

RK611/RK06

DRIVE DIAGNOSTIC PART 1
MD-11-DZR6H-D

EP-DZR6H-D-DL-A

APR 1977

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MADE IN USA

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

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DZR6H-D-D
PRODUCT NAME:	UNIBUS RK06 DISK DRIVE DIAGNOSTIC: PART 1
DATE:	JANUARY 1977
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	GARY PAPAZIAN

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1.0 ABSTRACT

THIS PROGRAM PERFORMS PART 1 OF THE DRIVE DIAGNOSTICS
TO INSURE THAT THE
DISK IS CAPABLE OF PERFORMING ALL STATIC & CYCLE UP TESTS.
IT INSURES THAT THE DRIVE CAN WRITE AND READ HEADERS
IN BOTH 20 & 22 SECTOR FORMATS.
FINALLY, IT INSURES THAT THE DISK CAN PERFORM SEEK

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OPERATIONS BY DOING SEVERAL SEEK PATTERNS.
ERROR DETECTION LOGIC IS CHECKED BY SOFTWARE ERROR FORCING.

AFTER A SUCCESSFUL RUN (WITH NO ERRORS) OF PART 1, THE DRIVE
IS READY FOR PART 2 OF THE DRIVE DIAGNOSTICS.

TESTING IS BASED ON A HIERARCHY APPROACH STARTING WITH
BASIC LOGIC TESTS AND PROCEEDING THRU DYNAMIC TESTING. THE
TESTS WILL BE KEPT SMALL TO FACILITATE SCOPING LOOPS.

*****CAUTION*****

HALTING THIS PROGRAM ANYWHERE BUT AT THE END OF A PASS,
MAY LEAVE THE HEADERS IN THE DISK CARTRIDGE IN AN
UNDETERMINED STATE.

2.0 REQUIREMENTS

2.1 HARDWARE

THE FOLLOWING HARDWARE IS REQUIRED TO RUN THE DISK DIAGNOSTIC:

PDP-11
CONSOLE TELETYPE
16K MEMORY
KW11-L OR KW11-P CLOCK
RK06 UNIBUS CONTROLLER (RK611)
1 TO 8 RK06 DRIVES

- NOTES: 1. IF NEITHER KW11-L OR P CLOCK IS USED, ALL TIMING
TESTS WILL BE BYPASSED. A MSG AT THE
BEGINNING OF THE TESTS WILL CONFIRM THIS.
2. THE PROGRAM CAN WORK OFF EITHER FORMATTED OR
NON-FORMATTED PACKS.

2.2 PRELIMINARY TESTING & PROGRAMS

THE RK611 DISKLESS CONTROLLER DIAGNOSTICS (ALL PARTS) SHOULD FIRST RUN SUCCESSFU

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, & 70.

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

3.2 XXDP

THIS PROGRAM CAN BE CHAINED BY XXDP & WILL NOT OVERLAY THE LOADER.

CHAIN MODE OPERATION (MONITOR)

1. THE INPUT DIALOGUE IS BYPASSED.
2. THE BUSS ADDRESS & CONTROLLER INTERRUPT VECTOR IS DEFAULTED.
3. DRIVE 0 WILL NOT BE TESTED.
4. ALL OTHER DRIVES IN THE 'DRIVE PRESENT' CONDITION WILL BE TESTED.

NOTE: THE DRIVE PRESENT CONDITION IS:

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

DUMP MODE OPERATION (MANUAL)

1. INPUT DIALOGUE IF STARTED FROM 220.
2. DRIVE 0 CAN BE TESTED, BUT THE OPERATOR IS FIRST GIVEN A MSG TO REPLACE THE PACK IN DR0 WITH A SCRATCH PACK & TYPE \CR> WHEN DONE.

3.3 ACT/APT

THIS PROGRAM IS ACT COMPATIBLE. IT IS APT COMPATIBLE TO THE EXTENT THAT APT HOOKS WILL BE IN THE PROGRAM & WILL WORK THRU THE 'UPTON INTERFACE'.

FOR OTHER INTERFACES, APT MAY ONLY LOAD & START THE PROGRAM. I.E. LOAD & DUMP MODE.

AUTOMATIC MODE (MONITOR)

1. THE INPUT DIALOGUE IS BYPASSED.
2. THE BUSS ADDRESS & CONTROLLER INTERRUPT VECTOR IS DEFAULTED.
3. ALL DRIVES IN THE 'DRIVE PRESENT' CONDITION WILL BE TESTED.

NOTE: THE DRIVE PRESENT CONDITION IS:

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

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:
BIT 7 = 1 ETABLE DOES SIZING
= 0 PROGRAM DOES SIZING
BIT 6 = 1 SPOOL MSGS 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
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.

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13. CONTROLLER DESCRIPTOR WORDS:
NOT USED

14. DEVICE DESCRIPTOR CODES (IN WORDS):
NOT USED

3.4 DUAL ACCESS

THIS PROGRAM WILL NOT TEST OR SUPPORT DUAL-ACCESS. A DRIVE
EQUIPED WITH DUAL ACCESS MUST BE SWITCHED TO THE PORT UNDER
TEST TO PREVENT CON ENTION WITH THE OTHER PORT.

DUAL ACCESS TESTS WILL BE INCORPORATED IN A SEPARATE PROGRAM
AT A LATER DATE.

3.5 MEMORY MANAGEMENT

MEMORY MANAGEMENT NOT USED

3.6 PARITY CHECK ENABLED

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

3.7 . BAD SECTOR

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

3.8 EXECUTION TIME

THE EXECUTION TIMES SHOWN BELOW ARE BASED ON THE PDP 11/50.

TOTAL TIME: 5 MIN, 30 SEC

A BREAKDOWN OF THE MORE LENGTHY TESTS ARE SHOWN BELOW:

TEST 16	STATIC CYL ADDRESS & DIFF REGS-PART 2:	2 MIN, 15 SEC
TEST 34	FORMAT PACK	: 1 MIN
TEST 37	SEEK FROM CYL 0 TO ALL CYLS	: 40 SEC
TEST 40	SEEK FROM CYL 410 TO ALL CYLS	: 40 SEC

3.9 FAULT ISOLATION

TO BE DETERMINED.

3.10 ERROR CORRECTION AND FAILURE RATE ANALYSIS

THIS PROGRAM WILL NOT DO ERROR CORRECTION OR FAILURE RATE

ANALYSIS.

3.11 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 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 SET DRIVES TO BE TESTED IN THE 'LOAD' CONDITION & WITH THE
APPROPRIATE PORT SELECTED & WRITE LOCK DISABLED. DRIVES
NOT TO BE TESTED MUST HAVE BOTH PORTS DESELECTED.

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

4.1.4 PRESS 'START'

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

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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. CORRECT PORT SELECTED
- C. WRITE LOCK DISABLED
- D. DRIVE READY INDICATOR ON

LOCATION 204 - SAME AS 200 START BUT BYPASS TEST 16 (N SQUARE)

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

LOCATION 230 - SAME AS 220 START BUT BYPASS TEST 16 (N SQUARE)

LOCATION 260 - RUN MODULE TEST ...DEFAULT MODE ONLY.
THIS SKIPS OVER THE FOLLOWING TESTS:

- 1. TEST 35 FORMAT PACK
- 2. TEST 36 DECREMENT FROM CYL 410 TO 0 & READ HEADERS
- 3. TEST 40 SEEK FROM CYL 0 TO ALL
- 4. TEST 41 SEEK FROM CYL 410 TO ALL

THE PURPOSE OF BYPASSING IS TO PROVIDE A QUICK MODULE TEST

LOCATION 270 - SAME AS 260 START BUT BYPASS TEST 16 ALSO.

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

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 MSG 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 MSGS. NORMALLY USED WHEN LOOPING ON TEST (SW14) OR LOOPING ON ERROR (SW9).
WITH SWITCH <13> SET, SWITCH <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.

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4.3.7 SW<09>

THIS SWITCH PROVIDES THE TIGHTEST POSSIBLE SCOPE LOOP FOR ERRORS. IF THE PROGRAM DETECTS AN ERROR, IT WILL LOOP BACK TO THE BEGINNING OF TEST.

4.3.8 SW<08>

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

4.4 'SOFTWARE' SWITCH REGISTER

IF THE PROGRAM IS BEING RUN ON A SWITCHLESS PROCESSOR (I.E. AN 11/04 OR 11A34) 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 & 3.3.

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: 1,2,4,6

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

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 DRIVE DIAGNOSTIC
PART 1
MAINDEC-11-DZR6H-D-PBDRIVES TO BE TESTED: 1,3<CR>TYPE IN BUSS ADDRESS IF NOT 177440 <CR>TYPE IN CONTROLLER INTERRUPT VECTOR IF NOT 210 <CR>547
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WILL TEST DRIVES:

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DRIVE 1

(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 DRIVE DIAGNOSTIC

PART 1

MAINDEC-11-DZR6H-D-PB

WILL TEST DRIVES:

0
1

DRIVE 0

DRIVE SERIAL NO. AAA

CARTRIDGE SERIAL NO. BBB

DRIVE 1

DRIVE SERIAL NO. CCC

CARTRIDGE SERIAL NO. DDD

END PASS #1

WILL TEST DRIVES:

0
1

DRIVE 0

DRIVE 1

END PASS # 2

(ETC)

THE ABOVE ASSUMES NO ERRORS DETECTED.

THE NUMBER OF PASSES IS DETERMINED BY ACT/APT/XXDP

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

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 & FORMATTING IS VALID, THE PROGRAM WILL:

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

IF HEADS ARE NOT LOADED AND/OR FORMATTING IS INVALID, THE PROGRAM WILL:

1. ECHO ↑C
2. TYPE 'HALT PENDING, PLEASE WAIT'
3. DO THE TEST(S) THAT LOADS HEADS AND/OR FORMATS THE INVALID CYLS
4. TYPE 'CPU HALTED'
5. HALT THE PROGRAM

NOTES:

1. THE ABOVE EXAMPLE IS FOR THE PROGRAM RUNNING IN DUMP MODE (MANUAL). IF THE PROGRAM IS RUNNING IN CHAIN/AUTO MODE VIA XXDP,ACT,APT; IT WILL FIRST LOAD HEADS AND/OR FORMAT CORRECTLY, IF REQ'D, THEN IT WILL JUMP ON TO THE MONITOR WHERE THE NEXT PROGRAM CAN BE CALLED IN.

THE TYPEOUTS WILL BE "ABORT PENDING - PLEASE WAIT"
& "PROGRAM ABORTING"

2. 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 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 SEEN ON THE LINE OR DEFAULTS TO TEST ALL THE DRIVES SEEN ON THE LINE. IT CHECKS THE EXISTENCE OF AN L OR P CLOCKS FOR USE IN THE TIMING TESTS.

B. STATIC & CYCLE UP TESTS

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THESE TESTS CHECK OUT THE ABILITY TO SELECT & DESELECT THE DRIVE; TO DETECT PARITY, UNSAFE, AND FAULT CONDITIONS WITH THE DRIVE READY TO OPERATE BUT WITHOUT THE SPINDLE ON.

THE ENTIRE POWER UP SEQUENCE IS TESTED BY VERIFYING ALL STATUS BITS SET/RESET IN PROPER SEQUENCE: THE BRUSH CYCLE, INNER-OUTER LIMIT DETECTION, FORWARD, REVERSE, PIP...ETC STATUS BITS ARE CHECKED.

C. SEEK, WRITE HEADER, READ HEADER TESTS

THESE TESTS CHECK THE ABILITY OF THE DRIVE TO DO SEEKS, HEADER OPERATIONS & 20, 22 SECTOR FORMATTING.

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 MSG. ANY ERROR IN THIS TEST WILL RESULT IN ABORTING ALL OTHER TESTS AND JUMPING TO 'END OF PASS'

TEST 2 SIZE THE BUSS

THIS TEST IS ENTERED ONLY IF 'DRIVE SELECTION' IS DEFAULTED EITHER BY RUNNING IN THE AUTO MODE OR A 200 START IN THE MANUAL MODE.
EVERY DRIVE FROM 0 THRU 7 IS ADDRESSED.
CONTROLLER ERROR (CERR) IS EXAMINED AND IF NOT SET, THE DRIVE WILL BE TESTED. 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.

TEST 3 VERIFY OPERATOR DRIVE SELECTIONS

THIS TEST IS ENTERED ONLY IF DRIVE SELECTION IS NOT DEFAULTED. EVERY DRIVE FROM 0 TO 7 IS ADDRESSED &

CONTROLLER ERROR (CERR) IS EXAMINED. IF NOT SET, THE PROGRAM WILL ASSUME THE DRIVE IS PRESENT. IT WILL THEN CHECK TO SEE THAT THE DRIVE WAS INPUTTED FOR TESTING. IF NOT, IT WILL BE AN ERROR. IF CERR WAS SET, THAT DRIVE WILL BE BYPASSED ONLY IF THE ERROR WAS A RESULT OF MDS OR UFE SET OR BOTH NED & DRA RESET (WRONG PORT). IF CERR IS A RESULT OF

NED ONLY. IT IS CHECKED AGAINST THE INPUTTED INFOR TO
VERIFY IT WAS NOT SPECIFIED.

TEST 4 FIND NEXT DRIVE TO BE TESTED

THIS TEST FINDS THE NEXT DRIVE PRESENT & PUTS THAT
ADDRESS IN 'DRVAD'.
THROUGHOUT THE FOLLOWING TESTS, THE DRIVE TESTED IS
THE DRIVE WHOSE ADDRESS IS IN 'DRVAD'.

TEST 5 UNLOAD DRIVE TO BE TESTED

THIS TEST UNLOADS THE DRIVE TO BE TESTED NEXT.
WAITS FOR ATTN & VERIFIES IT CAME FROM THE CORRECT DRIVE.
IT THEN WAITS FOR SPEED OK TO GO LOW BEFORE
PROCEEDING TO THE NEXT TEST.

STATIC & CYCLE UP TESTS

TEST 6 REFERENCE & CHECK ALL STATUS BYTES IN RKMR2 & RKMR3

CHECKS THE ABILITY TO REFERENCE ALL
DRIVE REGISTERS AND THAT THEY CONTAIN CORRECT STATUS.

TEST 7 PRINT DRIVE SERIAL NUMBER

THIS TEST READS & PRINTS THE DRIVE SERIAL # FROM MSG A, WORD 11
IN DECIMAL & IS PERFORMED ON THE 1ST PASS ONLY

TEST 10 SET VV WITH PACK CMD

IF VV IS RESET, THE PACK CMD IS USED TO SET IT.

TEST 11 RELEASE DRIVE

TESTS THE ABILITY TO RECOGNIZE THE RLS BIT AND NOT RAISE SACK

TEST 12 DRIVE TYPE TEST

THIS TEST COMPARES DRIVE TYPE IN MSG A AGAINST 'DDT' IN RKDS.
WRONG CDT IN RKCS1 IS SENT & ERRORS ARE VERIFIED.

TEST 13 C-D PARITY ERROR DETECTION

TESTS THE ABILITY OF THE DRIVE TO DETECT EVEN PARITY SENT BY
THE CONTROLLER BY SETTING 'PAT' ON RKMR1.

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THE DRIVE SHOULD RESPOND WITH 'C-D PARITY ERROR'
THE DRIVE STILL SENDS ODD PARITY TO THE CONTROLLER WHICH IS NOW
CHECKING FOR EVEN PARITY THEREFORE THE CONTROLLER SHOULD DETECT
AN ERROR AND SET SPAR.
THE ERROR CONDITION IS RESET WITH THE CLEAR CMD

TEST 14 VERIFY START SPINDLE CMD

THE PROGRAM CHECKS THE ENTIRE STARTUP SEQUENCE, IE:
BRUSH CYCLE, HEADS HOME, FWD, REV ETC.
BY VERIFYING ALL APPROPRIATE STATUS BITS FOR PROPER SEQUENCING.
THE CYL ADDRESS & CYL DIFFERENCE REGS ARE CHECKED
TO BE ZERO AT THE END OF THE SEQUENCE.

SEEK/READ HEADER/WRITE HEADER TESTS

TEST 15 STATIC CYL DIFF AND CYL ADDR REG TEST; PART 1

THIS TEST CHECKS EACH BIT OF THE CYL DIFFERENCE
AND CYL ADDRESS REGISTERS BY PERFORMING SEEKS TO ALL
MAJOR CYLS (0, 1, 2, 4, 8, 16, 32, 64, 128, 256) WITH EVEN PARITY SET.
THIS FREEZES THE INFORMATION IN THE ABOVE REGISTERS & ALLOWS FOR CHECKIN
THIS TEST VERIFIES C-D PARITY ERROR BIT SET, THAT HEADS DID
NOT MOVE & ALL OTHER APPLICABLE STATUS BITS & REGS.

TEST 16 STATIC CYL DIFF & CYL ADDR REG TEST-PART 2

THIS TEST CHECKS THE ABILITY OF THE DRIVE TO PROPERLY SET THE CYL
DIFF. & CYL ADDR REGS FOR ALL COMBINATIONS BY SEEKING TO
ALL CYLS FROM EVERY OTHER CYL. (N SQUARE SEEKS).
IT IS PERFORMED IN THE SAME MANNER AS THE ABOVE TEST.

TEST 17 HEAD REGISTER TEST

THIS TEST CHECKS THE ABILITY TO SELECT ALL HEADS (0, 1, 2)
VIA RKDA & READING BACK FROM MSG B3 BY THE SELECT DRIVE CMD.
HEAD 3 IS CHECKED TO PRODUCE INV. ADDR.

SINCE CHANGING HEAD ADDRESSES ARE TIED TO SEEK CMDS,
SELECTING HEAD 3 MUST RESULT IN A SEEK INCOMPLETE ALONG WITH
ILLEGAL ADDRESS. IF NOT THIS MEANS THAT CHANGING HEAD ADDRESSES
ARE NOT TIED TO SEEK CMDS

TEST 20 SEEK TO CYL 0

TESTS THE ABILITY TO DO A SEEK CMD.
VERIFIES THERE WAS NO MOVEMENT BY CHECKING ALL APPROPRIATE
STATUS BITS. VERIFIES CMD COMPLETION BETWEEN 10-15USEC.

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READ HEADER IS NOT PERFORMED AS THE PACK MAY NOT BE FORMATTED.

TEST 21 TEST SECTOR COUNT REG. FOR 22 & 20 SECTOR FORMAT

TEST 22 DETECT OUTER LIMIT

THIS TEST VERIFIES THAT THE ABOVE TEST DID ACTUALLY POSITION ON CYL 0
BY DETECTING OUTER LIMIT AS THE ADJACENT CYL.
AN ERROR IN THIS TEST INDICATES:

A. HEADS WERE NOT ON CYL 0
AND/OR B. COULD NOT SEEK IN REVERSE DIRECTION.

TEST 23 BASIC WRITE/READ HEADER & HEAD SWITCHING TEST

THIS TEST CHECKS HEAD SWITCHING BY WRITING UNIQUE HEADERS
ON EACH TRACK OF CYL 0, READING BACK & VERIFYING THEY REMAINED
UNIQUE. 22 SECTOR FORMAT IS USED

I.E. TRACK 0: ALL 0'S FOR ALL SECTOR HEADERS
TRACK 1: 0101 FOR ALL SECTOR HEADERS
TRACK 2: ALL 1'S FOR ALL SECTOR HEADERS

TEST 24 BASIC WRITE/READ HEADER TEST; ALL 1'S, 20 SECTORS

USING HEAD 0, WRITE & READ 20 SECTOR HEADERS BY WRITING ALL
1'S AS HEADERS. ATTEMPT TO FIND SECTORS 20 & 21. VERIFY
THEY ARE NO LONGER THERE BY READING 22 SECTORS AND NOT
FINDING 0'S AS DATA FROM THE PREVIOUS TEST.

TEST 25 WRITE & READ HEADERS CYL 0, HEAD 0

TEST 26 SEEK FROM CYL 0 TO 1 & READ HEADERS

THIS TEST CHECKS MSG A & B WORDS 0, 1, 2 FOR CORRECT STATUS AFTER RDY
IS RECEIVED FROM A SEEK CMD TO DETERMINE
THAT THE HEADS ARE ACTUALLY MOVING & THE CYL DIFF IS 1.
AFTER ATTN IS RECEIVED, CERR IS EXAMINED FOR ANY ERRORS.
CYL DIFFERENCE IN MSG A2 IS VERIFIED TO BE 0 & CYL ADDR
IN MSG B2 IS VERIFIED TO BE 1.

HEADERS ARE READ FROM 1 SECTOR, HEAD 0 & VERIFIED THAT THEY ARE
DIFFERENT FROM CYL 0 TO SHOW THAT THE HEADS DID ACTUALLY MOVE.

TEST 27 WRITE & READ HEADERS CYL 1, HEAD 0

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TEST 30 TEST RECALIBRATE CMD & READ HEADERS

THIS TEST DOES A RECALIBRATE & READS HEADERS.
IT VERIFIES THAT WRITING HEADERS ON CYL 1 FROM THE PREVIOUS
TEST DID NOT OVERWRITE CYL 0 HEADERS.

AN ERROR IN THIS TEST INDICATES THAT HEADS:

- OR A. MOVED TO A CYL OTHER THAN 1
 B. DID NOT GET BACK TO CYL 0

TEST 31 SINGLE INCREMENT SEEKS TO CYL 410

THIS TEST DOES SINGLE INCREMENT SEEKS OUT TO CYL 410
WITHOUT ANY WRITING OR READING SO AS NOT TO INADVERTENTLY
DESTROY DATA.

TEST 32 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL

THIS TEST VERIFIES THAT CYL 410, 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.
IF BSE INFO CANNOT BE READ, OR IF AFTER READING THE BSE INFO
IT IS DETERMINED THAT AN ALIGNMENT CARTRIDGE IS USED,
A MSG WILL BE TYPED INDICATING THAT ALL
FUTURE FORMAT AND READ-WRITE TESTS WILL BE BYPASSED.
THIS IS DONE SO AS NOT TO DESTROY BSE INFO OR AN ALIGNMENT PACK BY WRITI

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

THIS IS THE FIRST TEST WHERE THE READ DATA CMD IS PERFORMED

TEST 33 DETECT INNER LIMIT

THIS TEST VERIFIES THAT THE LAST CYL IN THE ABOVE
TEST WAS 410 BY DETECTING INNER LIMIT AS THE ADJACENT CYL.
IF THIS TEST FAILS, IT INDICATES THAT HEADS WERE NOT ON CYL 410
& THAT BSE INFO IS NOT VALID. THE FORMAT PACK TEST
& ALL READ-WRITE TESTS ARE BYPASSED
TO AVOID DESTROYING BSE INFO OR AN ALIGNMENT CARTRIDGE
SINCE THERE IS A SEEKING OR LIMIT DETECTION PROBLEM.

TEST 34 FORMAT PACK

THIS TEST FORMATS THE ENTIRE PACK IN 22 SECTOR FORMAT BY
DOING 1 CYL INCREMENTAL SEEKS
FROM 0 TO 410 WITH WRITE HEADER CMDS (ALL TRACKS).
HEADERS WILL BE READ IN THE NEXT TEST

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TEST 35 DECREMENT FROM CYL 410 TO 0 & READ HEADERS

THIS TEST VERIFIES MOTION IN THE NEGATIVE DIRECTION BY
SINGLE CYL INCREMENTAL SEEKS.

TEST 36 SEEK FROM CYL 0 TO ALL MAJOR CYLS & READ HEADERS

THIS TEST SEEKS FROM CYL 0 TO ALL THE MAJOR CYLS & READS HEADERS.
IT THEN SEEKS CYL 0 & READS HEADERS.

MAJOR CYLS ARE: 1 (DECIMAL) = 1 (OCTAL)

2	2
4	4
8	10
16	20
32	40
64	100
128	200
256	400

TEST 37 SEEK TO ALL CYLS FROM 0 & READ HEADERS

TEST 40 SEEK TO ALL CYLS FROM CYL 410 & READ HEADERS

TEST 41 SEEK TO ALL KEY INVALID CYLS

THIS TEST VERIFIES THAT 'INV ADDR' & 'SEEK INCOMPLETE' IS
PRODUCED & THAT HEADS DO NOT MOVE OR UNLOAD IF AN ILLEGAL
CYL IS SPECIFIED IN A SEEK.

INVALID CYLS ARE 411 THRU 511 (10) IE. 633 THRU 777 (8)

THIS TEST CHECKS KEY INVALID CYLS 411, 412, 416, 448 & 480
FOR A FULL LOGIC TEST

THE PROGRAM DOES NOT REQUIRE FORMATTED PACKS AS FORMATTING
IS PERFORMED IN ANY CASE.

ANY TEST THAT MODIFIES STANDARD FORMATTING IS FOLLOWED BY A
'CLEAN UP' TEST TO PUT THOSE CYLS BACK TO STANDARD
FORMAT.

6.0 ERROR REPORTING

6.1 ERROR INTERPRETATION

WHENEVER AN ERROR MSG 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

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1051 CONTENTS OF THE CORRESPONDING REGISTERS AT THE TIME OF
1052 ERROR.
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1054 EVERY ERROR MSG CONTAINS A PC. THIS PC INDICATES THE
1055 POSITION IN PROGRAM WHERE THE ERROR CALL IS LOCATED. THE
1056 ERROR MSG, BECAUSE OF PRACTICAL CONSIDERATIONS IS MADE
1057 SHORT AND MEANINGFUL. THE USER IS ADVISED TO LOOK UP THE
1058 PC IN THE PROGRAM LISTING, WHERE HE WILL FIND MORE INFORMATION
1059 ABOUT THE ERROR. IN MANY INSTANCES, A SINGLE FAULT WILL
1060 GIVE RISE TO MORE THAN ONE ERROR REPORT. A LITTLE DELIBERATION
1061 AND CAREFUL EXAMINATION OF THE DATA GIVEN WILL BE CERTAINLY
1062 VERY HELPFUL IN PINPOINTING THE FAULT. A BRIEF EXPLANATION
1063 OF WHAT IS BEING CHECKED IN THE TEST IS GIVEN AT THE
1064 BEGINNING OF EVERY TEST. ALL THE NUMBERS GIVEN WITH ERROR
1065 MSGS ARE IN OCTAL.
1066

NOTE

1067 NO ERROR LOGGING OR OPERATION HISTORY IS PROVIDED.
1068
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1070

5.2 ERROR PRINTOUT EXAMPLES:

EXAMPLE #1:

1071 MSG AO ERROR
1072 AFTER START SPINDLE CMD & FWD SET
1073
1074

1075 TEST NO. PC
1076 000014 016530
1077 EXPECT
1078 AO BO A1 B1 A2 B2 B3
1079 030144 100000 013704 000001
1080 ACTUAL
1081 140144 100000 101744 000001
1082 RKCS1 RKCS2 RKASOF RKER RKDS RKDC
1083 040200 000100 010000 000000 000000 000000
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1091 THE ABOVE EXAMPLE SHOWS EXPECTED & ACTUAL DATA FOR
1092 MSG REGISTERS AO, BO, A1 & B1.
1093

1094 MSGS A2, B2 & B3 WILL BE TYPED OUT ONLY AS
1095 REQUIRED IF THE CYL DIFFERENCE/OFFSET, CYL
1096 ADDRESS & HEAD & SECTOR INFORMATION IS A VARIABLE PARAMETER
1097 OF THE TEST.
1098

EXAMPLE #2:

1099 NO ATTN IN RKASOF
1100 AFTER UNLOAD CMD
1101

1102 TEST NO. PC
1103 000003 014330
1104 RKMR2 RKMR3 RKER RKDS RKCS1 RKCS2 RKASOF
1105
1106

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SEQ 0021

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000144 100000 000000 100101 000206 000104 000000

[END OF DOCUMENT]

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J02

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SEQ 0022

167400
000001

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; *** PGM REV 035 ***
.NLIST CND,MC,MD
.LIST ME
.ENABL ABS,AMA

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;DEFINE SYSMAC MACROS

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$SWR= 167400
$TN= 1

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;DEFINE SWITCHES 15,14,13,11,10,9,8
;SET FIRST TEST NO. TO 1

```

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.TITLE UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
;*COPYRIGHT (C) 1976
;*DIGITAL EQUIPMENT CORP.
;*MAYNARD, MASS. 01754
;*
;*PROGRAM BY GARY PAPAIZIAN
;*
;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
;*PACKAGE (MAINDEC-11-DZQAC-C3), JAN 19, 1977.
;*

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.SBTTL OPERATIONAL SWITCH SETTINGS

```

SWITCH	USE
15	HALT ON ERROR
14	LOOP ON TEST
13	INHIBIT ERROR TYPEOUTS
12	ABORT DRIVE AFTER 20 ERRORS
11	INHIBIT ITERATIONS
10	BELL ON ERROR
9	LOOP ON ERROR
8	LOOP ON TEST IN SWR<7:0>

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.SBTTL SUMMARY OF STARTING LOCATIONS

```

200	DEFAULT PARAMETER
204	DEFAULT PARAMETERS & BYPASS TEST 16
220	INPUT PARAMETERS
230	INPUT PARAMETERS & BYPASS TEST 16
240	ODT11
260	RUN MODULE TEST VERSION-DEFAULT MODE ONLY BYPASS TESTS 35,36,40 & 41
270	SAME AS 260 START BUT BYPASS TEST 16 ALSO

1168		.SBTTL BASIC DEFINITIONS
1169		;
1170		;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
1171	001100	STACK= 1100
1172		.EQUIV EMT,ERROR ;:BASIC DEFINITION OF ERROR CALL
1173		.EQUIV IOT,SCOPE ;:BASIC DEFINITION OF SCOPE CALL
1174		;
1175		;*MISCELLANEOUS DEFINITIONS
1176	000011	HT= 11 ;:CODE FOR HORIZONTAL TAB
1177	000012	LF= 12 ;:CODE FOR LINE FEED
1178	000015	CR= 15 ;:CODE FOR CARRIAGE RETURN
1179	000200	CRLF= 200 ;:CODE FOR CARRIAGE RETURN-LINE FEED
1180	177776	PS= 177776 ;:PROCESSOR STATUS WORD
1181		.EQUIV PS,PSW
1182	177774	STKLMT= 177774 ;:STACK LIMIT REGISTER
1183	177772	PIRQ= 177772 ;:PROGRAM INTERRUPT REQUEST REGISTER
1184	177570	DSWR= 177570 ;:HARDWARE SWITCH REGISTER
1185	177570	DDISP= 177570 ;:HARDWARE DISPLAY REGISTER
1186		;
1187		;*GENERAL PURPOSE REGISTER DEFINITIONS
1188	000000	R0= %0 ;:GENERAL REGISTER
1189	000001	R1= %1 ;:GENERAL REGISTER
1190	000002	R2= %2 ;:GENERAL REGISTER
1191	000003	R3= %3 ;:GENERAL REGISTER
1192	000004	R4= %4 ;:GENERAL REGISTER
1193	000005	R5= %5 ;:GENERAL REGISTER
1194	000006	R6= %6 ;:GENERAL REGISTER
1195	000007	R7= %7 ;:GENERAL REGISTER
1196	000006	SP= %6 ;:STACK POINTER
1197	000007	PC= %7 ;:PROGRAM COUNTER
1198		;
1199		;*PRIORITY LEVEL DEFINITIONS
1200	000000	PR0= 0 ;:PRIORITY LEVEL 0
1201	000040	PR1= 40 ;:PRIORITY LEVEL 1
1202	000100	PR2= 100 ;:PRIORITY LEVEL 2
1203	000140	PR3= 140 ;:PRIORITY LEVEL 3
1204	000200	PR4= 200 ;:PRIORITY LEVEL 4
1205	000240	PR5= 240 ;:PRIORITY LEVEL 5
1206	000300	PR6= 300 ;:PRIORITY LEVEL 6
1207	000340	PR7= 340 ;:PRIORITY LEVEL 7
1208		;
1209		;*SWITCH REGISTER SWITCH DEFINITIONS
1210	100000	SW15= 100000
1211	040000	SW14= 40000
1212	020000	SW13= 20000
1213	010000	SW12= 10000
1214	004000	SW11= 4000
1215	002000	SW10= 2000
1216	001000	SW09= 1000
1217	000400	SW08= 400
1218	000200	SW07= 200
1219	000100	SW06= 100
1220	000040	SW05= 40
1221	000020	SW04= 20
1222	000010	SW03= 10
1223	000004	SW02= 4

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1224      000002      SW01= 2
1225      000001      SW00= 1
1226      .EQUIV      SW09,SW9
1227      .EQUIV      SW08,SW8
1228      .EQUIV      SW07,SW7
1229      .EQUIV      SW06,SW6
1230      .EQUIV      SW05,SW5
1231      .EQUIV      SW04,SW4
1232      .EQUIV      SW03,SW3
1233      .EQUIV      SW02,SW2
1234      .EQUIV      SW01,SW1
1235      .EQUIV      SW00,SW0
1236
1237      .:DATA BIT DEFINITIONS (BIT00 TO BIT15)
1238      100000      BIT15= 100000
1239      040000      BIT14= 40000
1240      020000      BIT13= 20000
1241      010000      BIT12= 10000
1242      004000      BIT11= 4000
1243      002000      BIT10= 2000
1244      001000      BIT09= 1000
1245      000400      BIT08= 400
1246      000200      BIT07= 200
1247      000100      BIT06= 100
1248      000040      BIT05= 40
1249      000020      BIT04= 20
1250      000010      BIT03= 10
1251      000004      BIT02= 4
1252      000002      BIT01= 2
1253      000001      BIT00= 1
1254      .EQUIV      BIT09,BIT9
1255      .EQUIV      BIT08,BIT8
1256      .EQUIV      BIT07,BIT7
1257      .EQUIV      BIT06,BIT6
1258      .EQUIV      BIT05,BIT5
1259      .EQUIV      BIT04,BIT4
1260      .EQUIV      BIT03,BIT3
1261      .EQUIV      BIT02,BIT2
1262      .EQUIV      BIT01,BIT1
1263      .EQUIV      BIT00,BIT0
1264
1265      .:BASIC "CPU" TRAP VECTOR ADDRESSES
1266      000004      ERRVEC= 4      ;; TIME OUT AND OTHER ERRORS
1267      000010      RESVEC= 10     ;; RESERVED AND ILLEGAL INSTRUCTIONS
1268      000014      TBITVEC= 14    ;; "T" BIT
1269      000014      TRTVEC= 14     ;; TRACE TRAP
1270      000014      BPTVEC= 14    ;; BREAKPOINT TRAP (BPT)
1271      000020      IOTVEC= 20     ;; INPUT/OUTPUT TRAP (IOT) **SCOPE**
1272      000024      PWRVEC= 24     ;; POWER FAIL
1273      000030      EMTVEC= 30     ;; EMULATOR TRAP (EMT) **ERROR**
1274      000034      TRAPVEC= 34    ;; "TRAP" TRAP
1275      000060      TKVEC= 60       ;; TTY KEYBOARD VECTOR
1276      000064      TPVEC= 64      ;; TTY PRINTER VECTOR
1277      000240      PIRQVEC= 240   ;; PROGRAM INTERRUPT REQUEST VECTOR
1278
1279      .SBTTL RK06 CONTROLLER REGISTER DEFINITION

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RK06 CONTROLLER REGISTER DEFINITION

SEQ 0025

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1280
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1283      000000      RKCS1= 0      ; CONTROL AND STATUS REGISTER 1
1284      000002      RKWC= 2      ; WORD COUNT REGISTER
1285      000004      RKBA= 4      ; BUS ADDRESS REGISTER
1286      000006      RKDA= 6      ; DESIRED TRACK SECTOR REGISTER
1287      000010      RKCS2= 10     ; CONTROL AND STATUS REGISTER 2
1288      000012      RKDS= 12     ; DRIVE STATUS REGISTER
1289      000014      RKER= 14     ; ERROR REGISTER
1290      000016      RKASOF= 16    ; ATTENTION SUMMARY AND OFFSET REGISTER
1291      000020      RKDC= 20     ; DESIRED CYL REGISTER
1292      000024      RKDB= 24     ; DATA BUFFER
1293      000026      PKMR1= 26    ; MAINTENANCE REGISTER 1
1294      000034      RKMR2= 34    ; MAINTENANCE REGISTER 2 (MSG LINE A)
1295      000036      RKMR3= 36    ; MAINTENANCE REGISTER 3 (MSG LINE B)
1296      000030      RKECPS= 30   ; ECC POSITION INFORMATION
1297      000032      RKECPT= 32   ; ECC PATTERN INFORMATION
1298
1299      .SBTTL CONTROL AND STATUS REGISTER 1 BITS (RKCS1:0)
1300
1301      ; DRIVE CMDS
1302
1303      000001      SELDRV= 1      ; SELECT DRIVE (GET STATUS)
1304      000003      PACK= 3       ; PACK ACKNOWLEDGE
1305      000005      CLEAR= 5      ; DRIVE CLEAR
1306      000007      UNLOAD= 7     ; UNLOAD
1307      000011      SRTSPL= 11    ; START SPINDLE
1308      000013      RECAL= 13     ; RECALIBRATE
1309      000015      OFFSET= 15    ; OFFSET
1310      000017      SEEK= 17     ; SEEK
1311      000021      RDATA= 21     ; READ DATA
1312      000023      WRDATA= 23    ; WRITE DATA
1313      000025      RDHEAD= 25    ; READ HEADER
1314      000027      WRHEAD= 27    ; WRITE HEADER AND DATA
1315      000031      WRTCHK= 31    ; WRITE CHECK
1316
1317      000001      GO= BIT0       ; GO BIT
1318      000100      IE= BIT6      ; INTERRUPT ENABLE
1319      000200      RDY= BIT7     ; CONTROLLER READY
1320      000400      BA16= BIT8   ; BUS ADDRESS BIT 16
1321      001000      BA17= BIT9   ; BUS ADDRESS BIT 17
1322      002000      CDT= BIT10    ; CONTROLLER DRIVE TYPE (0=RK06)
1323      004000      CTO= BIT11    ; CONTROLLER TIMEOUT
1324      010000      CFMT= BIT12   ; CONTROLLER DRIVE FORMAT (0=22 SECTOR, 1=20 SECTOR)
1325      020000      DCPAR= BIT13  ; SERCON PARITY ERROR DETECTED BY CONTROLLER
1326      040000      DI= BIT14    ; DRIVE INTERRUPT
1327      100000      CERR= BIT15   ; CONTROLLER ERROR
1328      100000      CCLR= BIT15   ; CONTROLLER CLEAR
1329
1330      .SBTTL CONTROL AND STATUS REGISTER 2 BITS (RKCS2:10)
1331
1332      000007      DRVMSK= 7      ; MASK FOR DRIVE SELECTION CODE
1333      000010      RLS= BIT3     ; DESELECT OR RELEASE DRIVE IN BITS 0-2
1334      000020      BAI= BIT4    ; BUS ADDRESS INCREMENT INHIBIT
1335      000040      SCLR= BITS    ; SUBSYSTEM CLEAR CONTROLLER AND ALL DRIVES

```

1336 000100
1337 000200
1338 000400
1339 001000
1340 002000
1341 004000
1342 010000
1343 020000
1344 040000
1345 100000

IR= BIT6 ; INPUT READY
OR= BIT7 ; OUTPUT READY
UFE= BIT8 ; UNIT FIELD ERROR
MDS= BIT9 ; MULTIPLE DRIVE SELECT
PGE= BIT10 ; PROGRAMMING ERROR
NEM= BIT11 ; NON-EXISTENT MEMORY
NED= BIT12 ; NON-EXISTENT DRIVE
UPE= BIT13 ; UNIBUS PARITY ERROR
WCE= BIT14 ; WRITE CHECK ERROR
DLT= BIT15 ; DATA LATE ERROR

.SBTTL ERROR REGISTER BIT DEFINITION (RKER:14)

1346
1347
1348
1349 000001
1350 000002
1351 000004
1352 000010
1353 000020
1354 000040
1355 000100
1356 000200
1357 000400
1358 001000
1359 002000
1360 004000
1361 010000
1362 020000
1363 040000
1364 100000

ILF= BIT0 ; ILLEGAL FUNCTION CODE
SKI= BIT1 ; SEEK INCOMPLETE
NXF= BIT2 ; NON-EXECUTABLE FUNCTION
DAPAR= BIT3 ; DRIVE DETECTED SERCON PARITY ERROR
FMTE= BIT4 ; FORMAT ERROR
DTYE= BIT5 ; DRIVE TYPE ERROR
ECH= BIT6 ; ECC HARD
BSE= BIT7 ; BAD SECTOR ERROR
HVRC= BIT8 ; HEADER VRC ERROR
COE= BIT9 ; CYL ADDRESS OVERFLOW ERROR
IDAE= BIT10 ; INVALID DISK ADDRESS ERROR: HEAD/CYL
WLE= BIT11 ; WRITE LOCK ERROR
DTE= BIT12 ; DRIVE TIMING ERROR
OPT= BIT13 ; OPERATION (SEARCH) INCOMPLETE
UNS= BIT14 ; DRIVE UNSAFE
DCK= BIT15 ; DATA CHECK

.SBTTL STATUS REGISTER BIT DEFINITION (RKDS:12)

1365
1366
1367
1368 000001
1369
1370 000004
1371 000010
1372 000020
1373 000040
1374 000100
1375 000200
1376 000400
1377 004000
1378 020000
1379 040000
1380 100000

DRA= BIT0 ; DRIVE AVAILABLE (CONTROLLER IS SET IF
; THIS BIT IS RESET)
OFST= BIT2 ; DRIVE OFFSET
ACLO= BIT3 ; AC LOW
DCLO= BIT4 ; DC LOW
DROT= BIT5 ; DRIVE OFF TRACK
VV= BIT6 ; VOLUME VALID
DRDY= BIT7 ; DRIVE READY
DDT= BIT8 ; DRIVE TYPE (0=RK06)
WRL= BIT11 ; WRITE LOCK
PIP= BIT13 ; POSITIONING IN PROGRESS
DSC= BIT14 ; DRIVE STATUS CHANGE
SVAL= BIT15 ; STATUS VALID

.SBTTL MAINTENANCE REGISTER 1 BIT DEFINITION (RKMR1:22)

1381
1382
1383
1384 000017
1385 000020
1386 000040
1387 000100
1388 000200
1389 000400
1390 001000
1391 002000

MESMSK= 17 ; MSG MASK
PAT= BIT4 ; FORCE EVEN PARITY ON SERCON MSG LINES
DMO= BIT5 ; DIAGNOSTIC MODE
MSP= BIT6 ; MAINTENANCE SECTOR PULSE
MIND= BIT7 ; MAINTENANCE INDEX
MCLK= BIT8 ; MAINTENANCE CLOCK
MERD= BIT9 ; MAINTENANCE ENCODED READ DATA
MEWD= BIT10 ; MAINTENANCE ENCODED WRITE DATA

1392 004000
1393 010000
1394 C20000
1395 040000
1396 100000

PCA= BIT11 ;PRECOMPENSATION ADVANCE
PCD= BIT12 ;PRECOMPENSATION DELAY
ECCW= BIT13 ;ECC WORD IS BEING READ OR WRITTEN
WRTGAT= BIT14 ;WRITE GATE
RDGATE= BIT15 ;READ GATE

.SBTTL DEFINITION OF DRIVE STATUS BYTE 00 MSG A (RKMR2:34)

1397
1398
1399
1400 000040
1401 000100
1402 000200
1403 000400
1404 001000
1405 002000
1406 004000
1407 010000
1408 020000
1409 040000

D.DRA= BIT5 ;DRIVE AVAILABLE
D.VV= BIT6 ;VOLUME VALID
D.DRDY= BIT7 ;DRIVE READY
D.DUT= BIT8 ;DRIVE TYPE (0=RK06)
D.FORM= BIT9 ;DRIVE FORMAT
D.OFF= BIT10 ;OFFSET ON
D.WRL= BIT11 ;WRITE LOCK
D.SPIN= BIT12 ;SPINDLE ON
D.PIP= BIT13 ;POSITIONING IN PROGRESS
D.DSC= BIT14 ;DRIVE STATUS CHANGE

.SBTTL DEFINITION OF DRIVE STATUS BYTE 01 MSG A (RKMR2:34)

1410
1411
1412
1413 000020
1414 000040
1415 000100
1416 000200
1417 000400
1418 001000
1419 002000
1420 004000
1421 010000
1422 020000
1423 040000

D.SSP= BIT4 ;SERVO SIG PRESENT
D.HDHM= BIT5 ;HEADS HOME
D.BRHM= BIT6 ;BRUSHES HOME
D.DOOR= BIT7 ;DOOR INTERLOCKED
D.CART= BIT8 ;CARTRIDGE INTERLOCK
D.SPOK= BIT9 ;SPEED OK
D.FWD= BIT10 ;FORWARD
D.REV= BIT11 ;REVERSE
D.LOAD= BIT12 ;HEADS LOADING
D.RTZ= BIT13 ;RETURN TO ZERO
D.UNLD= BIT14 ;HEADS UNLOADING

.SBTTL DEFINITION OF DRIVE STATUS BYTE 00 MSG B (RKMR3:36)

1424
1425
1426
1427 000040
1428 000100
1429 000200
1430 000400
1431 001000
1432 002000
1433 004000
1434 010000
1435 020000
1436 040000

D.IDAE= BIT5 ;INVALID DISK ADDRESS ERROR:HEAD/CYL
D.ACLO= BIT6 ;AC LOW
D.FLT= BIT7 ;DRIVE FAULT
D.ILF= BIT8 ;ILLEGAL FUNCTION CODE
D.PAR= BIT9 ;DRIVE DETECTED SERCON PARITY ERROR
D.SKI= BIT10 ;SEEK INCOMPLETE
D.WLE= BIT11 ;WRITE LOCK ERROR
D.SPLS= BIT12 ;SPEED LOSS
D.DROT= BIT13 ;DRIVE OFF TRACK
D.UNS= BIT14 ;R/W UNSAFE

.SBTTL DEFINITION OF DRIVE STATUS BYTE 01 MSG B (RKMR3:36)

1437
1438
1439
1440 000020
1441 000040
1442 000100
1443 000200
1444 000400
1445 001000
1446 002000
1447 004000

D.SECT= BIT4 ;SECTOR ERROR
D.WCUR= BIT5 ;WRITE CURRENT AND NO WRITE GATE
D.WGAT= BIT6 ;WRITE GATE AND NO TRANSISTIONS
D.HDFL= BIT7 ;HEAD FAULT
D.MHD= BIT8 ;MULTIPLE HEAD SELECT
D.XERROR= BIT9 ;INDEX ERROR
D.TIB= BIT10 ;TRIBIT ERROR
D.PLO= BIT11 ;PLO ERROR

C03

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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DEFINITION OF DRIVE STATUS BYTE 01 MSG B (RKMR3:36)

SEQ 0028

1448 010000
1449 020000
1450 040000
1451
1452
1453
1454 000007
1455 017760
1456 017760
1457 077770
1458
1459
1460
1461 000003
1462 017760
1463 040000
1464 000760
1465 007000
1466 100000

D.NMOV= BIT12 ;SEEK AND NO MOTION
D.LIMD= BIT13 ;LIMIT DETECT ON SEEK
D.SUNS= BIT14 ;SERVO UNSAFE

.SBTTL COMMON MASKS AND OTHER BITS: MSG A (RKMR2:34)

M.DRV= 7 ;DRIVE CODE, ALL BYTES
M.CDIF= 17760 ;CYL DIFF, BYTE 10
M.OFST= 17760 ;OFFSET VALUE, BYTE 10
M.SER= 77770 ;DRIVE SERIAL #, BYTE 11

.SBTTL COMMON MASKS AND OTHER BITS: MSG B (RKMR3:36)

M.ID= 3 ;BYTE ID, ALL BYTES
M.CADD= 17760 ;CYL ADDRESS, BYTE 10
M.ALGN= BIT14 ;ALIGN SIGN, BYTE 10
M.SECT= 760 ;SECTOR COUNT, BYTE 11
M.HEAD= 7000 ;HEAD DECODE, BYTE 11
M.PAR= BIT15 ;PARITY, MESS A/B, ALL BYTES

```

1467
1468
1469
1470      000000
1471
1472
1473
1474      000174
1475      000174 000000
1476      000176 000000
1477
1478      000200 000137 007132
1479      000204 000204
1480      000204 000137 007026
1481      000220 000220
1482      000220 000137 007006
1483      000230 000230
1484      000230 000137 007046
1485      000240 000240
1486      000240 000137 067712
1487      000260 000260
1488      000260 000137 007070
1489      000270 000270
1490      000270 000137 007110
1491
1492
1493
1494
1495
1496      000274
1497      000046
1498      000046 043220
1499      000052 000052
1500      000052 100000
1501      000274
1502      001000
1503
1504
1505
1506
1507
1508      001000
1509      000024
1510      000024 000200
1511      000044 000044
1512      000044 001000
1513      001000
1514
1515
1516
1517
1518      001000
1519      001000 000000
1520      001002 001210
1521      001004 000430
1522      001006 001130

```

.SBTTL TRAP CATCHER

```

      . = 0
; *ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
; *SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
; *LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS
      . = 174
DISPREG: .WORD 0      ;; SOFTWARE DISPLAY REGISTER
SWREG:   .WORD 0      ;; SOFTWARE SWITCH REGISTER
.SBTTL STARTING ADDRESS(ES)
      JMP 2*START ;; JUMP TO STARTING ADDRESS OF PROGRAM
      . = 204
      JMP BYT16      ; BYPASS N-SQUARE TEST IN DEFAULT MODE
      . = 220
      JMP PARSRT      ; INPUT ALL PARAMETERS & START TESTING
      . = 230
      JMP BYT16A      ; BYPASS N-SQUARE TEST IN PARAM MODE
      . = 240
      JMP 0.0DT      ; ENTER 0DT11
      . = 260
      JMP MDTST      ; MODULE TESTS DEFAULT MODE ONLY
      . = 270
      JMP MDTSTA      ; BYPASS SEVERAL TESTS
                        ; SAME AS 260 & BYPASS N-SQUARE TEST ALSO

```

.SBTTL ACT11 HOOKS

```

; *****
; HOOKS REQUIRED BY ACT11
      $SVPC = .      ; SAVE PC
      . = 46
      SENDAD      ; 1) SET LOC.46 TO ADDRESS OF SENDAD IN .SEOP
      . = 52
      .WORD 100000      ; 2) SET LOC.52 TO 100000
      . = $SVPC      ; RESTORE PC
      . = 1000

```

.SBTTL APT PARAMETER BLOCK

```

; *****
; SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
; *****
      . $X = .      ; SAVE CURRENT LOCATION
      . = 24      ; SET POWER FAIL TO POINT TO START OF PROGRAM
      200      ; FOR APT START UP
      . = 44      ; POINT TO APT INDIRECT ADDRESS PNTR.
      $APTHDR      ; POINT TO APT HEADER BLOCK
      . = $X      ; RESET LOCATION COUNTER
; *****
; SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
; INTERFACE SPEC.

