 067706 070020      0 BACK ; - OPEN PREVIOUS
11514
11515 067710 070030      0 OFST ; 0 OFFSET
11516 067712 070106      0 WSCH ; W SEARCH WORD
11517 067714 070102      0 EFF ; E SEARCH EFFECTIVE ADDRESS
11518 067716 067526      0 BKPT ; B BREAKPOINTS
11519 067720 070372      0 PROC ; P PROCEED
11520 000030      0 LGL = -0 LGDR ;LGL MUST EQUAL 2X CHLGT ALWAYS
11521
11522 ; PROCESS / - OPEN WORD
11523
11524 067722 005702      0 WRD TST R2 ;GET VALUE IF R2 IS NON-ZERO
11525 067724 001410      BEQ 0 WRDA ;SKIP OTHERWISE
11526 067726 010405      MOV R4,R5 ; PUT VALUE IN CAD
11527 067730 006205      0 WRD1 ASR R5 ;MOVE ONE BIT TO CARRY
11528 067732 103711      0 ERR2 BCS 0 ERR ;JUMP IF ODD ADDRESS
11529 067734 006305      ASL R5 ;RESTORE THE CARRY BIT
11530 067736 011500      MOV @R5,RO ;GET CONTENTS OF WORD
11531 067740 004537 071024  JSR 5,0 CADV ;GO GET AND TYPE OUT @CAD
11532 067744 000714      BR 0 DCD1 ;GO BACK TO DECODER
11533 067746 042705 000001  0 WRDA BIC #1,R5 ;CLEAR CLOSED BIT
11534 067752 000766      BR 0 WRD1 ;GO BACK TO MAIN-LINE
11535
11536 ; PROCESS CARRIAGE RETURN
11537
11538 067754 004737 071234  0 CRET JSR PC,0 TCLS ;CLOSE LOCATION
11539 067760 052705 000001  BIS #1,R5 ;CLOSE EVERYTHING
11540 067764 000702      BR 0 DCD ;RETURN TO DECODER
11541
11542 ; PROCESS <LF>, OPEN NEXT WORD
11543
11544 067766 004737 071234  0 OP1 JSR PC,0 TCLS ;CLOSE PRESENT CELL
11545 067772 005725      TST (R5)+ ;GENERATE NEW ADDRESS
11546 067774 004537 071260  0 OP2 JSR 5,0 CRLF ;<CR><LF>
11547 070000 010500      MOV R5,RO ;NUMBER TO TYPE
11548 070002 004537 071024  JSR 5,0 CADV ; TYPE OUT ADDRESS
11549 070006 012700 000057  MOV #',RO ;TYPE A /
11550 070012 004537 071166  JSR 5,0 FTYP
11551 070016 000744      BR 0 WRD1 ;GO PROCESS IT
11552
    
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11553      , PROCESS , OPEN PREVIOUS WORD
11554      ;
11555 070020 004737 071234 0 BACK JSR PC,0.TCLS
11556 070024 005745          TST -(R5) ;GENERATE NEW ADDRESS
11557 070026 000762          BR 0 OP2 ;GO DO THE REST
11558      ;
11559      , PROCESS 0, COMPUTE OFFSET
11560      ;
11561 070030 006205 0 OFST. ASR R5 ;GET LOW ORDER BIT
11562 070032 103737          BCS 0 ERR2 ;ERROR IF CLOSED
11563 070034 006305          ASL R5 ;RESTORE WORD
11564 070036 112700 000040          MOV #' ,RO ;TYPE ONE BLANK
11565 070042 004537 071166          JSR 5,0 FTYP ; AS A SEPARATOR
11566 070046 160504          SUB R5,R4 ;COMPUTE
11567 070050 005304          DEC R4
11568 070052 005304          DEC R4 ; 16 BIT OFFSET
11569 070054 010400          MOV R4,RO ;TYPE A
11570 070056 010402          MOV R4,R2 ;SAVE R4
11571 070060 004537 071024          JSR 5,0 CADV ;NUMBER IN RO - WORD MODE
11572 070064 010200          MOV R2,RO
11573 070066 006200          ASR RO ;DIVIDE BY TWO
11574 070070 103402          BCS 0 OF1 ;BRANCH IF ODD
11575 070072 004537 071024          JSR 5,0 CADV ;NUMBER IN RO - BYTE MODE
11576 070076 000137 067576 0 OF1. JMP 0 DCD1 ;ALL DONE
11577      ;
11578      , SEARCHES - SMSK HAS THE MASK
11579      ; SMSK+2 HAS THE FWA
11580      ; SMSK+4 HAS THE LWA
11581      ;
11582      ;
11583      ;
11584      ;
11585      ;
11586 070102 005201 0 EFF INC R1 ;SET EFFECTIVE SEARCH
11587 070104 000401          BR 0 WDS
11588 070106 005001 0 WSCH. CLR R1 ;SET WORD SEARCH
11589 070110 005702 0 WDS TST R2 ;CHECK FOR OBJECT FOUND
11590 070112 001621 0 ERR1 BEQ 0 ERR ;ERROR IF NO OBJECT
11591 070114 013702 067270          MOV 0 MSK+2,R2 ;SET ORIGIN
11592 070120 013705 067266          MOV 0 MSK,R5 ;SET MASK
11593 070124 005105          COM R5 ;AND COMPLEMENT IT
11594 070126 020237 067272 0 WDS2. CMP R2,0 MSK+4 ; IS THE SEARCH ALL DONE?