```

```

$APTHD:
$HIBTS: .WORD 0      ; TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
$MBAOR: .WORD $MAIL      ; ADDRESS OF APT MAILBOX (BITS 0-15)
$TSTM:  .WORD 280      ; RUN TIM OF LONGEST TEST
$PASTM: .WORD 600      ; RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)

```

E03

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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APT PARAMETER BLOCK

SEQ 0030

1523 001010 001130
1524 001012 000042
1525
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1572
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1574
1575
1576
1577
1578SUNITM: .WORD 600. ; ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
.WORD SETEND-SMAIL/2 ; LENGTH MAILBOX-ETABLE (WORDS)

.LIST MD

; USE LOOP X TO OMIT JSR PC, SUBCLR

.MACRO LOOP A
SCOP1
MOV #STACK, SP ; RESTORE STK PTR.IF B A
JSR PC, SUBCLR
ERROR 24 ; CERR AFTER SCLR.ENDC
.ENDM LOOP; THIS MACRO FILLS EXPECTED MSG A0, B0, A1, B1, A2, B2 & B3 WITH STANDARD BITS SET
; A=D.DSC AFTER ATTN OR 0 AFTER DRIVE CLEAR OR ANY IMPLIED SEEKS
; NOTE: A CAN BE ANY BIT COMBINATION DESIRED.MACRO F.EAB A
MOV #A!D.SPIN!D.DRDY!D.VV!D.DRA, E.A0 ; EXPECTED MSG A0
CLR E.B0 ; EXPECTED MSG B0
MOV #D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP, E.A1 ; EXPECTED A1
MOV #1, E.B1 ; MSG ID FOR EXPECTED MSG B1
CLR E.A2 ; EXPECTED MSG A2
MOV #2, E.B2 ; MSG ID FOR EXPECTED MSG B2
MOV #3, E.B3 ; MSG ID FOR EXPECTED MSG B3
.ENDM F.EAB; THIS MACRO ASSUMES DRIVE MSG A0, B0, A1, B1 WILL ALWAYS BE TESTED
; USE A, C, D, E FOR MSG A0, B0, A1, B1 ERROR NUMBERS RESP.
; USE G=T.A2 TO READ MSG A2 & PUT INFO INTO 'CYLDIF'
; H=T.B2 TO READ MSG B2 & PUT INFOR INTO 'CYLADD'
; I=T.B3 TO READ MSG B3 & PUT INFO INTO 'SECTOR' & 'HEAD A'

F= < ERROR DESCRIPTION>

.MACRO CHECK A, C, D, E, F, G, H, I

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

.ENDM CHECK

; A=CYL DIFF/OFFSET ERROR #
; B=CYL ADDR ERROR #

F03

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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APT PARAMETER BLOCK

SEQ 0031

; C= <ERROR DESCRIPTION>

.MACRO CWD2 A,B,C,?D,?E

```

D:      TST      CYLDIF      ;SEE IF MSG A2=0
        BEQ      D           ;BR IF YES
        ERROR    A           ;MSG A2 NOT CLEARED C
        TST      CYLADD      ;SEE IF MSG B2=0
        BEQ      E           ;BR IF YES
        ERROR    B           ;MSG B2 NOT CLEARED C

```

E:
.ENDM CWD2

```

.MACRO LPCHK ?A
      CLR      $ESCAPE
      TST      LPFLG
      BEQ      A
      JMP      @SLPERR
A:     JMP      @SLPADR
.ENDM LPCHK

```

;SW 9 WAS SET.
;SW 14 OR 8 WAS SET

```

.MACRO SW814
      JSR      PC,SWTST      ;SEE IF SW 14 OR 8 IS SET
      SKIP R,<GO TO NEXT TEST> ;RETURN HERE IF NEITHER IS SET
                                ;RETURN HERE IF SW 14 IS SET OR
                                ;SW 8 WITH SWR <7:0> APPLY
.ENDM SW814

```

;SWR9 (LOOP ON ERROR) TEST

A=BRANCH POINT TO RECONDITION DRIVE
B=JMP POINT TO RE-ENTER MAIN LINE

```

.MACRO TSTSW9 A,B
      INC      LPFLG
      BIT      #SW9,@SWR      ;LOOP ON ERROR?
      BNE      A               ;YES, RECONDITION DRIVE
      JMP      B               ;RETURN TO MAINLINE
.ENDM TSTSW9

```

; USE DRCLR X TO OMIT CHECKING MSG A0,B0,A1 & B1

.MACRO DRCLR A,?C

```

      MOV      @CLR,RKCS1(R5)
      MOV      $UNIT,RKCS2(R5) ;DRIVE#
      MOV      @CLR,RKCS1(R5) ;DRIVE CLEAR CMD
      MOV      T10,TEMP1
      JSR      PC,FRDY          ;FIND RDY
      ERROR    151              ;NO RDY AFTER DRIVE CLEAR CMD
      JSR      PC,TSTATN        ;TEST FOR ATTN
      BR       C
      ERROR    154              ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD

```

C:
.IF B A

G03

```

      F.EAB  0
      CHECK  273,265,274,266,<AFTER DRIVE CLEAR CMD>,T.A2,T.B2,0
.ENDC

.ENDM  DRCLR

;A=BLANK TO CHECK A0 THRU B2
;A=NON BLANK TO OMIT CHECKING A0 THRU B2
;D=BLANK TO CHECK A0 THRU B2 IN DRCLR
;D=NON-BLANK TO OMIT CHECKING A0 THRU B2 IN DRCLR
.MACRO  CALIB  A,D,?C

      MOV    #CCLR,RKCS1(R5)
      MOV    $UNIT,RKCS2(R5)
      MOV    #RECAL,RKCS1(R5)          ;RECAL CMD
                                          ;RESET CYL DIFF/OFFSET & CYL ADDR REG
                                          ;IN RKMR2 & RKMR3 RESP.

      MOV    T10,TEMP1
      JSR    PC,FRDY                  ;FIND RDY
      ERROR  124                      ;RDY NOT SET AFTER RECAL CMD

      MOV    #1,RKMR1(R5)             ;SELECT WORD 1
      JSR    PC,GSTAT
      BIT    #D.RTZ,HMR2
      BNE    C
      ERROR  244                      ;RTZ NOT SET DURING RECAL CMD
C:      MOV    T10,TEMP2              ;SETUP TIMEOUT
      JSR    PC,FATT1                 ;FIND ATTN
      ERROR  55                      ;NO ATTN AFTER RECAL CMD
      .IF B
      F.EAB  D.DSC
      CHECK  221,275,222,276,<AFTER RECAL CMD>,T.A2,T.B2,T.B3
      CWD2   47,50,<AFTER RECAL CMD>
      .ENDC
      DRCLR  D
      .ENDM  CALIB

;IDAE IS CLEARED ONLY BY RECAL & DRIVE CLEAR
.MACRO  CIDAE  ?A

      MOV    #CCLR,RKCS1(R5)
      MOV    $UNIT,RKCS2(R5)
      MOV    #RECAL,RKCS1(R5)          ;RECAL CMD
      MOV    T10,TEMP1
      JSR    PC,FRDY                  ;FIND RDY
      ERROR  124                      ;RDY NOT FOUND AFTER RECAL CMD
      DRCLR  X

      JSR    PC,GSTAT
      BIT    #D.IDAE,HMR3             ;SEE IF IDAE IS CLEARED

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H03

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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APT PARAMETER BLOCK

SEQ 0033

```

1691      BEQ      A          ;BR IF YES
1692      ERROR    155        ;IDAE NOT CLEARED AFTER RECAL CMD
1693
1694      A:      MOV      #CCLR,RKCS1(R5)
1695      MOV      T1,TEMP2    ;LOOK FOR ATTN FROM RECAL
1696      JSR      PC,FATT1
1697      ERROR    55         ;NO ATTN AFTER RECAL CMD
1698
1699      .ENDM      CIDAE
1700
1701      ;
1702      ; A=D.FWD/D.REV
1703      ;
1704      .MACRO     SKRDY A
1705
1706      MOV      #SEEK,RKCS1(R5) ;SEEK CMD
1707      MOV      T10,TEMP1      ;SETUP TIMEOUT
1708      JSR      PC,FRDY        ;FIND RDY
1709      ERROR    131           ;NO RDY AFTER SEEK CMD
1710      MOV      #<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0 ;EXPECTED AO
1711      CLR      E.B0
1712      MOV      #<A!D.SPOR!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
1713      MOV      #1,E.B1
1714      CHECK    203,204,205,206,<DURING SEEK CMD>,T.A2,T.B2,0
1715
1716      .ENDM      SKRDY
1717
1718      .MACRO     SKATN ?A,?B
1719
1720      JSR      PC,FATT2      ;FIND ATTN
1721      ERROR    132          ;NO ATTN AFTER SEEK CMD
1722      BIT      #CERR,HCS1
1723      BEQ      A
1724      ERROR    210          ;CERR AFTER SEEK CMD
1725      A:      F.EAB      D.DSC
1726      CHECK    133,134,135,136,<AFTER SEEK CMD>,T.A2,T.B2,0
1727      TST      CYLDIF
1728      BEQ      B
1729      ERROR    137          ;CYL DIFF NOT CLEARED AFTER SEEK CMD
1730
1731      B:      DRCLR
1732      .ENDM      SKATN
1733
1734      ;
1735      ; QUICK START SPINDLE.
1736      ;
1737      .MACRO     QKSRT A
1738
1739      JSR      PC,SUBCLR
1740      ERROR    24           ;CERR AFTER SCLR
1741
1742      MOV      #SRTSPL,RKCS1(R5) ;START SPINDLE CMD
1743      MOV      T10,TEMP1      ;SET TIMEOUT
1744      JSR      PC,FRDY        ;FIND RDY
1745      ERROR    121           ;RDY NOT FOUND AFTER ST SPIN CMD.
1746

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      MOV      T500,TEMP2      ;SETUP TIMEOUT
      JSR      PC,FATT1        ;FIND ATTN
      ERROR    67              ;NO ATTN AFTER ST SPIN CMD.

      CLR      UNLD
      .IF B      A
      TSTSW9    10$,2$
      .ENDC
      .ENDM      QKSRT

;QUICK SEEK.  ENTER WITH CYL # IN RKDC
;MACRO  QKSEEK  ?A

      MOV      #SEEK,RKCS1(R5) ;SEEK CMD TO RECONDITION DRIVE.
      MOV      T10,TEMP1      ;SETUP TIMEOUT
      JSR      PC,FRDY         ;FIND RDY
      ERROR    131            ;NO RDY AFTER SEEK CMD.

      MOV      T50000,TEMP1
      JSR      PC,FATT2        ;FIND ATTN
      ERROR    132            ;NO ATTN AFTER SEEK CMD
      BIT      #CERR,HCS1
      BEQ      A
      ERROR    210            ;CERR AFTER SEEK CMD.

A:      JSR      PC,SUBCLR
      ERROR    24              ;CERR AFTER SCLR

      .ENDM      QKSEEK

;QUICK REPETITIVE SEEKS
;A=INC/DEC CYL#
;B=FINAL VALUE OF CYL# BEFORE EXITING
;MACRO  QKRPSK  A,B,?C,?D

      JSR      PC,SUBCLR
      ERROR    24              ;CERR AFTER SCLR

C:      MOV      TOCYL,RKDC(R5) ;CYL#
      QKSEEK
      CMP      TOCYL,#B        ;ALL CYL DONE?
      BEQ      D               ;BR IF YES
      A        TOCYL          ;ELSE DO ANOTHER
      BR       C

D:      JSR      PC,SUBCLR
      ERROR    24              ;CERR AFTER SCLR

      LPCHK

      .ENDM      QKRPSK

```

J03

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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APT PARAMETER BLOCK

SEQ 0035

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; QUICK UNLOAD
; D=BLANK TO DO SUBCLR & LPCHK
; D=NON-BLANK TO BYPASS
.MACRO QKUNLD D

    JSR    PC,SUBCLR
    ERROR  24          ;CERR AFTER SCLR

    MOV    #UNLOAD,RKCS1(R5)      ;UNLOAD CMD
    MOV    T10,TEMP1
    JSR    PC,FRDY                ;FIND RDY
    ERROR  11          ;RDY NOT SET AFTER UNLOAD CMD.
    JSR    PC,TSTATN
    ERROR  12          ;NO ATTN AFTER UNLOAD CMD

    JSR    PC,SUBCLR
    ERROR  24          ;CERR AFTER SCLR

    MOV    T10,TEMP2
    JSR    PC,FSPOK
    ERROR  315         ;SPEED NOT DOWN BY TIMEOUT
    B      D

    JSR    PC,SUBCLR
    ERROR  24          ;CERR AFTER SCLR

    LPCHK
.ENDC

.ENDM QKUNLD

; A=WRHEAD/(<CFMT!WRHEAD>
; USE WRHDR <A>,X TO OMIT CHECKING A0,B0,A1,B1
.MACRO WRHDR A,C,'D

    MOV    #<A>,RKCS1(R5)      ;WRITE HEADER CMD
    MOV    T50000,TEMP1        ;SETUP TIMEOUT
    JSR    PC,FRDY              ;FIND RDY
    ERROR  200                 ;NO RDY AFTER WRITE HEADER CMD
    JSR    PC,GSTAT             ;GET FRESH STATUS
    BIT    #CERR,HCS1
    BEQ    D
    ERROR  201                 ;CERR AFTER WRITE HEADER CMD
    TYPE   MSG18                ;ABORTING BALANCE OF TESTS
    JMP    $EOP                 ;ABORT DRIVE

D:
    IF B C
        F.EAB D
        CHECK 277,267,300,270,<AFTER WRITE HEADER CMD>,T.A2,T.B2,D
    .ENDC

```

K03

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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APT PARAMETER BLOCK

SEQ 0036

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```
.ENDM  WRHDR

; A=RDHEAD/(CFMT!RDHEAD)
; USE RDHDR <A>,X TO OMIT CHECKING AD,BC,A1,B1
.MACRO  RDHDR  A,C,'D,'E

        MOV     #RHTAB,RO
        MOV     #<A>,RKCS1(R5) ; READ HEADER CMD
        MOV     T50000,TEMP1 ; SETUP TIMEOUT
        JSR     PC,FROD ; FIND RDY
        ERROR   171 ; NO RDY AFTER READ HEADER CMD
        BIT     #CERR,HCS1
        BEQ     D
        ERROR   174 ; CERR AFTER READ HEADER CMD
        TYPE    MSG18 ; ABORT BALANCE OF TESTS
        JMP     $EOP ; ABORT DRIVE

D:      MOV     RKDB(R5),(RO)+ ; 1'ST WORD FROM SILO TO RHTAB
        MOV     RKDB(R5),(RO)+ ; 2'ND WORD
        MOV     RKDB(R5),(RO)+ ; 3'RD WORD

        BIT     #DLT,RKCS2(R5)
        BEQ     E
        JSR     PC,GSTAT
        ERROR   173 ; DLT AFTER READ HEADER CMD
        TYPE    MSG18 ; ABORTING BALANCE OF TESTS
        JMP     $EOP ; ABORT DRIVE

E:
; IF      B      C
        F.EAB   D
        CHECK   301,271,302,272,<AFTER READ HEADER CMD>,T.A2,T.B2,D

.ENDC

.ENDM  RDHDR

; A=TOCYL/FRCYL
; B=310 FOR TOCYL/311 FOR FRCYL
.MACRO  HDCHK3  A,B,'C

        RDHDR   RDHEAD,X
        CMP     RHTAB,A ; CHECK WORD 0 (CYL#) ONLY
        BEQ     C ; BR IF SAME
        ERROR   B ; READ CYL WORD HEADER ERROR

C:

.ENDM  HDCHK3

.MACRO  RALLHD  'A,'B,'C,'D,'E
```

```

1915      MOV      #RHTAB,RO
1916
1917      A:      MOV      #RDHEAD,RKCS1(R5)      ; READ HEADER CMD
1918      MOV      T500,TEMP1      ; SETUP TIMEOUT
1919      JSR      PC,FRDY      ; FIND RDY
1920      ERROR    171      ; NO RDY AFTER READ HEADER CMD
1921      BIT      #CERR,HCS1
1922      BEQ      B
1923      ERROR    174      ; CERR AFTER READ HEADER CMD
1924      TYPE     MSG18      ; ABORTING BALANCE OF TESTS
1925      JMP      $EOP      ; ABORT DRIVE
1926
1927      B:      MOV      RKDB(R5),(RC)+      ; 1'ST WORD FROM SILO TO RHTAB
1928      MOV      RKDB(R5),(RO)+      ; 2'ND WORD
1929      MOV      RKDB(R5),(RO)+      ; 3'RD WORD
1930
1931      BIT      #DLT,RKCS2(R5)      ; SEE IF DATA LATE
1932      BEQ      C
1933      JSR      PC,GSTAT
1934      ERROR    173      ; DATA LATE ON READ HEADER
1935      TYPE     MSG18      ; ABORT BALANCE OF TESTS
1936      JMP      $EOP      ; ABORT DRIVE
1937
1938      C:      CMP      RO,#RHTAB+132.      ; ALL 66 WORDS DONE?
1939      BNE      A      ; BR IF NO
1940
1941      JSR      PC, SORT      ; SORT RHTAB INTO SRTTAB SO THAT IT
1942      ; BEGINS WITH SECTOR 0
1943      CLR      WDCNT      ; WORD COUNT
1944      MOV      #SRTTAB,RO      ; ACTUAL HEADER TABLE
1945      MOV      #HDTAB,R1      ; CALC HEADER TABLE
1946
1947      D:      MOV      (RO)+,HDWD
1948      MOV      (R1)+,TEMP1
1949      CMP      HDWD,TEMP1      ; COMPARE ACTUAL WITH CALCULATED WORD
1950      BEQ      E      ; BR IF COMPARE
1951      ERROR    202      ; READ HEADER MISMATCH
1952
1953      E:      INC      WDCNT
1954      CMP      WDCNT,#66.      ; ALL WORDS DONE?
1955      BNE      D      ; BR IF NO
1956
1957      .ENDM      RALLHD
1958
1959      ;
1960      ; A=TOCYL/FRCYL , B=HEAD#, C = 0 FOR 22 SECTOR, 1 FOR 20 SECTOR
1961      ;
1962      .MACRO      HDTBL      A,B,C
1963
1964      MOV      A,CALADD      ; SETUP
1965      MOV      #B,HEAD      ; TO FILL
1966      MOV      #C,FORMAT      ; HEADER
1967      JSR      PC,FHDTAB      ; TABLE
1968
1969
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.ENDM  HDTBL
;USE FSECA FS022,RDSEC,22 FOR 22 SECTOR FORMAT
;USE FSECA FS020,R20SEC,20 FOR 20 SECTOR FORMAT.
;MACRO  FSECA  A,B,C

;FIND SECTOR 0 IN C SECTOR FORMAT.
;ERROR FLAGGED IF NOT FOUND BY TIMEOUT
A:      MOV      TEMP1,-(SP)      ;SAVE TEMP1
        MOV      T5000,TEMP1     ;SETUP TIMEOUT
1$:      JSR      PC,B            ;READ SECTOR
        TST      SECTOR          ;LOOK FOR SECTOR 0
        BNE      2$
        JSR      PC,B
        TST      SECTOR
        BEQ      3$              ;BR IF SAME TWICE
2$:      DEC      TEMP1
        BNE      1$              ;TRY AGAIN IF TIMEOUT NOT UP
        MOV      (SP)+,TEMP1     ;ELSE RESTORE TEMP1
        RTS      PC              ;EXIT
3$:      MOV      (SP)+,TEMP1
        ADD      #2,(SP)         ;SKIP OVER ERROR
        RTS      PC

.ENDM

;USE FSECB FNS22,RDSEC,22 FOR 22 SECTOR FORMAT
;USE FSECB FNS20,R20SEC,20 FOR 20 SECTOR FORMAT
;MACRO  FSECB  A,B,C

;FIND NEXT SECTOR IN C SECTOR FORMAT
;ERROR FLAGGED IF NOT FOUND BY TIMEOUT
A:      MOV      TEMP1,-(SP)      ;SAVE TEMP 1
        MOV      T500,TEMP1      ;SETUP TIMEOUT
1$:      JSR      PC,B            ;READ SECTOR
        CMP      PSEC,SECTOR
        BEQ      3$              ;BR IF SAME
        JSR      PC,B            ;ELSE TRY READ DIFFERENT TWICE
        CMP      PSEC,SECTOR
        BNE      2$              ;BR IF DIFFERENT TWICE
3$:      DEC      TEMP1           ;ELSE TRY AGAIN IF TIME LEFT
        BNE      1$
        MOV      (SP)+,TEMP1     ;RESTORE TEMP 1
        RTS      PC
2$:      MOV      (SP)+,TEMP1     ;RESTORE TEMP 1
        ADD      #2,(SP)         ;SKIP OVER ERROR
        RTS      PC

.ENDM

;USE SECTST FS022,FNS22,RDSEC FOR 22 SECTOR FORMAT

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APT PARAMETER BLOCK

SEQ 0039

;USE SECTST FS020,FNS20,R20SEC FOR 20 SECTOR FORMAT

.MACRO SECTST D,E,F?A,?B,?C

```

A:      JSR      PC,D          ;FIND SECTOR 0
        ERROR    142          ;SECTOR 0 NOT FOUND BY TIMEOUT

        CLR PSEC              ;PREVIOUS SECTOR
        JSR      PC,E          ;FIND NEXT SECTOR
        ERROR    143          ;DIFFERENT SECTOR NOT FOUND BY TIMEOUT
        MOV      PSEC,ESEC     ;SETUP EXPECTED SECTOR
        ADD      #1,ESEC       ;UPDATE PREV SECTOR
        MOV      SECTOR,PSEC   ;READ SECTOR
        JSR      PC,F
        CMP      SECTOR,PSEC
        BEQ      B            ;BR IF READ SAME TWICE
        JSR      PC,F
        CMP      SECTOR,PSEC
        BEQ      B            ;TRY 1 MORE TIME
        ERROR    144          ;MSG B3 ERROR, SECTOR REG UNSTABLE
                                ;MAY BE DURING SECTOR PULSE TIME

B:      CMP      SECTOR,ESEC
        BEQ      C
        ERROR    145          ;MSG B3 ERROR BETWEEN SECTOR COUNTS

C:      DEC      SECNT
        BNE      A            ;BR IF SECTOR COUNT NOT DONE

```

.ENDM SECTST

;DETECT OUTER LIMIT: 1,0,D.REV,OUTER
;DETECT INNER LIMIT: 409.,410.,D.FWD,INNER

.MACRO LIMIT A,B,C,D

```

        JSR      PC,SUBCLR     ;SUBSYS CLEAR & GET STATUS
        ERROR    24           ;CERR AFTER SCLR

        CLR      LPFLG
        INC      BYPCERR       ;BYPASS CHECKING FOR ANY CERR IN GSTAT1
        INC      UNLD          ;USED FOR VALID HALT

        MOV      #PAT,PKMR1(R5) ;PARITY & WORD 0
        MOV      #A,RKDC(R5)   ;CYL A
        MOV      #SEEK,RKCS1(R5) ;SEEK CMD
        MOV      T10,TMP1
        JSR      PC,FRDY        ;FIND RDY
        ERROR    122           ;NO RDY FROM SEEK WITH BAD PARITY
        JSR      PC,TSTATN      ;TEST FOR ATTN
        ERROR    125           ;NO ATTN FROM SEEK WITH BAD PARITY
        MOV      #<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED AO
        MOV      #<D.FLT!D.PAR>,E.B0
        MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
        MOV      #1,E.B1
        CHECK     110,111,146,147,<AFTER SEEK WITH BAD PARITY>,0,0,0

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2083          DRCLR
2084
2085          MOV      #B,RKDC(R5)      ;CYL B
2086          MOV      #SEEK,RKCS1(R5) ;SEEK TO CYL B
2087          MOV      T10,TEMP1
2088          JSR      PC,FRDY           ;FIND RDY
2089          ERROR    131              ;NO RDY AFTER SEEK CMD
2090          MOV      #CCLR,RKCS1(R5)
2091          JSR      PC,GSTAT
2092          JSR      PC,FLIM           ;FIND LIMIT DETECT
2093          ERROR    160              ;LIMIT DETECT NOT FOUND BEFORE TIMEOUT
2094
2095          BIT      #D.UNLD,HMR2
2096          BNE      15
2097          ERROR    305              ;DRIVE NOT UNLOADING AFTER LIMIT DETECT
2098          JMP      305              ;BYPASS REST OF TEST
2099
2100 15:         MOV      #20$,SESCAPE   ;MUST ESCAPE TO CYCLE UP DRIVE & TEST SWR
2101         MOV      #<D.DSC!D.PIP!D.SPIN!D.VV!D.DRA>,E.A0 ;EXPECTED AO
2102         MOV      #<D.SKI!D.FLT>,E.B0
2103         MOV      #<D.UNLD!D.REV!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
2104         MOV      #<D.LIMD!D.NMOV!1>,E.B1
2105         CHECK     161,162,163,164,<AFTER D LIMIT DETECT>,0,0,0
2106
2107         JSR      PC,TSTATN
2108         ERROR    165              ;NO ATTN AFTER D LIMIT DETECT
2109         CLR      BYPCERR          ;ALLOW CHECKING CERR IN GSTAT1
2110
2111         JSR      PC,SUBCLR         ;SUBSYS CLR
2112         ERROR    24              ;CERR AFTER SCLR
2113         MOV      T10,TEMP2        ;SET UP TIMEOUT
2114         JSR      PC,FHDHM         ;FIND HEAD HOME
2115         ERROR    166              ;HEAD HOME NOT FOUND BEFORE TIMEOUT
2116         JSR      PC,FLOAD         ;FIND LOAD HEADS
2117         ERROR    167              ;LOAD HEADS NOT FOUND BEFORE TIMEOUT
2118         MOV      T100,TEMP2        ;SETUP TIMEOUT
2119         JSR      PC,FATT1          ;FIND ATTN
2120         ERROR    67              ;ATTN NOT FOUND BEFORE TIMEOUT
2121 25:         CLR      $ESCAPE
2122         CLR      UNLD              ;CLEAR FLAG
2123         F.EAB      D.DSC
2124         CHECK     63,64,65,66,<AT END OF HEAD LOADING>,T.A2,T.B2,0
2125         CWD2      175,176,<AT END OF HEAD LOADING>
2126         DRCLR
2127         SWB14
2128
2129 .ENDM    LIMIT
2130
2131 ;
2132 ; A=CYL#, B=HEAD#
2133 ;
2134 .MACRO   HEADER A,B
2135
2136         NEWTST <<WRITE & READ HEADERS CYL A, HEAD B>>.1
2137
2138

```

C04

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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APT PARAMETER BLOCK

SEQ 0041

```

2139      MOV      #STACK,SP      ;RESTORE STK PTR
2140
2141      JSR      PC,SUBCLR
2142      ERROR    24      ;CERR AFTER SCLR
2143
2144      INC      BYPFMT      ;SET BIT 14 & 15 IN HEADER
2145
2146      MOV      #HDTAB,RKBA(R5) ;HEADER WORD TABLE
2147      MOV      #-66,RKWC(R5) ;WORD COUNT.
2148      MOV      #A,TOCYL
2149      HDTBL    TOCYL,0,0
2150      MOV      #A,RKDC(R5) ;CYL#
2151      WRHDR    WRHEAD
2152      CLR      SECNT      ;SECTOR COUNT
2153      LOOP
2154      MOV      #A,RKDC(R5) ;CYL #
2155      RALLHD
2156
2157      CLR BYPFMT      ;ALLOW CORRECT FORMATTING
2158
2159      .ENDM HEADER
2160
2161
2162
2163      ;SEEK TO MAJOR CYL: 0,1,TEMP3,TEMP4,D.FWD,D.REV,ASL,400,DEC,0
2164      ;SEEK 0 TO ALL CYL: 0,1,TEMP3,TEMP4,D.FWD,D.REV,INC,410,DEC,0
2165      ;SEEK 410 TO ALL CYL: 410.,409.,TEMP4,TEMP3,D.REV,D.FWD,DEC,0,INC,410.
2166
2167      .MACRO SKOSC A,B,C,D,E,F,G,H,I,J
2168
2169      MOV      #A,FRCYL      ;SETUP FROM CYL
2170      MOV      #B,TOCYL      ;SETUP TO CYL
2171
2172
2173      1$:      LOOP
2174      MOV      #10$,SESCAPE
2175      MOV      FRCYL,TEMP3      ;SETUP
2176      MOV      TOCYL,TEMP4      ;CYL DIFF
2177      SUB      C,D      ;FOR
2178      MOV      D,CALDIF      ;ERROR PRINTOUT
2179
2180      MOV      TOCYL,RKDC(R5) ;GO TO CYL #
2181      SKRDY    E
2182      2$:      MOV      #12$,SESCAPE
2183      MOV      T50000,TEMP1      ;SETUP TIMEOUT
2184      SKATN
2185      CMP      CYLADD,TOCYL
2186      BEQ      3$
2187      ERROR    207      ;CYL ADDR IN RKMR3 NOT=RKDC
2188
2189      3$:      LOOP
2190      CLR      SESCANE
2191      MOV      TOCYL,RKDC(R5) ;CYL #
2192      HDCHK3   TOCYL,310
2193
2194      LOOP

```

004

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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APT PARAMETER BLOCK

SEQ 0042

```

2195      MOV      #14$, $ESCAPE
2196      MOV      FRCYL, RKDC(R5) ; RETURN TO CYL #
2197      MOV      FRCYL, CCYL ; CURRENT CYL FOR TRUEERROR ROUTINE
2198      SKRDY      F
2199
2200 4$:      MOV      #16$, $ESCAPE
2201      MOV      T50000, TEMP1 ; SETUP TIMEOUT
2202      SKATN
2203      CMP      CYLADD, FRCYL
2204      BEQ      $$
2205      ERROR     243 ; CYL ADDR IN RKMR3 NOT=RKDC
2206
2207 5$:      LOOP
2208      CLR      $ESCAPE
2209      MOV      FRCYL, RKDC(R5) ; CYL #
2210      HDCHK3    FRCYL, 311
2211
2212      CMP      TOCYL, #H ; ALL CYL DONE?
2213      BEQ      6$ ; BR IF YES
2214      G        TOCYL ; ELSE DO ANOTHER
2215      JMP      1$
2216 6$:      SWB14
2217 8$:      QKRPSK 1, J
2218 10$:     TSTSW9 8$, 2$
2219 12$:     TSTSW9 8$, 3$
2220 14$:     TSTSW9 8$, 4$
2221 16$:     TSTSW9 8$, 5$
2222      .ENDM      SKOSC
2223
2224      .MACRO      EOPGM
2225
2226      SCOPE
2227      MOV      #1, $TIMES
2228      MOV      #STACK, SP
2229      INC      $DEVCT ; INCR COUNT FOR # OF DRIVES THAT ARE CHECKED
2230      CMP      DRIVS, $DEVCT ; ARE ALL DRIVES PRESINT TESTED?
2231      BEQ      $EOP1+2 ; BR IF YES
2232      JMP      NUDRV ; IF NOT , TEST NEXT DRIVE PRESENT
2233 $EOP1:    SCOPE
2234      .ENDM      EOPGM
2235
2236      .NLIST      MD

```

E04

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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COMMON TAGS

SEQ 0043

.SBTTL COMMON TAGS

```

*****
;THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
;USED IN THE PROGRAM.

```

.=1100

SCMTAG:

;;START OF COMMON TAGS

```

      .WORD 0
$TSTNM: .BYTE 0
$ERFLG: .BYTE 0
$ICNT: .WORD 0
$LPADR: .WORD 0
$LPERR: .WORD 0
$ERTTL: .WORD 0
$ITEMB: .BYTE 0
$ERMAX: .BYTE 1
$ERRPC: .WORD 0
$GDADR: .WORD 0
$BDADR: .WORD 0
$GDDAT: .WORD 0
$BDDAT: .WORD 0
      .WORD 0
      .WORD 0
$AUTOB: .BYTE 0
$INTAG: .BYTE 0
      .WORD 0
SWR: .WORD DSWR
DISPLAY: .WORD DDISP
$TKS: 177560
$TKB: 177562
$TPS: 177564
$TPB: 177566
$NULL: .BYTE 0
$FILLS: .BYTE 2
$FILLC: .BYTE 12
$TPFLG: .BYTE 0
$TMP0: .WORD 0
$TMP1: .WORD 0
$TMP2: .WORD 0
$TMP3: .WORD 0
$TMP4: .WORD 0
$TMP5: .WORD 0
$TIMES: 0
$ESCAPE: 0
$BELL: .ASCIZ <207><377><377>
$QUES: .ASCII ??
$CRLF: .ASCII <15>
$LF: .ASCIZ <12>

```

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;CONTAINS THE TEST NUMBER
;CONTAINS ERROR FLAG
;CONTAINS SUBTEST ITERATION COUNT
;CONTAINS SCOPE LOOP ADDRESS
;CONTAINS SCOPE RETURN FOR ERRORS
;CONTAINS TOTAL ERRORS DETECTED
;CONTAINS ITEM CONTROL BYTE
;CONTAINS MAX. ERRORS PER TEST
;CONTAINS PC OF LAST ERROR INSTRUCTION
;CONTAINS ADDRESS OF 'GOOD' DATA
;CONTAINS ADDRESS OF 'BAD' DATA
;CONTAINS 'GOOD' DATA
;CONTAINS 'BAD' DATA
;RESERVED--NOT TO BE USED

;AUTOMATIC MODE INDICATOR
;INTERRUPT MODE INDICATOR

;ADDRESS OF SWITCH REGISTER
;ADDRESS OF DISPLAY REGISTER
;TTY KBD STATUS
;TTY KBD BUFFER
;TTY PRINTER STATUS REG. ADDRESS
;TTY PRINTER BUFFER REG. ADDRESS
;CONTAINS NULL CHARACTER FOR FILLS
;CONTAINS # OF FILLER CHARACTERS REQUIRED
;INSERT FILL CHARS. AFTER A "LINE FEED"
;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
;USER DEFINED
;USER DEFINED
;USER DEFINED
;USER DEFINED
;USER DEFINED
;USER DEFINED
;MAX. NUMBER OF ITERATIONS
;ESCAPE ON ERROR ADDRESS
;CODE FOR BELL
;QUESTION MARK
;CARRIAGE RETURN
;LINE FEED

```

```

*****
;SBTTL APT MAILBOX-ETABLE

```

```

*****

```

.EVEN

```

$MAIL:
$MSGTY: .WORD AMSGTY ;;APT MAILBOX
;MESSAGE TYPE CODE

```

```

2237
2238
2239
2240
2241
2242
2243 001100
2244 001100 000000
2245 001100 000000
2246 001102 000
2247 001103 000
2248 001104 000000
2249 001106 000000
2250 001110 000000
2251 001112 000000
2252 001114 000
2253 001115 001
2254 001116 000000
2255 001120 000000
2256 001122 000000
2257 001124 000000
2258 001126 000000
2259 001130 000000
2260 001132 000000
2261 001134 000
2262 001135 000
2263 001136 000000
2264 001140 177570
2265 001142 177570
2266 001144 177560
2267 001146 177562
2268 001150 177564
2269 001152 177566
2270 001154 000
2271 001155 002
2272 001156 012
2273 001157 000
2274 001160 000000
2275 001162 000000
2276 001164 000000
2277 001166 000000
2278 001170 000000
2279 001172 000000
2280 001174 000000
2281 001176 000000
2282 001200 177607 000377
2283 001204 077
2284 001205 015
2285 001206 000012
2286
2287
2288
2289
2290
2291 001210
2292 001210 000000

```

F04

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SEQ 0044

2293	001212	000000	\$FATAL: .WORD	AFATAL	:: FATAL ERROR NUMBER
2294	001214	000000	\$TESTN: .WORD	ATESTN	:: TEST NUMBER
2295	001216	000000	\$PASS: .WORD	APASS	:: PASS COUNT
2296	001220	000000	\$DEVCT: .WORD	ADEVCT	:: DEVICE COUNT
2297	001222	000000	\$UNIT: .WORD	AUNIT	:: I/O UNIT NUMBER
2298	001224	000000	\$MSGAD: .WORD	AMSGAD	:: MESSAGE ADDRESS
2299	001226	000000	\$MSGLG: .WORD	AMSGLG	:: MESSAGE LENGTH
2300	001230		\$ETABLE:		:: APT ENVIRONMENT TABLE
2301	001230	000	\$ENV: .BYTE	AENV	:: ENVIRONMENT BYTE
2302	001231	000	\$ENVM: .BYTE	AENVM	:: ENVIRONMENT MODE BITS
2303	001232	000000	\$SWREG: .WORD	ASWREG	:: APT SWITCH REGISTER
2304	001234	000000	\$USWR: .WORD	AUSWR	:: USER SWITCHES
2305	001236	000000	\$CPUOP: .WORD	ACPUOP	:: CPU TYPE, OPTIONS
2306			::*		BITS 15-11=CPU TYPE
2307			::*		11/04=01, 11/05=02, 11/20=03, 11/40=04, 11/45=05
2308			::*		11/70=06, PDQ=07, Q=10
2309			::*		BIT 10=REAL TIME CLOCK
2310			::*		BIT 9=FLOATING POINT PROCESSOR
2311			::*		BIT 8=MEMORY MANAGEMENT
2312	001240	000	\$MAMS1: .BYTE	AMAMS1	:: HIGH ADDRESS, M.S. BYTE
2313	001241	000	\$MTYP1: .BYTE	AMTYP1	:: MEM. TYPE, BLK#1
2314			::*		MEM. TYPE BYTE -- (HIGH BYTE)
2315			::*		900 NSEC CORE=001
2316			::*		300 NSEC BIPOLAR=002
2317			::*		500 NSEC MOS=003
2318	001242	000000	\$MADR1: .WORD	AMADR1	:: HIGH ADDRESS, BLK#1
2319			::*		MEM. LAST ADDR.=3 BYTES, THIS WORD AND LOW OF "TYPE" ABOVE
2320	001244	000	\$MAMS2: .BYTE	AMAMS2	:: HIGH ADDRESS, M.S. BYTE
2321	001245	000	\$MTYP2: .BYTE	AMTYP2	:: MEM. TYPE, BLK#2
2322	001246	000000	\$MADR2: .WORD	AMADR2	:: MEM. LAST ADDRESS, BLK#2
2323	001250	000	\$MAMS3: .BYTE	AMAMS3	:: HIGH ADDRESS, M.S. BYTE
2324	001251	000	\$MTYP3: .BYTE	AMTYP3	:: MEM. TYPE, BLK#3
2325	001252	000000	\$MADR3: .WORD	AMADR3	:: MEM. LAST ADDRESS, BLK#3
2326	001254	000	\$MAMS4: .BYTE	AMAMS4	:: HIGH ADDRESS, M.S. BYTE
2327	001255	000	\$MTYP4: .BYTE	AMTYP4	:: MEM. TYPE, BLK#4
2328	001256	000000	\$MADR4: .WORD	AMADR4	:: MEM. LAST ADDRESS, BLK#4
2329	001260	000000	\$VECT1: .WORD	AVECT1	:: INTERRUPT VECTOR#1, BUS PRIORITY#1
2330	001262	000000	\$VECT2: .WORD	AVECT2	:: INTERRUPT VECTOR#2, BUS PRIORITY#2
2331	001264	177440	\$BASE: .WORD	ABASE	:: BASE ADDRESS OF EQUIPMENT UNDER TEST
2332	001266	000000	\$DEVN: .WORD	ADEVN	:: DEVICE MAP
2333	001270	000000	\$CDW1: .WORD	ACDW1	:: CONTROLLER DESCRIPTION WORD#1
2334	001272	000000	\$CDW2: .WORD	ACDW2	:: CONTROLLER DESCRIPTION WORD#2
2335	001274	000000	\$DDW0: .WORD	ADDW0	:: DEVICE DESCRIPTOR WORD#0
2336	001276	000000	\$DDW1: .WORD	ADDW1	:: DEVICE DESCRIPTOR WORD#1
2337	001300	000000	\$DDW2: .WORD	ADDW2	:: DEVICE DESCRIPTOR WORD#2
2338	001302	000000	\$DDW3: .WORD	ADDW3	:: DEVICE DESCRIPTOR WORD#3
2339	001304	000000	\$DDW4: .WORD	ADDW4	:: DEVICE DESCRIPTOR WORD#4
2340	001306	000000	\$DDW5: .WORD	ADDW5	:: DEVICE DESCRIPTOR WORD#5
2341	001310	000000	\$DDW6: .WORD	ADDW6	:: DEVICE DESCRIPTOR WORD#6
2342	001312	000000	\$DDW7: .WORD	ADDW7	:: DEVICE DESCRIPTOR WORD#7
2343	001314		\$ETEND:		
2344			.MEXIT		
2345		177440	ABASE=	177440	:: DEFAULT BUSS ADDRESS
2346	001314	000210	RKVEC:	210	:: DEFAULT CONTROLLER INTERRUPT VECTOR
2347	001316	000240	RKPRI:	PR5	:: PRIORITY
2348	001320	172540	PKS:	172540	:: P-CLOCK STATUS REG

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SEQ 0045

2349	001322	172542	PKSB:	172542	;P-CLOCK SET BUFFER
2350	001324	172544	PKRB:	172544	;P-CLOCK READ BUFFER
2351	001326	177546	LKS:	177546	;L-CLOCK STATUS REG.
2352					
2353	001330	000100	LCVEC:	100	;L-CLOCK INTERRUPT VECTOR
2354	001332	000104	PCVEC:	104	;P-CLOCK INTERRUPT VECTOR.
2355					
2356		000114	MEMVEC=	114	;MEMORY PARITY VECTOR
2357		172100	MEMBAS=	172100	;MEMORY PARITY OPTION CSR START ADDR
2358	001334	000000	TRAPPC:	0	;PC FOR MEMORY CHECK ENABLE TRAP
2359					
2360	001336	000000	PARAM:	0	;1 FOR 220 OR 230 START, NO DEFAULT
2361	001340	000000	BYPT16:	0	;1 FOR 210, 230, 270 START
2362	001342	000000	MODTST:	0	;1 FOR 260 OR 270 START
2363	001344	000000	FTITLE:	0	;FLAG FOR PRINTING OUT 1ST PROGRAM TITLE
2364					
2365	001346	000000	DRVPTX:	0	;CONTAINS THE POINTER TO THE DRIVE FLAG
2366					; (DRIVO-DRIV7) OF THE DRIVE TO BE CHECKED NEXT.
2367	001350	000000	FRCYL:	0	;FROM CYL
2368	001352	000000	TOCYL:	0	;TO CYL
2369	001354	000000	CCYL:	0	;CURRENT CYL, USED IN N SQUARE TEST
2370	001356	000000	PCYL:	0	;PREV CYL, USED IN N SQUARE TEST
2371	001360	000000	CALDIF:	0	;CALC CYL DIFF USED IN N SQUARE TEST
2372	001362	000000	CYLDIF:	0	;CYL DIFF, RIGHT JUSTIFIED FROM RKMR3
2373	001364	000000	CYLADD:	0	;CYL ADDR, RIGHT JUSTIFIED FROM RKMR3
2374	001366	000000	CALADD:	0	;CYL ADDR USED IN FHD TAB ROUTINE
2375					
2376	001370	000074	HZ:	60.	;60 FOR 60 CPS
2377					;50 FOR 50 CPS
2378	001372	000000	COUNT:	0	;LOADED TO 50 OR 60 TO COUNT TO 1 SEC
2379					;OR ANY OTHER NUMBER TO COUNT OFF FRACTIONAL SECOND
2380	001374	000000	SEC:	0	;SECOND COUNTER
2381	001376	000000	TIMUP:	0	;FLAG TO INDICATE TIME IS UP
2382	001400	000000	SECNT:	0	;SECTOR COUNT
2383	001402	000000	PSEC:	0	;PREVIOUS SECTOR
2384	001404	000000	ESEC:	0	;EXPECTED SECTOR
2385	001406	000000	SECTOR:	0	;SECTOR COUNT, RIGHT JUSTIFIED FROM RKMR3
2386					
2387	001410	000000	LPFLG:	0	;SET TO 0 TO RETURN TO \$LPADR
2388					;IF SW14 OR SW8 SET
2389					;SET TO 1 TO RETURN TO \$LPERR
2390					;IF SW9 SET
2391	001412	000001	T1:	1	;TIMEOUT CONSTANTS
2392	001414	000012	T10:	10.	
2393	001416	000144	T100:	100.	
2394	001420	000754	T500:	500.	
2395	001422	004704	T2500:	2500.	
2396	001424	011610	T5000:	5000.	
2397	001426	141520	T50000:	50000.	
2398					
2399	001430	000000	HEAD:	0	;HEAD NUMBER
2400	001432	000000	HEADX:	0	;HEAD # FROM H.B3 RIGHT JUSTIFIED
2401	001434	000000	HD1:	0	;SHIFTED HEAD# FOR FORMATTER ROUTINE
2402	001436	000000	FORMAT:	0	;FORMAT TYPE
2403	001440	000000	FMT1:	0	;SHIFTED FORMAT FOR FORMATTER ROUTINE
2404	001442	000000	WDCNT:	0	;WORD COUNT

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```

2405 001444 000000 DATA: 0 ;ALL 0'S
2406 001446 052525 DATA01: 52525 ;0101 PATT
2407 001450 177777 DATA1: 177777 ;ALL 1'S
2408
2409
2410 001452 000000 WORD: 0 ;HEADER/DATA WORD
2411 001454 000000 HOWD: 0 ;HEADER WORD FROM RKDB
2412
2413 001456 000000 BSERR: 0 ;CANNOT READ BSE INFO WHEN SET
2414 001460 000000 LIMERR: 0 ;LIMIT DETECT ERROR FLAG
2415
2416 001462 000000 BYPCERR: 0 ;SET TO 1 TO BYPASS CKCERR IN GSTAT1 ROUTINE
2417 001464 000000 BYPFMT: 0 ;BYPASS FORMAL FORMATTING OF HEADERS
2418 ;UNTIL BSE INFO HAS BEEN STORED.
2419 ;IF SET, BIT 14,15 = 1
2420
2421 001466 000000 CHKFLG: 0 ;WORDS TO BE CHECKED
2422
2423 001470 000102 HDTAB: .BLKW 66. ;CALCULATED HEADER WORD TABLE
2424 001674 000102 RHTAB: .BLKW 66. ;FILLED AFTER READ HEADER CMD
2425 002100 000102 SRTTAB: .BLKW 66. ;ABOVE RHTAB SORTED STARTING FORM
2426 ;SECTOR 0 BY SORT ROUTINE
2427 002304 000400 BSE22H: .BLKW 256. ;22 SECTOR HARDWARE BSE INFO.
2428 ;22 SECTOR SOFTWARE BSE INFO
2429 ;OVERLAYS MSG1
2430
2431 003304 000633 INVCYL: 411. ;INVALID CYL ADDR
2432 003306 000634 412.
2433 003310 000640 416.
2434 003312 000700 448.
2435 003314 000740 480.
2436
2437 003316 000000 UNLD: 0 ;SET TO 0 IF HEADS ARE LOADED
2438 ;SET TO 1 IF HEADS UNLOADED
2439 003320 000000 BADHDR: 0 ;SET TO 0 IF FORMATTING OK
2440 ;SET TO 1 IF FORMATTING ALTERED
2441 003322 000000 HPEND: 0 ;SET TO 0 IF HALT NOT PENDING
2442 ;SET TO 1 IF HALT PENDING
2443
2444 ;THE ABOVE 3 FLAGS ARE USED
2445 ;BY 'STOP' ROUTINE TO BRING
2446 ;THE CPU TO A VALID HALT.
2447
2448 003324 001 002 004 ATTN: .9YTE 1,2,4,10,20,40,100,200 ;ATN 0-7 RESP.
2449 003327 010 020 040
2450 003332 100 200
2451 .EVEN
2452
2453
2454 ;
2455 ;THE FOLLOWING ARE HOLDING REGISTERS FOR THE RK611 REGISTERS
2456 ;THEY ARE LOADED AFTER RCV IS REC'D FROM WRDY ROUTINE.
2457 ;
2458
2459 003334 000000 HCS1: 0 ;HOLD RKCS1
2460 003336 000000 HCS2: 0 ;HOLD RKCS2

```

2461 003340 000000
 2462 003342 000000
 2463 003344 000000
 2464 003346 000000
 2465 003350 000000
 2466 003352 000000
 2467 003354 000000
 2468 003356 000000
 2469 003360 000000
 2470 003362 000000
 2471 003364 000000
 2472 003366 000000
 2473 003370 000000
 2474
 2475 003372 000000
 2476 003374 000000
 2477 003376 000000
 2478 003400 000000
 2479 003402 000000
 2480
 2481
 2482
 2483 003404 000000
 2484 003406 000000
 2485 003410 000000
 2486 003412 000000
 2487 003414 000000
 2488 003416 000000
 2489 003420 000000
 2490 003422 000000
 2491
 2492
 2493
 2494 003424 000000
 2495 003426 000000
 2496 003430 000000
 2497 003432 000000
 2498 003434 000000
 2499 003436 000000
 2500 003440 000000
 2501 003442 000000
 2502
 2503
 2504
 2505
 2506 000001
 2507 000002
 2508 000004
 2509
 2510
 2511
 2512
 2513
 2514 003444 000000
 2515 003446 000000
 2516 003450 000000

HWC: 0
 HBA: 0
 HDA: 0
 HDS: 0
 HER: 0
 HASOF: 0
 HDC: 0
 HDB: 0
 HMR1: 0
 HMR2: 0
 HMR3: 0
 HPOS: 0
 HPAT: 0

;HOLD RKWC
 ;ETC.

TEMP1: 0
 TEMP2: 0
 TEMP3: 0
 TEMP4: 0
 TEMPS: 0

;TEMPORARY STORAGE.

; THE FOLLOWING ARE HOLDING REGISTERS FOR MSG A (0-3) & MSG B (0-3)

H.A0: 0
 H.B0: 0
 H.A1: 0
 H.B1: 0
 H.A2: 0
 H.B2: 0
 H.A3: 0
 H.B3: 0

; THE FOLLOWING ARE 'EXPECTED' REGISTER FOR THE ABOVE

E.A0: 0
 E.B0: 0
 E.A1: 0
 E.B1: 0
 E.A2: 0
 E.B2: 0
 E.A3: 0
 E.B3: 0

; THE FOLLOWING ARE IDENTITIES FOR DRIVE MSG WORDS TO BE TESTED

T.A2=BIT0
 T.B2=BIT1
 T.B3=BIT2

;TEST MSG A2 IF SET

; ALL THE FLAGS BELOW ARE CLEARED INITIALLY BY THE CLRFLG ROUTINE.

DDUMP: 0
 DDPCH: 0
 ACT11: 0

;FLAG - SET WHEN IN DDP DUMP MODE
 ;FLAG - SET WHEN IN DDP CHAIN MODE
 ;FLAG - SET WHEN IN ACT11 MODE OF OPERATION

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SEQ 0048

2517 003452 000000
2518 003454 000000

PPTP: 0
DRVS: 0

; FLAG - SET WHEN PROGRAM LOADED BY PAPER TAPE
; CONTAINS THE NUMBER OF DRIVES PRESENT

2519
2520
2521
2522

; THE FLAGS BELOW ARE SET TO 1 TO INDICATE THAT A PARTICULAR DRIVE
; IS PRESENT AND IS TO BE TESTED.

2523 003456 000000
2524 003460 000000
2525 003462 000000
2526 003464 000000
2527 003466 000000
2528 003470 000000
2529 003472 000000
2530 003474 000000

DRIV0: 0
DRIV1: 0
DRIV2: 0
DRIV3: 0
DRIV4: 0
DRIV5: 0
DRIV6: 0
DRIV7: 0

; FLAG SET TO 1 WHEN DRIVE 0 PRESENT
; FOR DRIVE 1
; FOR DRIVE 2
; FOR DRIVE 3
; FOR DRIVE 4
; FOR DRIVE 5
; FOR DRIVE 6
; FOR DRIVE 7

2531
2532 003476 000000
2533 003500 000000
2534 003502 000000
2535 003504 000000

LCLKF: 0
PCLKF: 0
DOTIM: 0
SIZFLG: 0

; L-CLOCK FLAG PRESENT FLAG
; P-CLOCK FLAG PRESENT FLAG
; SET IF EITHER CLOCK PRESENT FOR TIMING TESTS.
; SET IF DEFAULT DO SIZING IN TEST 1

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ERROR POINTER TABLE

SEQ 0049

.SBTTL ERROR POINTER TABLE

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

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

\$ERRTB:

;ERROR 1

EM2
 DH1
 DT1
 DF1

;DR # IN RKCS2 CANNOT BE READ BACK CORRECTLY IN RKMR2

;ERROR 2

EM5
 DH1
 DT1
 DF1

;DETECTED MDS

;ERROR 3

EM6
 DH1
 DT1
 DF1

;DETECTED UFE

;ERROR 4

EM7
 DH1
 DT1
 DF1

;DETECTED DRA & NED RESET (WRONG PORT SELECTED?)

;ERROR 5

EM8
 DH1
 DT1
 DF1

;DR PRESENT BUT NOT SPECIFIED BY OPERATOR

;ERROR 6

EM9
 DH1
 DT1
 DF1

;DR NOT PRESENT BUT SPECIFIED BY OPERATOR

;ERROR 7

EM10
 DH1
 DT1
 DF1

;ABORT TEST, COULD NOT REFERENCE CONTROLLER REGISTER

2536
 2537
 2538
 2539
 2540
 2541
 2542
 2543
 2544
 2545
 2546
 2547
 2548
 2549
 2550 003506
 2551
 2552
 2553 003506 057054
 2554 003510 063736
 2555 003512 066044
 2556 003514 066712
 2557
 2558
 2559 003516 057324
 2560 003520 063736
 2561 003522 066044
 2562 003524 066712
 2563
 2564
 2565 003526 057345
 2566 003530 063736
 2567 003532 066044
 2568 003534 066712
 2569
 2570
 2571 003536 057366
 2572 003540 063736
 2573 003542 066044
 2574 003544 066712
 2575
 2576 003546 057455
 2577 003550 063736
 2578 003552 066044
 2579 003554 066712
 2580
 2581
 2582 003556 057525
 2583 003560 063736
 2584 003562 066044
 2585 003564 066712
 2586
 2587
 2588 003566 057575
 2589 003570 063736
 2590 003572 066044
 2591 003574 066712

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ERROR POINTER TABLE

SEQ 0050

2592				
2593				
2594	003576	057640		
2595	003600	063736		
2596	003602	066044		
2597	003604	066712		
2598				
2599				
2600	003606	057704		
2601	003610	064527		
2602	003612	066044		
2603	003614	067036		
2604				
2605				
2606	003616	057735		
2607	003620	064527		
2608	003622	066044		
2609	003624	067036		
2610				
2611	003626	057757		
2612	003630	064527		
2613	003632	066044		
2614	003634	067036		
2615				
2616	003636	060004		
2617	003640	064527		
2618	003642	066044		
2619	003644	067036		
2620				
2621	003646	060036		
2622	003650	064527		
2623	003652	066044		
2624	003654	067036		
2625				
2626	003656	060063		
2627	003660	064127		
2628	003662	066446		
2629	003664	067206		
2630				
2631	003666	060100		
2632	003670	064127		
2633	003672	066446		
2634	003674	067206		
2635				
2636	003676	060115		
2637	003700	064127		
2638	003702	066446		
2639	003704	067206		
2640				
2641	003706	060132		
2642	003710	064127		
2643	003712	066446		
2644	003714	067206		
2645				
2646	003716	061464		
2647	003720	064127		

;	ERROR 10		
	EM11		;DRA & NED BOTH SET
	DH1		
	DT1		
	DF1		
;	ERROR 11		
	EM12		;CONTROLLER NOT READY
	DH18		;AFTER UNLOAD CMD.
	DT1		
	DF10		
;	ERROR 12		
	EM13		;NO ATTN
	DH18		;AFTER UNLOAD CMD
	DT1		
	DF10		
;	ERROR 13		
	EM14		;WRONG ATTN
	DH18		
	DT1		
	DF10		
;	ERROR 14		
	EM15		;DRDY NOT CLEARED
	DH18		
	DT1		
	DF10		
;	ERROR 15		
	EM16		;DSC NOT SET
	DH18		
	DT1		
	DF10		
;	ERROR 16		
	EM17		;MSG A0 ERROR
	DH8		;IN UNLD
	DT13		
	DF20		
;	ERROR 17		
	EM18		;MSG B0 ERROR
	DH8		;IN UNLD
	DT13		
	DF20		
;	ERROR 20		
	EM19		;MSG A1 ERROR
	DH8		;IN UNLD
	DT13		
	DF20		
;	ERROR 21		
	EM20		;MSG B1 ERROR
	DH8		;IN UNLD
	DT13		
	DF20		
;	ERROR 22		
	EM46		;MSG A2 ERROR
	DH8		;IN UNLD

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SEQ 0051

2648	003722	066526	DT14	
2649	003724	067262	DF22	
2650			; ERROR 23	
2651	003726	061477	EM47	; MSG B2 ERROR
2652	003730	064127	DH8	; IN UNLD
2653	003732	066526	DT14	
2654	003734	067262	DF22	
2655				
2656			; ERROR 24	
2657	003736	060147	EM21	; CERR SET
2658	003740	064616	DH21	; AFTER SCLR
2659	003742	066044	DT1	
2660	003744	067036	DF10	
2661			; ERROR 25	
2662	003746	060171	EM22	; RLS DID NOT SET CERR
2663	003750	063736	DH1	
2664	003752	066044	DT1	
2665	003754	066712	DF1	
2666				
2667			; ERROR 26	
2668	003756	060230	EM23	; SACK SET AFTER RLS SENT
2669	003760	063736	DH1	
2670	003762	066044	DT1	
2671	003764	066712	DF1	
2672				
2673			; ERROR 27	
2674	003766	060310	EM24	; VOL VALID NOT SET
2675	003770	064550	DH19	; AFTER PACK CMD
2676	003772	066044	DT1	
2677	003774	067036	DF10	
2678			; ERROR 30	
2679	003776	060334	EM25	; DRIVE TYPE SET IN MR2
2680	004000	063736	DH1	
2681	004002	066044	DT1	
2682	004004	066712	DF1	
2683			; ERROR 31	
2684	004006	060362	EM26	; DDT SET IN RKDS
2685	004010	063736	DH1	
2686	004012	066044	DT1	
2687	004014	066712	DF1	
2688			; ERROR 32	
2689	004016	060402	EM27	; DTYE SET IN RKER
2690	004020	063736	DH1	
2691	004022	066044	DT1	
2692	004024	066712	DF1	
2693			; ERROR 33	
2694	004026	060423	EM28	; DTYE NOT SET IN RKER
2695	004030	063736	DH1	
2696	004032	066044	DT1	
2697	004034	066712	DF1	
2698			; ERROR 34	
2699	004036	060450	EM29	; DTYE DID NOT SET CERR
2700	004040	063736	DH1	
2701	004042	066044	DT1	
2702	004044	066712	DF1	
2703			; ERROR 35	

2704	004046	060517	EM30	;C-D PARITY ERROR SET IN MR3
2705	004050	063736	DH1	
2706	004052	066044	DT1	
2707	004054	066712	DF1	
2708			;ERROR 36	
2709	004056	060550	EM31	;D-C PARITY SET IN CS1
2710	004060	063736	DH1	
2711	004062	066044	DT1	
2712	004064	066712	DF1	
2713			;ERROR 37	
2714	004066	060575	EM32	;FAULT NOT SET IN MR3
2715	004070	063736	DH1	
2716	004072	066044	DT1	
2717	004074	066712	DF1	
2718			;ERROR 40	
2719	004076	060622	EM33	;C-D PARITY ERROR NOT SET IN MR3
2720	004100	063736	DH1	
2721	004102	066044	DT1	
2722	004104	066712	DF1	
2723			;ERROR 41	
2724	004106	060657	EM34	;D-C PARITY NOT SET IN CS1
2725	004110	063736	DH1	
2726	004112	066044	DT1	
2727	004114	066712	DF1	
2728			;ERROR 42	
2729	004116	060710	EM35	;DCPAR DID NOT SET CERR
2730	004120	063736	DH1	
2731	004122	066044	DT1	
2732	004124	066712	DF1	
2733			;ERROR 43	
2734	004126	060763	EM36	;CYL ADDR IN B2 NOT = RKDC
2735	004130	064415	DH14	;AFTER SEEK WITH BAD PARITY
2736	004132	066526	DT14	
2737	004134	067262	DF22	
2738			;ERROR 44	
2739	004136	061023	EM37	;CYL DIFF IN A2 NOT=RKDC
2740	004140	064415	DH14	
2741	004142	066526	DT14	
2742	004144	067262	DF22	
2743			;ERROR 45	
2744	004146	060763	EM36	;CYL ADDR IN RKMR3 NOT=RKDC
2745	004150	064415	DH14	
2746	004152	066104	DT4	
2747	004154	067012	DF6	
2748			;ERROR 46	
2749	004156	061063	EM38	;CYL DIFF IN RKMR2 NOT=CALDIF
2750	004160	064415	DH14	
2751	004162	066104	DT4	
2752	004164	067012	DF6	
2753			;ERROR 47	
2754	004166	061134	EM39	;CYL DIFF/OFFSET IN RKMR2 NOT CLEARED
2755	004170	064507	DH17	;AFTER RECAL CMD
2756	004172	066526	DT14	
2757	004174	067262	DF22	
2758			;ERROR 50	
2759	004176	061171	EM40	;CYL ADDR IN RKMR3 NOT CLEARED

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SEQ 0053

2760	004200	064507	DH17	;AFTER RECAL CMD
2761	004202	06526	DT14	
2762	004204	06262	DF22	
2763			;ERROR 51	
2764	004206	060063	EM17	;AO ERROR
2765	004210	064732	DH26	;AFTER READ DATA CMD
2766	004212	066446	DT13	
2767	004214	067206	DF20	
2768			;ERROR 52	
2769	004216	060100	EM18	;BO ERROR
2770	004220	064732	DH26	
2771	004222	066446	DT13	
2772	004224	067206	DF20	
2773			;ERROR 53	
2774	004226	061260	EM43	;HEAD DECODE IN B3 NOT CLEARED
2775	004230	064507	DH17	;AFTER RECAL CMD
2776	004232	066616	DT15	
2777	004234	067316	DF23	
2778			;ERROR 54	
2779	004236	061307	EM44	;B3 HEAD DECODE INCORRECT
2780	004240	064445	DH16	
2781	004242	066616	DT15	
2782	004244	067316	DF23	
2783			;ERROR 55	
2784	004246	057735	EM13	;NO ATTN
2785	004250	064507	DH17	;AFTER RECAL CMD
2786	004252	066044	DT1	
2787	004254	067036	DF10	
2788			;ERROR 56	
2789	004256	062431	EM64	;MSG B3 HEAD REG NOT CLEARED
2790	004260	064127	DH8	;IN UNLOAD
2791	004262	066616	DT15	
2792	004264	067316	DF23	
2793			;ERROR 57	
2794	004266	060063	EM17	;MSG AO ERROR
2795	004270	064153	DH9	;AFTER START SPINDLE CMD REC'D BY DRIVE
2796	004272	066446	DT13	
2797	004274	067206	DF20	
2798			;ERROR 60	
2799	004276	060100	EM18	;MSG BO ERROR
2800	004300	064153	DH9	
2801	004302	066446	DT13	
2802	004304	067206	DF20	
2803			;ERROR 61	
2804	004306	060115	EM19	;MSG A1 ERROR
2805	004310	064153	DH9	
2806	004312	066446	DT13	
2807	004314	067206	DF20	
2808			;ERROR 62	
2809	004316	060132	EM20	;MSG B1 ERROR
2810	004320	064153	DH9	
2811	004322	066446	DT13	
2812	004324	067206	DF20	
2813			;ERROR 63	
2814	004326	060063	EM17	
2815	004330	064217	DH10	;AT END OF HEAD LOADING

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ERROR POINTER TABLE

SEQ 0054

2816 004332 066446
2817 004334 067206
2818
2819 004336 060100
2820 004340 064217
2821 004342 066446
2822 004344 067206
2823
2824 004346 060115
2825 004350 064217
2826 004352 066446
2827 004354 067206
2828
2829 004356 060132
2830 004360 064217
2831 004362 066446
2832 004364 067206
2833
2834 004366 057735
2835 004370 064217
2836 004372 066044
2837 004374 067036
2838
2839 004376 061613
2840 004400 063736
2841 004402 066044
2842 004404 066712
2843
2844 004406 060063
2845 004410 064246
2846 004412 066446
2847 004414 067206
2848
2849 004416 060100
2850 004420 064246
2851 004422 066446
2852 004424 067206
2853
2854 004426 060115
2855 004430 064246
2856 004432 066446
2857 004434 067206
2858
2859 004436 060132
2860 004440 064246
2861 004442 066446
2862 004444 067206
2863
2864 004446 061664
2865 004450 063736
2866 004452 066044
2867 004454 066712
2868
2869 004456 060063
2870 004460 064305
2871 004462 066446

DT13
DF20
;ERROR 64
EM18
DH10
DT13
DF20
;ERROR 65
EM19
DH10
DT13
DF20
;ERROR 66
EM20
DH10
DT13
DF20
;ERROR 67
EM13
DH10
DT1
DF10
;ERROR 70
EM50
DH1
DT1
DF1
;ERROR 71
EM17
DH11
DT13
DF20
;ERROR 72
EM18
DH11
DT13
DF20
;ERROR 73
EM19
DH11
DT13
DF20
;ERROR 74
EM20
DH11
DT13
DF20
;ERROR 75
EM51
DH1
DT1
DF1
;ERROR 76
EM17
DH12
DT13

;NO ATTN
;AT END OF HEAD LOADING.

;FWD NOT SET WITHIN 60 SEC FROM
;START SPINDLE CMD.

;AFTER START SPINDLE CMD & FWD SET.

;FWD NOT CLEARED WITHIN 5 SEC OF MOTION
;FROM START SPINDLE CMD.

;AT INNER LIMIT FROM START SPINDLE CMD.

2872 004464 067206
 2873
 2874 004466 060100
 2875 004470 064305
 2876 004472 066446
 2877 004474 067206
 2878
 2879 004476 060115
 2880 004500 064305
 2881 004502 066446
 2882 004504 067206
 2883
 2884 004506 060132
 2885 004510 064305
 2886 004512 066446
 2887 004514 067206
 2888
 2889 004516 061525
 2890 004520 063736
 2891 004522 066044
 2892 004524 066712
 2893
 2894 004526 060063
 2895 004530 064346
 2896 004532 066446
 2897 004534 067206
 2898
 2899 004536 060100
 2900 004540 064346
 2901 004542 066446
 2902 004544 067206
 2903
 2904 004546 060115
 2905 004550 064346
 2906 004552 066446
 2907 004554 067206
 2908
 2909 004556 060132
 2910 004560 064346
 2911 004562 066446
 2912 004564 067206
 2913
 2914 004566 061343
 2915 004570 063736
 2916 004572 066044
 2917 004574 066712
 2918
 2919 004576 060063
 2920 004600 064415
 2921 004602 066526
 2922 004604 067262
 2923
 2924 004606 060100
 2925 004610 064415
 2926 004612 066526
 2927 004614 067262

;ERROR 77
 ;ERROR 100
 ;ERROR 101
 ;ERROR 102
 ;ERROR 103
 ;ERROR 104
 ;ERROR 105
 ;ERROR 106
 ;ERROR 107
 ;ERROR 110
 ;ERROR 111

;FWD NOT SET WITHIN 4 SEC IN RTZ PORTION
 ;OF START SPIN CMD.

;FROM OUTER LIMIT TO CYL 0 DURING LOADING

;DRIVE READY NOT SET WITHIN 1 SEC
 ;FROM FWD IN RTZ PORTION OF START SPIN CMD.

;MSG A0 ERROR
 ;AFTER SEEK WITH BAD PARITY

;MSG B0 ERROR
 ;AFTER SEEK WITH BAD PARITY

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ERROR POINTER TABLE

SEQ 0056

2928			;ERROR 112	
2929	004616	060115	EM19	;A1 ERROR
2930	004620	064732	DH26	;AFTER READ DATA CMD
2931	004622	066446	DT13	
2932	004624	067206	DF20	
2933			;ERROR 113	
2934	004626	060132	EM20	;B1 ERROR
2935	004630	064732	DH26	
2936	004632	066446	DT13	
2937	004634	067206	DF20	
2938			;ERROR 114	
2939	004636	060063	EM17	
2940	004640	064445	DH16	;AFTER LOADING HEAD REGISTER & SEEK CMD
2941	004642	066446	DT13	
2942	004644	067206	DF20	
2943			;ERROR 115	
2944	004646	060100	EM18	
2945	004650	064445	DH16	
2946	004652	066446	DT13	
2947	004654	067206	DF20	
2948			;ERROR 116	
2949	004656	057704	EM12	;CONT NOT RDY
2950	004660	064550	DH19	;AFTER PACK CMD
2951	004662	066044	DT1	
2952	004664	067036	DF10	
2953			;ERROR 117	
2954	004666	057704	EM12	;CONT NOT RDY
2955	004670	064567	DH20	;AFTER SEL DR CMD
2956	004672	066044	DT1	
2957	004674	067036	DF10	
2958			;ERROR 120	
2959	004676	057704	EM12	
2960	004700	064616	DH21	_R SUBSYS CLEAR
2961	004702	066044	DT1	
2962	004704	067036	DF10	
2963			;ERROR 121	
2964	004706	057704	EM12	
2965	004710	064153	DH9	;AFTER START SPINDLE CMD
2966	004712	066044	DT1	
2967	004714	067036	DF10	
2968			;ERROR 122	
2969	004716	057704	EM12	
2970	004720	064415	DH14	;AFTER SEEK WITH BAD PARITY
2971	004722	066044	DT1	
2972	004724	067036	DF10	
2973			;ERROR 123	
2974	004726	063542	EM88	;NO DRIVES FOUND
2975	004730	063736	DH1	
2976	004732	066044	DT1	
2977	004734	066712	DF1	
2978			;ERROR 124	
2979	004736	057704	EM12	
2980	004740	064507	DH17	;AFTER RECAL CMD
2981	004742	066044	DT1	
2982	004744	067036	DF10	
2983			;ERROR 125	

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SEQ 0057

2984	004746	057735	EM13	;NO ATTN
2985	004750	064415	DH14	;FROM SEEK WITH BAD PARITY
2986	004752	066044	DT1	
2987	004754	067036	DF10	
2988			;ERROR 126	
2989	004756	063633	EM89	;NO DRVS FOUND IN DEVICE MAP
2990	004760	063736	DH1	
2991	004762	066044	DT1	
2992	004764	066712	DF1	
2993			;ERROR 127	
2994	004766	061134	EM39	;CYL DIFF/OFFSET IN RKMR2 NOT CLEARED
2995	004770	064616	DH21	;AFTER SCLR
2996	004772	066044	DT1	
2997	004774	067036	DF10	
2998			;ERROR 130	
2999	004776	061171	EM40	;CYL ADDR IN RKMR3 NOT CLEARED
3000	005000	064616	DH21	
3001	005002	066044	DT1	
3002	005004	067036	DF10	
3003			;ERROR 131	
3004	005006	057704	EM12	;NO RDY
3005	005010	064713	DH25	;AFTER SEEK CMD
3006	005012	066044	DT1	
3007	005014	067036	DF10	
3008			;ERROR 132	
3009	005016	057735	EM13	;NO ATTN
3010	005020	064713	DH25	
3011	005022	066044	DT1	
3012	005024	067036	DF10	
3013			;ERROR 133	
3014	005026	060063	EM17	;MSG A0 ERROR
3015	005030	064713	DH25	
3016	005032	066446	DT13	
3017	005034	067206	DF20	
3018			;ERROR 134	
3019	005036	060100	EM18	;MSG B0 ERROR
3020	005040	064713	DH25	
3021	005042	066446	DT13	
3022	005044	067206	DF20	
3023			;ERROR 135	
3024	005046	060115	EM19	;MSG A1 ERROR
3025	005050	064713	DH25	
3026	005052	066446	DT13	
3027	005054	067206	DF20	
3028			;ERROR 136	
3029	005056	060132	EM20	;MSG B1 ERROR.
3030	005060	064713	DH25	
3031	005062	066446	DT13	
3032	005064	067206	DF20	
3033			;ERROR 137	
3034	005066	061134	EM39	;CYL DIFF/OFFSET IN A2 NOT CLEARED
3035	005070	064713	DH25	
3036	005072	066526	DT14	
3037	005074	067262	DF22	
3038			;ERROR 140	
3039	005076	061171	EM40	;CYL ADDR IN B2 NOT CLEARED

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ERROR POINTER TABLE

SEQ 0059

3040	005100	064713		DH25	
3041	005102	066526		DT14	
3042	005104	067262		DF22	
3043			;ERROR 141		
3044	005106	061764		EM52	;20 SECTOR FORMAT NOT SET IN RKMR2
3045	005110	063736		DH1	
3046	005112	066044		DT1	
3047	005114	066712		DF1	
3048			;ERROR 142		
3049	005116	062023		EM53	;SECTOR 0 NOT FOUND WITHIN 50 MS
3050	005120	063736		DH1	
3051	005122	066044		DT1	
3052	005124	066712		DF1	
3053			;ERROR 143		
3054	005126	062054		EM54	;DIFF SECTOR NOT FOUND WITHIN 3MS
3055	005130	063736		DH1	
3056	005132	066044		DT1	
3057	005134	066712		DF1	
3058			;ERROR 144		
3059	005136	061512		EM48	;MSG B3 ERROR
3060	005140	065071		DH34	;SECTOR REG UNSTABLE
3061	005142	066044		DT1	
3062	005144	067036		DF10	
3063			;ERROR 145		
3064	005146	061512		EM48	
3065	005150	065115		DH35	;BETWEEN SECTOR COUNTS
3066	005152	066152		DT6	
3067	005154	067056		DF12	
3068			;ERROR 146		
3069	005156	060115		EM19	;MSG A1 ERROR
3070	005160	064415		DH14	;AFTER SEEK WITH BAD PARITY
3071	005162	066526		DT14	
3072	005164	067262		DF22	
3073			;ERROR 147		
3074	005166	060132		EM20	;MSG B1 ERROR
3075	005170	064415		DH14	
3076	005172	066526		DT14	
3077	005174	067262		DF22	
3078			;ERROR 150		
3079	005176	060115		EM19	;MSG A1 ERROR
3080	005200	065166		DH37	
3081	005202	066044		DT1	
3082	005204	067036		DF10	
3083			;ERROR 151		
3084	005206	057704		EM12	;NO RDY
3085	005210	064644		DH22	;AFTER CLEAR CMD
3086	005212	066044		DT1	
3087	005214	067036		DF10	
3088			;ERROR 152		
3089	005216	000000		0	
3090	005220	000000		0	
3091	005222	000000		0	
3092	005224	000000		0	
3093			;ERROR 153		
3094	005226	000000		0	
3095	005230	000000		0	

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SEQ 0059

3096	005232	000000	0	
3097	005234	000000	0	
3098			;ERROR 154	
3099	005236	062107	EM55	;ATTN NOT CLEARED
3100	005240	064644	DH23	
3101	005242	066044	DT1	
3102	005244	067036	DF10	
3103			;ERROR 155	
3104	005246	063377	EM85	;IDAE NOT CLEARED
3105	005250	064507	DH17	;AFTER RECAL CMD
3106	005252	066044	DT1	
3107	005254	067036	DF10	
3108			;ERROR 156	
3109	005256	057704	EM12	;CONT NOT READY
3110	005260	065716	DH51	;AFTER SEEK TO SELF
3111	005262	066044	DT1	
3112	005264	067036	DF10	
3113			;ERROR 157	
3114	005266	057735	EM13	;NO ATTN
3115	005270	065716	DH51	
3116	005272	066044	DT1	
3117	005274	067036	DF10	
3118			;ERROR 160	
3119	005276	062267	EM59	;LIMIT DETECT NOT FOUND
3120	005300	063736	DH1	
3121	005302	066044	DT1	
3122	005304	066712	DF1	
3123			;ERROR 161	
3124	005306	060063	EM17	;MSG A0 ERROR
3125	005310	065232	DH38	;AFTER LIMIT DETECT
3126	005312	066446	DT13	
3127	005314	067206	DF20	
3128			;ERROR 162	
3129	005316	060100	EM18	;MSG B0 ERROR
3130	005320	065232	DH38	
3131	005322	066446	DT13	
3132	005324	067206	DF20	
3133			;ERROR 163	
3134	005326	060115	EM19	;MSG A1 ERROR
3135	005330	065232	DH38	
3136	005332	066446	DT13	
3137	005334	067206	DF20	
3138			;ERROR 164	
3139	005336	060132	EM20	;MSG B1 ERROR
3140	005340	065232	DH38	
3141	005342	066446	DT13	
3142	005344	067206	DF20	
3143			;ERROR 165	
3144	005346	057735	EM13	;NO ATTN
3145	005350	065232	DH38	
3146	005352	066044	DT1	
3147	005354	067036	DF10	
3148			;ERROR 166	
3149	005356	062320	EM60	;HEADS HOME NOT FOUND
3150	005360	065232	DH38	
3151	005362	066044	DT1	

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SEQ 0060

3152	005364	067036	DF10	
3153			;ERROR 167	
3154	005366	062354	EM61	;LOAD HEADS NOT FOUND
3155	005370	065232	DH38	
3156	005372	066044	DT1	
3157	005374	067036	DF10	
3158			;ERROR 170	
3159	005376	057211	EM4	;FATAL ERROR
3160	005400	065464	DH45	;LIMIT DETECT ERROR ON PREVIOUS TEST
3161	005402	066044	DT1	
3162	005404	067142	DF16	
3163			;ERROR 171	
3164	005406	057704	EM12	;NO RDY
3165	005410	064776	DH30	;AFTER READ HEADER CMD
3166	005412	066044	DT1	
3167	005414	067036	DF10	
3168			;ERROR 172	
3169	005416	061134	EM39	;CYL DIFF/OFFSET NOT CLEARED
3170	005420	064776	DH30	;AFTER READ HEADER CMD
3171	005422	066526	DT14	
3172	005424	067262	DF22	
3173			;ERROR 173	
3174	005426	062410	EM63	;DLT SET
3175	005430	064776	DH30	
3176	005432	066044	DT1	
3177	005434	067122	DF15	
3178			;ERROR 174	
3179	005436	060147	EM21	;CERR SET
3180	005440	064776	DH30	
3181	005442	066044	DT1	
3182	005444	067122	DF15	
3183			;ERROR 175	
3184	005446	061134	EM39	;CYL DIFF NOT CLEARED
3185	005450	064217	DH10	;AT END OF HEAD LOADING
3186	005452	066526	DT14	
3187	005454	067262	DF22	
3188			;ERROR 176	
3189	005456	061171	EM40	;CYL ADDR NOT CLEARED.
3190	005460	064217	DH10	
3191	005462	066526	DT14	
3192	005464	067262	DF22	
3193			;ERROR 177	
3194	005466	062706	EM72	;FORMAT TEST BYPASSED
3195	005470	065543	DH46	;COULD NOT READ BSE INFO
3196	005472	066044	DT1	
3197	005474	067142	DF16	
3198			;ERROR 200	
3199	005476	057704	EM12	;NO RDY
3200	005500	065250	DH39	;AFTER WRITE HEADER CMD
3201	005502	066044	DT1	
3202	005504	067122	DF15	
3203			;ERROR 201	
3204	005506	060147	EM21	;CERR SET
3205	005510	065250	DH39	
3206	005512	066044	DT1	
3207	005514	067122	DF15	

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ERROR POINTER TABLE

SEQ 0061

3208			;ERROR 202	
3209	005516	062460	EM65	;READ HEADER ERROR
3210	005520	063736	DH1	
3211	005522	066216	DT7	
3212	005524	067102	DF14	
3213			;ERROR 203	
3214	005526	060063	EM17	;MSG A0 ERROR
3215	005530	065051	DH33	;DURING SEEK CMD
3216	005532	066446	DT13	
3217	005534	067206	DF20	
3218			;ERROR 204	
3219	005536	060100	EM18	;MSG B0 ERROR
3220	005540	065051	DH33	
3221	005542	066446	DT13	
3222	005544	067206	DF20	
3223			;ERROR 205	
3224	005546	060115	EM19	;MSG A1 ERROR
3225	005550	065051	DH33	
3226	005552	066446	DT13	
3227	005554	067206	DF20	
3228			;ERROR 206	
3229	005556	060132	EM20	;MSG B1 ERROR
3230	005560	065051	DH33	
3231	005562	066446	DT13	
3232	005564	067206	DF20	
3233			;ERROR 207	
3234	005566	060763	EM36	;CYL ADDR IN RKMR3 INCORRECT
3235	005570	064713	DH25	;AFTER SEEK CMD
3236	005572	066104	DT4	
3237	005574	067012	DF6	
3238			;ERROR 210	
3239	005576	060147	EM21	;CERR SET
3240	005600	064713	DH25	
3241	005602	066044	DT1	
3242	005604	067036	DF10	
3243			;ERROR 211	
3244	005606	062534	EM67	;READ CYL 0 HEADERS ON CYL 1
3245	005610	064713	DH25	
3246	005612	066044	DT1	
3247	005614	067036	DF10	
3248			;ERROR 212	
3249	005616	061063	EM38	;CYL DIFF IN RKMR2 NOT = CALDIF
3250	005620	065051	DH33	;DURING SEEK CMD
3251	005622	066104	DT4	
3252	005624	067012	DF6	
3253			;ERROR 213	
3254	005626	060063	EM17	;MSG A0 ERROR
3255	005630	065333	DH41	;DURING RECAL CMD
3256	005632	066446	DT13	
3257	005634	067206	DF20	
3258			;ERROR 214	
3259	005636	060100	EM18	;MSG B0 ERROR
3260	005640	065333	DH41	
3261	005642	066446	DT13	
3262	005644	067206	DF20	
3263			;ERROR 215	

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ERROR POINTER TABLE

SEQ 0062

3264	005646	060115	EM19	;MSG A1 ERROR
3265	005650	065333	DH41	
3266	005652	066446	DT13	
3267	005654	067206	DF20	
3268			;ERROR 216	
3269	005656	060132	EM20	;MSG B1 ERROR
3270	005660	065333	DH41	
3271	005662	066446	DT13	
3272	005664	067206	DF20	
3273			;ERROR 217	
3274	005666	061063	EM38	;CYL DIFF IN RKMR2 NOT=CALDIF
3275	005670	065333	DH41	
3276	005672	066104	DT4	
3277	005674	067012	DF6	
3278			;ERROR 220	
3279	005676	060147	EM21	;CERR SET
3280	005700	064507	DH17	;AFTER RECAL CMD
3281	005702	066044	DT1	
3282	005704	067036	DF10	
3283			;ERROR 221	
3284	005706	060063	EM17	;MSG A0 ERROR
3285	005710	064507	DH17	
3286	005712	066446	DT13	
3287	005714	067206	DF20	
3288			;ERROR 222	
3289	005716	060115	EM19	;MSG A1 ERROR
3290	005720	064507	DH17	
3291	005722	066446	DT13	
3292	005724	067206	DF20	
3293			;ERROR 223	
3294	005726	061134	EM39	;CYL DIFF/OFFSET IN RKMR2 NOT CLEARED
3295	005730	064507	DH17	
3296	005732	066044	DT1	
3297	005734	067036	DF10	
3298			;ERROR 224	
3299	005736	062500	EM66	;CYL ADDR IN RKMR3 INCORRECT
3300	005740	064507	DH17	
3301	005742	066044	DT1	
3302	005744	067036	DF10	
3303			;ERROR 225	
3304	005746	062573	EM68	;READING CYL 1 HEADERS ON CYL 0
3305	005750	064507	DH17	
3306	005752	066044	DT1	
3307	005754	067036	DF10	
3308			;ERROR 226	
3309	005756	057704	EM12	;NO RDY
3310	005760	064732	DH26	;AFTER READ DATA CMD
3311	005762	066044	DT1	
3312	005764	067036	DF10	
3313			;ERROR 227	
3314	005766	060147	EM21	;CERR SET
3315	005770	064732	DH26	
3316	005772	066044	DT1	
3317	005774	067122	DF15	
3318			;ERROR 230	
3319	005776	063515	EM87	;CANT READ BSE INFO