11595 070132 101217          BHI 0 DCD ; YES
11596 070134 011200          MOV @R2,RO ;GET OBJECT
11597 070136 005701          TST R1 ;NO
11598 070140 001027          BNE 0 EFF1 ;BRANCH IF EFFECTIVE SEARCH
11599 070142 010046          MOV RO,-(SP)
11600 070144 010403          MOV R4,R3 ;EXCLUSIVE OR
11601 070146 040400          BIC R4,RO ; IS DONE
11602 070150 042603          BIC (SP)+,R3 ; IN A VERY
11603 070152 050003          BIS RO,R3 ; FANCY MANNER HERE
11604 070154 040503          BIC R5,R3 ;AND RESULT WITH MASK
11605 070156 001016 0 WDS3. BNE 0 WDS4 ;RE-LOOP IF NO MATCH
11606 070160 010446          MOV R4,-(SP) ;REGISTERS R2,R4, AND R5 ARE SAFE
11607 070162 004537 071260          JSR 5,0 CRLF ;TYPE <CR,LF>
11608 070166 010200          MOV R2,RO ;GET READY TO TYPE

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11609 070170 004537 071024 JSR 5,0,CADV , TYPE ADDRESS
11610 070174 012700 000057 MOV #/,R0 , SLASH TO R0
11611 070200 004537 071166 JSR 5,0,FTYP , TYPE IT
11612 070204 011200 MOV @R2,R0 , GET CONTENTS
11613 070206 004537 071024 JSR 5,0,CADV , TYPE CONTENTS
11614 070212 012604 MOV (SP)+,R4 , RESTORE R4
11615 070214 005722 0 WDS4 TST (R2)+ , INCREMENT TO NEXT CELL AND
11616 070216 000743 BR 0,WDS2 , RETURN
11617 070220 020004 0 EFF1 CMP R0,R4 , IS (X)=K?
11618 070222 001755 BEQ 0,WDS3 , TYPE IF EQUAL
11619 070224 010003 MOV R0,R3 , (X) TO R3
11620 070226 060203 ADD R2,R3 , (X)+X
11621 070230 005203 ANC R3
11622 070232 005203 INC R3 , (X)+X+2
11623 070234 020304 CMP R3,R4 , IS (X)+X+2=K?
11624 070236 001747 BEQ 0,WDS3 , BRANCH IF EQUAL
11625 070240 042700 177400 BIC #177400,R0 , WIPE OUT EXTRANEIOUS BITS
11626 070244 110000 MOVE R0,R0 , EXTEND SIGN
11627 070246 000257 CCC
11628 070250 006300 ASL R0 , MULTIPLY BY TWO
11629 070252 005200 INC R0 , ADD TWO
11630 070254 005200 INC R0
11631 070256 060200 ADD R2,R0 , ADD PC
11632 070260 020004 CMP R0,R4 , IS THE RESULT A PROPER REL BRANCH?
11633 070262 000735 BR 0,WDS3
11634
11635 : PROCESS G - GO
11636
11637 070264 105037 071307 0 GO CLRB 0,P , DISALLOW PROCEED
11638 070270 006204 ASR P4 , CHECK LOW ORDER BIT
11639 070272 103617 BCS 0,ERR2 , ERROR IF ODD NUMBER
11640 070274 006304 ASL R4 , RESTORE WORD
11641 070276 010437 067260 MOV R4,0,UPC , SET UP NEW PC
11642 070302 112737 000340 177776 MOVEB #0,STM,ST , SET HIGH PRIORITY
11643 070310 004537 070756 JSR 5,0,RSTT , RESTORE TELETYPE
11644 070314 105037 071306 0 TBIT CLRB 0,T , CLEAR BOTH
11645 070320 042737 000020 067262 BIC #0,TBIT,0,UST , T-BIT FLAGS
11646 070326 017737 176742 067300 MOV @0,ADR1,0,UIN , SAVE INSTRUCTION
11647 070334 013777 071350 176732 MOV 0,TRTC,@0,ADR1 , REPLACE WITH TRAP
11648 070342 012600 0 GO2 MOV (SP)+,R0 , RESTORE
11649 070344 012601 MOV (SP)+,R1 , R0
11650 070346 012602 MOV (SP)+,R2 , THRU
11651 070350 012603 MOV (SP)+,R3
11652 070352 012604 MOV (SP)+,R4
11653 070354 012605 MOV (SP)+,R5 , R5
11654 070356 012606 MOV (SP)+,SP , AND SP
11655 070360 013746 067262 MOV 0,UST,-(SP) , AND STATUS
11656 070364 013746 067260 MOV 0,UPC,-(SP) , AND PC
11657 070370 000006 0 RTIT. RTT , CHANGED TO RTI FOR 11/20 AND /05
11658
11659 : PROCESS P - PROCEED
11660 : ONLY ALLOWED AFTER A BREAKPOINT
11661
11662 070372 105737 071307 0 PROC. TSTB 0,P , CHECK LEGALITY OF PROCEED
11663 070376 001645 BEQ 0,ERR1 , NOT LEGAL
11664 070400 105037 071307 CLRB 0,P , CLEAR PROCEED FLAG

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11665 070404 005702          TST      R2          ,WAS COUNT SPECIFIED?