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ERROR POINTER TABLE

SEQ 0063

3320	006000	065775	DH53	;ON SECT 10,12,14,16,18,20
3321	006002	066044	DT1	
3322	006004	067162	DF17	
3323			;ERROR 231	
3324	006006	000000	0	
3325	006010	000000	0	
3326	006012	000000	0	
3327	006014	000000	0	
3328			;ERROR 232	
3329	006016	060763	EM36	;CYL ADDR IN RKMR3 NOT=RKDC
3330	006020	064713	DH25	;AFTER SEEK CMD
3331	006022	066044	DT1	
3332	006024	066772	DF5	
3333			;ERROR 233	
3334	006026	063515	EM87	;CANNOT READ BSE INFO
3335	006030	065354	DH42	;ON SECT 0,2,4,6,8
3336	006032	066044	DT1	
3337	006034	067162	DF17	
3338			;ERROR 234	
3339	006036	000000	0	
3340	006040	000000	0	
3341	006042	000000	0	
3342	006044	000000	0	
3343			;ERROR 235	
3344	006046	062632	EM69	;ALIGN CARTRIDGE USED
3345	006050	065414	DH44	;WILL BYPASS FORMAT & ALL R/W TESTS
3346	006052	066044	DT1	
3347	006054	067036	DF10	
3348			;ERROR 236	
3349	006056	062142	EM56	;UNEXP MEM PARITY TRAP
3350	006060	064672	DH23	;TEST #, TRAP PC
3351	006062	066442	DT11	
3352	006064	066752	DF3	
3353			;ERROR 237	
3354	006066	062665	EM71	;DSC SET
3355	006070	064644	DH22	;AFTER DRIVE CLEAR CMD
3356	006072	066044	DT1	
3357	006074	067036	DF10	
3358			;ERROR 240	
3359	006076	062573	EM68	;READ CYL 1 HEADERS ON CYL 0
3360	006100	064507	DH17	;AFTER RECAL CMD
3361	006102	066044	DT1	
3362	006104	067036	DF10	
3363			;ERROR 241	
3364	006106	060763	EM36	;RKMR3 NOT = RKDC
3365	006110	064415	DH14	;AFTER SEEK WITH BAD PARITY
3366	006112	066264	DT8	
3367	006114	067012	DF6	
3368			;ERROR 242	
3369	006116	061063	EM38	;CYL DIFF IN RKMR2 INCORRECT
3370	006120	064415	DH14	
3371	006122	066264	DT8	
3372	006124	067012	DF6	
3373				
3374			;ERROR 243	
3375	006126	060763	EM36	;CYL ADDR IN RKMR3 INCORRECT

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ERROR POINTER TABLE

SEQ 0064

3376	006130	064713	DH25	; AFTER SEEK CMD
3377	006132	066264	DT8	
3378	006134	067012	DF6	
3379			; ERROR 244	
3380	006136	062754	EM74	; RTZ NOT SET
3381	006140	065333	DH41	; DURING RECAL CMD
3382	006142	066044	DT1	
3383	006144	067036	DF10	
3384			; ERROR 245	
3385	006146	057735	EM13	; NO ATTN
3386	006150	065610	DH48	; AFTER SEEK TO INVALID CYL
3387	006152	066044	DT1	
3388	006154	067036	DF10	
3389			; ERROR 246	
3390	006156	063001	EM75	; IDAE NOT SET
3391	006160	065610	DH48	
3392	006162	066104	DT4	
3393	006164	067012	DF6	
3394			; ERROR 247	
3395	006166	060575	EM32	; FAULT NOT SET
3396	006170	065610	DH48	
3397	006172	066104	DT4	
3398	006174	067012	DF6	
3399			; ERROR 250	
3400	006176	063027	EM76	; PIP SET
3401	006200	065610	DH48	
3402	006202	066104	DT4	
3403	006204	067012	DF6	
3404			; ERROR 251	
3405	006206	060036	EM16	; DSC NOT SET
3406	006210	065610	DH48	
3407	006212	066104	DT4	
3408	006214	067012	DF6	
3409			; ERROR 252	
3410	006216	060063	EM17	; MSG A0 ERROR
3411	006220	065610	DH48	
3412	006222	066446	DT13	
3413	006224	067206	DF20	
3414			; ERROR 253	
3415	006226	060100	EM18	; MSG B0 ERROR
3416	006230	065610	DH48	
3417	006232	066446	DT13	
3418	006234	067206	DF20	
3419			; ERROR 254	
3420	006236	060115	EM19	; MSG A1 ERROR
3421	006240	065610	DH48	
3422	006242	066446	DT13	
3423	006244	067206	DF20	
3424			; ERROR 255	
3425	006246	060132	EM20	; MSG B1 ERROR
3426	006250	065610	DH48	
3427	006252	066446	DT13	
3428	006254	067206	DF20	
3429			; ERROR 256	
3430	006256	061063	EM38	; CYL DIFF IN RKMR2 NOT='CYL DIF'
3431	006260	065610	DH48	

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ERROR POINTER TABLE

SEQ 0065

3432 006262 066104
3433 006264 067012
3434
3435 006266 060763
3436 006270 065610
3437 006272 066104
3438 006274 067012
3439
3440 006276 000000
3441 006300 000000
3442 006302 000000
3443 006304 000000
3444
3445 006306 000000
3446 006310 000000
3447 006312 000000
3448 006314 000000
3449
3450 006316 063050
3451 006320 064644
3452 006322 066044
3453 006324 067036
3454
3455 006326 063076
3456 006330 064415
3457 006332 066264
3458 006334 067012
3459
3460 006336 061217
3461 006340 064776
3462 006342 066526
3463 006344 067262
3464
3465 006346 060100
3466 006350 064644
3467 006352 066446
3468 006354 067206
3469
3470 006356 060132
3471 006360 064644
3472 006362 066446
3473 006364 067206
3474
3475 006366 060100
3476 006370 065250
3477 006372 066446
3478 006374 067206
3479
3480 006376 060132
3481 006400 065250
3482 006402 066446
3483 006404 067206
3484
3485 006406 060100
3486 006410 064776
3487 006412 066446

DT4
DF6
;ERROR 257
EM36
DH48
DT4
DF6
;ERROR 260
0
0
0
0
;ERROR 261
0
0
0
0
;ERROR 262
EM77
DH22
DT1
DF10
;ERROR 263
EM78
DH14
DT8
DF6
;ERROR 264
EM41
DH30
DT14
DF22
;ERROR 265
EM18
DH22
DT13
DF20
;ERROR 266
EM20
DH22
DT13
DF20
;ERROR 267
EM18
DH39
DT13
DF20
;ERROR 270
EM20
DH39
DT13
DF20
;ERROR 271
EM18
DH30
DT13

;CYL ADDR IN RKMR3 NOT=RKDC

;FAULT NOT CLEARED
;AFTER DRIVE CLEAR CMD

;CYL DIFF IN RKMR2 NOT=1 IN SEEK TO SELF
;AFTER SEEK WITH BAD PARITY

;CYL ADDR NOT CLEARED
;AFTER READ HEADER CMD

;MSG B0 ERROR
;AFTER DRIVE CLEAR CMD

;MSG B1 ERROR

;AFTER WRITE HEADER CMD

;AFTER READ HEADER CMD

3488	006414	067206	DF20	
3489			;ERROR 272	
3490	006416	060132	EM20	
3491	006420	064776	DH30	
3492	006422	066446	DT13	
3493	006424	067206	DF20	
3494			;ERROR 273	
3495	006426	060063	EM17	;MSG A0 ERROR
3496	006430	064644	DH22	;AFTER DRV CLR CMD
3497	006432	066446	DT13	
3498	006434	067206	DF20	
3499			;ERROR 274	
3500	006436	060115	EM19	;MSG A1 ERROR
3501	006440	064644	DH22	
3502	006442	066446	DT13	
3503	006444	067206	DF20	
3504			;ERROR 275	
3505	006446	060100	EM18	;MSG B0 ERROR
3506	006450	064507	DH17	;AFTER RECAL CMD
3507	006452	066446	DT13	
3508	006454	067206	DF20	
3509			;ERROR 276	
3510	006456	060132	EM20	;MSG B1 ERROR
3511	006460	064507	DH17	
3512	006462	066446	DT13	
3513	006464	067206	DF20	
3514			;ERROR 277	
3515	006466	060063	EM17	;MSG A0 ERROR
3516	006470	065250	DH39	;AFTER WRITE HEADER CMD
3517	006472	066446	DT13	
3518	006474	067206	DF20	
3519			;ERROR 300	
3520	006476	060115	EM19	;MSG A1 ERROR
3521	006500	065250	DH39	
3522	006502	066446	DT13	
3523	006504	067206	DF20	
3524			;ERROR 301	
3525	006506	060063	EM17	
3526	006510	064776	DH30	;AFTER READ HEADER CMD
3527	006512	066446	DT13	
3528	006514	067206	DF20	
3529			;ERROR 302	
3530	006516	060115	EM19	
3531	006520	064776	DH30	
3532	006522	066446	DT13	
3533	006524	067206	DF20	
3534			;ERROR 303	
3535	006526	061134	EM39	;CYL DIFF/OFFSET NOT CLEARED
3536	006530	065250	DH39	;AFTER WRITE HEADER CMD
3537	006532	066526	DT14	
3538	006534	067262	DF22	
3539			;ERROR 304	
3540	006536	061217	EM41	;CYL ADDR NOT CLEARED
3541	006540	065250	DH39	
3542	006542	066526	DT14	
3543	006544	067262	DF22	

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ERROR POINTER TABLE

SEQ 0067

3544				
3545			; ERROR 305	
3546	006546	063204	EM80	; UNLD NOT SET
3547	006550	065232	DH38	; AFTER LIMIT DETECT
3548	006552	066044	DT1	
3549	006554	067036	DF10	
3550			; ERROR 306	
3551	006556	063234	EM81	; SPIN NOT SET
3552	006560	064153	DH9	; AFTER START SPIN CMD.
3553	006562	066044	DT1	
3554	006564	067036	DF10	
3555			; ERROR 307	
3556	006566	063262	EM82	; RTZ NOT SET
3557	006570	065333	DH41	; DURING RECAL CMD
3558	006572	066044	DT1	
3559	006574	067036	DF10	
3560			; ERROR 310	
3561	006576	063307	EM83	; READ HEADER ERROR
3562	006600	063736	DH1	
3563	006602	066332	DT9	
3564	006604	067242	DF21	
3565			; ERROR 311	
3566	006606	063307	EM83	
3567	006610	063736	DH1	
3568	006612	066376	DT10	
3569	006614	067242	DF21	
3570			; ERROR 312	
3571	006616	063347	EM84	; FORMAT NOT SET
3572	006620	065250	DH39	; AFTER WRITE HEADER CMD
3573	006622	066044	DT1	
3574	006624	067036	DF10	
3575			; ERROR 313	
3576	006626	063347	EM84	
3577	006630	064776	DH30	; AFTER READ HEADER CMD
3578	006632	066044	DT1	
3579	006634	067036	DF10	
3580			; ERROR 314	
3581	006636	062165	EM57	; WCE AT CYL 411, TRK 2, SEC 21
3582	006640	063736	DH1	
3583	006642	066044	DT1	
3584	006644	066756	DF4	
3585			; ERROR 315	
3586	006646	062221	EM58	; SPOK NOT CLEARED
3587	006650	064527	DH18	; AFTER UNLD CMD
3588	006652	066044	DT1	
3589	006654	067036	DF10	
3590			; ERROR 316	
3591	006656	062652	EM70	; UNEXP ATTN
3592	006660	064153	DH9	; AFTER START SPIN CMD
3593	006662	066044	DT1	
3594	006664	067036	DF10	
3595			; ERROR 317	
3596	006666	062652	EM70	
3597	006670	064246	D.111	; AFT SPIN CMD & FWD SET
3598	006672	066044	DT1	
3599	006674	067036	DF10	

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ERROR POINTER TABLE

SEQ 0068

3600			;ERROR 320	
3601	006676	062652	EM70	
3602	006700	064305	DH12	;AT INNER LIMIT FROM ST SPIN CMD
3603	006702	066044	DT1	
3604	006704	067036	DF10	
3605			;ERROR 321	
3606	006706	062652	EM70	
3607	006710	064346	DH13	;FROM OUTER LIM TO CYL 0 DURING LOADING
3608	006712	066044	DT1	
3609	006714	067036	DF10	
3610			;ERROR 322	
3611	006716	060115	EM19	;MSG A1 ERROR
3612	006720	064445	DH16	;AFT LD HEAD REG & SEEK
3613	006722	066446	DT13	
3614	006724	067206	DF20	
3615			;ERROR 323	
3616	006726	060132	EM20	;MSG B1 ERROR.
3617	006730	064445	DH16	
3618	006732	066446	DT13	
3619	006734	067206	DF20	
3620			;ERROR 324	
3621	006736	061464	EM46	;MSG A2 ERROR
3622	006740	064445	DH16	
3623	006742	066526	DT14	
3624	006744	067262	DF22	
3625			;ERROR 325	
3626	006746	061477	EM47	;MSG B2 ERROR
3627	006750	064445	DH16	
3628	006752	066526	DT14	
3629	006754	067262	DF22	
3630			;ERROR 326	
3631	006756	062733	EM73	;CTO SET
3632	006760	063430	EM86	;WHILE WAITING FOR OR REC'D CONTR RDY. MSG A&B BAD
3633	006762	066044	DT1	
3634	006764	066726	DF2	
3635			;ERROR 327	
3636	006766	063163	EM79	;NED SET
3637	006770	063430	EM86	
3638	006772	066044	DT1	
3639	006774	066726	DF2	
3640				
3641			;ERROR 330	
3642	006776	057324	EM5	;MDS SET
3643	007000	063430	EM86	
3644	007002	066044	DT1	
3645	007004	066726	DF2	

```

3646
3647
3648 .SBTTL PROGRAM SETUP
3649 007006 012737 000001 001336 PARSRT: MOV #1,PARAM ;SET FLAG FOR 220 START
3650 007014 005037 001340 CLR BYPT16
3651 007020 005037 001342 CLR MODTST
3652 007024 000450 BR PRGSRT ;START PROGRAM
3653
3654 007026 005037 001336 BYT16: CLR PARAM
3655 007032 012737 000001 001340 MOV #1,BYPT16 ;SET FLAG TO BYPASS TEST 16
3656 007040 005037 001342 CLR MODTST
3657 007044 000440 BR PRGSRT
3658
3659 007046 012737 000001 001336 BYT16A: MOV #1,PARAM
3660 007054 012737 000001 001340 MOV #1,BYPT16
3661 007062 005037 001342 CLR MODTST
3662 007066 000427 BR PRGSRT
3663
3664 007070 005037 001336 MDTST: CLR PARAM
3665 007074 005037 001340 CLR BYPT16
3666 007100 012737 000001 001342 MOV #1,MODTST
3667 007106 000417 BR PRGSRT
3668
3669 007110 005037 001336 MDTSTA: CLR PARAM
3670 007114 012737 000001 001340 MOV #1,BYPT16
3671 007122 012737 000001 001342 MOV #1,MODTST
3672 007130 000406 BR PRGSRT
3673 007132 005037 001336 START: CLR PARAM ;CLEAR FOR 200 START
3674 007136 005037 001340 CLR BYPT16
3675 007142 005037 001342 CLR MODTST
3676 007146 000005 PRGSRT: RESET ;CLEAR ALL INT ENABLE & INIT
3677 007150 012706 001100 MOV #STACK,SP ;SETUP STACK POINTER
3678 007154 012746 000000 MOV #PRO,-(SP) ;PSW LOADED TO BE
3679 007160 012746 007166 MOV #1$,-(SP) ;LSI-11 COMPATABLE
3680 007164 000002 RTI ;ENABLE ALL INTERRUPTS
3681
3682 007166 004737 052276 1$: JSR PC,$TKINT ;SETUP KB VECTOR ADDR, PRIORITY 4
3683 ;& TURN ON KB INTERRUPT
3684
3685
3686 ;*** CPU PRIORITY LEVEL NOW AT 0 ***
3687 ;*** ANY DEVICE WHICH SETS ITS ***
3688 ;*** INTERRUPT ENABLE BIT WILL ***
3689 ;*** SERVICED. ***
3690
3691 ;CLOCK INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 6 (IN 'ST5')
3692 ;RK06 CONTROLLER INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 5 IN 'SETINT')
3693 ;KEYBOARD INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 4 (SEE ABOVE)
3694
3695 ;ALL 'SYSMAC' TRAPS WILL CHANGE CPU PRIORITY TO LEVEL 7 (SEE BELOW)
3696
3697 ;SYSMAC 'SETUP'
3698 .SBTTL INITIALIZE THE COMMON TAGS
3699 ;;CLEAR THE COMMON TAGS ($CMTAG) AREA
3700 007172 012706 001100 MOV #CMTAG,R6 ;;FIRST LOCATION TO BE CLEARED
3701 007176 005026 CLR (R6)+ ;;CLEAR MEMORY LOCATION

```

F06

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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INITIALIZE THE COMMON TAGS

SEQ 0070

3702	007200	022706	001140		CMP	#SWR,R6 ;;DONE?	
3703	007204	001374			BNE	.-6	;;LOOP BACK IF NO
3704	007206	012706	001100		MOV	#STACK,SP	;;SETUP THE STACK POINTER
3705							
3706	007212	012737	050404	000020		;;INITIALIZE A FEW VECTORS	
3707	007220	012737	000340	000022	MOV	#SCOPE,2#IOTVEC	;;IOT VECTOR FOR SCOPE ROUTINE
3708	007226	012737	050664	000030	MOV	#340,2#IOTVEC+2	;;LEVEL 7
3709	007234	012737	000340	000032	MOV	#ERROR,2#EMTVEC	;;EMT VECTOR FOR ERROR ROUTINE
3710	007242	012737	054402	000034	MOV	#340,2#EMTVEC+2	;;LEVEL 7
3711	007250	012737	000340	000036	MOV	#STRAP,2#TRAPVEC	;;TRAP VECTOR FOR TRAP CALLS
3712	007256	012737	050316	000024	MOV	#340,2#TRAPVEC+2	;;LEVEL 7
3713	007264	012737	000340	000026	MOV	#SPWRDN,2#PWAVEC	;;POWER FAILURE VECTOR
3714	007272	013737	043166	043160	MOV	#340,2#PWAVEC+2	;;LEVEL 7
3715	007300	005037	001174		MOV	SENDCT,SEOPCT	;;SETUP END-OF-PROGRAM COUNTER
3716	007304	005037	001176		CLR	STIMES	;;INITIALIZE NUMBER OF ITERATIONS
3717	007310	112737	000001	001115	CLR	SESCAPE	;;CLEAR THE ESCAPE ON ERROR ADDRESS
3718	007316	012737	007316	001106	MOVB	#1,SEMAX	;;ALLOW ONE ERROR PER TEST
3719	007324	012737	007324	001110	MOV	#.,SLPADR	;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
3720					MOV	#.,SLPERR	;;SETUP THE ERROR LOOP ADDRESS
3721						;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS	
3722	007332	013746	000004			;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.	
3723	007336	012737	007372	000004	MOV	2#ERRVEC, -(SP)	;;SAVE ERROR VECTOR
3724	007344	012737	177570	001140	MOV	#64\$,2#ERRVEC	;;SET UP ERROR VECTOR
3725	007352	012737	177570	001142	MOV	#DSWR,SWR	;;SETUP FOR A HARDWARE SWICH REGISTER
3726	007360	022777	177777	171552	MOV	#DDISP,DISPLAY	;;AND A HARDWARE DISPLAY REGISTER
3727	007366	001012			CMP	#-1,2#SWR	;;TRY TO REFERENCE HARDWARE SWR
3728					BNE	66\$	;;BRANCH IF NO TIMEOUT TRAP OCCURRED
3729	007370	000403					;;AND THE HARDWARE SWR IS NOT = -1
3730	007372	012716	007400		BR	65\$	;;BRANCH IF NO TIMEOUT
3731	007376	000002			MOV	#65\$, (SP)	;;SET UP FOR TRAP RETURN
3732	007400	012737	000176	001140	RTI		
3733	007406	012737	000174	001142	MOV	#SWREG,SWR	;;POINT TO SOFTWARE SWR
3734	007414	012637	000004		MOV	#DISPREG,DISPLAY	;;RESTORE ERROR VECTOR
3735							
3736	007420	005037	001216		MOV	(SP)+,2#ERRVEC	
3737	007424	132737	000200	001231	CLR	\$PASS	;;CLEAR PASS COUNT
3738	007432	001403			BITB	#APTSIZE,\$ENVM	;;TEST USER SIZE UNDER APT
3739	007434	012737	001232	001140	BEQ	67\$	;;YES,USE NON-APT SWITCH
3740	007442				MOV	#SSWREG,SWR	;;NO,USE APT SWITCH REGISTER
3741	007442	012737	007506	000004			
3742	007450	012737	000340	000006	67\$: MOV	#1\$,ERRVEC	;;SET TIMEOUT VECTOR
3743					MOV	#PR7,ERRVEC+2	
3744	007456	012701	172100				
3745	007462	005011			3\$: MOV	#MEMBAS,R1	;;ADDR OF MEM CSR
3746	007464	012711	000001		CLR	(R1)	;;SEE IF CAN REFERENCE
3747	007470	012737	050234	000114	MOV	#1,(R1)	;;SET ENABLE BIT IF YES
3748	007476	012737	000340	000116	MOV	#MEMERR,MEMVEC	;;LOAD MEMORY CHECK VECTOR IF NO TIMEOUT
3749	007504	000401			MOV	#PR7,MEMVEC+2	
3750					BR	2\$	
3751	007506	022626					
3752	007510	062701	000002		1\$: CMP	(SP)+, (SP)+	;;ADJ STACK
3753	007514	020127	172140		2\$: ADD	#2,R1	;;TRY NEXT CSR
3754	007520	001360			CMP	R1,#MEMBAS+40	;;SEE IF TRIED ALL
3755	007522	012737	000006	000004	BNE	3\$	;;BR IF NO
3756	007530	005037	000006		MOV	#ERRVEC+2,ERRVEC	;;RESTORE TRAP CATCHER
3757					CLR	ERRVEC+2	

G06

UNIBUS RK06 DRIVE DIAGNOSTIC PAR 1
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INITIALIZE THE COMMON TAGS

SEQ 0071

3758	007534	004737	043254		JSR	PC,CLRFLG	;CLEAR DDUMP THRU SIZFLG
3759	007540	005037	001220		CLR	\$DEVCT	
3760	007544	005037	001222		CLR	\$UNIT	
3761							
3762							
3763							
3764							
3765							
3766	007550	005737	000042		START1:	TST	42
3767	007554	001014				BNE	1\$
3768	007556	004737	043274			JSR	PC,TITLE
3769	007562	123727	000041	000013		CMPB	41,#13
3770	007570	001010				BNE	2\$
3771	007572	005237	003444			INC	DDUMP
3772	007576	104401	055526			TYPE	MSG2
3773	007602	000137	007616			JMP	ST2
3774	007606	000137	007662		1\$:	JMP	ST3
3775	007612	005237	003452		2\$:	INC	PPTP
3776							
3777							
3778							
3779							
3780							
3781							
3782							
3783							
3784	007616	005737	001336		ST2:	TST	PARAM
3785	007622	001002				BNE	1\$
3786	007624	000137	007714			JMP	ST4
3787	007630	104401	055564		1\$:	TYPE	MSG3
3788	007634	004737	043354			JSR	PC,GDRVS
3789	007640	104401	055616			TYPE	MSG4
3790	007644	004737	043514			JSR	PC,G8A
3791	007650	104401	055644			TYPE	MSG5
3792	007654	004737	043542			JSR	PC,GINT
3793	007660	000427				BR	ST5
3794							
3795							
3796							
3797							
3798							
3799							
3800							
3801							
3802	007662	123727	000041	000013	ST3:	CMPB	41,#13
3803	007670	001007				BNE	1\$
3804	007672	005237	003446			INC	DDPCH
3805	007676	004737	043274			JSR	PC,TITLE
3806	007702	104401	055707			TYPE	MSG7
3807	007706	000402				BR	ST4
3808	007710	005237	003450		1\$:	INC	ACT11
3809							
3810	007714	012737	177440	001264	ST4:	MOV	#177440,\$BASE
3811	007722	012737	000210	001314		MOV	#210,RKVEC
3812	007730	004737	043574			JSR	PC,SETINT
3813	007734	005237	003504			INC	SIZFLG

Address	Hex 1	Hex 2	Hex 3	Label	Operation	Comment
3814					CLR UNLD	; INITIALIZE FLAGS
3815	007740	005037	003316	STS:	CLR BADHDR	; USED IN 'STOP ROUTINE
3816	007744	005037	003320		CLR HPEND	; FOR VALID PROGRAM HALTS
3817	007750	005037	003322		CLR \$ESCAPE	
3818	007754	005037	001176		CLR \$DRIVO, DRVPTR	; SETUP
3819	007760	012737	003456	001346	MOV \$DEVCT	; NO. OF DRVS DONE
3820	007766	005037	001220		CLR \$UNIT	; CURRENT DRV UNDER TEST
3821	007772	005037	001222		MOV #1\$ ERRVEC	; SETUP TIMEOUT ERROR VECTOR
3822	007776	012737	010044	000004	TST \$PK\$	; SEE IF L-CLOCK THERE
3823	010004	005777	171316		INC LCLKF	; PRESENT, SET FLAG.
3824	010010	005237	003476		MOV LCVEC, RO	; VECTOR ADDR
3825	010014	013700	001330		MOV #2\$ ERRVEC	
3826	010020	012737	010106	000004	TST \$PK\$	; SEE IF P-CLOCK THERE
3827	010026	005777	171266		INC PCLKF	; PRESENT, SET FLAG
3828	010032	005237	003500		MOV PCVEC, RO	; VECTOR ADDR
3829	010036	013700	001332		BR 3\$	
3830	010042	000412				
3831						
3832	010044	022626		1\$:	CMP (SP)+, (SP)+	; L-CLOCK NOT THERE, CLEAR STACK
3833	010046	012737	010112	000004	MOV #4\$ ERRVEC	
3834	010054	005777	171240		TST \$PK\$	; SEE IF P-CLOCK THERE
3835	010060	005237	003500		INC PCLKF	; PRESENT, SET FLAG
3836	010064	013700	001332		MOV PCVEC, RO	; VECTOR ADDR
3837	010070	005237	003502	3\$:	INC DOTIM	; INDICATES TIMING TESTS CAN BE DONE
3838	010074	012720	047344		MOV #CLOCK, (RO)+	; SERVICE ROUTINE FOR CLOCKS
3839	010100	012710	00030C		MOV #PR6, (RO)	
3840	010104	000407			BR TST1	; ; GO TO NEXT TEST
3841						
3842	010106	022626		2\$:	CMP (SP)+, (SP)+	; P-CLOCK NOT THERE, CLEAR STACK
3843	010110	000767			BR 3\$	
3844						
3845	010112	022626		4\$:	CMP (SP)+, (SP)+	; NEITHER CLOCK THERE, CLEAR STACK
3846	010114	005037	003502		CLR DOTIM	; TIMING TESTS CANNOT BE DONE.
3847	010120	104401	056150		TYPE ,MSG13	; ALL TIMING TESTS BYPASSED
3848						
3849						

.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 MSG. ANY
; ERROR IN THIS TEST WILL RESULT IN ABORTING ALL OTHER
; TESTS AND JUMPING TO 'END OF PASS'
;

```

```

*****

```

```

TST1:  SCOPE
        MOV     #1,STIMES      ;DO 1 ITERATION
        MOV     #STACK,SP      ;RESTORE STK PTR
        MOV     #PRO,-(SP)      ;RESET PSW TO PRIORITY 0
        MOV     #SS,-(SP)      ;& MAKE IT LSI COMPATABLE
        RTI

```

```

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

```

```

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

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

```

```

*****
;TEST 2      SIZE THE BUSS
;

```

```

;
; THIS TEST IS ENTERED ONLY IF 'DRIVE SELECTION' IS DEFAULTED
; EITHER BY RUNNING IN THE AUTO MODE OR A 200 START IN THE
; MANUAL MODE.
; EVERY DRIVE FROM 0 THRU 7 IS ADDRESSED.
; CONTROLLER ERROR (CERR) IS EXAMINED AND IF NOT SET, THE
; DRIVE WILL BE TESTED. IF SET, THE PROGRAM WILL BYPASS
;

```

```

3850
3851
3852
3853
3854
3855
3856
3857
3858
3859
3860
3861
3862 010124 000004
3863 010126 012737 000001 001174
3864 010134 012706 001100
3865
3866 010140 012746 000000
3867 010144 012746 010152
3868 010150 000002
3869 010152
3870
3871 010152 012737 010270 000004
3872 010160 013705 001264
3873 010164 005765 000000
3874 010170 005765 000010
3875 010174 005765 000002
3876 010200 005765 000004
3877 010204 005765 000006
3878 010210 005765 000012
3879 010214 005765 000014
3880 010220 005765 000016
3881 010224 005765 000020
3882 010230 005765 000024
3883 010234 005765 000026
3884 010240 005765 000034
3885 010244 005765 000036
3886 010250 005765 000030
3887 010254 005765 000032
3888
3889 010260 012737 050146 000004
3890 010266 000404
3891
3892 010270 022626
3893 010272 104007
3894 010274 000137 043132
3895
3896
3897
3898
3899
3900
3901
3902
3903
3904
3905

```

J06

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T2 SIZE THE BUSS

SEQ 0074

```

3906
3907
3908
3909
3910
3911 010300 000004
3912 010302 012737 000001 001174
3913 010310 012706 001100
3914 010314 005237 001462
3915
3916 010320 132737 000200 001231
3917 010326 001002
3918 010330 000137 010444
3919
3920 010334 104401 056030
3921 010340 005037 003454
3922 010344 005000
3923 010346 012701 003456
3924 010352 013702 001266
3925
3926 010356 032702 000001
3927 010362 001410
3928 010364 005237 003454
3929 010370 005211
3930 010372 104401 001205
3931 010376 010046
3932
3933 010400 104403
3934 010402 001
3935 010403 000
3936
3937 010404 005721
3938 010406 005200
3939 010410 022700 000010
3940 010414 001402
3941
3942 010416 006002
3943 010420 000756
3944
3945 010422 005737 003454
3946 010426 001402
3947 010430 000137 011362
3948
3949 010434 104126
3950 010436 000000
3951 010440 000137 007740
3952
3953 010444 012765 000040 000010
3954 010452 013737 001414 003372
3955 010460 004737 043612
3956 010464 104120
3957 010466 005737 003504
3958 010472 001562
3959 010474 104401 056030
3960 010500 005037 003454
3961 010504 005000

; * TESTING THAT DRIVE ONLY IF THE ERROR WAS A RESULT OF
; * MDS, UFE OR NED BEING SET; OR BOTH NED & DRA RESET IN-
; * DICATING THE OTHER PORT IS ACCESSED.
; *****
TST2: SCOPE
MOV #1, $TIMES ; DO 1 ITERATION
MOV #STACK, SP ; RESTORE STK PTR
INC BYPCERR ; DO NOT TEST CERR IN 'FRDY'

BITB #BIT7, $ENVM ; SEE IF USE APT SELECTED DRIVES
BNE 14$ ; BR IF YES
JMP 12$ ; ELSE DO NORM SIZING OR VERIFY

14$: TYPE MSG10 ; WILL TEST DRIVES
CLR DRVS ; # OF DRIVES PRESENT
CLR RO ; DRV ADDR
MOV #DRIVO, R1 ; DRV FLAG
MOV $DEVM, R2 ; APT DEVICE MAP

15$: BIT #BIT0, R2 ; SEE IF DRV IN DEVICE MAP
BEQ 16$ ; BR IF NO
INC DRVS ; ELSE INCR DRIVE COUNT
INC (R1) ; & SET DRIVE PRESENT FLAG
TYPE $CRLF
MOV RO, -(SP) ; SAVE RO FOR TYPEOUT
; TYPE DRIVE #
; GO TYPE--OCTAL ASCII
; TYPE 1 DIGIT(S)
; SUPPRESS LEADING ZEROS

16$: TST (R1)+ ; ADV POINTER TO NEXT FLAG
INC RO ; INC DRIVE #
CMP #8, RO ; ALL 8 TESTED?
BEQ 17$ ; BR IF YES

ROR R2 ; ELSE GET NEXT BIT OFF DEVICE MAP
BR 15$ ; & TRY AGAIN

17$: TST DRVS ; SEE IF MORE DRIVES PRESENT
BEQ 18$ ; BR IF NO
JMP NUDRV ; ELSE EXIT TEST

18$: ERROR 126 ; NO DRIVES FOUND IN $DEVM
HALT ; SETUP CORRECTLY & PRESS 'CONTINUE'
JMP ST5 ; TO TRY AGAIN

12$: MOV #SCLR, RKCS2(R5) ; SUBSYSTEM CLEAR
MOV T10, TEMP1
JSR PC, FRDY ; FIND RDY
ERROR 120 ; RDY NOT SET BY END OF SCLR
TST SIZEFLG
BEQ TST3 ; DO NOT SIZE, GOTO NEXT TEST
TYPE MSG10 ; WILL TEST DRIVES
CLR DRVS ; # OF DRIVES PRESENT
CLR RO ; DRV ADDR

```

K06

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T2 SIZE THE BUSS

SEQ 0075

3962	010506	012701	003456		MOV	#DRIVO,R1	;DRV FLAG
3963	010512			1\$:	SCOP1		
3964	010512	104415			MOV	#STACK,SP	;RESTORE STK PTR
3965	010514	012706	001100				
3966							
3967	010520	012765	000040	000010	MOV	#SCLR,RKCS2(R5)	;SUBSYS CLEAR
3968	010526	013737	001414	003372	MOV	T10,TEMP1	
3969	010534	004737	043612		JSR	PC,FRDY	;FIND RDY
3970	010540	104120			ERROR	120	;RDY NOT SET BY END OF SCLR
3971	010542	010065	000010		MOV	RO,RKCS2(R5)	;SELECT THE DRIVE ADDR
3972	010546	012765	000001	000000	MOV	#SELDIV,RKCS1(R5)	
3973	010554	013737	001414	003372	MOV	T10,TEMP1	
3974	010562	004737	043612		JSR	PC,FRDY	;FIND RDY
3975	010566	104117			ERROR	117	;NO RDY AFTER SELECT DR. CMD
3976	010570	032737	100000	003334	BIT	#CERR,HCS1	
3977	010576	001046			BNE	2\$	
3978	010600	013737	003362	003372	MOV	HMR2,TEMP1	
3979	010606	042737	177770	003372	BIC	#1C<DRVMSK>,TEMP1	
3980	010614	020037	003372		CMP	RO,TEMP1	;S/B SAME
3981	010620	001016			BNE	3\$	
3982	010622	005700			TST	RO	
3983	010624	001003			BNE	4\$	
3984	010626	005737	003446		TST	DDPCH	;SEE IF XXDP CHAIN MODE
3985	010632	001014			BNE	5\$	
3986	010634	005237	003454	4\$:	INC	DRIVS	;INC DRIVE COUNT.
3987	010640	005211			INC	(R1)	;SET DRIVE PRESENT FLAG
3988	010642	104401	001205		TYPE	#SCLF	
3989	010646	010046			MOV	RO,-(SP)	;SAVE RO FOR TYPEOUT
3990							;TYPE DR #
3991	010650	104403			TYPOS		;GO TYPE--OCTAL ASCII
3992	010652	001			.BYTE	1	;TYPE 1 DIGIT(S)
3993	010653	000			.BYTE	0	;SUPPRESS LEADING ZEROS
3994	010654	000403			BR	5\$	
3995							
3996	010656	004737	044320	3\$:	JSR	PC,BYP	;TYPE BYPASS DR #
3997	010662	104001			ERROR	1	;SELECTED DR # DOES NOT MATCH RKMR2 DR #
3998							
3999	010664	005721		5\$:	TST	(R1)+	;ADVANCE PTR TO NEXT DR. FLAG
4000	010666	005200			INC	RO	;INC DR #
4001	010670	022700	000010		CMP	#8.,RO	
4002	010674	001306			BNE	1\$	;MORE LEFT.
4003	010676	005737	003454		TST	DRIVS	
4004	010702	001054			BNE	10\$	
4005	010704	104123			ERROR	123	;NO DRIVES FOUND
4006	010706	000000			HALT		;SETUP CORRECTLY
4007	010710	000137	007740		JMP	5T5	;PRESS 'CONT'
4008							
4009	010714	032737	001000	2\$:	BIT	#MDS,HCS2	
4010	010722	001015			BNE	6\$	
4011	010724	032737	000400	003336	BIT	#UFE,HCS2	
4012	010732	001015			BNE	7\$	
4013	010734	032737	000001	003346	BIT	#DRA,HDS	
4014	010742	001015			BNE	8\$	
4015	010744	032737	010000	003336	BIT	#NED,HCS2	
4016	010752	001424			BEQ	9\$	
4017	010754	000743			BR	5\$	

L06

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T2 SIZE THE BUSS

SEQ 0076

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4018
4019 010756 004737 044320 6$: JSR PC,BYP ;TYPE BYP DR #
4020 010762 104002 ERROR 2 ;MDS DETECTED
4021 010764 000737 BR 5$
4022
4023 010766 004737 044320 7$: JSR PC,BYP
4024 010772 104003 ERROR 3 ;UFE DETECTED
4025 010774 000733 BR 5$
4026
4027 010776 032737 010000 003336 8$: BIT #NED,HCS2
4028 011004 001713 BEQ 4$
4029 011006 104401 056251 TYPE MSG15 ;DRV#
4030 011012 010046 MOV RO,-(SP) ;SAVE RO FOR TYPEOUT
4031
4032 011014 104403 TYPOS ;TYPE DR#
4033 011016 001 .BYTE 1 ;GO TYPE--OCTAL ASCII
4034 011017 000 .BYTE 0 ;TYPE 1 DIGIT(S)
4035 011020 104010 ERROR 10 ;SUPPRESS LEADING ZEROS
4036 011022 000720 BR 5$ ;DRA & NED BOTH SET
4037
4038 011024 004737 044320 9$: JSR PC,BYP
4039 011030 104004 ERROR 4 ;NO DRA & NO NED = OTHER PORT SELECTED
4040 011032 000714 BR 5$
4041 011034 000137 011362 10$: JMP NUDRV
4042
4043 *****
4044 *TEST 3 VERIFY OPERATOR DRIVE SELECTIONS
4045 *
4046 * THIS TEST IS ENTERED ONLY IF DRIVE SELECTION IS NOT
4047 * DEFAULTED. EVERY DRIVE FROM 0 TO 7 IS ADDRESSED &
4048 * CONTROLLER ERROR (CERR) IS EXAMINED. IF NOT SET, THE
4049 * PROGRAM WILL ASSUME THE DRIVE IS PRESENT. IT WILL THEN CHECK
4050 * TO SEE THAT THE DRIVE WAS INPUTTED FOR TESTING. IF NOT, IT WILL
4051 * BE AN ERROR. IF CERR WAS SET, THAT DRIVE WILL BE BYPASSED
4052 * ONLY IF THE ERROR WAS A RESULT OF MDS OR UFE SET OR BOTH
4053 * NED & DRA RESET (WRONG PORT). IF CERR IS A RESULT OF
4054 * NED ONLY, IT IS CHECKED AGAINST THE INPUTTED INFOR TO
4055 * VERIFY IT WAS NOT SPECIFIED.
4056 *****
4057
4058 011040 000004 ST3: SCOPE
4059 011042 012737 000001 001174 MOV #1,STIMES ;DO 1 ITERATION
4060 011050 012706 001100 MOV #STACK,SP ;RESTORE STK PTR
4061 011054 005000 CLR RO ;DRIVE ADDR
4062 011056 012701 003456 MOV #DRIVO,R1 ;DRIVE FLAG
4063 011062
4064 011062 104415 1$: SCOP1
4065 011064 012706 001100 MCV #STACK,SP ;RESTORE STK PTR
4066
4067 011070 012765 000040 000010 MCV #SCLR,RKCS2(R5)
4068 011076 013737 001414 003372 MOV T10,TEMP1
4069 011104 004737 043612 JSR PC,FRDY ;FIND RDY
4070 011110 104120 ERROR 120 ;NO RDY AFTER SCLR
4071 011112 010065 000010 MOV RO,RKCS2(R5) ;DRV ADDR
4072 011116 012765 000001 000000 MOV #SELDRV,RKCS1(R5)
4073 011124 013737 001414 003372 MOV T10,TEMP1

```

M06

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T3 VERIFY OPERATOR DRIVE SELECTIONS

SEQ 0077

4074	011132	004737	043612		JSR	PC,FRDY		;FIND RDY
4075	011136	104117			ERROR	117		;NO RDY AFTER SELDRV CMD
4076	011140	032737	100000	003334	BIT	#CERR,HCS1		
4077	011146	001036			BNE	25		
4078	011150	013737	003362	003372	MOV	HMR2,TEMP1		
4079	011156	042737	177770	003372	BIC	#1C<DRVMSK>,TEMP1		
4080	011164	020037	003372		CMP	RO,TEMP1		;S/B SAME
4081	011170	001010			BNE	35		
4082	011172	005711		115:	TST	(R1)		
4083	011174	001417			BEQ	55		
4084	011176	005721		45:	TST	(R1)+		;SHIFT PTR TO NEXT DR FLAG
4085	011200	005200			INC	RO		;INC DR#
4086	011202	022700	000010		CMP	#8.,RO		
4087	011206	001325			BNE	15		;MORE LEFT
4088	011210	000466			BR	TST4		;GO TO NEXT TEST
4089								
4090	011212	004737	044320	35:	JSR	PC,BYP		;TRY BYPASS DRIVE#
4091	011216	104001			ERROR	1		;WRITTEN DR# DOES NOT MATCH RKMR2 DR#
4092	011220	005711			TST	(R1)		
4093	011222	001765			BEQ	45		;BRANCH IF NOT SPEC BY INPUT
4094	011224	005337	003454	125:	DEC	DRVS		;DECREMENT TOTAL DRVS
4095	011230	005011			CLR	(R1)		;CLEAR DRIVE FLAG
4096	011232	000761			BR	45		
4097								
4098	011234	004737	044320	55:	JSR	PC,BYP		
4099	011240	104005			ERROR	5		;DR PRESENT BUT NOT SPECIFIED BY OPERATOR
4100	011242	000755			BR	45		
4101								
4102	011244	032737	001000	003336	25:	BIT	#MDS,HCS2	
4103	011252	001027			BNE	65		
4104	011254	032737	000400	003336	BIT	#UFE,HCS2		
4105	011262	001027			BNE	75		
4106	011264	032737	000001	003346	BIT	#DRA,HDS		
4107	011272	001005			BNE	85		
4108	011274	032737	010000	003336	BIT	#NED,HCS2		
4109	011302	001423			BEQ	95		
4110	011304	000404			BR	105		
4111	011306	032737	010000	003336	85:	BIT	#NED,HCS2	
4112	011314	001726			BEQ	115		
4113	011316	005711		105:	TST	(R1)		
4114	011320	001726			BEQ	45		
4115								
4116	011322	004737	044320		JSR	PC,BYP		;TYPE BYPASS DRIVE#
4117	011326	104006			ERROR	6		
4118	011330	000735			BR	125		
4119								
4120	011332	004737	044320	65:	JSR	PC,BYP		;TYPE BYPASS DRIVE#
4121	011336	104002			ERROR	2		;MDS DETECTED
4122	011340	000762			BR	85		
4123								
4124	011342	004737	044320	75:	JSR	PC,BYP		
4125	011346	104003			ERROR	3		;UFE DETECTED
4126	011350	000756			BR	85		
4127								
4128	011352	004737	044320	95:	JSR	PC,BYP		
4129	011356	104004			ERROR	4		;DRA & NED RESET - OTHER PORT SELECTED

N06

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T3 VERIFY OPERATOR DRIVE SELECTIONS

SEQ 0078

4130 011360 000752

BR 85

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011362 005037 001462

NUDRV: CLR BYPCERR ;ENTER HERE FROM LAST TEST
;8 TEST CERR IN 'FRDY'

;TEST 4 FIND NEXT DRIVE TO BE TESTED

THIS TEST FINDS THE NEXT DRIVE PRESENT & PUTS THAT
ADDRESS IN 'SUNIT'.
THROUGHOUT THE FOLLOWING TESTS, THE DRIVE TESTED IS
THE DRIVE WHOSE ADDRESS IS IN 'SUNIT'.