11666 070406 001402          BEQ      0 PR1       ,NO
11667 070410 010437 067276          MOV      R4,0 CT    ,YES, PUT AWAY COUNT
11668 070414 112737 000340 177776 0 PR1  MOVB     #0,STM,ST  ,FORCE HIGH PRIORITY
11669 070422 004537 070756          JSR      5,0,RSTT   ;RESTORE TTY
11670 070426 112737 000340 177776 0 C1  MOVB     #0,STM,ST  ,SET HIGH PRIORITY
11671 070434 105237 071306          INCB     0 T        ;SET T-BIT FLAG
11672 070440 052737 000020 067262          BIS      #0,TBT,0 UST ;SET T-BIT
11673 070446 000735          BR       0,G02
11674
11675          ;
11676          ; BREAKPOINT HANDLER
11677          ; A TRT BREAKPOINT CAUSES 0 BRK TO BE ENTERED, WHICH SAVES
11678          ; VARIOUS ODDS AND ENDS, FINDS OUT IF THE BREAKPOINT WAS LEGAL,
11679          ; AND GIVES CONTROL TO THE COMMAND DECODER
11680 070450 012637 067260          0 BRK   MOV      (SP)+,0 UPC ;PRIORITY IS 7 UPON ENTRY
11681 070454 012637 067262          MOV      (SP)+,0 UST ;SAVE STATUS AND PC
11682 070460 004037 070666          0 BK1   JSR      0,0 SVR ;SAVE VARIOUS REGISTERS
11683 070464 105737 071306          TSTB     0 T        ;CHECK FOR T-BIT SET
11684 070470 001311          BNE      0 TBIT     ;JUMP IF SET
11685 070472 013777 067300 176574          MOV      0 UIN,00 ADR1 ;REMOVE BREAKPOINTS
11686 070500 105737 067264          TSTB     0 PRI     ;CHECK IF PRIORITY
11687 070504 100003          BPL      0 BK2     ; IS AS SAME AS USER PGM
11688 070506 113705 067262          MOVB     0 'JST,R5 ;PICK UP USER UST IF SO
11689 070512 000407          BR       0 BK3     ;AND DON'T COMPUTE THE PRIORITY
11690 070514 113705 067264          0 BK2   MOVB     0 PRI,R5 ;OTHERWISE PICK UP ACTUAL PR ORITY
11691 070520 000257          CCC
11692 070522 106005          RORB     R5        ;SHIFT LOW ORDER BITS
11693 070524 106005          RORB     R5        ; INTO
11694 070526 106005          ROPB     R5        ; HIGH ORDER
11695 070530 106005          RORB     R5        ; POSITION
11696 070532 110537 177776          0 B+3   MOVB     R5,ST     ;PUT THE STATUS AWAY WHERE IT BELONGS
11697 070536 013705 067260          MOV      0 UPC,R5 ;GET PC, IT POINTS TO THE TRT
11698 070542 005745          TST      -(R5)     ;SUBTRACT TWO
11699 070544 010537 067260          MOV      R5,0 UPC ;FROM THE USER'S PC
11700 070550 020537 067274          CMP      R5,0 ADR1 ;COMPARE WITH LIST
11701 070554 001417          BEQ      0 B2     ;JUMP IF FOUND
11702 070556 004537 070724          JSR      5,0 SVTT  ;SAVE TELETYPE STATUS
11703 070562 004537 071260          JSR      5,0 CRLF
11704 070566 012704 071312          MOV      #0,BD,R4 ;ERROP, NOTHING FOUND
11705 070572 012703 071313          MOV      #0,BD+1,R3
11706 070576 004537 071152          JSR      5,0 TYPE  ;OUTPUT "BE" FOR BAD ENTRY
11707 070602 010500          MOV      R5,R0
11708 070604 042737 000020 067262          BIC      #0,TBT,0 UST ;CLEAR OUT ANY POSSIBLE FAKE T-BIT
11709 070612 000420          BR       0 B3     ; AND CONTINUE
11710 070614 005337 067276          0 B2   DEC      0 CT
11711 070620 003302          BGT      0 C1     ;JUMP IF REPEAT
11712 070622 012737 000001 067276          MOV      #1,0 CT  ;RESET COUNT TO 1
11713 070630 105237 071307          INCB     0 P        ;ALLOW PROCEED
11714 070634 004537 070724          JSR      5,0 SVTT  ;SAVE TELETYPE STATUS, R4 IS SAFE
11715 070640 012700 000102          MOV      #'B,R0
11716 070644 004537 071166          JSR      5,0 Ftyp  ;TYPE "B"
11717 070650 013700 067274          MOV      0 ADR1,R0 ;GET ADDRESS OF BREAK
11718 070654 004537 071024          0 B3   JSR      5,0 CADV ;TYPE ADDRESS
11719 070660 005005          CLR      R5        ;CLEAR CAD
11720 070662 000137 067572          JMP      0 DCD     ;GO TO DECODER

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11721 ;
11722 ; SAVE REGISTERS R0-R6 IN INTERNAL STACK
11723 ;
11724 0 SVR MOV (SP)+,0 XXX ; PICK REGISTER FROM STACK AND SAVE
11725 070666 012637 071304 MOV SP,0 USP ; SAVE USER STACK ADDRESS
11726 070672 010637 067256 MOV #0 USP,SP ; SET TO INTERNAL STACK
11727 070676 012706 067256 MOV R5,-(SP) ; SAVE
11728 070702 010546 MOV R4,-(SP) ; REGISTERS
11729 070704 010446 MOV R3,-(SP) ; 1
11730 070706 010346 MOV R2,-(SP) ; THRU
11731 070710 010246 MOV R1,-(SP) ; 5
11732 070712 010146 MOV 0 XXX,-(SP) ; PUT SAVED REGISTER ON STACK
11733 070714 013746 071304 TST -(SP)
11734 070720 005746 RTS R0
11735 ;
11736 ; SAVE TELETYPE STATUS
11737 ;
11738 0 SVTF MOVB 0 RCSR,0 CSR1 ; SAVE R C/SR
11739 070724 113737 177560 071310 MOVB 0 TCSR,0 CSR2 ; SAVE T C/SR
11740 070732 113737 177564 071311 CLRB 0 RCSR ; CLEAR ENABLE AND MAINTENANCE
11741 070740 105037 177560 CLRB 0 TCSR ; BITS IN BOTH C/SR
11742 070744 105037 177564 JSR 5,0 CRLF ; TYPE <CR,LF>
11743 070750 004537 071260 RTS R5
11744 ;
11745 ; RESTORE TELETYPE STATUS
11746 ;
11747 0 PSTT JSR 5,0 CRLF ; <CR,LF> BEFORE RESTORING
11748 070756 004537 071260 TSTB 0 TCSR ; WAIT READY ON PRINTER
11749 070762 105737 177564 BPL -4
11750 070766 100375 BIT #4000,0 RCSR ; CHECK BUSY FLAG ON READER
11751 070770 032737 004000 177560 BEQ 0 RSE1 ; SKIP READY LOOP IF NOT BUSY
11752 070776 001403 TSTB 0 RCSR ; WAIT READY
11753 071000 105737 177560 BPL -4 ; ON READER
11754 071004 100375 0 RSE1 MOVB 0 CSR1,0 RCSR ; RESTORE
11755 071006 113737 071310 177560 MOVB 0 CSR2,0 TCSR ; THE STATUS REGISTERS
11756 071014 113737 071311 177564 RTS R5
11757 ;
11758 ; TYPE OUT CONTENTS OF WORD OR BYTE WITH ONE TRAILING SPACE
11759 ; WORD IS IN R0
11760 ;
11761 0 CADV MOV R2,-(SP) ; SAVE R2
11762 071024 010246 MOV #0 BUF+6,R4 ; BUFFER START ADDRESS
11763 071026 012704 071347 MOV #'0,-(SP) ; CONSTANT ASCII 0
11764 071032 012746 000060 0 SPC MOV R0,R2 ; GET
11765 071036 010002 BIC #177770,R2 ; OCTAL CHARACTER
11766 071040 042702 177770 ADD @SP,R2 ; CONVERT TO ASCII
11767 071044 061602 MOVB R2,-(R4) ; STORE IN BUFFER
11768 071046 110244 ASR R0 ; SHIFT THIS MESS
11769 071050 006200 ASR R0 ; RIGHT
11770 071052 006200 ASR R0 ; THREE WHOLE PLACES
11771 071054 006200 CMP R4,#0 BUF+1 ; DONE?