;ST4: SCOPE

4152	011366	000004			MOV	#1,\$TIMES	;;DO 1 ITERATION
4153	011370	012737	000001	001174	MOV	#STACK,SP	;;RESTORE STK PTR
4154	011376	012706	001100		MOV	#STN-1,\$TESTN	
4155	011402	012737	000004	001214	MOV	#STN-1,\$STSTN	
4156	011410	012737	000004	001102	MOV	#STN-1,\$STSTN	
4157							
4158	011416	005737	003454		TST	DRIVS	;ANY DRIVES PRESENT?
4159	011422	001004			BNE	4\$	;YES BRANCH
4160	011424	104401	056367		TYPE	MSG19	;ALL DRIVES TESTED
4161	011430	000137	043132		JMP	\$EOP1	;NO, GO TO END
4162							
4163	011434	013701	001346		4\$: MOV	DRVPTN,R1	;ADDR OF NEXT DRIVE FLAG
4164	011440	005737	001220		TST	\$DEVCT	;IS FIRST DRIVE BEING CHECKED
4165	011444	001402			BEQ	2\$	;YES, BRANCH
4166	011446	005237	001222		1\$: INC	\$UNIT	;INCR DRIVE ADDR TO NEXT DRIVE
4167	011452	005721			2\$: TST	(R1)+	;IS DRIVE PRESENT?
4168	011454	001774			BEQ	1\$	;NO FIND NEXT DRIVE PRESENT
4169	011456	005737	003446		TST	DDPCH	;DDP CHAIN MODE?
4170	011462	001403			BEQ	3\$	;NO, BRANCH
4171	011464	005737	001222		TST	\$UNIT	;YES, IS IT DRIVE 0?
4172	011470	001766			BEQ	1\$	;IF YES, DON'T TEST DR 0
4173	011472	010137	001346		3\$: MOV	R1,DRVPTN	;STORE POINTER TO THE NEXT DR. FLAG
4174	011476	104401	056251		TYPE	MSG15	; "DRIVE"
4175	011502	013700	001222		MOV	\$UNIT,R0	
4176	011506	010046			MOV	R0,-(\$P)	;;SAVE R0 FOR TYPEOUT
4177							;;DRIVE #
4178	011510	104403			TYPOS		;;GO TYPE--OCTAL ASCII
4179	011512	001			.BYTE	1	;;TYPE 1 DIGIT(S)
4180	011513	000			.BYTE	0	;;SUPPRESS LEADING ZEROS
4181							
4182	011514	104401	001205		TYPE	,SCLF	

;TEST 5 UNLOAD DRIVE TO BE TESTED

```

4186
4187
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4189
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4191
4192
4193 011520 000004
4194 011522 012737 000001 001174
4195 011530 012706 001100
4196
4197 011534 005237 003316
4198
4199 011540 004737 045522
4200 011544 104024
4201
4202 011546 012765 000007 000000
4203 011554 013737 001414 003372
4204 011562 004737 043612
4205 011566 104011
4206 011570 004737 044074
4207 011574 104012
4208
4209 011576 004737 045522
4210 011602 104024
4211
4212 011604 013737 001414 003374
4213 011612 004737 046556
4214 011616 104315
4215
4216
4217
4218
4219
4220 011620
4221
4222
4223
4224
4225
4226
4227
4228
4229
4230 011620 000004
4231 011622 012737 000001 001174
4232 011630 012706 001100
4233
4234 011634 004737 045522
4235 011640 104024
4236
4237 011642 004737 045150
4238 011646 032737 000100 003362
4239 011654 001004
4240 011656 012737 000040 003424
4241 011664 000403

```

** THIS TEST UNLOADS THE DRIVE TO BE TESTED NEXT.
 ** WAITS FOR ATTN & VERIFIES IT CAME FROM THE CORRECT DRIVE.
 ** IT THEN WAITS FOR SPEED OK TO GO LOW BEFORE
 ** PROCEEDING TO THE NEXT TEST
 **

TS5: SCOPE

MOV #1,STIMES ;DO 1 ITERATION

MOV #STACK,SP

INC UNLD ;USED TO CHECK VALID HALT

JSR PC,SUBCLR

ERROR 24 ;CERR AFTER SCLR

MOV #UNLOAD,RKCS1(R5) ;UNLOAD CMD

MOV T10,TEMP1

JSR PC,FRDY ;FIND RDY

ERROR 11 ;RDY NOT SET AFTER UNLOAD CMD.

JSR PC,TSTATN

ERROR 12 ;NO ATTN AFTER UNLOAD CMD

JSR PC,SUBCLR

ERROR 24 ;CERR AFTER SCLR

MOV T10,TEMP2

JSR PC,FSPOK

ERROR 315 ;SPEED NOT DOWN BY TIMEOUT

PFSRT: ;ENTER HERE FOR POWER FAIL RESTART

.SBTTL STATIC & CYCLE UP TESTS

TEST 6 REFERENCE & CHECK ALL STATUS BYTES IN RKMR2 & RKMR3

CHECKS THE ABILITY TO REFERENCE ALL
 DRIVE REGISTERS AND THAT THEY CONTAIN CORRECT STATUS.

TS6: SCOPE

MOV #1,STIMES ;DO 1 ITERATION

MOV #STACK,SP ;RESTORE STK PTR

JSR PC,SUBCLR

ERROR 24 ;CERR AFTER SCLR

JSR PC,GSTAT

BIT #D.VV,HMR2

BNE 45 ;BR IF VV SET

MOV #D.DRA,E.A0 ;LOAD EXPECTED VALUE FOR A0

BR 55

C07

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T6 REFERENCE & CHECK ALL STATUS BYTES IN RKMR2 & RKMR3

SEQ 0080

```

4242
4243 011666 012737 000140 003424 4$: MOV #<D.DRA!D.VV>,E.A0
4244 011674 005037 003426 5$: CLR E.B0 ;EXPECTED MSG B0
4245 011700 012737 000740 003430 MOV #<D.HDHM!D.BRHM!D.DOOR!D.CART>,E.A1 ;EXPECTED MSG A1
4246 011706 012737 000001 003432 MOV #1,E.B1 ;EXPECTED MSG B1
4247 011714 005037 003434 CLR E.A2 ;EXPECTED MSG A2
4248 011720 012737 000002 003436 MOV #2,E.B2 ;EXPECTED MSG B2
4249 011726 012737 000003 003442 MOV #3,E.B3 ;EXPECTED MSG B3
4250
4251 011734 004737 044334 JSR PC,CHKMSG ;CHECK MSGS A0,B0,A1,B1
4252 011740 000007 .WORD T.A2!T.B2!T.B3 ;& MSGS SPECIFIED HERE
4253 011742 104016 ERROR 16 ;MSG A0 ERROR FOR DRIVE UNLOADED
4254 011744 104017 ERROR 17 ;MSG B0 ERROR
4255 011746 104020 ERROR 20 ;MSG A1 ERROR
4256 011750 104021 ERROR 21 ;MSG B1 ERROR
4257
4258 011752 005737 001362 TST CYLDIF ;SEE IF MSG A2=0
4259 011756 001401 BEQ 64$ ;BR IF YES
4260 011760 104022 ERROR 22 ;MSG A2 NOT CLEARED FOR DRIVE UNLOADED
4261 011762 005737 001364 64$: TST CYLADD ;SEE IF MSG B2=0
4262 011766 001401 BEQ 65$ ;BR IF YES
4263 011770 104023 ERROR 23 ;MSG B2 NOT CLEARED FOR DRIVE UNLOADED
4264 011772
4265 011772 023727 001432 000001 65$: CMP HEADA,#1 ;FOR HEAD 0, B3=1
4266 012000 001401 BEQ TST7 ;GO TO NXT TST IF YES
4267 012002 104056 ERROR 56 ;HEAD REG IN B3 NOT 0 IN UNLOAD
4268
4269
4270
4271
4272
4273
4274
4275
4276
4277
4278 012004 000004
4279 012006 012737 000001 001174
4280 012014 012706 001100
4281
4282 012020 005737 001216 TST $PASS
4283 012024 001046 BNE TST10 ;GO TO NEXT IF NOT FIRST PASS
4284 012026 004737 045522 JSR PC,SUBCLR ;DO SUBSYS CLEAR
4285 012032 104024 ERROR 24 ;CERR AFTER SCLR
4286
4287 012034 104401 056263 TYPE MSG16 ;DRIVE SERIAL NO.
4288 012040 012765 000003 000026 MOV #3,RKMR1(R5) ;SELECT BYTE 3
4289 012046 004737 045150 JSR PC,GSTAT ;GET STATUS
4290 012052 013701 003362 MOV HMR2,R1 ;GET SERIAL #
4291 012056 012704 054000 MOV #50C1VL,R4 ;GET ADDR CHAR BUFF
4292 012062 010446 MOV R4,-(SP) ;STORE ON STACK FOR $SUPRS
4293 012064 012703 000003 MOV #3,R3 ;SETUP CHAR COUNT
4294 012070 006101 ROL R1 ;INITIALIZE BIT POSITIONS
4295 012072 006101 ROL R1
4296 012074 006101 1$: ROL R1 ;GET NEXT 4 BITS
4297 012076 006101 ROL R1

```

```

*****
;TEST 7 PRINT DRIVE SERIAL NUMBER
;
; THIS TEST READS & PRINTS THE DRIVE SERIAL # FROM MSG A, WORD 11
; IN BCD & IS PERFORMED ON THE 1ST PASS ONLY
;
*****

```

```

;*****
;TST7: SCOPE
;MOV #1,$TIMES ;DO 1 ITERATION
;MOV #STACK,SP ;RESTORE S1K PTR
;
;TST $PASS
;BNE TST10 ;GO TO NEXT IF NOT FIRST PASS
;JSR PC,SUBCLR ;DO SUBSYS CLEAR
;ERROR 24 ;CERR AFTER SCLR
;
;TYPE MSG16 ;DRIVE SERIAL NO.
;MOV #3,RKMR1(R5) ;SELECT BYTE 3
;JSR PC,GSTAT ;GET STATUS
;MOV HMR2,R1 ;GET SERIAL #
;MOV #50C1VL,R4 ;GET ADDR CHAR BUFF
;MOV R4,-(SP) ;STORE ON STACK FOR $SUPRS
;MOV #3,R3 ;SETUP CHAR COUNT
;ROL R1 ;INITIALIZE BIT POSITIONS
;ROL R1
;ROL R1 ;GET NEXT 4 BITS
;ROL R1

```

D07

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T7 PRINT DRIVE SERIAL NUMBER

SEQ 0081

4298 012100 006101
 4299 012102 006101
 4300 012104 010100
 4301 012106 042700 177760
 4302 012112 052700 000060
 4303 012116 110024
 4304 012120 005303
 4305 012122 001364
 4306 012124 105014
 4307 012126 004737 054246
 4308 012132 104401 001205
 4309 012136 104401 001205

ROL R1
 ROL R1
 MOV R1,RO ;GET WORKING COPY
 BIC #177760,RO ;CLEAR ALL BUT LOW 4 BITS
 BIS #60,RO ;CONVERT TO ASCII DIGIT
 MOVB RO,(R4)+ ;PUT ASCII DIGIT INTO CHAR BUFF
 DEC R3
 BNE 1\$;BR IF ALL 3 CHARS NOT DONE
 CLRB (R4) ;ELSE INSERT NULL TERMINATOR
 JSR PC,\$SUPRS ;TYPE
 TYPE ,SCLF
 TYPE ,SCLF

 *TEST 10 SET VV WITH PACK CMD

* IF VV IS RESET, THE PACK CMD IS USED TO SET IT.

 *TEST 10: SCOPE

4317 012142 000004
 4318 012144 012737 000001 001174
 4319 012152 012706 001100
 4320
 4321 012156 005065 000026
 4322 012162 004737 045150
 4323 012166 032737 000100 003362
 4324 012174 001024
 4325
 4326 012176 104415
 4327 012200 012706 001100
 4328
 4329 012204 004737 045522
 4330 012210 104024
 4331
 4332 012212 012765 000003 000000
 4333 012220 013737 001414 003372
 4334 012226 004737 043612
 4335 012232 104116
 4336
 4337 012234 032737 000100 003362
 4338 012242 001001
 4339 012244 104027

MOV #1,\$TIMES ;DO 1 ITERATION
 MOV #STACK,SP ;RESTORE STK PTR
 CLR RKMR'(R5) ;SELECT BYTE 0
 JSR PC,GSTAT ;GET STATUS
 BIT #D.VV,HMR2
 BNE TST11 ;GO TO NEXT TEST IF VV SET
 SCOPE1
 MOV #STACK,SP ;RESTORE STK PTR
 JSR PC,SUBCLR
 ERROR 24 ;CERR AFTER SCLR
 MOV #PACK,RKCS1(R5) ;CMD TO SET VV
 MOV T10,TEMP1
 JSR PC,FRDY ;FIND RDY
 ERROR 116 ;RDY NOT SET AFTER PACK CMD
 BIT #D.VV,HMR2
 BNE TST11 ;GO TO NEXT TEST IF VV NOW SET
 ERROR 27 ;PACK DID NOT SET V.V.

 *TEST 11 RELEASE DRIVE

* TESTS THE ABILITY TO RECOGNIZE THE RLS BIT AND NOT RAISE SACK

 *TEST 11: SCOPE

4347 012246 000004
 4348 012250 012737 000001 001174
 4349 012256 012706 001100
 4350
 4351 012262 004737 045522
 4352 012266 104024
 4353 012270 032737 000400 003336

MOV #1,\$TIMES ;DO 1 ITERATION
 MOV #STACK,SP ;RESTORE STK PTR
 JSR PC,SUBCLR ;DO SUBSYS CLEAR & GET STATUS
 ERROR 24 ;CONTR ERROR SET AFTER SCLR
 BIT #UFE,HCS2

E07

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T11 RELEASE DRIVE

SEQ 0082

```

4354 012276 001401      BEQ      15
4355 012300 104003      ERROR    3      ;UFE SET AFTER SCLR
4356
4357 012302      15:
4358 012302 104415      SCOP1
4359 012304 012706 001100 MOV      #STACK,SP      ;RESTORE STK PTR
4360
4361 012310 004737 045522 JSR      PC,SUBCLR
4362 012314 104024      ERROR    24      ;CERR AFTER SCLR
4363
4364 012316 062765 000010 000010 ADD      #RLS,RKCS2(R5) ;ADD RELEASE BIT TO $UNIT
4365 012324 004737 045150 JSR      PC,GSTAT      ;GET STATUS
4366
4367 012330 032737 100000 003334 BIT      #CERR,HCS1      ;CHECK FOR CONTR ERROR
4368 012336 001401      BEQ      25
4369 012340 104025      ERROR    25      ;RLS SET CERR
4370 012342 032737 000400 003336 25: BIT      #UFE,HCS2
4371 012350 001401      BEQ      TST12      ;GO TO NEXT TEST IF SET
4372 012352 104026      ERROR    26      ;SACK SET AFTER RLS SENT
4373
4374
4375 *****
4376 ;*TEST 12      DRIVE TYPE TEST
4377 ;*
4378 ;*      THIS TEST COMPARES DRIVE TYPE IN MSG A AGAINST 'DDT' IN RKDS.
4379 ;*      WRONG CDT IN RKCS1 IS SENT & ERRORS ARE VERIFIED.
4380 ;*
4381 *****
4382 TST12: SCOPE
4383 MOV      #1,$TIMES      ;DO 1 ITERATION
4384 MOV      #STACK,SP      ;RESTORE STK PTR
4385
4386 JSR      PC,SUBCLR      ;SUBSYS CLEAR & GET STATUS
4387 ERROR    24      ;CONT ERROR SET AFT SUBSYS CLEAR
4388 BIT      #D.DDT,HMR2
4389 BEQ      25
4390 ERROR    30      ;DR TYPE SET IN MR2
4391 BIT      #DDT,HDS
4392 BEQ      35
4393 ERROR    31      ;DDT SET IN RKDS
4394 BIT      #DTYE,HER
4395 BEQ      45
4396 ERROR    32      ;DTYE SET IN RKER
4397
4398 45:
4399 SCOP1
4400 MOV      #STACK,SP      ;RESTORE STK PTR
4401
4402 JSR      PC,SUBCLR
4403 ERROR    24      ;CERR AFTER SCLR
4404
4405 MOV      #<CDT!SELDV>,RKCS1(R5) ;GET STATUS WITH CDT SET
4406 MOV      T10,TEMP1
4407 JSR      PC,FRDY      ;FIND RDY
4408 ERROR    117      ;RDY NOT SET BY END OF SEL DRV CMD
4409 BIT      #D.DDT,HMR2
4410 BEQ      55

```

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T12 DRIVE TYPE TEST

SEQ 0083

```

4410 012502 104030          ERROR 30          ;DR TYPE SET IN MR2
4411 012504 032737 000400 003346 5$: BIT #DDT,HDS
4412 012512 001401          BEQ 6$
4413 012514 104031          ERROR 31          ;DDT SET IN RKDS
4414 012516 032737 000040 003350 6$: BIT #DTYE,HER ;DTYE=DDT(NOT)*CDT
4415 012524 001001          BNE 7$
4416 012526 104033          ERROR 33          ;DTYE NOT SET AFT WRITING CDT=1
4417 012530 032737 100000 003334 7$: BIT #CERR,HCS1
4418 012536 001001          BNE TST13        ;GO TO NEXT TEST
4419 012540 104034          ERROR 34          ;CERR NOT SET AFT WRITING CDT=1
4420
4421
4422
4423
4424
4425
4426
4427
4428
4429
4430
4431
4432
4433 012542 000004          *****
4434 012544 012737 000001 001174  *TEST 13 C-D PARITY ERROR DETECTION
4435 012552 012706 001100          *
4436
4437 012556 004737 045522          *TESTS THE ABILITY OF THE DRIVE TO DETECT EVEN PARITY SENT BY
4438 012562 104024          *THE CONTROLLER BY SETTING 'PAT' ON RKMR1.
4439 012564 032737 001000 003364          *THE DRIVE SHOULD RESPOND WITH 'C-D PARITY ERROR'
4440 012572 001401          *THE DRIVE STILL SENDS ODD PARITY TO THE CONTROLLER WHICH IS NOW
4441 012574 104035          *CHECKING FOR EVEN PARITY THEREFORE THE CONTROLLER SHOULD DETECT
4442 012576 032737 020000 003334 2$: BIT #DCPAR,HCS1 AN ERROR AND SET DCPAR.
4443 012604 001401          *THE ERROR CONDITION IS RESET WITH THE CLEAR CMD
4444 012606 104036          *
4445
4446
4447
4448
4449
4450
4451
4452
4453 012624 012765 000020 000026          *****
4454 012632 004737 045150          *ST13: SCOPE
4455 012636 032737 000200 003364          MOV #1,STIMES ;DO 1 ITERATION
4456 012644 001001          MOV #STACK,SP ;RESTORE STK PTR
4457 012646 104037          JSR PC,SUBCLR ;SUBSYS CLEAR & GET STATUS
4458 012650 032737 001000 003364          ERROR 24 ;CONT ERROR AFTER SUBSYS CLR
4459 012656 001001          BIT #D.PAR,HMR3
4460 012660 104040          BEQ 2$ ;C-D PARITY ERROR SET IN MR3
4461 012662 032737 020000 003334 5$: BIT #DCPAR,HCS1
4462 012670 001001          BEQ 3$ ;DCPAR SET IN CSI
4463 012672 104041          ERROR 36
4464 012674 032737 100000 003334 6$: BIT #CERR,HCS1
4465 012702 001001          BNE TST14        ;GO TO NEXT TEST

```

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T13 C-D PARITY ERROR DETECTION

SEQ 0084

```

4466 012704 104042          ERROR 42          ;CERR NOT SET BY WRITING PAT IN MR1
4467
4468
4469
4470
4471
4472
4473
4474
4475
4476
4477
4478 012706 000004          ST14: SCOPE
4479 012710 012737 000001 001174      MOV #1,STIMES ;DO 1 ITERATION
4480 012716 012706 001100              MOV #STACK,SP ;RESTORE STK PTR
4481
4482 012722 004737 045522          JSR PC,SUBCLR ;SUBSYS CLEAR & GET STATUS
4483 012726 104024              ERROR 24 ;CERR AFTER SCLR
4484
4485 012730 012765 000011 000000      MOV #SRTSPL,RKCS1(R5) ;START SPINDLE CMD
4486 012736 013737 001414 003372      MOV T10,TEMP1 ;SETUP TIMEOUT
4487 012744 004737 043612          JSR PC,FRDY
4488 012750 104121              ERROR 121 ;RDY NOT SET AFTER START SPIN CMD
4489
4490 012752 004737 045150          JSR PC,GSTAT ;WORD 0
4491 012756 032737 010000 003362      BIT #0,SPIN,HMR2
4492 012764 001001              BNE 13$
4493 012766 104306              ERROR 306 ;SPIN NOT SET AFTER START SPIN CMD
4494
4495 012770 012737 014212 001176 13$: MOV #25$,SESCAPE
4496 012776 004737 044074          JSR PC,TSTATN ;TEST FOR ATTN
4497 013002 000401              BR 15$
4498 013004 104316              ERROR 316
4499 013006 012737 010140 003424 15$: MOV #<D.SPIN!D.VV!D.DRA>,E.A0 ;LOAD IN EXPECTED VALUES
4500 013014 005037 003426          CLR E.B0
4501 013020 012737 000740 003430      MOV #<D.CART!D.DOOR!D.HDHM!D.BRHM>,E.A1
4502 013026 012737 000001 003432      MOV #1,E.B1
4503
4504 013034 004737 044334          JSR PC,CHKMSG ;CHECK MSGS A0,B0,A1,B1
4505 013040 000000              .WORD 0 ;& MSGS SPECIFIED HERE
4506 013042 104057              ERROR 57 ;MSG A0 ERROR AFTER START SPIN CMD REC'D BY DRIVE
4507 013044 104060              ERROR 60 ;MSG B0 ERROR
4508 013046 104061              ERROR 61 ;MSG A1 ERROR
4509 013050 104062              ERROR 62 ;MSG B1 ERROR
4510 013052 005737 003502          TST DOTIM
4511 013056 001135              BNE 3$ ;BRANCH IF P OR L CLOCK PRESENT
4512 013060 012737 014236 001176 1$: MOV #30$,SESCAPE
4513 013066 012765 100000 000000      MOV #CCLR,RKCS1(R5)
4514 013074 013737 001416 003374      MOV T100,TEMP2 ;SETUP TIMEOUT
4515 013102 004737 044126          JSR PC,FATT1 ;FIND ATTN
4516 013106 104067              ERROR 67 ;NO ATTN AFTER HEAD LOADING
4517 013110
4518
4519 013110 012737 050340 003424      MOV #<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
4520 013116 005037 003426          CLR E.B0 ;EXPECTED MSG B0
4521 013122 012737 001720 003430      MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T14 VERIFY START SPINDLE CMD

SEQ 0085

4522	013130	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4523	013136	005037	003434		CLR	E.A2	;EXPECTED MSG A2
4524	013142	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4525	013150	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4526							
4527	013156	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
4528	013162	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
4529	013164	104063			ERROR	63	;MSG A0 ERROR AT END OF HEAD LOAD
4530	013166	104064			ERROR	64	;MSG B0 ERROR
4531	013170	104065			ERROR	65	;MSG A1 ERROR
4532	013172	104066			ERROR	66	;MSG B1 ERROR
4533							
4534	013174	005737	001362		TST	CYLDIF	;SEE IF MSG A2=0
4535	013200	001401			BEQ	64\$	;BR IF YES
4536	013202	104175			ERROR	175	;MSG A2 NOT CLEARED AT END OF HEAD LOAD
4537	013204	001737	001364		TST	CYLADD	;SEE IF MSG B2=0
4538	013210	001401			BEQ	65\$	;BR IF YES
4539	013212	104176			ERROR	176	;MSG B2 NOT CLEARED AT END OF HEAD LOAD
4540	013214						
4541							
4542	013214	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
4543	013222	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
4544	013230	012765	000005	000000	MOV	#CLR,RKCS1(R5)	;DRIVE CLEAR CMD
4545	013236	013737	001414	003372	MOV	T10,TEMP1	
4546	013244	004737	043612		JSR	PC,FRDY	;FIND RDY
4547	013250	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
4548	013252	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
4549	013256	000401			BR	66\$	
4550	013260	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4551	013262						
4552							
4553	013262	012737	010340	003424	MOV	#<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
4554	013270	005037	003426		CLR	E.B0	;EXPECTED MSG B0
4555	013274	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
4556	013302	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4557	013310	005037	003434		CLR	E.A2	;EXPECTED MSG A2
4558	013314	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4559	013322	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4560							
4561	013330	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
4562	013334	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
4563	013336	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
4564	013340	104265			ERROR	265	;MSG B0 ERROR
4565	013342	104274			ERROR	274	;MSG A1 ERROR
4566	013344	104266			ERROR	266	;MSG B1 ERROR
4567							
4568	013346	000137	014024		JMP	12\$	
4569							
4570	013352	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
4571	013360	013737	001370	001372	MOV	HZ,COUNT	
4572	013366	012737	000074	001374	MOV	#60,SEC	
4573	013374	004737	047304		JSR	PC,CLKON	;TURN CLK INTR ON FOR 60 SEC MAX
4574	013400	012765	000001	000026	MOV	#1,RKMR1(R5)	;SELECT WORD 1
4575	013406	004737	045150		JSR	PC,GSTAT	
4576	013412	032737	002000	003362	BIT	#D.FWD,HMR2	
4577	013420	001004			BNE	5\$	

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T14 VERIFY START SPINDLE CMD

SEQ 0086

4578	013422	005737	001376		TST	TIMUP		; IS 60 SEC DELAY UP?
4579	013426	001767			BEQ	45		; BRANCH IF NO & REPEAT
4580	013430	104070			ERROR	70		; FWD NOT SET WITHIN 60 SEC FROM
4581								; START SPINDLE CMD.
4582	013432	004737	047400	55:	JSR	PC,CLKOF		; TURN OFF CLOCK INTERRUPT
4583	013436	012765	100000	000000	MOV	#CCLR,RKCS1(R5)		
4584								
4585	013444	013737	001370	001372	MOV	HZ,COUNT		
4586	013452	012737	000005	001374	MOV	#5,SEC		
4587	013460	004737	047304		JSR	PC,CLKON		; TURN CLK INTR ON FOR 5 SEC MAX
4588	013464	012765	000001	000026	65:	MOV	#1,RKMR1(R5)	; WORD 1
4589	013472	004737	045150		JSR	PC,GSTAT		
4590	013476	032737	002000	003362	BIT	#D.FWD,HMR2		
4591	013504	001404			BEQ	75		
4592	013506	005737	001376		TST	TIMUP		
4593	013512	001764			BEQ	65		
4594	013514	104075			ERROR	75		; FWD NOT CLEARED WITHIN 5 SEC OF MOTION
4595								; FROM START SPINDLE CMD.
4596	013516	004737	047400	75:	JSR	PC,CLKOF		; TURN OFF CLK INTERRUPT
4597	013522	004737	044074		JSR	PC,TSTATN		; TEST FOR ATTN
4598	013526	000401			BR	175		
4599	013530	104320			ERROR	320		; UNEXP ATTN AFTER INNER LIM DETECT
4600	013532	012737	030140	003424	175:	MOV	#<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0	; EXPECTED A0
4601	013540	005037	003426		CLR	E.B0		
4602	013544	012737	025720	003430	MOV	#<D.RTZ!D.REV!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1		
4603	013552	012737	000001	003432	MOV	#1,E.B1		
4604								
4605	013560	004737	044334		JSR	PC,CHKMSG		; CHECK MSGS A0,B0,A1,B1
4606	013564	000000			.WORD	0!0!0		; & MSGS SPECIFIED HERE
4607	013566	104076			ERROR	76		; MSG A0 ERROR AT INNER LIMIT DETECT
4608	013570	104077			ERROR	77		; MSG B0 ERROR
4609	013572	104100			ERROR	100		; MSG A1 ERROR
4610	013574	104101			ERROR	101		; MSG B1 ERROR
4611								
4612	013576	013737	001370	001372	MOV	HZ,COUNT		
4613	013604	012737	000004	001374	MOV	#4,SEC		
4614	013612	004737	047304		JSR	PC,CLKON		; TURN CLK INTR ON FOR 4 SEC MAX
4615	013616	012765	000001	000026	85:	MOV	#1,RKMR1(R5)	; WORD 1
4616	013624	004737	045150		JSR	PC,GSTAT		
4617	013630	032737	002000	003362	BIT	#D.FWD,HMR2		
4618	013636	001004			BNE	95		
4619	013640	005737	001376		TST	TIMUP		
4620	013644	001764			BEQ	85		
4621	013646	104102			ERROR	102		; FWD NOT DETECTED WITHIN 4 SEC IN RTZ PORTION OF
4622								; START SPINDLE CMD.
4623	013650	004737	047400	95:	JSR	PC,CLKOF		; TURN CLOCK INTR OFF.
4624	013654	004737	044074		JSR	PC,TSTATN		; TEST FOR ATTN
4625	013660	000401			BR	185		
4626	013662	104321			ERROR	321		; UNEXP ATTN AFTER OUTER LIM TO CYL 0
4627	013664	012737	030140	003424	185:	MOV	#<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0	; EXPECTED A0
4628	013672	005037	003426		CLR	E.B0		
4629	013676	012737	023720	003430	MOV	#<D.RTZ!D.FWD!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1		
4630	013704	012737	000001	003432	MOV	#1,E.B1		
4631								
4632	013712	004737	044334		JSR	PC,CHKMSG		; CHECK MSGS A0,B0,A1,B1
4633	013716	000000			.WORD	0!0!0		; & MSGS SPECIFIED HERE

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T14 VERIFY START SPINDLE CMD

SEQ 0087

4634	013720	104103		ERROR	103	;MSG A0 ERROR FROM OUT LIM TO CYL 0 DURING LOAD
4635	013722	104104		ERROR	104	;MSG B0 ERROR
4636	013724	104105		ERROR	105	;MSG A1 ERROR
4637	013726	104106		ERROR	106	;MSG B1 ERROR
4638	013730	013737	001370 001372	MOV	H2,COUNT	
4639	013736	012737	000001 001374	MOV	#1,SEC	
4640	013744	004737	047304	JSR	PC,CLKON	;TURN CLK INTR ON FOR 1 SEC MAX
4641	013750	005065	000026	CLR	RKMR1(R5)	;WORD 0
4642	013754	004737	045150	JSR	PC,GSTAT	
4643	013760	032737	000200 003362	BIT	#D.DRDY,HMR2	;SEE IF DRIVE READY
4644	013766	001004		BNE	115	
4645	013770	005737	001376	TST	TIMUP	
4646	013774	001765		BEQ	105	
4647	013776	104107		ERROR	107	;DRIVE READY NOT SET WITHIN 1 SEC FROM
4648						;FWD IN RTZ PORTION OF START SPIN CMD
4649	014000	004737	047400	JSR	PC,CLKOF	;TURN CLOCKS OFF
4650	014004	004737	044074	JSR	PC,TSTATN	;TEST ATTN
4651	014010	104067		ERROR	67	;NO ATTN AFTER START SPIN CMD
4652	014012	012737	014236 001176	MOV	#305,\$ESCAPE	
4653	014020	000137	013110	JMP	25	;CHECK RKMR 2 & 3 WORDS 0 & 1
4654						
4655	014024	005037	001176	CLR	\$ESCAPE	
4656	014030	012765	100000 000000	MOV	#CCLR,RKCS1(R5)	
4657	014036	005065	000026	CLR	RKMR1(R5)	
4658	014042	004737	045150	JSR	PC,GSTAT	
4659	014046	032737	010000 003362	BIT	#D.SPIN,HMR2	
4660	014054	001003		BNE	145	
4661	014056	104306		ERROR	306	;SPIN NOT SET AFTER ST. SPIN CMD
4662	014060	000137	043076	JMP	\$EOP	;ABORT DRIVE
4663	014064	005037	003316	CLR	UNLD	;USED FOR VALID HALT
4664	014070	004737	047526	JSR	PC,SWTST	;SEE IF SW 14 OR 8 IS SET
4665	014074	000472		BR	TST15	;GO TO NEXT TEST
4666						;RETURN HERE IF SW 14 IS SET OR
4667						;SW 8 WITH SWR <7:0> APPLY
4668	014076	005237	003316	INC	UNLD	
4669						
4670	014102	004737	045522	JSR	PC,SUBCLR	
4671	014106	104024		ERROR	24	;CERR AFTER SCLR
4672						
4673	014110	012765	000007 000000	MOV	#UNLOAD,RKCS1(R5)	;UNLOAD CMD
4674	014116	013737	001414 003372	MOV	T10,TEMP1	
4675	014124	004737	043612	JSR	PC,FRDY	;FIND RDY
4676	014130	104011		ERROR	11	;RDY NOT SET AFTER UNLOAD CMD.
4677	014132	004737	044074	JSR	PC,TSTATN	
4678	014136	104012		ERROR	12	;NO ATTN AFTER UNLOAD CMD
4679						
4680	014140	004737	045522	JSR	PC,SUBCLR	
4681	014144	104024		ERROR	24	;CERR AFTER SCLR
4682						
4683	014146	013737	001414 003374	MOV	T10,TEMP2	
4684	014154	004737	046556	JSR	PC,FSPOK	
4685	014160	104315		ERROR	315	;SPEED NOT DOWN BY TIMEOUT
4686						
4687	014162	004737	045522	JSR	PC,SUBCLR	
4688	014166	104024		ERROR	24	;CERR AFTER SCLR
4689						

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T14 VERIFY START SPINDLE CMD

SEQ C088

4690 014170 005037 001176
 4691 014174 005737 001410
 4692 014200 001402
 4693 014202 000177 164702
 4694 014206 000177 164674

CLR \$ESCAPE
 TST LPFLG
 BEQ 67\$
 JMP \$SLPERR ;SW 9 WAS SET.
 67\$: JMP \$SLPADR ;SW 14 OR 8 WAS SET

4695
 4696
 4697
 4698 014212 004737 047400
 4699 014216 005237 001410
 4700 014222 032777 001000 164710
 4701 014230 001322
 4702 014232 000137 013060
 4703 014236 004737 047400
 4704 014242 005237 001410
 4705 014246 032777 001000 164664
 4706 014254 001310
 4707 014256 000137 014024

25\$: JSR PC,CLKOF
 INC LPFLG
 BIT \$SW9,\$SWR ;LOOP ON ERROR?
 BNE 20\$;YES, RECONDITION DRIVE
 JMP 1\$;RETURN TO MAINLINE
 30\$: JSR PC,CLKOF
 INC LPFLG
 BIT \$SW9,\$SWR ;LOOP ON ERROR?
 BNE 20\$;YES, RECONDITION DRIVE
 JMP 12\$;RETURN TO MAINLINE

.SBTTL SEEK/READ HEADER/WRITE HEADER TESTS

4708
 4709
 4710
 4711
 4712
 4713
 4714
 4715
 4716
 4717
 4718
 4719

 *TEST 15 STATIC CYL DIFF AND CYL ADDR REG TEST; PART 1
 *
 * THIS TEST CHECKS EACH BIT OF THE CYL DIFFERENCE
 * AND CYL ADDRESS REGISTERS BY PERFORMING SEEKS TO ALL
 * MAJOR CYLS (0,1,2,4,8,16,32,64,128,256) WITH EVEN PARITY SET.
 * THIS FREEZES THE INFORMATION IN THE ABOVE REGISTERS & ALLOWS FOR CHECKING.
 * THIS TEST VERIFIES C-D PARITY ERROR BIT SET, THAT HEADS DID
 * NOT MOVE & ALL OTHER APPLICABLE STATUS BITS & REGS.

4720
 4721 014262 000004
 4722 014264 012737 000001 001174
 4723 014272 012706 001100
 4724
 4725 014276 005000
 4726 014300 012737 100000 003402
 4727
 4728 014306
 4729 014306 104415
 4730 014310 012706 001100
 4731
 4732 014314 004737 045522
 4733 014320 104024
 4734
 4735
 4736 014322 012765 100000 000000
 4737 014330 013765 001222 000010
 4738 014336 012765 000013 000000
 4739
 4740
 4741 014344 013737 001414 003372
 4742 014352 004737 043612
 4743 014356 104124
 4744
 4745 014360 012765 000001 000026

ST15: SCOPE
 MOV #1,STIMES ;DO 1 ITERATION
 MOV \$STACK,SP ;RESTORE STK PTR
 CLR R0 ;CYL # REGISTER
 MOV \$BIT15,TEMP5
 1\$: SCOP1
 MOV \$STACK,SP ;RESTORE STK PTR
 JSR PC,SUBCLR
 ERROR 24 ;CERR AFTER SCLR
 MOV \$CCLR,RKCS1(R5)
 MOV \$UNIT,RKCS2(R5)
 MOV \$RECAL,RKCS1(R5) ;RECAL CMD
 ;RESET CYL DIFF/OFFSET & CYL ADDR REG
 ;IN RKMR2 & RKMR3 RESP.
 MOV T10,TEMP1
 JSR PC,FRDY ;FIND RDY
 ERROR 124 ;RDY NOT SET AFTER RECAL CMD
 MOV #1,RKMR1(R5) ;SELECT WORD 1

L07

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T15 STATIC CYL DIFF AND CYL ADDR REG TEST; PART 1

SEQ 0089

4746	014366	004737	045150		JSR	PC,GSTAT	
4747	014372	032737	020000	003362	BIT	#D,RTZ,HMR2	
4748	014400	001001			BNE	64\$	
4749	014402	104244			ERROR	244	;RTZ NOT SET DURING RECAL CMD
4750	014404	013737	001414	003374	MOV	T10,TEMP2	;SETUP TIMEOUT
4751	014412	004737	044126		JSR	PC,FATT1	;FIND ATTN
4752	014416	104055			ERROR	55	;NO ATTN AFTER RECAL CMD
4753							
4754	014420	012737	050340	003424	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
4755	014426	005037	003426		CLR	E.B0	;EXPECTED MSG B0
4756	014432	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
4757	014440	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4758	014446	005037	003434		CLR	E.A2	;EXPECTED MSG A2
4759	014452	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4760	014460	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4761							
4762	014466	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
4763	014472	000007			.WORD	T.A2!T.B2!T.B3	; & MSGS SPECIFIED HERE
4764	014474	104221			ERROR	221	;MSG A0 ERROR AFTER RECAL CMD
4765	014476	104275			ERROR	275	;MSG B0 ERROR
4766	014500	104222			ERROR	222	;MSG A1 ERROR
4767	014502	104276			ERROR	276	;MSG B1 ERROR
4768							
4769	014504	005737	001362		TST	CYLDIF	;SEE IF MSG A2=0
4770	014510	001401			BEQ	65\$	;BR IF YES
4771	014512	104047			ERROR	47	;MSG A2 NOT CLEARED AFTER RECAL CMD
4772	014514	005737	001364		TST	CYLADD	;SEE IF MSG B2=0
4773	014520	001401			BEQ	66\$	;BR IF YES
4774	014522	104050			ERROR	50	;MSG B2 NOT CLEARED AFTER RECAL CMD
4775	014524						
4776							
4777	014524	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
4778	014532	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
4779	014540	012765	000005	000000	MOV	#CLR,RKCS1(R5)	;DRIVE CLEAR CMD
4780	014546	013737	001414	003372	MOV	T10,TEMP1	
4781	014554	004737	043612		JSR	PC,FRDY	;FIND RDY
4782	014560	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
4783	014562	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
4784	014566	000401			BR	67\$	
4785	014570	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4786	014572						
4787							
4788	014572	012737	010340	003424	MOV	#<D!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
4789	014600	005037	003426		CLR	E.B0	;EXPECTED MSG B0
4790	014604	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
4791	014612	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4792	014620	005037	003434		CLR	E.A2	;EXPECTED MSG A2
4793	014624	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4794	014632	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4795							
4796	014640	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
4797	014644	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
4798	014646	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
4799	014650	104265			ERROR	265	;MSG B0 ERROR
4800	014652	104274			ERROR	274	;MSG A1 ERROR
4801	014654	104266			ERROR	266	;MSG B1 ERROR

M07

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T15 STATIC CYL DIFF AND CYL ADDR REG TEST; PART 1

SEQ 0090

4802						
4803						
4804	014656	104415		SCOP1		
4805	014660	012706	001100	MOV	#STACK,SP	;RESTORE STK PTR
4806						
4807	014664	004737	045522	JSR	PC,SUBCLR	
4808	014670	104024		ERROR	24	;CERR AFTER SCLR
4809						
4810	014672	005237	001462	INC	BYPCERR	;DO NOT TEST CERR IN GSTAT1
4811	014676	012765	000020	MOV	#PAT,RKMR1(R5)	;EVEN PARITY
4812	014704	010065	000020	MOV	RD,RKDC(R5)	;CYL ADDR
4813	014710	012765	000017	MOV	#SEEK,RKCS1(R5)	;SEEK CMD.
4814	014716	013737	001414	MOV	T10,TEMP1	
4815	014724	004737	043612	JSR	PC,FRDY	;FIND RDY
4816	014730	104122		ERROR	122	;NO RDY FROM SEEK WITH BAD PARITY
4817	014732	004737	044074	JSR	PC,TSTATN	;TEST FOR ATTN
4818	014736	104125		ERROR	125	;NO ATTN FROM SEEK & BAD PARITY
4819	014740	012737	050340	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED A0
4820	014746	012737	001200	MOV	#<D.FLT!D.PAR>,E.B0	
4821	014754	012737	001720	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	
4822	014762	012737	000001	MOV	#1,E.B1	
4823	014770	010037	003434	MOV	RD,E.A2	
4824	014774	010037	003436	MOV	RD,E.B2	
4825	015000	052737	000002	BIS	#2,E.B2	;ADD MSG ID
4826						
4827	015006	004737	044334	JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
4828	015012	000003		.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
4829	015014	104110		ERROR	110	;MSG A0 ERROR AFTER SEEK WITH BAD PARITY
4830	015016	104111		ERROR	111	;MSG B0 ERROR
4831	015020	104146		ERROR	146	;MSG A1 ERROR
4832	015022	104147		ERROR	147	;MSG B1 ERROR
4833						
4834	015024	020037	001364	CMP	RD,CYLADD	
4835	015030	001401		BEQ	2\$	
4836	015032	104043		ERROR	43	;CYL ADDR IN B2 NOT=RKDC
4837						
4838	015034	020037	001362	2\$: CMP	RD,CYLDIFF	
4839	015040	001401		BEQ	3\$	
4840	015042	104044		ERROR	44	;CYL DIFF IN A2 NOT=RKDC
4841						
4842	015044	005037	001462	3\$: CLR	BYPCERR	;ALLOW CHECKING FOR ANY CERR IN GSTAT1
4843	015050	006137	003402	ROL	TEMP5	;SET CARRY ONLY ONCE
4844	015054	006100		ROL	RD	;SELECT NEXT MAJOR CYL
4845	015056	020027	001000	CMP	RD,#1000	;ALL MAJOR CYL DONE?
4846	015062	001001		BNE	4\$	;BRANCH IF NO
4847	015064	000402		BR	TST16	;GO TO NEXT TST
4848	015066	000137	014306	4\$: JMP	1\$	
4849						

```

*****
;TEST 16      STATIC CYL DIFF & CYL ADDR REG TEST-PART 2
;

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;
;   THIS TEST CHECKS THE ABILITY OF THE DRIVE TO PROPERLY SET THE CYL
;   DIFF. & CYL ADDR REGS FOR ALL COMBINATIONS BY SEEKING TO
;   ALL CYLS FROM EVERY OTHER CYL. (N SQUARE SEEKS).
;   IT IS PERFORMED IN THE SAME MANNER AS THE ABOVE TEST.
;

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4857

NO7

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T16 STATIC CYL DIFF & CYL ADDR REG TEST-PART 2

SEQ 0091

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4858
4859 015072 000004
4860 015074 012737 000001 001174
4861 015102 012706 001100
4862
4863 015106 005737 001340
4864 015112 001404
4865 015114 104401 056002
4866 015120 000137 016362
4867
4868 015124 104401 055744
4869
4870 015130 005037 001350
4871 015134 005037 001352
4872 015140 005037 001354
4873 015144 005037 001356
4874
4875 015150 104415
4876 015152 012706 001100
4877
4878 015156 004737 045522
4879 015162 104024
4880
4881
4882 015164 012765 100000 000000
4883 015172 013765 001222 000010
4884 015200 012765 000013 000000
4885
4886
4887 015206 013737 001414 003372
4888 015214 004737 043612
4889 015220 104124
4890
4891 015222 012765 000001 000026
4892 015230 004737 045150
4893 015234 032737 020000 003362
4894 015242 001001
4895 015244 104244
4896 015246 013737 001414 003374
4897 015254 004737 044126
4898 015260 104055
4899
4900 015262 012737 050340 003424
4901 015270 005037 003426
4902 015274 012737 001720 003430
4903 015302 012737 000001 003432
4904 015310 005037 003434
4905 015314 012737 000002 003436
4906 015322 012737 000003 003442
4907
4908 015330 004737 044334
4909 015334 000007
4910 015336 104221
4911 015340 104275
4912 015342 104222
4913 015344 104276

*****
T16: SCOPE
MOV #1,STIMES ;DO 1 ITERATION
MOV #STACK,SP ;RESTORE STK PTR

TST BYPT16
BEQ 13$
TYPE MSG9 ;BYPASSING TEST 16
JMP 12$

13$: TYPE ,MSG8 ;PLEASE WAIT, LONG TEST

CLR FRCYL ;FROM CYL
CLR TOCYL ;TO CYL
CLR CCYL ;CURRENT CYL
CLR PCYL ;PREV CYL

SCOP1
MOV #STACK,SP ;RESTORE STK PTR

JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR

MOV #CCLR,RKCS1(R5)
MOV $UNIT,RKCS2(R5)
MOV #RECAL,RKCS1(R5) ;RECAL CMD
;RESET CYL DIFF/OFFSET & CYL ADDR REG
;IN RKMR2 & RKMR3 RESP.

MOV T10,TEMP1
JSR PC,FROY ;FIND RDY
ERROR 124 ;RDY NOT SET AFTER RECAL CMD

MOV #1,RKMR1(R5) ;SELECT WORD 1
JSR PC,GSTAT
BIT #D.RTZ,HMR2
BNE 64$
ERROR 244 ;RTZ NOT SET DURING RECAL CMD
MOV T10,TEMP2 ;SETUP TIMEOUT
JSR PC,FATT1 ;FIND ATTN
ERROR 55 ;NO ATTN AFTER RECAL CMD

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

JSR PC,CHKMSG ;CHECK MSGS A0,B0,A1,B1
; & MSGS SPECIFIED HERE
WORD T.A2!T.B2!T.B3
ERROR 221 ;MSG A0 ERROR AFTER RECAL CMD
ERROR 275 ;MSG B0 ERROR
ERROR 222 ;MSG A1 ERROR
ERROR 276 ;MSG B1 ERROR

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4914											
4915	015346	005737	001362		TST	CYLDIF		;SEE IF MSG A2=0			
4916	015352	001401			BEQ	65\$		;BR IF YES			
4917	015354	104047			ERROR	47		;MSG A2 NOT CLEARED AFTER RECAL. CMD			
4918	015356	005737	001364	65\$:	TST	CYLADD		;SEE IF MSG B2=0			
4919	015362	001401			BEQ	66\$		;BR IF YES			
4920	015364	104050			ERROR	50		;MSG B2 NOT CLEARED AFTER RECAL. CMD			
4921	015366			66\$:							
4922											
4923	015366	012765	100000	000000	MOV	#CCLR,RKCS1(R5)					
4924	015374	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#				
4925	015402	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)		;DRIVE CLEAR CMD			
4926	015410	013737	001414	003372	MOV	T10,TEMP1					
4927	015416	004737	043612		JSR	PC,FRDY		;FIND RDY			
4928	015422	104151			ERROR	151		;NO RDY AFTER DRIVE CLEAR CMD			
4929	015424	004737	044074		JSR	PC,TSTATN		;TEST FOR ATTN			
4930	015430	000401			BR	67\$					
4931	015432	104154			ERROR	154		;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD			
4932	015434			67\$:							
4933											
4934	015434	012737	010340	003424	MOV	#<D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0		;EXPECTED MSG A0			
4935	015442	005037	003426		CLR	E.B0		;EXPECTED MSG B0			
4936	015446	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRAH!D.SSP>,E.A1		;EXPECTED A1			
4937	015454	012737	000001	003432	MOV	#1,E.B1		;MSG ID FOR EXPECTED MSG B1			
4938	015462	005037	003434		CLR	E.A2		;EXPECTED MSG A2			
4939	015466	012737	000002	003436	MOV	#2,E.B2		;MSG ID FOR EXPECTED MSG B2			
4940	015474	012737	000003	003442	MOV	#3,E.B3		;MSG ID FOR EXPECTED MSG B3			
4941											
4942	015502	004737	044334		JSR	PC,CHKMSG		;CHECK MSGS A0,B0,A1,B1			
4943	015506	000003			.WORD	T.A2!T.B2!0		; & MSGS SPECIFIED HERE			
4944	015510	104273			ERROR	273		;MSG A0 ERROR AFTER DRIVE CLEAR CMD			
4945	015512	104265			ERROR	265		;MSG B0 ERROR			
4946	015514	104274			ERROR	274		;MSG A1 ERROR			
4947	015516	104266			ERROR	266		;MSG B1 ERROR			
4948											
4949											
4950	015520	104415			SCOP1						
4951	015522	012706	001100		MOV	#STACK,SP		;RESTORE STK PTR			
4952											
4953	015526	004737	045522		JSR	PC,SUBCLR					
4954	015532	104024			ERROR	24		;CERR AFTER SCLR			
4955											
4956											
4957	015534	012765	000020	000026	15:	MOV	#PAT,RKMR1(R5)	;EVEN PARITY			
4958	015542	013765	001352	000020	MOV	TOCYL,RKDC(R5)		;SET TO CYL ADDR			
4959	015550	013737	001352	001354	MOV	TOCYL,CCYL		;CURRENT CYL			
4960	015556	013737	001354	003376	MOV	CCYL,TEMP3					
4961	015564	013737	001356	003400	MOV	PCYL,TEMP4		;PREV CYL			
4962	015572	163737	003376	003400	SUB	TEMP3,TEMP4					
4963	015600	100002			BPL	2\$		;BR IF TEMP4 IS POS			
4964	015602	005437	003400		NEG	TEMP4					
4965	015606	013737	003400	001360	25:	MOV	TEMP4,CALDIF				
4966	015614	013737	001354	001356	MOV	CCYL,PCYL					
4967	015622	012765	000017	000000	MOV	#SEEK,RKCS1(R5)		;SEEK CMD.			
4968	015630	013737	001414	003372	MOV	T10,TEMP1					
4969	015636	004737	043612		JSR	PC,FRDY		;FIND RDY			

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T16 STATIC CYL DIFF & CYL ADDR REG TEST-PART 2

SEQ 0093

4970	015642	104122			ERROR	122	;NO RDY AFTER SEEK WITH BAD PARITY
4971	015644	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
4972	015650	104125			ERROR	125	;NO ATTN FROM SEEK & BAD PARITY
4973	015652	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	;CLEAR ERROR
4974	015660	013765	001352	000020	MOV	TOCYL,RKDC(R5)	;RESTOR RKDC AFT CCLR
4975	015666	004737	046112		JSR	PC,RDCYLA	;READ CYL ADDR
4976	015672	023737	001352	001364	CMP	TOCYL,CYLADD	;SEE IF TO CYL ECHOED OK
4977	015700	001401			BEQ	35	
4978	015702	104045			ERROR	45	;MR3 NOT=RKDC
4979							
4980	015704	004737	046026		JSR	PC,RDCYLD	;READ CYL DIFF
4981	015710	023737	001360	001362	CMP	CALDIF,CYLDIF	;SEE IF CYL DIFF CORRECT
4982	015716	001401			BEQ	45	
4983	015720	104046			ERROR	46	;CYL DIFF IN RKMR2 INCORRECT
4984							
4985	015722						
4986							
4987	015722	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
4988	015730	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
4989	015736	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
4990	015744	013737	001414	003372	MOV	T10,TEMP1	
4991	015752	004737	043612		JSR	PC,FRDY	;FIND RDY
4992	015756	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
4993	015760	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
4994	015764	000401			BR	68\$	
4995	015766	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
4996	015770						
4997							
4998							
4999	015770	104415			SCOP1		
5000	015772	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
5001							
5002	015776	004737	045522		JSR	PC,SUBCLR	
5003	016002	104024			ERROR	24	;CERR AFTER SCLR
5004							
5005	016004	012765	000020	000026	MOV	#PAT,RKMR1(R5)	;EVEN PARITY
5006	016012	013765	001350	000020	MOV	FRCYL,RKDC(R5)	;SET RETURN CYL ADDR
5007	016020	013737	001350	001354	MOV	FRCYL,CCYL	
5008	016026	013737	001354	003376	MOV	CCYL,TEMP3	
5009	016034	013737	001356	003400	MOV	PCYL,TEMP4	
5010	016042	163737	003376	003400	SUB	TEMP3,TEMP4	
5011	016050	100002			BPL	55	;BR IF TEMP4 IS POS
5012	016052	005437	003400		NEG	TEMP4	
5013	016056	013737	003400	001360	MOV	TEMP4,CALDIF	
5014	016064	013737	001354	001356	MOV	CCYL,PCYL	
5015	016072	012765	000017	000000	MOV	#SEEK,RKCS1(R5)	;SEEK CMD
5016	016100	013737	001414	003372	MOV	T10,TEMP1	
5017	016106	004737	043612		JSR	PC,FRDY	;FIND RDY
5018	016112	104122			ERROR	122	;NO RDY AFTER SEEK WITH BAD PARITY
5019	016114	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
5020	016120	104125			ERROR	125	;NO ATTN FROM SEEK & BAD PARITY
5021	016122	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	;CLEAR ERROR
5022	016130	013765	001350	000020	MOV	FRCYL,RKDC(R5)	;RESTOR RKDC AFT CCLR
5023	016136	004737	046112		JSR	PC,RDCYLA	;READ CYL ADDR
5024	016142	023737	001350	001364	CMP	FRCYL,CYLADD	;SEE IF RETURN CYL ECHOED OK
5025	016150	001401			BEQ	65	

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5026 016152 104241          ERROR 241          ;MR3 NOT=RKDC
5027
5028 016154 023737 001352 001350 6$:  CMP      TOCYL,FRCYL      ;SEE IF TO=FROM
5029 016162 001022          BNE      10$          ;DO NORMAL TEST IF NO
5030 016164 005737 001352          TST      TOCYL          ;SEE IF=0
5031 016170 001007          BNE      9$           ;CYL DIFF S/B 0 ON CYL 0
5032 016172 004737 046026          JSR      PC,RDCYLD
5033 016176 005737 001362          TST      CYLDIF
5034 016202 001421          BEQ      7$           ;CYL DIFF IN RKMR2 INCORRECT
5035 016204 104242          ERROR 242
5036 016206 000417          BR       7$
5037
5038 016210 004737 046026          JSR      PC,RDCYLD      ;CYL DIFF/OFFSET SHOULD NOT
5039 016214 023727 001362 000001 9$:  CMP      CYLDIF,#1      ;CHANGE IN SEEK TO SELF
5040 016222 001411          BEQ      7$           ;SHOULD = 1 IN THIS TEST
5041 016224 104263          ERROR 263          ;CYL DIFF IN RKMR2 DID NOT REMAIN = 0
5042 016226 000407          BR       7$
5043 016230 004737 046026          JSR      PC,RDCYLD      ;READ CYL DIFF
5044 016234 023737 001360 001362 10$:  CMP      CALDIF,CYLDIF ;SEE IF CYL DIFF OK
5045 016242 001401          BEQ      7$
5046 016244 104242          ERROR 242          ;CYL DIFF IN RKMR2 INCORRECT
5047
5048 016246          7$:
5049
5050 016246 012765 100000 000000  MOV      #CCLR,RKCS1(R5)
5051 016254 013765 001222 000010  MOV      $UNIT,RKCS2(R5) ;DRIVE#
5052 016262 012765 000005 000000  MOV      #CLEAR,RKCS1(R5) ;DRIVE CLEAR CMD
5053 016270 013737 001414 003372  MOV      T10,TEMP1
5054 016276 004737 043612          JSR      PC,FRDY
5055 016302 104151          ERROR 151          ;FIND RDY
5056 016304 004737 044074          JSR      PC,TSTATN      ;NO RDY AFTER DRIVE CLEAR CMD
5057 016310 000401          BR       69$         ;TEST FOR ATTN
5058 016312 104154          ERROR 154          ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5059 016314          69$:
5060
5061
5062 016314 005237 001352          INC      TOCYL
5063 016320 023727 001352 000633  JMP      TOCYL,#411.      ;SEE IF SCANNED ALL CYLS
5064 016326 001402          BEQ      8$           ;BR IF YES
5065 016330 000137 015534          JMP      1$           ;ELSE REPEAT
5066
5067 016334 005237 001350          INC      FRCYL
5068 016340 023727 001350 000633 8$:  CMP      FRCYL,#411.      ;SEE IF ALL DONE
5069 016346 001405          BEQ      TST17        ;GO TO NEXT TST
5070 016350 013737 001350 001352  MOV      FRCYL,TOCYL      ;FRCYL ALWAYS = OR > TOCYL
5071 016356 000137 015534          JMP      1$           ;ELSE REPEAT
5072 016362          12$:
5073
5074
5075 *****
5076 *TEST 17      HEAD REGISTER TEST
5077 *
5078 *      THIS TEST CHECKS THE ABILITY TO SELECT ALL HEADS (0,1,2)
5079 *      VIA RKDA & READING BACK FROM MSG B3 BY THE SELECT DRIVE CMD.
5080 *      HEAD 3 IS CHECKED TO PRODUCE INV. ADDR.
5081 *

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S082      *      SINCE CHANGING HEAD ADDRESSES ARE TIED TO SEEK CMDS,
S083      *      SELECTING HEAD 3 MUST RESULT IN A SEEK INCOMPLETE ALONG WITH
S084      *      ILLEGAL ADDRESS. IF NOT, THIS MEANS THAT CHANGING HEAD ADDRESSES
S085      *      ARE NOT TIED TO SEEK CMDS
S086      *
S087      * *****
S088      *
S088 016362 000004
S089 016364 012737 000001 001174
S090 016372 012706 001100
S091
S092 016376 005000
S093 016400
S094 016400 104415
S095 016402 012706 001100
S096
S097 016406 004737 045522
S098 016412 104024
S099
S100
S101
S102 016414 012765 100000 000000
S103 016422 013765 001222 000010
S104 016430 012765 000013 000000
S105
S106
S107 016436 013737 001414 003372
S108 016444 004737 043612
S109 016450 104124
S110
S111 016452 012765 000001 000026
S112 016460 004737 045150
S113 016464 032737 020000 003362
S114 016472 001001
S115 016474 104244
S116 016476 013737 001414 003374 64$:
S117 016504 004737 044126
S118 016510 104055
S119
S120 016512 012737 050340 003424
S121 016520 005037 003426
S122 016524 012737 001720 003430
S123 016532 012737 000001 003432
S124 016540 005037 003434
S125 016544 012737 000002 003436
S126 016552 012737 000003 003442
S127
S128 016560 004737 044334
S129 016564 000007
S130 016566 104221
S131 016570 104275
S132 016572 104222
S133 016574 104276
S134
S135 016576 005737 001362
S136 016602 001401
S137 016604 104047

T17: SCOPE
MOV #1,STIMES ;DO 1 ITERATION
MOV #STACK,SP ;RESTORE STK PTR

1$: CLR R0 ;HEAD #
SCOPI
MOV #STACK,SP ;RESTORE STK PTR
JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR

MOV #CCLR,RKCS1(R5)
MOV #UNIT,RKCS2(R5)
MOV #RECAL,RKCS1(R5) ;RECAL CMD
;RESET CYL DIFF/OFFSET & CYL ADDR REG
;IN RKMR2 & RKMR3 RESP.

MOV T10,TEMP1
JSR PC,FRDY ;FIND RDY
ERROR 124 ;RDY NOT SET AFTER RECAL CMD

MOV #1,RKMR1(R5) ;SELECT WORD 1
JSR PC,GSTAT
BIT #D.RTZ,HMR2
BNE 64$
ERROR 244 ;RTZ NOT SET DURING RECAL CMD
MOV T10,TEMP2 ;SETUP TIMEOUT
JSR PC,FATT1 ;FIND ATTN
ERROR 55 ;NO ATTN AFTER RECAL CMD

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

JSR PC,CHKMSG ;CHECK MSGS A0,B0,A1,B1
; & MSGS SPECIFIED HERE
WORD T.A2!T.B2!T.B3
ERROR 221 ;MSG A0 ERROR AFTER RECAL CMD
ERROR 275 ;MSG B0 ERROR
ERROR 222 ;MSG A1 ERROR
ERROR 276 ;MSG B1 ERROR

TST CYLDIF ;SEE IF MSG A2=0
BEQ 65$ ;BR IF YES
ERROR 47 ;MSG A2 NOT CLEARED AFTER RECAL CMD

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T17 HEAD REGISTER TEST

SEQ 0096

5138	016606	005737	001364	65\$:	TST	CYLADD	;SEE IF MSG B2=0
5139	016612	001401			BEQ	66\$	;BR IF YES
5140	016614	104050			ERROR	50	;MSG B2 NOT CLEARED AFTER RECAL CMD
5141	016616			66\$:			
5142							
5143	016616	012765	100000		MOV	#CCLR,RKCS1(R5)	
5144	016624	013765	001222		MOV	\$UNIT,RKCS2(R5)	;DRIVE#
5145	016632	012765	000005		MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
5146	016640	013737	001414		MOV	T10,TEMP1	
5147	016646	004737	043612		JSR	PC,FRDY	;FIND RDY
5148	016652	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
5149	016654	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
5150	016660	000401			BR	67\$	
5151	016662	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5152	016664			67\$:			
5153							
5154	016664	012737	010340	003424	MOV	#<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
5155	016672	005037	003426		CLR	E.B0	;EXPECTED MSG B0
5156	016676	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5157	016704	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5158	016712	005037	003434		CLR	E.A2	;EXPECTED MSG A2
5159	016716	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5160	016724	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5161							
5162	016732	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
5163	016736	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
5164	016740	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
5165	016742	104265			ERROR	265	;MSG B0 ERROR
5166	016744	104274			ERROR	274	;MSG A1 ERROR
5167	016746	104266			ERROR	266	;MSG B1 ERROR
5168							
5169							
5170	016750	023727	001432	000001	CMP	HEAD, #1	;FOR HEAD 0, B3=1
5171	016756	001401			BEQ	3\$	
5172	016760	104053			ERROR	53	;RECAL DID NOT RESET HEAD REG IN B3.
5173							
5174	016762				3\$:		
5175	016762	104415			SCOP1		
5176	016764	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
5177							
5178	016770	004737	045522		JSR	PC,SUBCLR	
5179	016774	104024			ERROR	24	;CERR AFTER SCLR
5180							
5181	016776	000300			SWAB	RO	
5182	017000	010065	000006		MOV	RO,RKDA(R5)	;HEAD #
5183	017004	000300			SWAB	RO	
5184							
5185	017006	012765	000017	000000	MOV	#SEEK,RKCS1(R5)	;SEEK CMD
5186	017014	013737	001414	003372	MOV	T10,TEMP1	
5187	017022	004737	043612		JSR	PC,FRDY	;FIND RDY
5188	017026	104156			ERROR	156	;NO RDY AFTER SEEK TO SELF
5189	017030	004737	044074		JSR	PC,TSTATN	
5190	017034	104157			ERROR	157	;NO ATTN AFTER SEEK TO SELF
5191	017036	012737	050340	003424	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED A0
5192	017044	020027	000003		CMP	RO, #3	
5193	017050	001403			BEQ	4\$	;BR FOR HEAD 3

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JNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T17 HEAD REGISTER TEST

SEQ 0097

5194	017052	005037	003426		CLR	E.B0	;FOR HEADS 0,1,2
5195	017056	000403			BR	5\$	
5196	017060	012737	002240	003426	4\$: MOV	#(D.SKI!D.FLT!D.IDAE),E.B0	;FOR HEAD 3
5197	017066	012737	001720	003430	5\$: MOV	#(D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP),E.A1	
5198	017074	012737	000001	003432	MOV	#1,E.B1	
5199	017102	005037	003434		CLR	E.A2	
5200	017106	012737	000002	003436	MOV	#2,E.B2	
5201	017114	005700			TST	R0	;SEE IF HEAD 0
5202	017116	001004			BNE	6\$	;BR IF NO
5203	017120	012737	001003	003442	MOV	#(BIT9!3),E.B3	;LOAD EXPECTED B3 FOR HEAD 0 & MSG ID
5204	017126	000412			BR	8\$	
5205	017130	020027	000001		6\$: CMP	R0,#1	;SEE IF HEAD 1
5206	017134	001004			BNE	7\$	;BR IF NO
5207	017136	012737	002003	003442	MOV	#(BIT10!3),E.B3	;B3 FOR HEAD 1
5208	017144	000403			BR	8\$	
5209	017146	012737	004003	003442	7\$: MOV	#(BIT11!3),E.B3	;B3 FOR HEAD 2
5210	017154				8\$:		
5211							
5212	017154	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
5213	017160	000007			.WORD	T.A2!T.B2!T.B3	; & MSGS SPECIFIED HERE
5214	017162	104114			ERROR	114	;MSG A0 ERROR AFTER LOAD HEAD REG & SEEK CMD
5215	017164	104115			ERROR	115	;MSG B0 ERROR
5216	017166	104322			ERROR	322	;MSG A1 ERROR
5217	017170	104323			ERROR	323	;MSG B1 ERROR
5218							
5219	017172	005737	001362		TST	CYLDIF	;SEE IF MSG A2=0
5220	017176	001401			BEQ	68\$	;BR IF YES
5221	017200	104324			ERROR	324	;MSG A2 NOT CLEARED AFTER LOAD HEAD REG & SEEK CMD
5222	017202	005737	001364		68\$: TST	CYLADD	;SEE IF MSG B2=0
5223	017206	001401			BEQ	69\$	;BR IF YES
5224	017210	104325			ERROR	325	;MSG B2 NOT CLEARED AFTER LOAD HEAD REG & SEEK CMD
5225	017212				69\$:		
5226							
5227	017212	020027	000003		CMP	R0,#3	
5228	017216	001412			BEQ	9\$	;BR IF HEAD 3
5229							
5230	017220	005037	003372		CLR	TEMP1	
5231	017224	116037	003324	003372	MOVB	ATTN(R0),TEMP1	
5232	017232	023737	003372	001432	CMP	TEMP1,HEAD4	;FOR RKDA=HEAD 0, HEAD=1 IN B3
5233							;FOR RKDA=HEAD 1, HEAD=2 IN B3
5234							;FOR RKDA=HEAD 2, HEAD=4 IN B3
5235	017240	001401			BEQ	9\$	
5236	017242	104054			ERROR	54	;HEAD DECODE IN B3 INCORRECT
5237							
5238							
5239	017244	005200			9\$: INC	R0	
5240	017246	020027	000004		CMP	R0,#4	;0 THRU 3 DONE?
5241	017252	001402			BEQ	10\$	;BR IF YES
5242	017254	000137	016400		JMP	1\$	;ELSE REPEAT
5243							
5244	017260				10\$:		
5245							
5246	017260	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
5247	017266	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	
5248	017274	012765	0000 3	000000	MOV	#RECAL,RKCS1(R5)	;RECAL CMD
5249	017302	013737	001414	003372	MOV	T10,TEMP1	

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T17 HEAD REGISTER TEST

SEQ 0098

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5250 017310 004737 043612      JSR    PC,FRDY      ;FIND RDY
5251 017314 104124      ERROR   124      ;RDY NOT FOUND AFTER RECAL CMD
5252
5253 017316 012765 100000 000000  MOV    #CCLR,RKCS1(R5)
5254 017324 013765 001222 000010  MOV    $UNIT,RKCS2(R5) ;DRIVE#
5255 017332 013765 000005 000000  MOV    #CLEAR,RKCS1(R5) ;DRIVE CLEAR CMD
5256 017340 013737 001414 003372  MOV    T10,TEMP1
5257 017346 004737 043612      JSR    PC,FRDY      ;FIND RDY
5258 017352 104151      ERROR   151      ;NO RDY AFTER DRIVE CLEAR CMD
5259 017354 004737 044074      JSR    PC,TSTATN    ;TEST FOR ATTN
5260 017360 000401      BR      71$
5261 017362 104154      ERROR   154      ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5262
5263
5264
5265 017364 004737 045150      JSR    PC,GSTAT
5266 017370 032737 000040 003364  BIT    #D.IDAE,HMR3    ;SEE IF IDAE IS CLEARED
5267 017376 001401      BEQ     70$      ;BR IF YES
5268 017400 104155      ERROR   155      ;IDAE NOT CLEARED AFTER RECAL CMD
5269
5270 017402 012765 100000 000000 70$: MOV    #CCLR,RKCS1(R5)
5271 017410 013737 001412 003374  MOV    T1,TEMP2      ;LOOK FOR ATTN FROM RECAL
5272 017416 004737 044126      JSR    PC,FATT1
5273 017422 104055      ERROR   55      ;NO ATTN AFTER RECAL CMD
5274
5275
5276
5277
5278
5279
5280
5281
5282
5283
5284
5285 017424 000004      ;*****
5286 017426 012737 000001 001174  ;TEST 20      SEEK TO CYL 0
5287 017434 012706 001100      ;
5288
5289 017440 004737 045522      ;
5290 017444 104024      ;TESTS THE ABILITY TO DO A SEEK CMD.
5291 017446 004737 046112      ;VERIFIES THERE WAS NO MOVEMENT BY CHECKING ALL APPROPRIATE
5292 017452 005737 001364      ;STATUS BITS. VERIFIES CMD COMPLETION BETWEEN 10-15USEC.
5293 017456 001401      ;READ HEADER IS NOT PERFORMED AS THE PACK MAY NOT BE FORMATTED.
5294 017460 104130      ;*****
5295 017462      ;
5296 017462 104415      ;
5297 017464 012706 001100 15$: SCOPE
5298
5299 017470 004737 045522      TST20: MOV    #1,$TIMES      ;DO 1 ITERATION
5300 017474 104024      MOV    #STACK,SP      ;RESTORE STK PTR
5301
5302 017476 012765 000017 000000  JSR    PC,SUBCLR      ;SUBSYS CLEAR & GET STATUS
5303 017504 012737 000005 003372  ERROR   24      ;CERR AFTER SCLR
5304 017512 004737 043612      JSR    PC,RDCYLA      ;READ CYL ADDR IN RKMR3
5305 017516 104131      TST    CYLADD
                    BEQ     1$
                    ERROR   130      ;CYL ADDR NOT CLEARED AFTER SCLR

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T20 SEEK TO CYL 0

SEQ 0099

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5306 017520 012737 000005 003372      MOV      #5,TEMP1      ;SETUP 100US TIMEOUT
5307
5308 017526 004737 044222      JSR      PC,FATT2      ;FIND ATTN
5309 017532 104132      ERROR    132          ;NO ATTN AFTER SEEK CMD
5310 017534 032737 100000 003334      BIT      #CERR,HCS1
5311 017542 001401      BEQ      64$
5312 017544 104210      ERROR    210          ;CERR AFTER SEEK CMD
5313 017546
5314
5315 017546 012737 050340 003424      MOV      #<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
5316 017554 005037 003426      CLR      E.B0          ;EXPECTED MSG B0
5317 017560 012737 001720 003430      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5318 017566 012737 000001 003432      MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
5319 017574 005037 003434      CLR      E.A2          ;EXPECTED MSG A2
5320 017600 012737 000002 003436      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
5321 017606 012737 000003 003442      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
5322
5323 017614 004737 044334      JSR      PC,CHKMSG     ;CHECK MSGS A0,B0,A1,B1
5324 017620 000003      .WORD    T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
5325 017622 104133      ERROR    133          ;MSG A0 ERROR AFTER SEEK CMD
5326 017624 104134      ERROR    134          ;MSG B0 ERROR
5327 017626 104135      ERROR    135          ;MSG A1 ERROR
5328 017630 104136      ERROR    136          ;MSG B1 ERROR
5329 017632 005737 001362      TST      CYLDIF
5330 017636 001401      BEQ      65$
5331 017640 104137      ERROR    137          ;CYL DIFF NOT CLEARED AFTER SEEK CMD
5332
5333 017642
5334
5335 017642 012765 100000 000000      MOV      #CLR,RKCS1(R5)
5336 017650 013765 001222 000010      MOV      $UNIT,RKCS2(R5) ;DRIVE#
5337 017656 012765 000005 000000      MOV      #CLEAR,RKCS1(R5) ;DRIVE CLEAR CMD
5338 017664 013737 001414 003372      MOV      T10,TEMP1
5339 017672 004737 043612      JSR      PC,FRDY      ;FIND RDY
5340 017676 104151      ERROR    151          ;NO RDY AFTER DRIVE CLEAR CMD
5341 017700 004737 044074      JSR      PC,TSTATN    ;TEST FOR ATTN
5342 017704 000401      BR       66$
5343 017706 104154      ERROR    154          ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5344 017710
5345
5346 017710 012737 010340 003424      MOV      #<D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
5347 017716 005037 003426      CLR      E.B0          ;EXPECTED MSG B0
5348 017722 012737 001720 003430      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
5349 017730 012737 000001 003432      MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
5350 017736 005037 003434      CLR      E.A2          ;EXPECTED MSG A2
5351 017742 012737 000002 003436      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
5352 017750 012737 000003 003442      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
5353
5354 017756 004737 044334      JSR      PC,CHKMSG     ;CHECK MSGS A0,B0,A1,B1
5355 017762 000003      .WORD    T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
5356 017764 104273      ERROR    273          ;MSG A0 ERROR AFTER DRIVE CLEAR CMD
5357 017766 104265      ERROR    265          ;MSG B0 ERROR
5358 017770 104274      ERROR    274          ;MSG A1 ERROR
5359 017772 104266      ERROR    266          ;MSG B1 ERROR
5360
5361 017774 005737 001364      TST      CYLADD

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T20 SEEK TO CYL 0

SEQ 0100

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5362 020000 001401 BEQ TST21 ;GO TO NEXT TEST
5363 020002 104140 ERROR 140 ;CYL ADDR IN B2 NOT CLEARED AFT SEEK CMD.
5364
5365 ;*****
5366 ;*TEST 21 TEST SECTOR COUNT REG. IN MSG B3
5367 ;*****
5368 020004 000004 TST21: SCOPE
5369 020006 012737 000001 001174 MOV #1,STIMES ;DO 1 ITERATION
5370 020014 012706 001100 MOV #STACK,SP ;RESTORE STK PTR
5371
5372 020020 004737 045522 JSR PC,SUBCLR ;SUBSYS CLEAR & GET STATUS
5373 020024 104024 ERROR 24 ;CERR AFTER SCLR
5374 020026 012737 020156 001176 MOV #2$,SESCAPE ;GO TO NEXT TEST IF ANY ERROR DETECTED
5375
5376 020034 012737 000025 001400 MOV #21.,SECNT ;22 SECTOR FORMAT TEST
5377
5378 020042 004737 045652 JSR PC,FS022 ;FIND SECTOR 0
5379 020046 104142 ERROR 142 ;SECTOR 0 NOT FOUND BY TIMEOUT
5380
5381 020050 005037 001402 CLR PSEC ;PREVIOUS SECTOR
5382 020054 004737 045736 64$: JSR PC,FNS22 ;FIND NEXT SECTOR
5383 020060 104143 ERROR 143 ;DIFFERENT SECTOR, NOT FOUND BY TIMEOUT
5384 020062 013737 001402 001404 MOV PSEC,ESEC
5385 020070 062737 000001 001404 ADD #1,ESEC ;SETUP EXPECTED SECTOR
5386 020076 013737 001406 001402 MOV SECTOR,PSEC ;UPDATE PREV SECTOR
5387 020104 004737 045602 JSR PC,RDSEC ;READ SECTOR
5388 020110 023737 001406 001402 CMP SECTOR,PSEC
5389 020116 001407 BEQ 65$ ;BR IF READ SAME TWICE
5390 020120 004737 045602 JSR PC,RDSEC
5391 020124 023737 001406 001402 CMP SECTOR,PSEC
5392 020132 001401 BEQ 65$ ;TRY 1 MORE TIME
5393 020134 104144 ERROR 144 ;MSG B3 ERROR, SECTOR REG UNSTABLE
5394 ;MAY BE DURING SECTOR PULSE TIME
5395 020136 023737 001406 001404 65$: CMP SECTOR,ESEC
5396 020144 001401 BEQ 66$
5397 020146 104145 ERROR 145 ;MSG B3 ERROR BETWEEN SECTOR COUNTS
5398 020150 005337 001400 66$: DEC SECNT
5399 020154 001337 BNE 64$ ;BR IF SECTOR COUNT NOT DONE
5400
5401
5402 020156 005037 001176 2$: CLR $ESCAPE
5403
5404 ;*****
5405 ;*TEST 22 DETECT OUTER LIMIT
5406 ;*
5407 ;* THIS TEST VERIFIES THAT THE ABOVE TEST DID ACTUALLY POSITION ON CYL 0
5408 ;* BY DETECTING OUTER LIMIT AS THE ADJACENT CYL.
5409 ;* AN ERROR IN THIS TEST INDICATES:
5410 ;*
5411 ;* A. HEADS WERE NOT ON CYL 0
5412 ;* AND/OR B. COULD NOT SEEK IN REVERSE DIRECTION.
5413 ;*
5414 ;*****
5415 020162 000004 TST22: SCOPE
5416 020164 012737 000001 001174 MOV #1,STIMES ;DO 1 ITERATION
5417 020172 012706 001100 MOV #STACK,SP ;RESTORE STK PTR

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K08

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T22 DETECT OUTER LIMIT

SEQ 0101

5418							
5419	020176	004737	045522		JSR	PC, SUBCLR	; SUBSYS CLEAR & GET STATUS
5420	020202	104024			ERROR	24	; CERR AFTER SCLR
5421							
5422	020204	005037	001410		CLR	LPFLG	
5423	020210	005237	001462		INC	BYP CERR	; BYPASS CHECKING FOR ANY CERR IN GSTAT1
5424	020214	005237	003316		INC	UNLD	; USED FOR VALID HALT
5425							
5426	020220	012765	000020	000026	MOV	#PAT, RKMR1(R5)	; PARITY & WORD 0
5427	020226	012765	000001	000020	MOV	#1, RKDC(R5)	; CYL 1
5428	020234	012765	000017	000000	MOV	#SEEK, RKCS1(R5)	; SEEK CMD
5429	020242	013737	001414	003372	MOV	T10, TEMP1	
5430	020250	004737	043612		JSR	PC, FRDY	; FIND RDY
5431	020254	104122			ERROR	122	; NO RDY FROM SEEK WITH BAD PARITY
5432	020256	004737	044074		JSR	PC, TSTATN	; TEST FOR ATTN
5433	020262	104125			ERROR	125	; NO ATTN FROM SEEK WITH BAD PARITY
5434	020264	012737	050340	003424	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>, E.A0	; EXPECTED AC
5435	020272	012737	001200	003426	MOV	#<D.FLT!D.PAR>, E.B0	
5436	020300	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>, E.A1	
5437	020306	012737	000001	003432	MOV	#1, E.B1	
5438							
5439	020314	004737	044334		JSR	PC, CHKMSG	; CHECK MSGS A0, B0, A1, B1
5440	020320	000000			.WORD	0!0!0	; & MSGS SPECIFIED HERE
5441	020322	104110			ERROR	110	; MSG A0 ERROR AFTER SEEK WITH BAD PARITY
5442	020324	104111			ERROR	111	; MSG B0 ERROR
5443	020326	104146			ERROR	146	; MSG A1 ERROR
5444	020330	104147			ERROR	147	; MSG B1 ERROR
5445							
5446	020332	012765	100000	000000	MOV	#CCLR, RKCS1(R5)	
5447	020340	013765	001222	000010	MOV	#UNIT, RKCS2(R5)	; DRIVE#
5448	020346	012765	000005	000000	MOV	#CLEAR, RKCS1(R5)	; DRIVE CLEAR CMD
5449	020354	013737	001414	003372	MOV	T10, TEMP1	
5450	020362	004737	043612		JSR	PC, FRDY	; FIND RDY
5451	020366	104151			ERROR	151	; NO RDY AFTER DRIVE CLEAR CMD
5452	020370	004737	044074		JSR	PC, TSTATN	; TEST FOR ATTN
5453	020374	000401			BR	64\$	
5454	020376	104154			ERROR	154	; ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5455	020400						
5456							
5457	020400	012737	010340	003424	MOV	#<D.SPIN!D.DRDY!D.VV!D.DRA>, E.A0	; EXPECTED MSG A0
5458	020406	005037	003426		CLR	E.B0	; EXPECTED MSG B0
5459	020412	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>, E.A1	; EXPECTED A1
5460	020420	012737	000001	003432	MOV	#1, E.B1	; MSG ID FOR EXPECTED MSG B1
5461	020426	005037	003434		CLR	E.A2	; EXPECTED MSG A2
5462	020432	012737	000002	003436	MOV	#2, E.B2	; MSG ID FOR EXPECTED MSG B2
5463	020440	012737	000003	003442	MOV	#3, E.B3	; MSG ID FOR EXPECTED MSG B3
5464							
5465	020446	004737	044334		JSR	PC, CHKMSG	; CHECK MSGS A0, B0, A1, B1
5466	020452	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
5467	020454	104273			ERROR	273	; MSG A0 ERROR AFTER DRIVE CLEAR CMD
5468	020456	104265			ERROR	265	; MSG B0 ERROR
5469	020460	104274			ERROR	274	; MSG A1 ERROR
5470	020462	104266			ERROR	266	; MSG B1 ERROR
5471							
5472							
5473	020464	012765	000000	000020	MOV	#0, RKDC(R5)	; CYL 0

64\$:

5474	020472	012765	000017	000000		MOV	#SEEK,RKCS1(R5)	;SEEK TO CYL 0
5475	020500	013737	001414	003372		MOV	T10,TEMP1	
5476	020506	004737	043612			JSR	PC,FRDY	;FIND RDY
5477	020512	104131				ERROR	131	;NO RDY AFTER SEEK CMD
5478	020514	012765	100000	000000		MOV	#CCLR,RKCS1(R5)	
5479	020522	004737	045153			JSR	PC,GSTAT	
5480	020526	004737	046356			JSR	PC,FLIM	;FIND LIMIT DETECT
5481	020532	104160				ERROR	160	;LIMIT DETECT NOT FOUND BEFORE TIMEOUT
5482								
5483	020534	032737	040000	003362		BIT	#D.UNLD,HMR2	
5484	020542	001003				BNE	15	
5485	020544	104305				ERROR	305	;DRIVE NOT UNLOADING AFTER LIMIT DETECT
5486	020546	000137	021260			JMP	305	;BYPASS REST OF TEST
5487								
5488	020552	012737	021170	001176	15:	MOV	#205,\$ESCAPE	;MUST ESCAPE TO CYCLE UP DRIVE & TEST SWR
5489	020560	012737	070140	003424		MOV	#<D.DSC!D.PIP!D.SPIN!D.VV!D.DRA>,E.A0	;EXPECTED A0
5490	020566	012737	002200	003426		MOV	#<D.SKI!D.FLT>,E.B0	
5491	020574	012737	045720	003430		MOV	#<D.UNLD!D.REV!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	
5492	020602	012737	030001	003432		MOV	#<D.LIM!D.NMOV!1>,E.B1	
5493								
5494	020610	004737	044334			JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
5495	020614	000000				.WORD	0!0!0	; & MSGS SPECIFIED HERE
5496	020616	104161				ERROR	161	;MSG A0 ERROR AFTER OUTER LIMIT DETECT
5497	020620	104162				ERROR	162	;MSG B0 ERROR
5498	020622	104163				ERROR	163	;MSG A1 ERROR
5499	020624	104164				ERROR	164	;MSG B1 ERROR
5500								
5501	020626	004737	044074			JSR	PC,TSTATN	
5502	020632	104165				ERROR	165	;NO ATTN AFTER OUTER LIMIT DETECT
5503	020634	005037	001462			CLR	BYPCERR	;ALLOW CHECKING CERR IN GSTAT1
5504								
5505	020640	004737	045522			JSR	PC,SUBCLR	;SUBSYS CLR
5506	020644	104024				ERROR	24	;CERR AFTER SCLR
5507	020646	013737	001414	003374		MOV	T10,TEMP2	;SET UP TIMEOUT
5508	020654	004737	046434			JSR	PC,FHDHM	;FIND HEAD HOME
5509	020660	104166				ERROR	166	;HEAD HOME NOT FOUND BEFORE TIMEOUT
5510	020662	004737	046510			JSR	PC,FLOAD	;FIND LOAD HEADS
5511	020666	104167				ERROR	167	;LOAD HEADS NOT FOUND BEFORE TIMEOUT
5512	020670	013737	001416	003374		MOV	T100,TEMP2	;SETUP TIMEOUT
5513	020676	004737	044126			JSR	PC,FATT1	;FIND ATTN
5514	020702	104067				ERROR	67	;ATTN NOT FOUND BEFORE TIMEOUT
5515	020704	005037	001176		25:	CLR	\$ESCAPE	
5516	020710	005037	003316			CLR	UNLD	;CLEAR FLAG
5517								
5518	020714	012737	050340	003424		MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
5519	020722	005037	003426			CLR	E.B0	;EXPECTED MSG B0
5520	020726	012737	001720	003430		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
5521	020734	012737	000001	003432		MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5522	020742	005037	003434			CLR	E.A2	;EXPECTED MSG A2
5523	020746	012737	000002	003436		MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5524	020754	012737	000003	003442		MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5525								
5526	020762	004737	044334			JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
5527	020766	000003				.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
5528	020770	104063				ERROR	63	;MSG A0 ERROR AT END OF HEAD LOADING
5529	020772	104064				ERROR	64	;MSG B0 ERROR

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T22 DETECT OUTER LIMIT

SEQ 0103

5530	020774	104065			ERROR	65		;MSG A1 ERROR
5531	020776	104066			ERROR	66		;MSG B1 ERROR
5532								
5533	02:000	005737	001362		TST	CYLDIF		;SEE IF MSG A2=0
5534	021004	001401			BEQ	655		;BR IF YES
5535	021006	104175			ERROR	175		;MSG A2 NOT CLEARED AT END OF HEAD LOADING
5536	021010	005737	001364		TST	CYLADD		;SEE IF MSG B2=0
5537	021014	001401			BEQ	665		;BR IF YES
5538	021016	104176			ERROR	176		;MSG B2 NOT CLEARED AT END OF HEAD LOADING
5539	021020							
5540								
5541	021020	012765	100000	000000	MOV	#CCLR,RKCS1(R5)		
5542	021026	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#	
5543	021034	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)		;DRIVE CLEAR CMD
5544	021042	013737	001414	003372	MOV	T10,TEMP1		
5545	021050	004737	043612		JSR	PC,FRDY		;FIND RDY
5546	021054	104151			ERROR	151		;NO RDY AFTER DRIVE CLEAR CMD
5547	021056	004737	044074		JSR	PC,TSTATN		;TEST FOR ATTN
5548	021062	000401			BR	675		
5549	021064	104154			ERROR	154		;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
5550	021066							
5551								
5552	021066	012737	010340	003424	MOV	#<D.D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0		;EXPECTED MSG A0
5553	021074	005037	003426		CLR	E.B0		;EXPECTED MSG B0
5554	021100	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1		;EXPECTED A1
5555	021106	012737	000001	003432	MOV	#1,E.B1		;MSG ID FOR EXPECTED MSG B1
5556	021114	005037	003434		CLR	E.A2		;EXPECTED MSG A2
5557	021120	012737	000002	003436	MOV	#2,E.B2		;MSG ID FOR EXPECTED MSG B2
5558	021126	012737	000003	003442	MOV	#3,E.B3		;MSG ID FOR EXPECTED MSG B3
5559								
5560	021134	004737	044334		JSR	PC,CHKMSG		;CHECK MSGS A0,B0,A1,B1
5561	021140	000003			.WORD	T.A2!T.B2!0		;8 MSGS SPECIFIED HERE
5562	021142	104273			ERROR	273		;MSG A0 ERROR AFTER DRIVE CLEAR CMD
5563	021144	104265			ERROR	265		;MSG B0 ERROR
5564	021146	104274			ERROR	274		;MSG A1 ERROR
5565	021150	104266			ERROR	266		;MSG B1 ERROR
5566								
5567	021152	004737	047526		JSR	PC,SWTST		;SEE IF SW 14 OR 8 IS SET
5568	021156	000440			BR	TST23		;GO TO NEXT TEST
5569								;RETURN HERE IF SW 14 IS SET OR
5570								;SW 8 WITH SWR <7:0> APPLY
5571								
5572								
5573	021160	005037	001176		CLR	\$ESCAPE		
5574	021164	000177	157716		JMP	\$SLPADR		
5575	021170							
5576								
5577	021170	004737	045522		JSR	PC,SUBCLR		
5578	021174	104024			ERROR	24		;CERR AFTER SCLR
5579								
5580	021176	012765	000011	000000	MOV	#SRTSPL,RKCS1(R5)		;START SPINDLE CMD
5581	021204	013737	001414	003372	MOV	T10,TEMP1		;SET TIMEOUT
5582	021212	004737	043612		JSR	PC,FRDY		;FIND RDY
5583	021216	104121			ERROR	121		;RDY NOT FOUND AFTER ST SPIN CMD.
5584								
5585	021220	013737	001420	003374	MOV	T500,TEMP2		;SETUP TIMEOUT