11772 071056 020427 071342 BHI 0 SPC ; NO
11773 071062 101365 BIC #177776,R0 ; GET LAST BIT
11774 071064 042700 177776 ADD (SP)+,R0 ; CONVERT TO ASCII
11775 071070 062600 MOVB R0,-(R4) ; AND PUT IT AWAY
11776 071072 110044 MOV #0 BUF+6,R3 ; LWA
11776 071074 012703 071347

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11777 071100 004537 071152          JSR    5,0 TYPE      ;TYPE WHOLE STRING OF CHARACTERS
11778 071104 012602          MOV    (SP)+,R2     ;RESTORE R2
11779 071106 000205          RTS    R5
11780
11781          ; GENERAL CHARACTER INPUT ROUTINE
11782          ; CHARACTER INPUT GOES TO R0
11783
11784 071110 105737 177560          0 GET  TSTB    0 RCSR      ;WAIT FOR
11785 071114 100375          BPL    -4           ; INPUT FROM KEYBOARD
11786 071116 113700 177562          MOVB   0 RDB,R0     ;GET A CHARACTER
11787 071122 004537 071166          JSR    5,0 FTYP     ;ECHO CHARACTER
11788 071126 042700 177600          BIC    #177600,R0   ;STRIP OFF PARITY FROM CHARACTER
11789 071132 001766          BEQ    0 GET        ;IGNORE NULLS
11790 071134 122700 000040          CMPB   #40,R0       ;CHECK FOR SPACES
11791 071140 001763          BEQ    0 GET        ;IGNORE NULLS
11792 071142 122700 000073          CMPB   #',,R0       ;CHECK FOR SEMI-COLON
11793 071146 001760          BEQ    0 GET        ;IGNORE THEM IF FOUND
11794 071150 000205          RTS    R5
11795
11796          ; GENERAL CHARACTER OUTPUT ROUTINE
11797          ; ADDRESS OF FIRST BYTE IN R4,
11798          ; ADDRESS OF LAST BYTE IN R3, (R3)>>(R4)
11799
11800 071152 020304          0 TYPE CMP    R3 R4      ;CHECK FOR COMPLETION
11801 071154 103426          BLO    0 TYP1       ; EXIT WHEN DONE
11802 071156 112400          MOVB   (R4)+,R0     ;GET A CHARACTER
11803 071160 004537 071166          JSR    5,0 FTYP     ;TYPE ONE CHARACTER
11804 071164 000772          BR     0 TYPE       ;LOOP UNTIL DONE
11805
11806          ; TYPE ONLY ONE CHARACTER (CONTAINED IN R0)
11807
11808 071166 105737 177564          0 FTYP TSTB    0 TCSR     ;CHECK STATUS
11809 071172 100375          BPL    -4           ;WAIT UNTIL READY
11810 071174 110037 177566          MOVB   R0,0 TDB     ;TYPE ONE CHARACTER
11811 071200 120037 000045          CMPB   R0,#45       ;IS CHAR TO BE FILLED?
11812 071204 001012          BNE    0 TYP1       ;NO
11813 071206 113746 000044          MOVB   @#44,-(SP)   ;YES, INIT THE COUNT
11814 071212 105737 177564          0 TYP2 TSTB    0 TCSR     ;CHECK STATUS
11815 071216 100375          BPL    0 TYP2       ;WAIT UNTIL READY
11816 071220 105037 177566          CLRB   0 TDB        ;GENEPATE NULL FILLER
11817 071224 105316          DECB   @SP
11818 071226 003371          BGT    0 TYP2       ;CHECK STATUS
11819 071230 005726          TST    (SP)+        ;POP STACK
11820 071232 000205          0 TYP1 RTS    R5
11821
11822          ; CLOSE WORD OR BYTE AND EXIT,
11823          ; UPON ENTERING, R2 HAS NUMERIC FLAG, R4 HAS CONTENTS
11824
11825 071234 006205          0 TCLS ASR    R5        ;GET LOW ORDER BIT
11826 071236 103405          BCS    0 TC         ;JUMP IF ALREADY CLOSED
11827 071240 006305          ASL    R5
11828 071242 005702          TST    R2           ; IF NO NUMBER WAS TYPED THERE IS
11829 071244 001401          BEQ    0 CLS1       ;NO CHANGE TO THE OPEN CELL
11830 071246 010415          MOV    R4,@R5       ;STORE WORD
11831 071250 000207          0 CLS1 RTS    PC
11832 071252 005746          0 TC   TST    -(SP)   ;POP EXTRA CELL FROM STACK

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11833 071254 000137 067556          JMP      0 ERR          ,AND SCREAM BLOODY MURDER
11834
11835          , 0 CRLF - TYPE <CR,LF>
11836          , 0 CRLS - TYPE <CR,LF>*
11837
11838 071260 012703 071315          0 CRLF·  MOV      #0 CR+1,R3      ,LWA <CR,LF>
11839 071264 000402                    BR          0 CRS
11840 071266 012703 071316          0 CRLS·  MOV      #0 CR+2,R3      ,LWA <CR,LF>*
11841 071272 012704 071314          0 CRS    MOV      #0 CR,R4        ,FWA
11842 071276 004537 071152          JSR          5,0 TYPE          ;TYPE SOMETHING
11843 071302 000205                    RTS          R5
11844
11845 071304 000000          0 XXX    WORD     0          ,TEMPORARY STORAGE
11846 071306          000          0 T      BYTE     0          , T-BIT FLAG
11847 071307          000          0 P      BYTE     0          ,PROCEED FLAG = 0 IF PROCEED NOT ALLOWED
11848                                     = 1 IF PROCEED ALLOWED
11849 071310          000          0 CSR1   BYTE     0          ,SAVE CELL - R C/SR
11850 071311          000          0 CSR2   BYTE     0          ,SAVE CELL - T C/SP
11851
11852
11853 071312 042502          0 BD     WORD     "BE
11854
11855 071314          015          0 CR     BYTE     015          , <CR>
11856 071315          012          BYTE     012          , <LF>
11857 071316          052          BYTE     '*'          , *
11858
11859 071317          057          0 LGCH   BYTE     '/'          ,
11860 071320          015          BYTE     015          , CARRIAGE RETURN
11861 071321          044          BYTE     'S          , S
11862 071322          107          BYTE     'G          , G
11863 071323          012          BYTE     012          , <LF>
11864 071324          137          BYTE     '-'          , -
11865 071325          136          BYTE     'O          , O
11866 071326          117          BYTE     'W          , W
11867 071327          127          BYTE     'E          , E
11868 071330          105          BYTE     'B          , B
11869 071331          102          BYTE     'P          , P
11870 071332          120
11871          000014          0 CLGT   =          -0 LGCH          ,TABLE LENGTH
11872
11873 071333          123          0 TL     BYTE     'S          ,DO          1
11874 071334          120          BYTE     'P          ,NOT          2
11875 071335          115          BYTE     'M          ,CHANGE       3
11876 071336          000          BYTE     0          ,THE          4
11877 071337          000          BYTE     0          ,ORDER       5
11878 071340          102          BYTE     'B          ,HERE        6
11879          000006          0 LG     =          0 TL
11880
11881 071341          071347          0 BUF     =          +6          ,6 CHAR BUFFER WITH
11882 071347          040          BYTE     EVEN          ,TRAILING BLANK
11883
11884
11885
11886 071350 000003          0 TRTC   TRT          ,TRACE TRAP PROTOTYPE
11887
11888          ,THE ORDER OF THE FOLLOWING ENTRIES IS CRITICAL

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```
11889
11890      067242 067242
11891      067242 000000      0 URO      0      0 ODT-40
11892      067244 000000      0      0      ,USER R0
11893      067246 000000      0      0      ,      R1
11894      067250 000000      0      0      ,      R2
11895      067252 000000      0      0      ,      R3
11896      067254 000000      0      0      ,      R4
11897      067256 000000      0 USP      0      0      ,USER SP
11898      067260 000000      0 UPC      0      0      ,USER PC
11899      067262 000000      0 UST      0      0      ,USER ST
11900      067264 000007      0 PRI      7      0 ODT PRIORITY
11901      067266 000000      0 MSK      0      0      ,MASK
11902      067270 000000      0      0      ,LOW LIMIT
11903      067272 000000      0      0      ,HIGH LIMIT
11904
11905      , BREAK POINT LISTS, ADR1 = ADDRESS OF BREAKPOINT, CT = COUNT,
11906      , UIN = CONTENTS
11907
11908      067274 000000      0 ADR1     0
11909      067276 000000      0 CT       0
11910      067300 000000      0 UIN      0
11911      000001
                                END
```

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#							
APTSPO= 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						

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#												
DPA	= 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										
DRVPT	001342	2626#	3746*	4126	4146*									
DSC	= 040000	1442#												
DSHR	= 177570	1247#	2527	3650										
DTE	= 010000	1424#												
DTYE	= 000040	1417#	3954	4056										
DT1	065530	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	11055#	
DT13	066066	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	11103#				
DT14	066146	3003	3008	11113#										
DT15	066236	11124#												
DT3	065570	2880	11062#											
DT4	065574	3483	3548	11063#										
DT6	065642	2875	2885	11071#										
DT7	065706	3458	11079#											
DT8	065754	3478	11087#											
DT9	066022	3013	11095#											
D ACLO	= 000100	1491#												
D BRHM	= 000100	1478#	4277	4312	4341	4410	4446	4500	4569	4605	4727	4767	4822	4862

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	1497#												
D SPOK= 001000	1481#	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 SSF = 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	1513#												