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T22 DETECT OUTER LIMIT

SEQ 0104

5586 021226 004737 044126
5587 021232 104067
5588
5589 021234 005037 003316
5590 021240 005237 001410
5591 021244 032777 001000 157666
5592 021252 001342
5593 021254 000137 020704
5594 021260

JSR PC,FATT1 ;FIND ATTN
ERROR 67 ;NO ATTN AFTER ST SPIN CMD.
CLR UNLD
INC LPFLG
BIT #SW9,2SWR ;LOOP ON ERROR?
BNE 10\$;YES, RECONDITION DRIVE
JMP 2\$;RETURN TO MAINLINE

30\$:

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TEST 23 BASIC WRITE/READ HEADER & HEAD SWITCHING TEST

THIS TEST CHECKS HEAD SWITCHING BY WRITING UNIQUE HEADERS
ON EACH TRACK OF CYL 0, READING BACK & VERIFYING THEY REMAINED
UNIQUE. 22 SECTOR FORMAT IS USED
I.E. TRACK 0: ALL 0'S FOR ALL SECTOR HEADERS
TRACK 1: 0101 FOR ALL SECTOR HEADERS
TRACK 2: ALL 1'S FOR ALL SECTOR HEADERS

5612 021260 000004
5613 021262 012737 000001 001174
5614 021270 012706 001100
5615 021274 005737 001460
5616 021300 001403
5617 021302 104170
5618 021304 000137 043076
5619 021310
5620
5621 021310 005237 003320
5622 021314 005037 001430
5623
5624 021320 104415
5625 021322 012706 001100
5626
5627 021326 004737 045522
5628 021332 104024
5629
5630 021334 052765 000020 000010
5631 021342 012765 001470 000004
5632 021350 012765 177676 000002
5633 021356 000337 001430
5634 021362 013765 001430 000006
5635 021370 000337 001430
5636
5637 021374 013700 001430
5638 021400 006300
5639 021402 016037 001444 001470
5640
5641 021410 012765 000027 000000

ST23: SCOPE
MOV #1,\$TIMES ;DO 1 ITERATION
MOV #STACK,SP ;RESTORE STK PTR
TST LIMERR ;CHK FOR LIMIT ERROR
BEQ 5\$;BR IF NO
ERROR 170 ;FATAL ERROR
JMP \$EOP ;ABORT BAL OF TESTS
5\$:
INC BADHDR ;USED FOR VALID HALT
CLR HEAD ;HEAD CTR
SCOP1
MOV #STACK,SP ;RESTORE STK PTR
JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR
1\$:
BIS #BA1,RKCS2(R5) ;SET BUSS ADDR INCR INHIBIT
MOV #HDTAB,RKBA(R5) ;HEADER WORD TABLE
MOV #-66.,RKWC(R5) ;WORD COUNT.
SWAB HEAD
MOV HEAD,RKDA(R5) ;SETUP HEAD ADDR
SWAB HEAD
MOV HEAD,RO
ASL RO ;DOUBLE RO
MOV DATA0(RO),HDTAB ;SETUP HEADER WORD FOR RKBA
MOV #<WRHEAD>,RKCS1(R5) ;WRITE HEADER CMD

5642	021416	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
5643	021424	004737	043612		JSR	PC,FRDY	;FIND RDY
5644	021430	104200			ERROR	200	;NO RDY AFTER WRITE HEADER CMD
5645	021432	004737	045150		JSR	PC,GSTAT	;GET FRESH STATUS
5646	021436	032737	100000	003334	BIT	#CERR,HCS1	
5647	021444	001405			BEQ	64\$	
5648	021446	104201			ERROR	201	;CERR AFTER WRITE HEADER CMD
5649	021450	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
5650	021454	000137	043076		JMP	\$EOP	;ABORT DRIVE
5651	021460						
5652				64\$:			
5653	021460	012737	010340	003424	MOV	#<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
5654	021466	005037	003426		CLR	E.B0	;EXPECTED MSG B0
5655	021472	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
5656	021500	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5657	021506	005037	003434		CLR	E.A2	;EXPECTED MSG A2
5658	021512	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5659	021520	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5660							
5661	021526	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
5662	021532	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
5663	021534	104277			ERROR	277	;MSG A0 ERROR AFTER WRITE HEADER CMD
5664	021536	104267			ERROR	267	;MSG B0 ERROR
5665	021540	104300			ERROR	300	;MSG A1 ERROR
5666	021542	104270			ERROR	270	;MSG B1 ERROR
5667							
5668							
5669	021544	005737	001362		TST	CYLDIF	;SEE IF MSG A2=0
5670	021550	001401			BEQ	65\$	;BR IF YES
5671	021552	104303			ERROR	303	;MSG A2 NOT CLEARED AFTER WRITE HEADER CMD
5672	021554	005737	001364	65\$:	TST	CYLADD	;SEE IF MSG B2=0
5673	021560	001401			GEQ	66\$	;BR IF YES
5674	021562	104304			ERROR	304	;MSG B2 NOT CLEARED AFTER WRITE HEADER CMD
5675	021564			66\$:			
5676							
5677	021564	005237	001430		INC	HEAD	
5678	021570	023727	001430	000003	CMP	HEAD,#3	
5679	021576	001256			BNE	1\$	
5680							
5681	021600	005037	001430		CLR	HEAD	;HEAD CTR
5682	021604	104415			SCOP1		
5683	021606	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
5684							
5685	021612	004737	045522		JSR	PC,SUBCLR	
5686	021616	104024			ERROR	24	;CERR AFTER SCLR
5687							
5688							
5689							
5690	021620	000337	001430		SWAB	HEAD	
5691	021624	013765	001430	000006	MOV	HEAD,RKDA(R5)	;SETUP HEAD ADDR
5692	021632	000337	001430		SWAB	HEAD	
5693							
5694	021636	012700	001674		MOV	#RHTAB,R0	
5695	021642	012765	000025	000000	MOV	#<R0HEAD>,RKCS1(R5)	;READ HEADER CMD
5696	021650	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
5697	021656	004737	043612		JSR	PC,FRDY	;FIND RDY

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T23 BASIC WRITE/READ HEADER & HEAD SWITCHING TEST

SEQ 0106

5698	021662	104171			ERROR	171		; NO RDY AFTER READ HEADER CMD
5699	021664	032737	100000	003334	BIT	#CERR,HCS1		
5700	021672	001405			BEQ	67\$		
5701	021674	104174			ERROR	174		; CERR AFTER READ HEADER CMD
5702	021676	104401	056333		TYPE	MSG18		; ABORT BALANCE OF TESTS
5703	021702	000137	043076		JMP	\$EOP		; ABORT DRIVE
5704								
5705	021706	016520	000024		67\$: MOV	RKDB(R5),(R0)+		; 1'ST WORD FROM SILO TO RHTAB
5706	021712	016520	000024		MOV	RKDB(R5),(R0)+		; 2'ND WORD
5707	021716	016520	000024		MOV	RKDB(R5),(R0)+		; 3'RD WORD
5708								
5709								
5710	021722	032765	100000	000010	BIT	#DLT,RKCS2(R5)		
5711	021730	001407			BEQ	68\$		
5712	021732	004737	045150		JSR	PC,GSTAT		
5713	021736	104173			ERROR	173		; DLT AFTER READ HEADER CMD
5714	021740	104401	056333		TYPE	MSG18		; ABORTING BALANCE OF TESTS
5715	021744	000137	043076		JMP	\$EOP		; ABORT DRIVE
5716	021750				68\$:			
5717								
5718	021750	012737	010340	003424	MOV	#(0!D.SPIN!D.DRDY!D.VV!D.DRA),E.A0		; EXPECTED MSG A0
5719	021756	005037	003426		CLR	E.B0		; EXPECTED MSG B0
5720	021762	012737	001720	003430	MOV	#(0.D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP),E.A1		; EXPECTED A1
5721	021770	012737	000001	003432	MOV	#1,E.B1		; MSG ID FOR EXPECTED MSG B1
5722	021776	005037	003434		CLR	E.A2		; EXPECTED MSG A2
5723	022002	012737	000002	003436	MOV	#2,E.B2		; MSG ID FOR EXPECTED MSG B2
5724	022010	012737	000003	003442	MOV	#3,E.B3		; MSG ID FOR EXPECTED MSG B3
5725								
5726	022016	004737	044334		JSR	PC,CHKMSG		; CHECK MSGS A0,B0,A1,B1
5727	022022	000003			.WORD	T.A2!T.B2!0		; & MSGS SPECIFIED HERE
5728	022024	104301			ERROR	301		; MSG A0 ERROR AFTER READ HEADER CMD
5729	022026	104271			ERROR	271		; MSG B0 ERROR
5730	022030	104302			ERROR	302		; MSG A1 ERROR
5731	022032	104272			ERROR	272		; MSG B1 ERROR
5732								
5733								
5734	022034	005737	001362		TST	CYLDIF		; SEE IF MSG A2=0
5735	022040	001401			BEQ	69\$		; BR IF YES
5736	022042	104172			ERROR	172		; MSG A2 NOT CLEARED AFTER READ HEADER CMD
5737	022044	005737	001364		69\$: TST	CYLADD		; SEE IF MSG B2=0
5738	022050	001401			BEQ	70\$		; BR IF YES
5739	022052	104264			ERROR	264		; MSG B2 NOT CLEARED AFTER READ HEADER CMD
5740	022054				70\$:			
5741	022054	000337	001430		SWAB	HEAD		
5742	022060	013765	001430	000006	MOV	HEAD,RKDA(R5)		; RESTORE RKDA
5743	022066	000337	001430		SWAB	HEAD		
5744								
5745	022072	012701	001674		MOV	#RHTAB,R1		
5746								
5747	022076	005037	001442		CLR	WDCNT		; HEADER WORD COUNT
5748	022102	013700	001430		MOV	HEAD,R0		
5749	022106	006300			ASL	R0		; DOUBLE R0
5750	022110	016037	001444	003372	MOV	DATA0(R0),TEMP1		; GET THE 'SHOULD BE' DATA
5751	022116	012137	001454		3\$: MOV	(R1)+,HDWD		; READ HEADER WORD
5752	022122	023737	001454	003372	CMP	HDWD,TEMP1		
5753	022130	001401			BEQ	4\$		

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T23 BASIC WRITE/READ HEADER & HEAD SWITCHING TEST

SEQ 0107

```

5754 022132 104202
5755 022134 005237 001442
5756 022140 023727 001442 000003
5757 022146 001363
5758
5759 022150 005237 001430
5760 022154 023727 001430 000003
5761 022162 001402
5762 022164 000137 021620
5763
5764
5765
5766
5767
5768
5769
5770
5771
5772
5773 022170 000004
5774 022172 012737 000001 001174
5775 022200 012706 001100
5776
5777 022204 004737 045522
5778 022210 104024
5779 022212 052765 000020 000010
5780 022220 012765 001450 000004
5781 022226 012765 177704 000002
5782
5783
5784 022234 012765 010027 000000
5785 022242 013737 001426 003372
5786 022250 004737 043612
5787 022254 104200
5788 022256 004737 045150
5789 022262 032737 100000 003334
5790 022270 001405
5791 022272 104201
5792 022274 104401 056333
5793 022300 000137 043076
5794 022304
5795
5796 022304 012765 010001 000000
5797 022312 013737 001414 003372
5798 022320 004737 043612
5799 022324 104117
5800 022326 032737 001000 003362
5801 022334 001001
5802 022336 104312
5803
5804 022340
5805
5806 022340 012737 010340 003424
5807 022346 005037 003426
5808 022352 012737 001720 003430
5809 022360 012737 000001 003432

4$: ERROR 202 ;READ HEADER MISMATCH
INC WDCNT
CMP WDCNT,#3 ;DO ONLY 1 SECTOR
BNE 3$

INC HEAD
CMP HEAD,#3 ;ALL 3 HEADS DONE?
BEQ TST24 ;GO TO NXT TST IF YES
JMP 2$ ;ELSE REPEAT

*****
TEST 24 BASIC WRITE/READ HEADER TEST; ALL 1'S, 20 SECTORS
*
* USING HEAD 0, WRITE & READ 20 SECTOR HEADERS BY WRITING ALL
* 1'S AS HEADERS. ATTEMPT TO FIND SECTORS 20 & 21. VERIFY
* THEY ARE NO LONGER THERE BY READING 22 SECTORS AND NOT
* FINDING 0'S AS DATA FROM THE PREVIOUS TEST.
*****
TST24: SCOPE
MOV #1,STIMES ;DO 1 ITERATION
MOV #STACK,SP ;RESTORE STK PTR

JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR
BIS #BAI,RKCS2(R5) ;SET BUSS ADDR INCR INHIBIT
MOV #DATA1,RKBA(R5) ;XFER 1'S ONLY
MOV #-60.,RKWC(R5) ;WORD COUNT

MOV #<CFMT!WRHEAD>,RKCS1(R5) ;WRITE HEADER CMD
MOV T50000,TEMP1 ;SETUP TIMEOUT
JSR PC,FRDY ;FIND RDY
ERROR 200 ;NO RDY AFTER WRITE HEADER CMD
JSR PC,GSTAT ;GET FRESH STATUS
BIT #CERR,HCS1
BEQ 64$
ERROR 201 ;CERR AFTER WRITE HEADER CMD
TYPE MSG18 ;ABORTING BALANCE OF TESTS
JMP $EOP ;ABORT DRIVE

64$:

MOV #<CFMT!SELDV>,RKCS1(R5) ;GET 20 SECTOR STATUS
MOV T10,TEMP1
JSR PC,FRDY ;FIND RDY
ERROR 117 ;NO RDY AFTER SELDRV CMD
BIT #D.FORM,HMR2
BNE 1$
ERROR 312 ;FORMAT NOT SET AFTER WRITE HDR CMD

1$:
MOV #<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
CLR E.B0 ;EXPECTED MSG B0
MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1

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T24 BASIC WRITE/READ HEADER TEST; ALL 1'S, 20 SECTORS

SEQ 0108

5810	022366	005037	003434		CLR	E.A2	;EXPECTED MSG A2
5811	022372	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5812	022400	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5813							
5814	022406	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
5815	022412	000000			WORD	0!0!0	;8 MSGS SPECIFIED HERE
5816	022414	104277			ERROR	277	;MSG A0 ERROR AFTER WRITE HEADER CMD
5817	022416	104267			ERROR	267	;MSG B0 ERROR
5818	022420	104300			ERROR	300	;MSG A1 ERROR
5819	022422	104270			ERROR	270	;MSG B1 ERROR
5820							
5821	022424	005037	001400		CLR	SECNT	;SECTOR COUNT
5822	022430						
5823	022430	104415			SCOP1		
5824	022432	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
5825							
5826	022436	004737	045522		JSR	PC,SUBCLR	
5827	022442	104024			ERROR	24	;CERR AFTER SCLR
5828							
5829							
5830	022444	012700	001674		MOV	#RHTAB,RO	
5831	022450	012765	010025	000000	MOV	#<CFMT!RDHEAD>,RKCS1(R5)	;READ HEADER CMD
5832	022456	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
5833	022464	004737	043612		JSR	PC,FRDY	;FIND RDY
5834	022470	104171			ERROR	171	;NO RDY AFTER READ HEADER CMD
5835	022472	032737	100000	003334	BIT	#CERR,HCS1	
5836	022500	001405			BEQ	65\$	
5837	022502	104174			ERROR	174	;CERR AFTER READ HEADER CMD
5838	022504	104401	056333		TYPE	MSG18	;ABORT BALANCE OF TESTS
5839	022510	000137	043076		JMP	\$EOP	;ABORT DRIVE
5840							
5841	022514	016520	000024		MOV	RKDB(R5),(RO)+	;1'ST WORD FROM SILO TO RHTAB
5842	022520	016520	000024		MOV	RKDB(R5),(RO)+	;2'ND WORD
5843	022524	016520	000024		MOV	RKDB(R5),(RO)+	;3'RD WORD
5844							
5845							
5846	022530	032765	100000	000010	BIT	#DLT,RKCS2(R5)	
5847	022536	001407			BEQ	66\$	
5848	022540	004737	045150		JSR	PC,GSTAT	
5849	022544	104173			ERROR	173	;DLT AFTER READ HEADER CMD
5850	022546	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
5851	022552	000137	043076		JMP	\$EOP	;ABORT DRIVE
5852	022556						
5853							
5854	022556	012765	010001	000000	MOV	#<CFMT!SELDV>,RKCS1(R5)	
5855	022564	013737	001414	003372	MOV	T10,TEMP1	
5856	022572	004737	043612		JSR	PC,FRDY	;FIND RDY
5857	022576	104117			ERROR	117	;NO RDY AFTER SELDRV CMD
5858	022600	032737	001000	003362	BIT	#D.FORM,HMR2	
5859	022606	001001			BNE	6\$	
5860	022610	104313			ERROR	313	;FORMAT NOT SET AFTER READ HDR CMD
5861							
5862	022612						
5863							
5864	022612	012737	010340	003424	MOV	#<O!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
5865	022620	005037	003426		CLR	E.B0	;EXPECTED MSG B0

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T24 BASIC WRITE/READ HEADER TEST; ALL 1'S, 20 SECTORS

SEQ 0109

5866	022624	012737	001720	003430	MOV	#(D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP),E.A1	;EXPECTED A1
5867	022632	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5868	022640	005037	003434		CLR	E.A2	;EXPECTED MSG A2
5869	022644	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5870	022652	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5871							
5872	022660	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
5873	022664	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
5874	022666	104301			ERROR	301	;MSG A0 ERROR AFTER READ HEADER CMD
5875	022670	104271			ERROR	271	;MSG B0 ERROR
5876	022672	104302			ERROR	302	;MSG A1 ERROR
5877	022674	104272			ERROR	272	;MSG B1 ERROR
5878							
5879	022676	005737	001362		TST	CYLDIF	;SEE IF MSG A2=0
5880	022702	001401			BEQ	67\$	;BR IF YES
5881	022704	104172			ERROR	172	;MSG A2 NOT CLEARED AFTER READ HEADER CMD
5882	022706	005737	001364		67\$: TST	CYLADD	;SEE IF MSG B2=0
5883	022712	001401			BEQ	68\$	;BR IF YES
5884	022714	104264			ERROR	264	;MSG B2 NOT CLEARED AFTER READ HEADER CMD
5885	022716				68\$:		
5886	022716	012701	001674		MOV	#RHTAB,R1	
5887							
5888	022722	005037	001442		3\$: CLR	WDCNT	;HEADER WORD COUNT
5889	022726	013737	001450	003372	MOV	DATA1,TEMP1	;GET 'SHOULD BE' DATA
5890	022734	012137	001454		4\$: MOV	(R1)+,HDWD	;READ HEADER WORD
5891	022740	023737	001454	003372	CMP	HDWD,TEMP1	;MATCH OK?
5892	022746	001401			BEQ	5\$	;BR IF YES
5893	022750	104202			ERROR	202	;READ HEADER MISMATCH
5894	022752	005237	001442		5\$: INC	WDCNT	
5895	022756	023727	001442	000003	CMP	WDCNT,#3	;JUST 1 SECTOR AND 1 HEAD
5896	022764	001363			BNE	4\$	
5897							
5898							
5899							
5900							
5901							
5902							
5903							
5904	022766	000004			*****		
5905	022770	012737	000001	001174	*****		
5906	022776	012706	001100		*****		
5907					*****		
5908	023002	004737	045522		*****		
5909	023006	104024			*****		
5910					*****		
5911	023010	005237	001464		*****		
5912					*****		
5913	023014	012765	001470	000004	*****		
5914	023022	012765	177676	000002	*****		
5915	023030	012737	000000	001352	*****		
5916					*****		
5917	023036	013737	001352	001366	*****		
5918	023044	012737	000000	001430	*****		
5919	023052	012737	000000	001436	*****		
5920	023060	004737	046632		*****		
5921					*****		

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T25 WRITE & READ HEADERS CYL 0, HEAD 0

SEQ 0110

5922	023064	012765	000000	000020	MOV	#0,RKDC(R5)	;CYL#
5923							
5924	023072	012765	000027	000000	MOV	#<WRHEAD>,RKCS1(R5)	;WRITE HEADER CMD
5925	023100	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
5926	023106	004737	043612		JSR	PC,FRDY	;FIND RDY
5927	023112	104200			ERROR	200	;NO RDY AFTER WRITE HEADER CMD
5928	023114	004737	045150		JSR	PC,GSTAT	;GET FRESH STATUS
5929	023120	032737	100000	003334	BIT	#CERR,HCS1	
5930	023126	001405			BEQ	64\$	
5931	023130	104201			ERROR	201	;CERR AFTER WRITE HEADER CMD
5932	023132	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
5933	023136	000137	043076		JMP	\$EOP	;ABORT DRIVE
5934	023142						
5935							
5936	023142	012737	010340	003424	MOV	#<O!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
5937	023150	005037	003426		CLR	E.B0	;EXPECTED MSG B0
5938	023154	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
5939	023162	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
5940	023170	005037	003434		CLR	E.A2	;EXPECTED MSG A2
5941	023174	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
5942	023202	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
5943							
5944	023210	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0 B0 A1 B1
5945	023214	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
5946	023216	104277			ERROR	277	;MSG A0 ERROR AFTER WRITE HEADER CMD
5947	023220	104267			ERROR	267	;MSG B0 ERROR
5948	023222	104300			ERROR	300	;MSG A1 ERROR
5949	023224	104270			ERROR	270	;MSG B1 ERROR
5950							
5951	023226	005037	001400		CLR	SECNT	;SECTOR COUNT
5952	023232	104415			SCOP1		
5953	023234	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
5954							
5955	023240	004737	045522		JSR	PC,SUBCLR	
5956	023244	104024			ERROR	24	;CERR AFTER SCLR
5957							
5958	023246	012765	000000	000020	MOV	#0,RKDC(R5)	;CYL #
5959							
5960	023254	012700	001674		MOV	#RHTAB,R0	
5961							
5962	023260	012765	000025	000000	MOV	#RDHEAD,RKCS1(R5)	;READ HEADER CMD
5963	023266	013737	001420	003372	MOV	T500,TEMP1	;SETUP TIMEOUT
5964	023274	004737	043612		JSR	PC,FRDY	;FIND RDY
5965	023300	104171			ERROR	171	;NO RDY AFTER READ HEADER CMD
5966	023302	032737	100000	003334	BIT	#CERR,HCS1	
5967	023310	001405			BEQ	66\$	
5968	023312	104174			ERROR	174	;CERR AFTER READ HEADER CMD
5969	023314	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
5970	023320	000137	043076		JMP	\$EOP	;ABORT DRIVE
5971							
5972	023324	016520	000024		MOV	RKDB(R5),(R0)+	;1'ST WORD FROM SILO TO RHTAB
5973	023330	016520	000024		MOV	RKDB(R5),(R0)+	;2'ND WORD
5974	023334	016520	000024		MOV	RKDB(R5),(R0)+	;3'RD WORD
5975							
5976	023340	032765	100000	000010	BIT	#DLT,RKCS2(R5)	;SEE IF DATA LATE
5977	023346	001407			BEQ	67\$	

H09

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T25 WRITE & READ HEADERS CYL 0, HEAD 0

SEQ 0111

5978	023350	004737	045150		JSR	PC,GSTAT	
5979	023354	104173			ERROR	173	;DATA LATE ON READ HEADER
5980	023356	104401	056333		TYPE	MSG18	;ABORT BALANCE OF TESTS
5981	023362	000137	043076		JMP	\$EOP	;ABORT DRIVE
5982							
5983	023366	020027	002100	67\$:	CMP	RO,#RHTAB+132.	;ALL 66 WORDS DONE?
5984	023372	001332			BNE	65\$	;BR IF NO
5985							
5986	023374	004737	047154		JSR	PC, SORT	;SORT RHTAB INTO SRTTAB SO THAT IT
5987							;BEGINS WITH SECTOR 0
5988	023400	005037	001442		CLR	WDCNT	;WORD COUNT
5989	023404	012700	002100		MOV	#SRTTAB, RO	;ACTUAL HEADER TABLE
5990	023410	012701	001470		MOV	#HDTAB, R1	;CALC HEADER TABLE
5991							
5992	023414	012037	001454	68\$:	MOV	(RO)+, HDWD	
5993	023420	012137	003372		MOV	(R1)+, TEMP1	
5994	023424	023737	001454	003372	CMP	HDWD, TEMP1	;COMPARE ACTUAL WITH CALCULATED WORD
5995	023432	001401			BEQ	69\$	;BR IF COMPARE
5996	023434	104202			ERROR	202	;READ HEADER MISMATCH
5997							
5998	023436	005237	001442	69\$:	INC	WDCNT	
5999	023442	023727	001442	000102	CMP	WDCNT, #66.	;ALL WORDS DONE?
6000	023450	001361			BNE	68\$	;BR IF NO
6001							
6002							
6003	023452	005037	001464		CLR	BYPFMT	;ALLOW CORRECT FORMATTING
6004							
6005							
6006							
6007							
6008							
6009							
6010							
6011							
6012							
6013							
6014							
6015							
6016							
6017							
6018							
6019							
6020							
6021							
6022	023456	000004					
6023	023460	012737	000001	001174			
6024	023466	012706	001100				
6025	023472	004737	045522				
6026	023476	104024					
6027	023500	005037	001350				
6028	023504	012737	000001	001352			
6029	023512	012737	000001	001360			
6030	023520	012765	000001	000020			
6031	023526	012737	024542	001176			
6032							
6033	023534	012765	000017	000000			

```

*****
*TEST 26      SEEK FROM CYL 0 TO 1 & READ HEADERS
*
*   THIS TEST CHECKS MSG A & B WORDS 0,1,2 FOR CORRECT STATUS AFTER RDY
*   IS RECEIVED FROM A SEEK CMD TO DETERMINE
*   THAT THE HEADS ARE ACTUALLY MOVING & THE CYL DIFF IS 1.
*   AFTER ATTN IS RECEIVED, CERR IS EXAMINED FOR ANY ERRORS.
*   CYL DIFFERENCE IN MSG A2 IS VERIFIED TO BE 0 & CYL ADDR
*   IN MSG B2 IS VERIFIED TO BE 1.
*
*   HEADERS ARE READ FROM 1 SECTOR, HEAD 0 & VERIFIED THAT THEY ARE
*   DIFFERENT FROM CYL 0 TO SHOW THAT THE HEADS DID ACTUALLY MOVE.
*
*****
*ST26:  SCOPE
*        MOV      #1, $TIMES      ;DO 1 ITERATION
*        MOV      #STACK, SP      ;RESTORE STK PTR
*        JSR      PC, SUBCLR
*        ERROR    24              ;CERR AFTER SCLR
*        CLR      FRCYL
*        MOV      #1, TOCYL
*        MOV      #1, CALDIF
*        MOV      #1, RKDC(R5)    ;SET FOR CYL 1
*        MOV      #10$, $ESCAPE
*
*        MOV      #SEEK, RKCS1(R5) ;SEEK CMD

```

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T26 SEEK FROM CYL 0 TO 1 & READ HEADERS

SEQ 0112

6034	023542	013737	001414	003372	MOV	T10,TEMP1	;SETUP TIMEOUT
6035	023550	004737	043612		JSR	PC,FRDY	;FIND RDY
6036	023554	104131			ERROR	131	;NO RDY AFTER SEEK CMD
6037	023556	012737	030140	003424	MOV	#<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0	;EXPECTED A0
6038	023564	005037	003426		CLR	E.B0	
6039	023570	012737	003720	003430	MOV	#<D.FWD!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	
6040	023576	012737	000001	003432	MOV	#1,E.B1	
6041							
6042	023604	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6043	023610	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
6044	023612	104203			ERROR	203	;MSG A0 ERROR DURING SEEK CMD
6045	023614	104204			ERROR	204	;MSG B0 ERROR
6046	023616	104205			ERROR	205	;MSG A1 ERROR
6047	023620	104206			ERROR	206	;MSG B1 ERROR
6048							
6049	023622	023727	001362	000001	CMP	CYLDIF,#1	
6050	023630	001401			BEQ	15	
6051	023632	104212			ERROR	212	;CYL DIFF INCORRECT DURING SEEK CMD.
6052							
6053							
6054	023634	012737	024562	001176	15: MOV	#125,\$ESCAPE	
6055	023642	013737	001422	003372	MOV	T2500,TEMP1	;SETUP TIMEOUT
6056							
6057							
6058	023650	004737	044222		JSR	PC,FATT2	;FIND ATTN
6059	023654	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
6060	023656	032737	100000	003334	BIT	#CERR,HCS1	
6061	023664	001401			BEQ	645	
6062	023666	104210			ERROR	210	;CERR AFTER SEEK CMD
6063	023670				645:		
6064							
6065	023670	012737	050340	003424	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
6066	023676	005037	003426		CLR	E.B0	;EXPECTED MSG B0
6067	023702	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
6068	023710	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6069	023716	005037	003434		CLR	E.A2	;EXPECTED MSG A2
6070	023722	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6071	023730	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6072							
6073	023736	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6074	023742	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
6075	023744	104133			ERROR	133	;MSG A0 ERROR AFTER SEEK CMD
6076	023746	104134			ERROR	134	;MSG B0 ERROR
6077	023750	104135			ERROR	135	;MSG A1 ERROR
6078	023752	104136			ERROR	136	;MSG B1 ERROR
6079	023754	005737	001362		TST	CYLDIF	
6080	023760	001401			BEQ	655	
6081	023762	104137			ERROR	137	;CYL DIFF NOT CLEARED AFTER SEEK CMD
6082							
6083	023764				655:		
6084							
6085	023764	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
6086	023772	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
6087	024000	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
6088	024006	013737	001414	003372	MOV	T10,TEMP1	
6089	024014	004737	043612		JSR	PC,FRDY	;FIND RDY

J09

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T26 SEEK FROM CYL 0 TO 1 & READ HEADERS

SEQ 0113

6090	024020	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
6091	024022	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
6092	024026	000401			BR	66\$	
6093	024030	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
6094	024032			66\$:			
6095							
6096	024032	012737	010340	003424	MOV	#<D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
6097	024040	005037	003426		CLR	E.B0	;EXPECTED MSG B0
6098	024044	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
6099	024052	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6100	024060	005037	003434		CLR	E.A2	;EXPECTED MSG A2
6101	024064	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6102	024072	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6103							
6104	024100	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6105	024104	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
6106	024106	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
6107	024110	104265			ERROR	265	;MSG B0 ERROR
6108	024112	104274			ERROR	274	;MSG A1 ERROR
6109	024114	104266			ERROR	266	;MSG B1 ERROR
6110							
6111	024116	005737	001364		TST	CYLADD	
6112	024122	023727	001364	000001	CMP	CYLADD,#1	
6113	024130	001401			BEQ	2\$	
6114	024132	104207			ERROR	207	;CYL ADDR INCORRECT AFTER SEEK CMD
6115							
6116							
6117	024134			2\$:	SCOP1		
6118	024134	104415			MOV	#STACK,SP	;RESTORE STK PTR
6119	024136	012706	001100				
6120							
6121	024142	004737	045522		JSR	PC,SUBCLR	
6122	024146	104024			ERROR	24	;CERR AFTER SCLR
6123							
6124	024150	005037	001176		CLR	\$ESCAPE	
6125	024154	012765	000001	000020	MOV	#1,RKDC(R5)	;CYL #
6126							
6127	024162	012700	001674		MOV	#RHTAB,R0	
6128	024166	012765	000025	000000	MOV	#<R0HEAD>,RKCS1(R5)	;READ HEADER CMD
6129	024174	013737	001426	003372	MOV	T5000,TEMP1	;SETUP TIMEOUT
6130	024202	004737	043612		JSR	PC,FRDY	;FIND RDY
6131	024206	104171			ERROR	171	;NO RDY AFTER READ HEADER CMD
6132	024210	032737	100000	003334	BIT	#CERR,HCS1	
6133	024216	001405			BEQ	67\$	
6134	024220	104174			ERROR	174	;CERR AFTER READ HEADER CMD
6135	024222	104401	056333		TYPE	MSG18	;ABORT BALANCE OF TESTS
6136	024226	000137	043076		JMP	\$EOP	;ABORT DRIVE
6137							
6138	024232	016520	000024		MOV	RKDB(R5),(R0)+	;1'ST WORD FROM SILO TO RHTAB
6139	024236	016520	000024		MOV	RKDB(R5),(R0)+	;2'ND WORD
6140	024242	016520	000024		MOV	RKDB(R5),(R0)+	;3'RD WORD
6141							
6142							
6143	024246	032765	100000	000010	BIT	#DLT,RKCS2(R5)	
6144	024254	001407			BEQ	68\$	
6145	024256	004737	045150		JSR	PC,GSTAT	

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6146	024262	104173			ERROR	173	;DLT AFTER READ HEADER CMD
6147	024264	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
6146	024270	000137	043076		JMP	\$EOP	;ABORT DRIVE
6149	024274						
6150							
6151							
6152	024274	005737	001674		TST	RHTAB	;CHECK 1'ST WORD ONLY:CYL#
6153	024300	001001			BNE	3\$	
6154	024302	104211			ERROR	211	;CYL 0 HEADER ON CYL 1
6155							
6156	024304	013737	001674	001454	3\$: MOV	RHTAB,HDWD	
6157	024312	012737	000001	003372	MOV	#1,TEMP1	
6158	024320	023737	001454	003372	CMP	HDWD,TEMP1	
6159	024326	001401			BEQ	4\$	
6160	024330	104202			ERROR	202	;READ CYL WORD HEADER ERROR
6161	024332						
6162	024332	004737	047526		JSR	PC,SWTST	;SEE IF SW 14 OR 8 IS SET
6163	024336	000521			BR	TST27	;GO TO NEXT TEST
6164							;RETURN HERE IF SW 14 IS SET OR
6165							;SW 8 WITH SWR <7:0> APPLY
6166	024340	004737	045522		6\$: JSR	PC,SUBCLR	
6167	024344	104024			ERROR	24	;CERR AFTER SCLR
6168							
6169	024346	012765	000017	000000	MOV	#SEEK,RKCS1(R5)	;SEEK CMD TO RECONDITION DRIVE.
6170	024354	013737	001414	003372	MOV	T10,TEMP1	;SETUP TIMEOUT
6171	024362	004737	043612		JSR	PC,FRDY	;FIND RDY
6172	024366	104131			ERROR	131	;NO RDY AFTER SEEK CMD.
6173							
6174	024370	013737	001426	003372	MOV	T50000,TEMP1	
6175	024376	004737	044222		JSR	PC,FAT2	;FIND ATTN
6176	024402	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
6177	024404	032737	100000	003334	BIT	#CERR,HCS1	
6178	024412	001401			BEQ	69\$	
6179	024414	104210			ERROR	210	;CERR AFTER SEEK CMD.
6180							
6181	024416	004737	045522		69\$: JSR	PC,SUBCLR	
6182	024422	104024			ERROR	24	;CERR AFTER SCLR
6183							
6184							
6185	024424	012737	050340	003424	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
6186	024432	005037	003426		CLR	E.B0	;EXPECTED MSG B0
6187	024436	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
6188	024444	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6189	024452	005037	003434		CLR	E.A2	;EXPECTED MSG A2
6190	024456	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6191	024464	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6192							
6193	024472	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0 B0 A1 B1
6194	024476	000003			WORD	T.A2!T.B2!0	;MSG SPECIFIED HERE
6195	024500	104133			ERROR	133	;MSG A0 ERROR AFTER SEEK CMD
6196	024502	104134			ERROR	134	;MSG B0 ERROR
6197	024504	104135			ERROR	135	;MSG A1 ERROR
6198	024506	104136			ERROR	136	;MSG B1 ERROR
6199	024510	005737	001364		TST	CYLA00	
6200	024514	001401			BEQ	7\$	
6201	024516	104043			ERROR	43	;CYL ADDR IN RKMR3 NOT=RKDC

6202					
6203	024520				
6204	024520	005037	001176		
6205	024524	005737	001410		
6206	024530	001402			
6207	024532	000177	154352		
6208	024536	000177	154344		
6209					
6210	024542				
6211	024542	005237	001410		
6212	024546	032777	001000	154364	
6213	024554	001271			
6214	024556	000137	023634		
6215	024562				
6216	024562	005237	001410		
6217	024566	032777	001000	154344	
6218	024574	001261			
6219	024576	000137	024134		
6220					
6221					
6222					
6223					
6224					
6225					
6226					
6227	024602	000004			
6228	024604	012737	000001	001174	
6229	024612	012706	001130		
6230					
6231	024616	004737	045522		
6232	024622	104024			
6233					
6234	024624	005237	001464		
6235					
6236	024630	012765	001470	000004	
6237	024636	012765	177676	000002	
6238	024644	012737	000001	001352	
6239					
6240	024652	013737	001352	001366	
6241	024660	012737	000000	001430	
6242	024666	012737	000000	001436	
6243	024674	004737	046632		
6244					
6245	024700	012765	000001	000020	
6246					
6247	024706	012765	000027	000000	
6248	024714	013737	001426	003372	
6249	024722	004737	043612		
6250	024726	104200			
6251	024730	004737	045150		
6252	024734	032737	100000	003334	
6253	024742	001405			
6254	024744	104201			
6255	024746	104401	056333		
6256	024752	000137	043076		
6257	024756				

75:	CLR	\$ESCAPE	
	TST	LPFLG	
	BEQ	70\$	
	JMP	\$SLPERR	;SW 9 WAS SET.
70\$:	JMP	\$SLPADR	;SW 14 OR 8 WAS SET
10\$:			
	INC	LPFLG	
	BIT	\$SW9,\$SWR	;LOOP ON ERROR?
	BNE	6\$	;YES, RECONDITION DRIVE
	JMP	1\$	;RETURN TO MAINLINE
12\$:			
	INC	LPFLG	
	BIT	\$SW9,\$SWR	;LOOP ON ERROR?
	BNE	6\$	;YES, RECONDITION DRIVE
	JMP	2\$	;RETURN TO MAINLINE


```

*****
;TEST 27 WRITE & READ HEADERS CYL 1, HEAD 0
*****
TST27: SCOPE
        MOV    #1,$TIMES      ;DO 1 ITERATION
        MOV    #STACK,SP     ;RESTORE STK PTR
        JSR    PC,SUBCLR      ;CERR AFTER SCLR
        INC    BYPFMT         ;SET BIT 14 & 15 IN HEADER
        MOV    #HDTAB,RKBA(R5);HEADER WORD TABLE
        MOV    #-66,RKWC(R5);WORD COUNT.
        MOV    #1,TOCYL
        MOV    TOCYL,CALADD   ;SETUP
        MOV    #0,HEAD        ;TO FILL
        MOV    #0,FORMAT      ;HEADER
        JSR    PC,FHDTAB      ;TABLE
        MOV    #1,RKDC(R5)    ;CYL#
        MOV    #<WRHEAD>,RKCS1(R5);WRITE HEADER CMD
        MOV    T50000,TEMP1   ;SETUP TIMEOUT
        JSR    PC,FRDY        ;FIND RDY
        JSR    PC,GSTAT        ;NO RDY AFTER WRITE HEADER CMD
        BIT    #CERR,HCS1     ;GET FRESH STATUS
        BEQ    64$
        JSR    PC,MSG18
        JMP    $EOP
64$:

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M09

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T27 WRITE & READ HEADERS CYL 1, HEAD 0

SEQ 0116

6258						
6259	024756	012737	010340	003424	MOV	#<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
6260	024764	005037	003426		CLR	E.B0 ;EXPECTED MSG B0
6261	024770	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1 ;EXPECTED A1
6262	024776	012737	000001	003432	MOV	#1,E.B1 ;MSG ID FOR EXPECTED MSG B1
6263	025004	005037	003434		CLR	E.A2 ;EXPECTED MSG A2
6264	025010	012737	000002	003436	MOV	#2,E.B2 ;MSG ID FOR EXPECTED MSG B2
6265	025016	012737	000003	003442	MOV	#3,E.B3 ;MSG ID FOR EXPECTED MSG B3
6266						
6267	025024	004737	044334		JSR	PC,CHKMSG ;CHECK MSGS A0,B0,A1,B1
6268	025030	000003			.WORD	T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
6269	025032	104277			ERROR	277 ;MSG A0 ERROR AFTER WRITE HEADER CMD
6270	025034	104267			ERROR	267 ;MSG B0 ERROR
6271	025036	104300			ERROR	300 ;MSG A1 ERROR
6272	025040	104270			ERROR	270 ;MSG B1 ERROR
6273						
6274	025042	005037	001400		CLR	SECNT ;SECTOR COUNT
6275	02 046	104415			SCOP1	
6276	025050	012706	001100		MOV	#STACK,SP ;RESTORE STK PTR
6277						
6278	025054	004737	045522		JSR	PC,SUBCLR
6279	025060	104024			ERROR	24 ;CERR AFTER SCLR
6280						
6281	025062	012765	000001	000020	MOV	#1,RKDC(R5) ;CYL #
6282						
6283	025070	012700	001674		MOV	#RHTAB,R0
6284						
6285	025074	012765	000025	000000	MOV	#RDHEAD,RKCS1(R5) ;READ HEADER CMD
6286	025102	013737	001420	003372	MOV	T500,TEMP1 ;SETUP TIMEOUT
6287	025110	004737	043612		JSR	PC,FRDY ;FIND RDY
6288	025114	104171			ERROR	171 ;NO RDY AFTER READ HEADER CMD
6289	025116	032737	100000	003334	BIT	#CERR,HCS1
6290	025124	001405			BEQ	66\$
6291	025126	104174			ERROR	174 ;CERR AFTER READ HEADER CMD
6292	025130	104401	056333		TYPE	MSG18 ;ABORTING BALANCE OF TESTS
6293	025134	000137	043076		JMP	\$EOP ;ABORT DRIVE
6294						
6295	025140	016520	000024		MOV	RKDB(R5),(R0)+ ;1'ST WORD FROM SILO TO RHTAB
6296	025144	016520	000024		MOV	RKDB(R5),(R0)+ ;2'ND WORD
6297	025150	016520	000024		MOV	RKDB(R5),(R0)+ ;3'RD WORD
6298						
6299	025154	032765	100000	000010	BIT	#DLT,RKCS2(R5) ;SEE IF DATA LATE
6300	025162	001407			BEQ	67\$
6301	025164	004737	045150		JSR	PC,GSTAT
6302	025170	104173			ERROR	173 ;DATA LATE ON READ HEADER
6303	025172	104401	056333		TYPE	MSG18 ;ABORT BALANCE OF TESTS
6304	025176	000137	043076		JMP	\$EOP ;ABORT DRIVE
6305						
6306	025202	020027	002100		CMP	R0,#RHTAB+132. ;ALL 66 WORDS DONE?
6307	025206	001332			BNE	65\$;BR IF NO
6308						
6309	025210	004737	047154		JSR	PC, SORT ;SORT RHTAB INTO SRTTAB SO THAT IT
6310						BEGINS WITH SECTOR 0
6311	025214	005037	001442		CLR	WDCNT ;WORD COUNT
6312	025220	012700	002100		MOV	#SRTTAB,R0 ;ACTUAL HEADER TABLE
6313	025224	012701	001470		MOV	#HDTAB,R1 ;CALC HEADER TABLE

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T27 WRITE & READ HEADERS CYL 1, HEAD 0