D TIB = 002000	1509#												
D UNLD= 040000	1486#												
D UNS = 040000	1499#												
D VV = 000100	1464#	4239	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 WCUR= 000040	1504#												
D WGAT= 000100	1505#												
D WLE = 004000	1496#												
D WRL = 004000	1469#												
D XERR= 001000	1508#												
ECCW = 020000	1457#												
ECH = 000100	1418#												
EMTVEC= 000030	1336#	3634*	3635*										
EM1 057054	8129	10432#											
EM10 057730	2838	10510#											
EM11 060013	2843	10519#											
EM12 060057	2848	2858	2868	3196	3201	3206	3211	3226	3251	3331	3411	3446	3556
	10526#												
EM13 060115	3031	3101	3106	3166	3176	3216	3256	3336	3356	10532#			
EM14 060137	2878	10536#											
EM15 060175	2986	10542#											
EM16 060304	3566	3581	10554#										
EM17 060347	2941	2961	3016	3026	3041	3051	3121	3146	3261	3286	3311	3371	3391
	3491	3531	10560#										
EM18 060370	2900	2915	2931	2946	2966	3056	3076	3126	3151	3266	3291	3316	3376
	3396	3496	10563#										
EM19 060411	2951	2971	3021	3036	3046	3061	3131	3156	3271	3296	3321	3381	3401
	3501	3536	10566#										
EM2 057127	2803	10440#											
EM20 060432	2910	2926	2936	2956	2976	3066	3081	3136	3161	3276	3301	3326	3386
	3406	3506	10569#										
EM21 060453	2853	2863	2895	2905	3426	3451	3486	3541	3561	10572#			

EM22	060475	3111	10576#															
EM23	060602	3116	10588#															
EM24	060702	2921	10600#															
EM25	060735	2996	10605#															
EM26	061007	2981	10613#															
EM27	061066	3071	10621#															
EM28	061205	3863	10635#															
EM29	061313	3351	3441	10648#														
EM3	057217	9076	10450#															
EM30	061361	3096	10655#															
EM31	061402	2991	3091	3181	3361	3416	3461	10658#										
EM32	061425	3141	10662#															
EM33	061444	3171	3191	3366	10665#													
EM34	061467	3186	3221	10669#														
EM35	061516	3246	10673#															
EM36	061544	3476	3481	3546	10677#													
EM37	061607	3306	10683#															
EM38	061640	3341	10688#															
EM39	061713	3001	3281	3431	10696#													
EM4	057272	10458#																
EM40	061762	3006	3436	10703#														
EM5	057346	2809	3241	10466#														
EM55	062020	3346	10708#															
EM6	057367	2815	10469#															
EM63	062053	3421	10713#															
EM65	062074	3456	10716#															
EM69	062116	3591	10719#															
EM7	057410	2821	10472#															
EM73	062147	3231	10724#															
EM74	062170	3086	10727#															
EM79	062215	3236	10731#															
EM8	057600	10494#																
EM80	062236	2873	10734#															
EM82	062275	2883	10740#															
EM83	062347	2889	10748#															
EM84	062404	3232	3237	3242	10753#													
EM9	057654	2832	10502#															
EM93	062475	3011	10763#															
ERRVEC=	000004	1329#	3648	3649#	3660#	3667#	3668#	3681#	3682#	3751#	3755#	3762#	3799#	3817#				
		3818#	9235	9236#	9238#	9241#												
E A0	005404	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#	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#	8373#	8374#	8381#	8385	8387#	8416	9034#	11103	11113				
		11124																
E A1	005410	2746#	4277#	4312#	4341#	4364#	4365#	4410#	4446#	4500#	4523#	4524#	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#	8375#	8376#	8389	8391#	8436	9036#	11103	11113	11124				
E A2	005414	2748#	4279#	4314#	4343#	4412#	4448#	4502#	4571#	4607#	4729#	4769#	4824#	4864#				
		4926#	4949#	4978#	5001#	5027#	5051#	5101#	5124#	5153#	5176#	5202#	5226#	5292#				
		5313#	5374#	5395#	5459#	5490#	5546#	5585#	5632#	5684#	5715#	5771#	5810#	5857#				

O DCD	067572	11470	11472	11482#	11540	11595	11720		
O DCD1	067576	11483#	11532	11576					
O EFF	070102	11517	11586#						
O EFF1	070220	11598	11617#						
O ENTR	067306	11409#							
O ERR	067556	11456	11467	11479#	11502	11528	11590	11833	
O ERR1	070112	11590#	11663						
O ERR2	067732	11528#	11562	11639					
O FTYP	071166	11481	11550	11565	11611	11716	11787	11803	11808#
O GET	071110	11435	11485	11784#	11789	11791	11793		
O GO	070264	11510	11637#						
O GO2	070342	11648#	11673						
O LG =	000006	11439	11879#						
O LGCH	071317	11498	11859#	11871					
O LGDP	067672	11505	11507#	11520					
O LGL =	000030	11520#							
O LGL1	067644	11498#	11503						
O LGL2	067664	11499	11504#						
O MSK	067266	11591	11592	11594	11901#				
O ODT	067302	1543	11407#	11890					
O OFST	070030	11515	11561#						
O OF1	070076	11574	11576#						
O OP1	067766	11511	11544#						
O OP2	067774	11460	11546#	11557					
O ORPC	067500	11452#	11512						
O P	071307	11427*	11637*	11662	11664*	11713*	11847*		
O PRI	067264	11419	11686	11690	11900#				
O PROC	070372	11519	11662#						
O PR1	070414	11666	11668#						
O RALL	067546	11430	11465	11471#					
O RCSR=	177560	11397#	11738	11740*	11750	11752	11754*	11784	
O RDB =	177562	11396#	11786						
O REGT	067430	11435#	11509						
O RSE1	071006	11751	11754#						
O RSP	067440	11437#	11440						
O RST	067344	11408	11417#						
O RSTT	070756	11643	11669	11747#					
O RST1	067374	11416	11424#						
O RTIT	070370	11426*	11657#						
O SCAN	067602	11446	11485#	11496					
O SP	067472	11438	11447#						
O SPC	071036	11764#	11772						
O SP1	067460	11443#	11448						
O STM =	000340	11383#	11428	11642	1166S	11670			
O STRT	067332	11407	11414#						
O SVR	070666	11417	11682	11724#					
O SVTT	070724	11702	11714	11738#					
O T	071306	11644*	11671*	11683	11846#				
O TBIT	070314	11644#	11684						
O TBT =	000020	11384#	11645	11672	11708				
O TC	071252	11826	11832#						
O TCLS	071234	11452	11538	11544	11555	11825#			
O TCSR=	177564	11399#	11739	11741*	11748	11755*	11808	11814	
O TDB =	177566	11398#	11810*	11816*					
O TL	071333	11436	11439	11447	11873#	11879			
C TRTC	071350	11471	11647	11886#					

O TVEC=	000014	11382#	11410	11428*	11429*				
O TYPE	071152	11706	11777	11800#	11804	11842			
O TYP1	071232	11801	11812	11820#					
O TYP2	071212	11814#	11815	11818					
O UIN	067300	11418	11646*	11685	11910#				
O UPC	067260	11411*	11641*	11656	11680*	11697	11699*	11898#	
O URO	067242	11414	11444	11891#					
O USP	067256	11415*	11725*	11726	11897#				
O UST	067262	11409*	11645*	11655	11672*	11681*	11688	11708*	11899#
O WDS	070110	11587	11589#						
O WDS2	070126	11594#	11616						
O WDS3	070156	11605#	11618	11624	11633				
O WDS4	070214	11605	11615#						
O WRD	067722	11507	11524#						
O WRDA	067746	11525	11533#						
O WRD1	067730	11527#	11534	11551					
O WSCH	070106	11516	11588#						
O XXX	071304	11724*	11732	11845#					
O 45	067406	11425	11427#						
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#							
PIRQUE=	000240	1340#							
PKPB	001324	2613#							
PKS	001320	2611#	3756	3763	8894*	8908*			
PKSB	001322	2612#	8893*						
PPTP	005432	2764#	3701*						
PPGSRT	010054	3599	3602#	3865	8120				
PPO =	000000	1263#	3604	3794					
PF1 =	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#						
RDCHR =	104410	9813	10195#						
RDCYLA	045756	4740	4835	8618#					
RDCYLD	045672	8602#							
RDDATA=	000021	1374#	7364						
RDGATE=	100000	1459#							

Symbol	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
RDHEAD=	000025	1376#	7781	7902														
RDLIN =	104411	8096	9887	10196#														
RDOCT =	104412	8143	8156	10197#														
RDSEC	045622	8590#	8799															
RDTAB	004276	2684#																
RDY =	000200	1382#	8205	8219														
RECAL =	000013	1371#	4262	7136	7264	9010												
RESREG=	104414	9947	9999	10199#	11351													
RESVEC=	000010	1330#																
PHEAD	046174	8466	8663#															
PHTAB	001666	2679#	7780	7814	7901	7935	8806	8808	8812	8815	11095							
R+ASOF=	000016	1353#	3808	7141	7269	7732	7854	8244	8281	8308	8337							
R+BA =	000004	1348#	3804	7356*	7400*	7418*	7481*	7606*	8240									
R+CS1 =	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*															
R+CS2 =	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*								
R+DA =	000006	1349#	3805	7358*	7402*	7420*	7480*	7609*	8241									
R+DB =	000024	1355#	3810	7620	7788	7789	7790	7909	7910	7911								
R+DC =	000020	1354#	3809	4709*	4746*	4804*	4841*	6304*	6424*	7078*	7206*	7360*	7482*	7607*				
		7725*	7775*	7346*	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	5755	5824	5892	5946				

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															
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	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	5389	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	7956	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				

STYPE 1194# 9332
STYPO 1194# 9535

ABS 071352 000

ERRORS DETECTED 0

DZR6GA DZR6GA SEQ/SOL/CRF/NL TOC/DOC=DZR6GA P11
RUN-TIME 36 35 4 SECONDS
RUN-TIME RATIO 1564/76=20 4
COPE USED 33K (65 PAGES)

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