SEQ 0117

6314					
6315	025230	012037	001454		68\$: MOV (R0)+,HWD
6316	025234	012137	003372		MOV (R1)+,TEMP1
6317	025240	023737	001454	003372	CMP HWD,TEMP1 ;COMPARE ACTUAL WITH CALCULATED WORD
6318	025246	001401			BEG 69\$;BR IF COMPARE
6319	025250	104202			ERROR 202 ;READ HEADER MISMATCH
6320					
6321	025252	005237	001442		69\$: INC WDCNT
6322	025256	023727	001442	000102	CMP WDCNT,#66. ;ALL WORDS DONE?
6323	025264	001361			BNE 68\$;BR IF NO
6324					
6325					
6326	025266	005037	001464		CLR BYPFMT ;ALLOW CORRECT FORMATTING
6327					
6328					
6329					
6330					*****
6331					*TEST 30 TEST RECALIBRATE CMD & READ HEADERS
6332					*
6333					* THIS TEST DOES A RECALIBRATE & READS HEADERS.
6334					* IT VERIFIES THAT WRITING HEADERS ON CYL 1 FROM THE PREVIOUS
6335					* TEST DID NOT OVERWRITE CYL 0 HEADERS.
6336					* AN ERROR IN THIS TEST INDICATES THAT HEADS:
6337					*
6338					*
6339					* A. MOVED TO A CYL OTHER THAN 1
6340					* OR B. DID NOT GET BACK TO CYL 0
6341					*
6342					*****
6343	025272	000004			†ST30: SCOPE
6344	025274	012737	000001	001174	MOV #1,STIMES ;DO 1 ITERATION
6345	025302	012706	001100		MOV #STACK,SP ;RESTORE STK PTR
6346					
6347	025306	004737	045522		JSR PC,SUBCLR
6348	025312	104024			ERROR 24 ;CERR AFTER SCLR
6349	025314	012737	000001	001350	MOV #1,FRCYL ;PARAMETERS
6350	025322	005037	001352		CLR TOCYL ;FOR
6351	025326	012737	000001	001360	MOV #1,CALDIF ;ERROR TYPEOUTS
6352	025334	012737	026360	001176	MOV #10\$,SESCAPE
6353	025342	012765	000013	000000	MOV #RECAL,RKCSI(R5) ;RECAL CMD
6354	025350	013737	001414	003372	MOV T10,TEMP1 ;SETUP TIMEOUT
6355	025356	004737	043612		JSR PC,FRDY ;FIND RDY
6356	025362	104124			ERROR 124 ;NO RDY AFTER RECAL CMD
6357	025364	012765	100000	000000	MOV #CCLR,RKCSI(R5)
6358	025372	012765	000001	000026	MOV #1,RKMRI(R5) ;SELECT WORD 1
6359	025400	004737	045150		JSR PC,GSTAT
6360	025404	032737	020000	003362	BIT #D.RTZ,HMR2
6361	025412	001001			BNE 1\$
6362	025414	104307			ERROR 307 ;RTZ NOT SET DURING RECAL CMD
6363					
6364	025416	012737	030140	003424	1\$: MOV #<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0 ;EXPECTED AO
6365	025424	005037	003426		CLR E.B0
6366	025430	012737	025720	003430	MOV #<D.RTZ!D.REV!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
6367	025436	012737	000001	003432	MOV #1,E.B1
6368					
6369	025444	004737	044334		JSR PC,CHKMSG ;CHECK MSGS AO,BO,A1,B1

6370	025450	000001				.WORD	T.A2!0!0		& MSGS SPECIFIED HERE
6371	025452	104213				ERROR	213		;MSG A0 ERROR DURING RECAL CMD
6372	025454	104214				ERROR	214		;MSG B0 ERROR
6373	025456	104215				ERROR	215		;MSG A1 ERROR
6374	025460	104216				ERROR	216		;MSG B1 ERROR
6375	025462	005737	001362			TST	CYLDIF		
6376	025466	001401				BEQ	25		
6377	025470	104217				ERROR	217		;CYL DIFF INCORRECT DURING RECAL CMD.
6378									
6379	025472	012737	026400	001176	25:	MOV	#125,\$ESCAPE		
6380	025500	012737	177777	003372		MOV	#-1,TEMP1		;SETUP TIMEOUT
6381	025506	004737	044222			JSR	PC,FATT2		;FIND ATTN
6382	025512	104055				ERROR	55		;NO ATTN AFTER RECAL CMD
6383	025514	032737	100000	003334		BIT	#CERR,HCS1		
6384	025522	001401				BEQ	35		
6385	025524	104220				ERROR	220		;CERR AFTER RECAL CMD
6386	025526				35:				
6387									
6388	025526	012737	050340	003424		MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0		;EXPECTED MSG A0
6389	025534	005037	003426			CLR	E.B0		;EXPECTED MSG B0
6390	025540	012737	001720	003430		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1		;EXPECTED A1
6391	025546	012737	000001	003432		MOV	#1,E.B1		;MSG ID FOR EXPECTED MSG B1
6392	025554	005037	003434			CLR	E.A2		;EXPECTED MSG A2
6393	025560	012737	000002	003436		MOV	#2,E.B2		;MSG ID FOR EXPECTED MSG B2
6394	025566	012737	000003	003442		MOV	#3,E.B3		;MSG ID FOR EXPECTED MSG B3
6395									
6396	025574	004737	044334			JSR	PC,CHKMSG		;CHECK MSGS A0,B0,A1,B1
6397	025600	000003				.WORD	T.A2!T.B2!0		& MSGS SPECIFIED HERE
6398	025602	104221				ERROR	221		;MSG A0 ERROR AFTER RECAL CMD
6399	025604	104275				ERROR	275		;MSG B0 ERROR
6400	025606	104222				ERROR	222		;MSG A1 ERROR
6401	025610	104276				ERROR	276		;MSG B1 ERROR
6402									
6403	025612	005737	001362			TST	CYLDIF		;SEE IF MSG A2=0
6404	025616	001401				BEQ	645		;BR IF YES
6405	025620	104047				ERROR	47		;MSG A2 NOT CLEARED AFTER RECAL CMD
6406	025622	005737	001364		645:	TST	CYLOAD		;SEE IF MSG B2=0
6407	025626	001401				BEQ	655		;BR IF YES
6408	025630	104050				ERROR	50		;MSG B2 NOT CLEARED AFTER RECAL CMD
6409	025632				655:				
6410									
6411	025632	012765	100000	000000		MOV	#CLR,RKCS1(R5)		
6412	025640	013765	001222	000010		MOV	\$UNIT,RKCS2(R5)		;DRIVE#
6413	025646	012765	000005	000000		MOV	#CLEAR,RKCS1(R5)		;DRIVE CLEAR CMD
6414	025654	013737	001414	003372		MOV	T10,TEMP1		
6415	025662	004737	043612			JSR	PC,FRDY		;FIND RDY
6416	025666	104151				ERROR	151		;NO RDY AFTER DRIVE CLEAR CMD
6417	025670	004737	044074			JSR	PC,TSTATN		;TEST FOR ATTN
6418	025674	000401				BR	665		
6419	025676	104154				ERROR	154		;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
6420	025700				665:				
6421									
6422	025700	012737	010340	003424		MOV	#<D.D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0		;EXPECTED MSG A0
6423	025706	005037	003426			CLR	E.B0		;EXPECTED MSG B0
6424	025712	012737	001720	003430		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1		;EXPECTED A1
6425	025720	012737	000001	003432		MOV	#1,E.B1		;MSG ID FOR EXPECTED MSG B1

6426	025726	005037	003434		CLR	E.A2	;EXPECTED MSG A2
6427	025732	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6428	025740	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6429							
6430	025746	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6431	025752	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
6432	025754	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
6433	025756	104265			ERROR	265	;MSG B0 ERROR
6434	025760	104274			ERROR	274	;MSG A1 ERROR
6435	025762	104266			ERROR	266	;MSG B1 ERROR
6436							
6437	025764	004737	045522		JSR	PC,SUBCLR	
6438	025770	104024			ERROR	24	;CERR AFTER SCLR
6439							
6440	025772	005037	001176		CLR	\$ESCAPE	
6441							
6442	025776	012700	001674		MOV	#RHTAB,RO	
6443	026002	012765	000025	000000	MOV	#<RDHEAD>,RKCS1(R5)	;READ HEADER CMD
6444	026010	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
6445	026016	004737	043612		JSR	PC,FRDY	;FIND RDY
6446	026022	104171			ERROR	171	;NO RDY AFTER READ HEADER CMD
6447	026024	032737	100000	003334	BIT	#CERR,HCS1	
6448	026032	001405			BEQ	67\$	
6449	026034	104174			ERROR	174	;CERR AFTER READ HEADER CMD
6450	026036	104401	056333		TYPE	MSG18	;ABORT BALANCE OF TESTS
6451	026042	000137	043076		JMP	\$EOP	;ABORT DRIVE
6452							
6453	026046	016520	000024		MOV	RKDB(R5),(RO)+	;1'ST WORD FROM SILO TO RHTAB
6454	026052	016520	000024		MOV	RKDB(R5),(RO)+	;2'ND WORD
6455	026056	016520	000024		MOV	RKDB(R5),(RO)+	;3'RD WORD
6456							
6457							
6458	026062	032765	100000	000010	BIT	#DLT,RKCS2(R5)	
6459	026070	001407			BEQ	68\$	
6460	026072	004737	045150		JSR	PC,GSTAT	
6461	026076	104173			ERROR	173	;DLT AFTER READ HEADER CMD
6462	026100	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
6463	026104	000137	043076		JMP	\$EOP	;ABORT DRIVE
6464	026110						
6465							
6466	026110	023727	001674	000001	CMP	RHTAB,#1	;CHECK WORD 0, CYL # ONLY
6467	026116	001001			BNE	5\$	
6468	026120	104240			ERROR	240	;CYL 1 HEADERS ON CYL 0
6469							
6470	026122	005737	001674		TST	RHTAB	
6471	026126	001401			BEQ	6\$	
6472	026130	104202			ERROR	202	;READ CYL WORD HEADER ERROR
6473	026132						
6474	026132	004737	047526		JSR	PC,SWTST	;SEE IF SW 14 OR 8 IS SET
6475	026136	000530			BR	TST31	;GO TO NEXT TEST
6476							;RETURN HERE IF SW 14 IS SET OR
6477							;SW 8 WITH SWR <7:0> APPLY
6478	026140	004737	045522		JSR	PC,SUBCLR	
6479	026144	104024			ERROR	24	;CERR AFTER SCLR
6480	026146	012765	000001	000020	MOV	#1,RKDC(R5)	;RECONDITION BACK TO CYL 1
6481							

D10

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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130 TEST RECALIBRATE CMD & (C) HEADERS

SEQ 0120

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6482 026154 012765 000017 000000      MOV      #SEEK,RKCS1(-5) ;SEEK CMD TO RECONDITION DRIVE.
6483 026162 013737 001414 003372      MOV      T10,TEMP1      ;SETUP TIMEOUT
6484 026170 004737 043612              JSR      PC,FRDY        ;FIND RDY
6485 026174 104131                      ERROR    131          ;NO RDY AFTER SEEK CMD.
6486
6487 026176 013737 001426 003372      MOV      T50000,TEMP1
6488 026204 004737 044222              JSR      PC,FATT2      ;FIND ATTN
6489 026210 104132                      ERROR    132          ;NO ATTN AFTER SEEK CMD
6490 026212 032737 100000 003334      BIT      #CERR,HCS1
6491 026220 001401                      BEQ      69$
6492 026222 104210                      ERROR    210          ;CERR AFTER SEEK CMD.
6493
6494 026224 004737 045522              69$: JSR      PC,SUBCLR
6495 026230 104024                      ERROR    24          ;CERR AFTER SCLR
6496
6497
6498
6499 026232 012737 010340 003424      MOV      #<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
6500 026240 005037 003426              CLR      E.B0          ;EXPECTED MSG B0
6501 026244 012737 001720 003430      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1 ;EXPECTED A1
6502 026252 012737 000001 003432      MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
6503 026260 005037 003434              CLR      E.A2          ;EXPECTED MSG A2
6504 026264 012737 000002 003436      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
6505 026272 012737 000003 003442      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
6506 026300 012737 000022 003436      MOV      #<BIT4!2>,E.B2 ;EXPECTED MSG B2 & ID FOR CYL 1
6507
6508 026306 004737 044334              JSR      PC,CHKMSG      ;CHECK MSGS A0,B0,A1,B1
6509 026312 000003                      .WORD    T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
6510 026314 104133                      ERROR    133          ;MSG A0 ERROR AFTER SEEK CMD
6511 026316 104134                      ERROR    134          ;MSG B0 ERROR
6512 026320 104135                      ERROR    135          ;MSG A1 ERROR
6513 026322 104136                      ERROR    136          ;MSG B1 ERROR
6514 026324 023727 001364 000001      CMP      CYLADD,#1
6515 026332 001401                      BEQ      9$
6516 026334 104043                      ERROR    43          ;CYL ADDR IN RKMR3 NOT=RKDC
6517 026336
6518 026336 005037 001176              9$: CLR      $ESCAPE
6519 026342 005737 001410              TST      LPFLG
6520 026346 001402                      BEQ      70$
6521 026350 000177 152534              JMP      @SLPERR      ;SW 9 WAS SET.
6522 026354 000177 152526              70$: JMP      @SLPADR      ;SW 14 OR 8 WAS SET
6523 026360
6524 026360 005237 001410              10$: INC      LPFLG
6525 026364 032777 001000 152546      BIT      #SW9,@SWR
6526 026372 001262                      BNE      8$
6527 026374 000137 025472              JMP      2$
6528 026400
6529 026400 005237 001410              12$: INC      LPFLG
6530 026404 032777 001000 152526      BIT      #SW9,@SWR
6531 026412 001252                      BNE      8$
6532 026414 000137 025764              JMP      4$
6533
6534
6535
6536
6537
*****
;TEST 31 SINGLE INCREMENT SEEKS TO CYL 410
;
; THIS TEST DOES SINGLE INCREMENT SEEKS OUT TO CYL 410
; WITHOUT ANY WRITING OR READING SO AS NOT TO INADVERTENTLY

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JNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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*31 SINGLE INCREMENT SEEKS TO CYL 410

SEQ 0121

```

6538
6539
6540
6541 026420 000004
6542 026422 012737 000001 001174
6543 026430 012706 001100
6544
6545 026434 004737 045522
6546 026440 104024
6547 02 442 005037 001350
6548 026446 012737 000001 001352
6549 026454 012737 000001 001360
6550
6551 026462
6552 026462 104415
6553 026464 012706 001100
6554
6555 026470 004737 045522
6556 026474 104024
6557
6558 026476 012737 027302 001176
6559 026504 013765 001352 000020
6560
6561 026512 012765 000017 000000
6562 026520 013737 001414 003372
6563 026526 004737 043612
6564 026532 104131
6565 026534 012737 030140 003424
6566 026542 005037 003426
6567 026546 012737 003720 003430
6568 026554 012737 000001 003432
6569
6570 026562 004737 044334
6571 026566 000003
6572 026570 104203
6573 026572 104204
6574 026574 104205
6575 026576 104206
6576
6577 026600 023727 001362 000001
6578 026606 001401
6579 026610 104212
6580
6581 026612 012737 027322 001176
6582 026620 013737 001422 003372
6583
6584 026626 004737 044222
6585 026632 104132
6586 026634 032737 100000 003334
6587 026642 001401
6588 026644 104210
6589 026646
6590
6591 026646 012737 050340 003424
6592 026654 005037 003426
6593 026660 012737 001720 003430

; * DESTROY DATA.
; *
; *****
; ST31: SCOPE
; MOV #1,STIMES ; DO 1 ITERATION
; MOV #STACK,SP ; RESTORE STK PTR
; JSR PC,SUBCLR
; ERROR 24 ; CERR AFTER SCLR
; CLR FRCYL ; FROM CYL
; MOV #1,TOCYL ; TO CYL
; MOV #1,CALDIF ; CALCULATED DIFF.

1$:
; SCOP1
; MOV #STACK,SP ; RESTORE STK PTR
; JSR PC,SUBCLR
; ERROR 24 ; CERR AFTER SCLR
; MOV #10$,SESCAPE
; MOV TOCYL,RKDC(R5) ; CYL TO SEEK TO
; MOV #SEEK,RKCS1(R5) ; SEEK CMD
; MOV T10,TEMP1 ; SETUP TIMEOUT
; JSR PC,FRDY ; FIND RDY
; ERROR 131 ; NO RDY AFTER SEEK CMD
; MOV #<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0 ; EXPECTED A0
; CLR E.B0
; MOV #<D.FWD!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
; MOV #1,E.B1
; JSR PC,CHKMSG ; CHECK MSGS A0 B0 A1 B1
; .WORD T.A2!T.B2!0 ; & MSGS SPECIFIED HERE
; ERROR 203 ; MSG A0 ERROR DURING SEEK CMD
; ERROR 204 ; MSG B0 ERROR
; ERROR 205 ; MSG A1 ERROR
; ERROR 206 ; MSG B1 ERROR
; CMP CYLDIF,#1
; BEQ 25
; ERROR 212 ; CYL DIFF INCORRECT DURING SEEK

2$:
; MOV #12$,SESCAPE
; MOV T2500,TEMP1 ; SETUP TIMEOUT
; JSR PC,FATT2 ; FIND ATTN
; ERROR 132 ; NO ATTN AFTER SEEK CMD
; BIT #CERR,HCS1
; BEQ 64$
; ERROR 210 ; CERR AFTER SEEK CMD

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

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T31 SINGLE INCREMENT SEEKS TO CYL 410

SEQ 0122

6594	026666	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6595	026674	005037	003434		CLR	E.A2	;EXPECTED MSG A2
6596	026700	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6597	026706	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6598							
6599	026714	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6600	026720	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
6601	026722	104133			ERROR	133	;MSG A0 ERROR AFTER SEEK CMD
6602	026724	104134			ERROR	134	;MSG B0 ERROR
6603	026726	104135			ERROR	135	;MSG A1 ERROR
6604	026730	104136			ERROR	136	;MSG B1 ERROR
6605	026732	005737	001362		TST	CYLDIF	
6606	026736	001401			BEQ	65\$	
6607	026740	104137			ERROR	137	;CYL DIFF NOT CLEARED AFTER SEEK CMD
6608							
6609	026742						
6610							
6611	026742	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
6612	026750	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
6613	026756	012765	000005	000000	MOV	#CLR,RKCS1(R5)	;DRIVE CLEAR CMD
6614	026764	013737	001414	003372	MOV	T10,TEMP1	
6615	026772	004737	043612		JSR	PC,FRDY	;FIND RDY
6616	026776	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
6617	027000	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
6618	027004	000401			BR	66\$	
6619	027006	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
6620	027010						
6621							
6622	027010	012737	010340	003424	MOV	#<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
6623	027016	005037	003426		CLR	E.B0	;EXPECTED MSG B0
6624	027022	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
6625	027030	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6626	027036	005037	003434		CLR	E.A2	;EXPECTED MSG A2
6627	027042	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6628	027050	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6629							
6630	027056	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6631	027062	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
6632	027064	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
6633	027066	104265			ERROR	265	;MSG B0 ERROR
6634	027070	104274			ERROR	274	;MSG A1 ERROR
6635	027072	104266			ERROR	266	;MSG B1 ERROR
6636							
6637	027074	023737	001364	001352	CMP	CYLADD,TOCYL	
6638	027102	001401			BEQ	3\$	
6639	027104	104207			ERROR	207	;CYL ADDR IN RKMR2 NOT=RKDC
6640							
6641	027106	023727	001352	000632	3\$: CMP	TOCYL,#410.	;ALL CYL DONE?
6642	027114	001407			BEQ	4\$	;BR IF YES
6643	027116	005237	001350		INC	FRCYL	;ELSE DO ANOTHER
6644	027122	005237	001352		INC	TOCYL	
6645	027126	001402			BEQ	4\$	;BR IF YES
6646	027130	000137	026462		JMP	1\$	
6647							
6648	027134						
6649	027134	004737	047526		4\$: JSR	PC,SWTST	;SEE IF SW 14 OR 8 IS SET

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T31 SINGLE INCREMENT SEEKS TO CYL 410

SEQ 0123

```

6650 027140 000500          BR      TST32          ; GO TO NEXT TEST
6651                                     ; RETURN HERE IF SW 14 IS SET OR
6652                                     ; SW 8 WITH SWR <7:0> APPLY
6653
6654
6655
6656 027142          65:
6657
6658 027142 004737 045522      JSR      PC,SUBCLR      ;CERR AFTER SCRL
6659 027146 104024          ERROR 24
6660
6661 027150 013765 001352 000020 67$: MOV      TOCYL,RKDC(R5) ,CYL#
6662
6663 027156 012765 000017 000000 MOV      #SEEK,RKCS1(R5) ;SEEK CMD TO RECONDITION DRIVE.
6664 027164 013737 001414 003372 MOV      T10,TEMP1 ;SETUP TIMEOUT
6665 027172 004737 043612      JSR      PC,FRDY      ;FIND RDY
6666 027176 104131          ERROR 131 ;NO RDY AFTER SEEK CMD.
6667
6668 027200 013737 001426 003372 MOV      T50000,TEMP1
6669 027206 004737 044222      JSR      PC,FAT12 ;FIND ATTN
6670 027212 104132          ERROR 132 ;NO ATTN AFTER SEEK CMD
6671 027214 032737 100000 003334 BIT      #CERR,HCS1
6672 027222 001401          BEQ      69$
6673 027224 104210          ERROR 210 ;CERR AFTER SEEK CMD.
6674
6675 027226 004737 045522      69$: JSR      PC,SUBCLR
6676 027232 104024          ERROR 24 ;CERR AFTER SCLR
6677
6678 027234 023727 001352 000000 CMP      TOCYL,#0 ;ALL CYL DONE?
6679 027242 001403          BEQ      68$ ;BR IF YES
6680 027244 005337 001352      DEC      TOCYL ;ELSE DO ANOTHER
6681 027250 000737          BR      67$
6682
6683 027252 004737 045522      68$: JSR      PC,SUBCLR
6684 027256 104024          ERROR 24 ;CERR AFTER SCLR
6685
6686 027260 005037 001176      CLR      $ESCAPE
6687 027264 005737 001410      TST      LPFLG
6688 027270 001402          BEQ      70$
6689 027272 000177 151612      JMP      @SLPERR ;SW 9 WAS SET.
6690 027276 000177 151604      70$: JMP      @SLPADR ;SW 14 OR 8 WAS SET
6691
6692
6693
6694 027302          10$:
6695 027302 005237 001410      INC      LPFLG
6696 027306 032777 001000 151624 BIT      #SW9,@SWR ;LOOP ON ERROR?
6697 027314 001312          BNE      6$ ;YES, RECONDITION DRIVE
6698 027316 000137 026612      JMP      2$ ;RETURN TO MAINLINE
6699
6700 027322          12$:
6701 027322 005237 001410      INC      LPFLG
6702 027326 032777 001000 151604 BIT      #SW9,@SWR ;LOOP ON ERROR?
6703 027334 001302          BNE      6$ ;YES, RECONDITION DRIVE
6704 027336 000137 027134      JMP      4$ ;RETURN TO MAINLINE
6705

```

H10

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T32 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #

SEQ 0124

6706
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027342	000004		
027344	012737	000001	001174
027352	012706	001100	
027356	004737	045522	
027362	104024		
027364	005037	003374	
027370	005037	003376	
027374	012737	002304	003400
027402	013765	003400	000004
027410	012737	001000	003402
027416	013765	003402	000006
027424	012765	000632	000020
027432	012765	177400	000002
027440	012765	000021	000000
027446	013737	001426	003372
027454	004737	043612	
027460	104226		
027462	004737	045150	
027466	032737	100000	003334
027474	001470		
027476	104227		
027500	012737	010340	003424
027506	005037	003426	
027512	012737	001720	003430
027520	012737	000001	003432
027526	005037	003434	
027532	012737	000002	003436
027540	012737	000003	003442

```

*****
*TEST 32      READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #
*
*   THIS TEST VERIFIES THAT CYL 410, 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 FOR BAD
*   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 MSG 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.
*
*   THIS IS THE FIRST TEST WHERE THE READ DATA CMD IS PERFORMED
*****
TST32:  SCOPE
        MOV     #1,STIMES      ;DO 1 ITERATION
        MOV     #STACK,SP      ;RESTORE STK PTR

        JSR     PC,SUBCLR      ;CERR AFTER SCLR
        ERROR   24              ;SECTOR C^R
        CLR     TEMP2           ;0=22 SECTOR HARDWARE DETECTED TABLE
        CLR     TEMP3           ;1=22 SECTOR SOFTWARE DETECTED TABLE
                                   ;2=DONE
        MOV     #BSE22H,TEMP4   ;STORE 22 SECTOR HARDWARE BSE INFO
        MOV     TEMP4,RKBA(R5)
        MOV     #1000,TEMP5     ;TRACK 2, SECTOR 0
        MOV     TEMP5,RKDA(R5)

        1$:  MOV     #410.,RKDC(R5) ;CYL 410
        MOV     #-256.,RKWC(R5) ;LOAD WORD CT
        MOV     #RDATA,RKCS1(R5) ;READ DATA CMD
        MOV     T50000,TEMP1    ;SETUP TIMEOUT
        JSR     PC,FRDY         ;FIND RDY
        ERROR   226             ;NO RDY AFTER READ DATA CMD
        JSR     PC,GSTAT        ;GET FRESH STATUS
        BIT     #CERR,HCS1
        BEQ     B5
        ERROR   227             ;CERR AFTER READ DATA CMD

        MOV     #<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
        CLR     E.B0            ;EXPECTED MSG B0
        MOV     #<0.SPOK!D.CART!D.DOOR!D.BRMH!D.SSP>,E.A1 ;EXPECTED A1
        MOV     #1,E.B1         ;MSG ID FOR EXPECTED MSG B1
        CLR     E.A2            ;EXPECTED MSG A2
        MOV     #2,E.B2         ;MSG ID FOR EXPECTED MSG B2
        MOV     #3,E.B3         ;MSG ID FOR EXPECTED MSG B3

```

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T32 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #

SEQ 0125

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6762 027546 004737 044334      JSR      PC,CHKMSG      ;CHECK MSGS AO,B0,A1,B1
6763 027552 000000              .WORD    0!0!0          ;& MSGS SPECIFIED HERE
6764 027554 104051      ERROR    51              ;MSG AO ERROR AFTER READ DATA CMD
6765 027556 104052      ERROR    52              ;MSG B0 ERROR
6766 027560 104112      ERROR    112             ;MSG A1 ERROR
6767 027562 104113      ERROR    113             ;MSG B1 ERROR
6768
6769 027564 004737 045522      JSR      PC,SUBCLR
6770 027570 104024      ERROR    24              ;CERR AFTER SUBCLR
6771
6772 027572 005237 003374      INC      TEMP2
6773 027576 023727 003374 000005  CMP     TEMP2,#5      ;READ ALL 5 SECTORS?
6774 027604 001007              BNE     5$
6775 027606 005737 003376      TST     TEMP3
6776 027612 001002              BNE     2$
6777 027614 104233      ERROR    233             ;CANT READ SECTORS 0,2,4,6,8
6778 027616 000414              BR      3$
6779 027620 104230      2$:  ERROR    230             ;CANT READ SECTORS 10,12,14,16,18,20
6780 027622 000412              BR      3$
6781
6782 027624 013765 003400 000004 5$:  MOV     TEMP4,RKBA(R5) ;RESTORE TABLE ADDR
6783 027632 062737 000002 003402  ADD     #2,TEMP5      ;SETUP TO READ 2 SECTORS FROM LAST
6784 027640 013765 003402 000006  MOV     TEMP5,RKDA(R5)
6785 027646 000666              BR      1$
6786
6787 027650 005237 001456      3$:  INC     BSERR
6788 027654 000454              BR      TST33      ;SET BSE FLAG
6789                                ;GO TO NEXT TEST
6790
6791 027656 005737 002312      8$:  TST     BSE22H+6      ;TEST CARTRIDGE TYPE
6792 027662 001404              BEQ     9$          ;BRANCH IF DATA CARTRIDGE
6793 027664 104235              ERROR    235             ;ALIGNMENT CARTRIDGE USED
6794 027666 005237 001456      INC     BSERR
6795 027672 000426              BR      10$          ;SET BSE ERROR FLAG
6796
6797 027674 005237 003376 000001 9$:  INC     TEMP3
6798 027700 023727 003376      CMP     TEMP3,#1
6799 027706 001020              BNE     10$
6800 027710 005037 003374      CLR     TEMP2
6801 027714 012737 054472 003400  MOV     #BSE22S,TEMP4 ;STORE 22 SECTOR SOFTWARE BSE ADDR
6802 027722 013765 003400 000004  MOV     TEMP4,RKBA(R5) ;TRACK 2, SECTOR 12
6803 027730 012737 001012 003402  MOV     #1012,TEMP5
6804 027736 013765 003402 000006  MOV     TEMP5,RKDA(R5)
6805 027744 000137 027424      JMP     1$          ;REPEAT
6806
6807 027750 005737 001216      10$: TST     $PASS
6808 027754 001014              BNE     TST33      ;GO TO NEXT TST IF NOT 1'ST PASS
6809 027756 104401 056304      TYPE    MSG17      ;CART SERIAL #
6810 027762 012746 002304      MOV     #BSE22H,-(SP)
6811 027766 004737 053676      JSR     PC,$DB20      ;CONVERT DBL BINARY WORD TO OCTAL
6812 027772 004737 054246      JSR     PC,$SUPRS      ;TYPE SERIAL #
6813 027776 104401 001205      TYPE    ,SCLRF
6814 030002 104401 001205      TYPE    ,SCLRF
6815
6816
6817
;*****
;TEST 33      DETECT INNER LIMIT
;*
```

J10

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T33 DETECT INNER LIMIT

SEQ 0126

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6827 030006 000004
6828 030010 012737 000001 001174
6829 030016 012706 001100
6830
6831 030022 004737 045522
6832 030026 104024
6833
6834 030030 005037 001410
6835 030034 005237 001462
6836 030040 005237 003316
6837
6838 030044 012765 000020 000026
6839 030052 012765 000631 000020
6840 030060 012765 000017 000000
6841 030066 013737 001414 003372
6842 030074 004737 043612
6843 030100 104122
6844 030102 004737 044074
6845 030106 104125
6846 030110 012737 050340 003424
6847 030116 012737 001200 003426
6848 030124 012737 001720 003430
6849 030132 012737 000001 003432
6850
6851 030140 004737 044334
6852 030144 000000
6853 030146 104110
6854 030150 104111
6855 030152 104146
6856 030154 104147
6857
6858 030156 012765 100000 000000
6859 030164 013765 001222 000010
6860 030172 012765 000005 000000
6861 030200 013737 001414 003372
6862 030206 004737 043612
6863 030212 104151
6864 030214 004737 044074
6865 030220 000401
6866 030222 104154
6867 030224
6868
6869 030224 012737 010340 003424
6870 030232 005037 003426
6871 030236 012737 001720 003430
6872 030244 012737 000001 003432
6873 030252 005037 003434

: * THIS TEST VERIFIES THAT THE LAST CYL IN THE ABOVE
: * TEST WAS 410 BY DETECTING INNER LIMIT AS THE ADJACENT CYL.
: * IF THIS TEST FAILS, IT INDICATES THAT HEADS WERE NOT ON CYL 410
: * & THAT BSE INFO IS NOT VALID. THE FORMAT PACK TEST
: * & ALL READ-WRITE TESTS ARE BYPASSED
: * TO AVOID DESTROYING BSE INFO OR AN ALIGNMENT CARTRIDGE
: * SINCE THERE IS A SEEKING OR LIMIT DETECTION PROBLEM.
: *
: *****
: ST33: SCOPE
: MOV #1,STIMES ;DO 1 ITERATION
: MOV #STACK,SP ;RESTORE STK PTR
: JSR PC,SUBCLR ;SUBSYS CLEAR & GET STATUS
: ERROR 24 ;CERR AFTER SCLR
: CLR LPFLG
: INC BYPCERR ;BYPASS CHECKING FOR ANY CERR IN GSTAT1
: INC UNLD ;USED FOR VALID HALT
: MOV #PAT,RKMR1(R5) ;PARITY & WORD 0
: MOV #409,RKDC(R5) ;CYL 409.
: MOV #SEEK,RKCS1(R5) ;SEEK CMD
: MOV T10,TEMP1
: JSR PC,FRDY ;FIND RDY
: ERROR 122 ;NO RDY FROM SEEK WITH BAD PARITY
: JSR PC,TSTATN ;TEST FOR ATTN
: ERROR 125 ;NO ATTN FROM SEEK WITH BAD PARITY
: MOV #<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED A0
: MOV #<D.FLT!D.PAR>,E.B0
: MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
: MOV #1,E.B1
: JSR PC,CHKMSG ;CHECK MSGS A0,B0,A1,B1
: .WORD 0!0!0 ;& MSGS SPECIFIED HERE
: ERROR 110 ;MSG A0 ERROR AFTER SEEK WITH BAD PARITY
: ERROR 111 ;MSG B0 ERROR
: ERROR 146 ;MSG A1 ERROR
: ERROR 147 ;MSG B1 ERROR
: MOV #CCLR,RKCS1(R5)
: MOV $UNIT,RKCS2(R5) ;DRIVE#
: MOV #CLEAR,RKCS1(R5) ;DRIVE CLEAR CMD
: MOV T10,TEMP1
: JSR PC,FRDY ;FIND RDY
: ERROR 151 ;NO RDY AFTER DRIVE CLEAR CMD
: JSR PC,TSTATN ;TEST FOR ATTN
: BR 645
: ERROR 154 ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
: 645:
: MOV #<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
: CLR E.B0 ;EXPECTED MSG B0
: MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
: MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
: CLR E.A2 ;EXPECTED MSG A2

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K10

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T33 DETECT INNER LIMIT

SEQ 0127

6874	030256	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6875	030264	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6876							
6877	030272	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6878	030276	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
6879	030300	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
6880	030302	104265			ERROR	265	;MSG B0 ERROR
6881	030304	104274			ERROR	274	;MSG A1 ERROR
6882	030306	104266			ERROR	266	;MSG B1 ERROR
6883							
6884							
6885	030310	012765	000632	000020	MOV	#410.,RKDC(R5)	;CYL 410.
6886	030316	012765	000017	000000	MOV	#SEEK,RKCS1(R5)	;SEEK TO CYL 410.
6887	030324	013737	001414	003372	MOV	T10,TEMP1	
6888	030332	004737	043612		JSR	PC,FRDY	;FIND RDY
6889	030336	104131			ERROR	131	;NO RDY AFTER SEEK CMD
6890	030340	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
6891	030346	004737	045150		JSR	PC,GSTAT	
6892	030352	004737	046356		JSR	PC,FLIM	;FIND LIMIT DETECT
6893	030356	104160			ERROR	160	;LIMIT DETECT NOT FOUND BEFORE TIMEOUT
6894							
6895	030360	032737	040000	003362	BIT	#D.UNLD,HMR2	
6896	030366	001003			BNE	15	
6897	030370	104305			ERROR	305	;DRIVE NOT UNLOADING AFTER LIMIT DETECT
6898	030372	000137	031234		JMP	305	;BYPASS REST OF TEST
6899							
6900	030376	012737	031144	001176	15: MOV	#205,\$ESCAPE	;MUST ESCAPE TO CYCLE UP DRIVE & TEST SWR
6901	030404	012737	070140	003424	MOV	#<D.OSC!D.PIP!D.SPIN!D.VV!D.DRA>,E.A0	;EXPECTED A0
6902	030412	012737	002200	003426	MOV	#<D.SKI!D.FLT>,E.B0	
6903	030420	012737	045720	003430	MOV	#<D.UNLD!D.REV!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	
6904	030426	012737	030001	003432	MOV	#<D.LIM!D.NMOV!1>,E.B1	
6905							
6906	030434	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6907	030440	000000			.WORD	0!0!0	;8 MSGS SPECIFIED HERE
6908	030442	104161			ERROR	161	;MSG A0 ERROR AFTER INNER LIMIT DETECT
6909	030444	104162			ERROR	162	;MSG B0 ERROR
6910	030446	104163			ERROR	163	;MSG A1 ERROR
6911	030450	104164			ERROR	164	;MSG B1 ERROR
6912							
6913	030452	004737	044074		JSR	PC,TSTATN	
6914	030456	104165			ERROR	165	;NO ATTN AFTER INNER LIMIT DETECT
6915	030460	005037	001462		CLR	BYPERR	;ALLOW CHECKING CERR IN GSTAT1
6916							
6917	030464	004737	045522		JSR	PC,SUBCLR	;SUBSYS CLR
6918	030470	104024			ERROR	24	;CERR AFTER SCLR
6919	030472	013737	001414	003374	MOV	T10,TEMP2	;SET UP TIMEOUT
6920	030500	004737	046434		JSR	PC,FHDHM	;FIND HEAD HOME
6921	030504	104166			ERROR	166	;HEAD HOME NOT FOUND BEFORE TIMEOUT
6922	030506	004737	046510		JSR	PC,FLOAD	;FIND LOAD HEADS
6923	030512	104167			ERROR	167	;LOAD HEADS NOT FOUND BEFORE TIMEOUT
6924	030514	013737	001416	003374	MOV	T100,TEMP2	;SETUP TIMEOUT
6925	030522	004737	044126		JSR	PC,FATT1	;FIND ATTN
6926	030526	104067			ERROR	67	;ATTN NOT FOUND BEFORE TIMEOUT
6927	030530	005037	001176		25: CLR	\$ESCAPE	
6928	030534	005037	003316		CLR	UNLD	;CLEAR FLAG
6929							

L10

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T33 DETECT INNER LIMIT

SEQ 0128

6930	030540	012737	050340	003424	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
6931	030546	005037	003426		CLR	E.B0	;EXPECTED MSG B0
6932	030552	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
6933	030560	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6934	030566	005037	003434		CLR	E.A2	;EXPECTED MSG A2
6935	030572	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6936	030600	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6937							
6938	030606	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6939	030612	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
6940	030614	104063			ERROR	63	;MSG A0 ERROR AT END OF HEAD LOADING
6941	030616	104064			ERROR	64	;MSG B0 ERROR
6942	030620	104065			ERROR	65	;MSG A1 ERROR
6943	030622	104066			ERROR	66	;MSG B1 ERROR
6944							
6945	030624	005737	001362		TST	CYLDIF	;SEE IF MSG A2=0
6946	030630	001401			BEQ	65\$	;BR IF YES
6947	030632	104175			ERROR	175	;MSG A2 NOT CLEARED AT END OF HEAD LOADING
6948	030634	005737	001364		TST	CYLAOD	;SEE IF MSG B2=0
6949	030640	001401			BEQ	66\$	;BR IF YES
6950	030642	104176			ERROR	176	;MSG B2 NOT CLEARED AT END OF HEAD LOADING
6951	030644						
6952							
6953	030644	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
6954	030652	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
6955	030660	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
6956	030666	013737	001414	003372	MOV	T10,TEMP1	
6957	030674	004737	043612		JSR	PC,FRDY	;FIND RDY
6958	030700	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
6959	030702	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
6960	030706	000401			BR	67\$	
6961	030710	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
6962	030712						
6963							
6964	030712	012737	010340	003424	MOV	#<D!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
6965	030720	005037	003426		CLR	E.B0	;EXPECTED MSG B0
6966	030724	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
6967	030732	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
6968	030740	005037	003434		CLR	E.A2	;EXPECTED MSG A2
6969	030744	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
6970	030752	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
6971							
6972	030760	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
6973	030764	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
6974	030766	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
6975	030770	104265			ERROR	265	;MSG B0 ERROR
6976	030772	104274			ERROR	274	;MSG A1 ERROR
6977	030774	104266			ERROR	266	;MSG B1 ERROR
6978							
6979	030776	004737	047526		JSR	PC,SWTST	;SEE IF SW 14 OR 8 IS SET
6980	031002	000514			BR	TST34	;GO TO NEXT TEST
6981							;RETURN HERE IF SW 14 IS SET OR
6982							;SW 8 WITH SWR <7:0> APPLY
6983							
6984							
6985	031004						

10\$:

SEQ 0129

Address	Op Code	Op 1	Op 2	Op 3	Op 4	Op 5	Op 6	Op 7	Op 8	Op 9	Op 10	Op 11	Op 12	Op 13	Op 14	Op 15	Op 16	Op 17	Op 18	Op 19	Op 20	Op 21	Op 22	Op 23	Op 24	Op 25	Op 26	Op 27	Op 28	Op 29	Op 30	Op 31	Op 32	Op 33	Op 34	Op 35	Op 36	Op 37	Op 38	Op 39	Op 40	Op 41	Op 42	Op 43	Op 44	Op 45	Op 46	Op 47	Op 48	Op 49	Op 50	Op 51	Op 52	Op 53	Op 54	Op 55	Op 56	Op 57	Op 58	Op 59	Op 60	Op 61	Op 62	Op 63	Op 64	Op 65	Op 66	Op 67	Op 68	Op 69	Op 70	Op 71	Op 72	Op 73	Op 74	Op 75	Op 76	Op 77	Op 78	Op 79	Op 80	Op 81	Op 82	Op 83	Op 84	Op 85	Op 86	Op 87	Op 88	Op 89	Op 90	Op 91	Op 92	Op 93	Op 94	Op 95	Op 96	Op 97	Op 98	Op 99	Op 100	Op 101	Op 102	Op 103	Op 104	Op 105	Op 106	Op 107	Op 108	Op 109	Op 110	Op 111	Op 112	Op 113	Op 114	Op 115	Op 116	Op 117	Op 118	Op 119	Op 120	Op 121	Op 122	Op 123	Op 124	Op 125	Op 126	Op 127	Op 128	Op 129	Op 130	Op 131	Op 132	Op 133	Op 134	Op 135	Op 136	Op 137	Op 138	Op 139	Op 140	Op 141	Op 142	Op 143	Op 144	Op 145	Op 146	Op 147	Op 148	Op 149	Op 150	Op 151	Op 152	Op 153	Op 154	Op 155	Op 156	Op 157	Op 158	Op 159	Op 160	Op 161	Op 162	Op 163	Op 164	Op 165	Op 166	Op 167	Op 168	Op 169	Op 170	Op 171	Op 172	Op 173	Op 174	Op 175	Op 176	Op 177	Op 178	Op 179	Op 180	Op 181	Op 182	Op 183	Op 184	Op 185	Op 186	Op 187	Op 188	Op 189	Op 190	Op 191	Op 192	Op 193	Op 194	Op 195	Op 196	Op 197	Op 198	Op 199	Op 200	Op 201	Op 202	Op 203	Op 204	Op 205	Op 206	Op 207	Op 208	Op 209	Op 210	Op 211	Op 212	Op 213	Op 214	Op 215	Op 216	Op 217	Op 218	Op 219	Op 220	Op 221	Op 222	Op 223	Op 224	Op 225	Op 226	Op 227	Op 228	Op 229	Op 230	Op 231	Op 232	Op 233	Op 234	Op 235	Op 236	Op 237	Op 238	Op 239	Op 240	Op 241	Op 242	Op 243	Op 244	Op 245	Op 246	Op 247	Op 248	Op 249	Op 250	Op 251	Op 252	Op 253	Op 254	Op 255	Op 256	Op 257	Op 258	Op 259	Op 260	Op 261	Op 262	Op 263	Op 264	Op 265	Op 266	Op 267	Op 268	Op 269	Op 270	Op 271	Op 272	Op 273	Op 274	Op 275	Op 276	Op 277	Op 278	Op 279	Op 280	Op 281	Op 282	Op 283	Op 284	Op 285	Op 286	Op 287	Op 288	Op 289	Op 290	Op 291	Op 292	Op 293	Op 294	Op 295	Op 296	Op 297	Op 298	Op 299	Op 300	Op 301	Op 302	Op 303	Op 304	Op 305	Op 306	Op 307	Op 308	Op 309	Op 310	Op 311	Op 312	Op 313	Op 314	Op 315	Op 316	Op 317	Op 318	Op 319	Op 320	Op 321	Op 322	Op 323	Op 324	Op 325	Op 326	Op 327	Op 328	Op 329	Op 330	Op 331	Op 332	Op 333	Op 334	Op 335	Op 336	Op 337	Op 338	Op 339	Op 340	Op 341	Op 342	Op 343	Op 344	Op 345	Op 346	Op 347	Op 348	Op 349	Op 350	Op 351	Op 352	Op 353	Op 354	Op 355	Op 356	Op 357	Op 358	Op 359	Op 360	Op 361	Op 362	Op 363	Op 364	Op 365	Op 366	Op 367	Op 368	Op 369	Op 370	Op 371	Op 372	Op 373	Op 374	Op 375	Op 376	Op 377	Op 378	Op 379	Op 380	Op 381	Op 382	Op 383	Op 384	Op 385	Op 386	Op 387	Op 388	Op 389	Op 390	Op 391	Op 392	Op 393	Op 394	Op 395	Op 396	Op 397	Op 398	Op 399	Op 400	Op 401	Op 402	Op 403	Op 404	Op 405	Op 406	Op 407	Op 408	Op 409	Op 410	Op 411	Op 412	Op 413	Op 414	Op 415	Op 416	Op 417	Op 418
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N10

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T33 DETECT INNER LIMIT

SEQ 0130

7042 031234

7043

7044

7045

7046

7047

7048

7049

7050

7051

7052 031234 000004

7053 031236 012737 000001 001174

7054

7055

7056 031244 012706 001100

7057 031250 005737 001342

7058 031254 001402

7059 031256 104401 056417

7060

7061 031262 005737 001460

7062 031266 001403

7063 031270 104170

7064 031272 000137 043076

7065 031276 005737 001456

7066 031302 001403

7067 031304 104177

7068 031306 000137 033356

7069

7070 031312 004737 045522

7071 031316 104024

7072

7073 031320 104401 056117

7074

7075 031324 005037 001352

7076

7077 031330 013737 001352 001366

7078 031336 012737 000000 001430

7079 031344 012737 000000 001436

7080 031352 004737 046632

7081

7082

7083 031356 012765 001470 000004

7084 031364 012765 177676 000002

7085 031372 000337 001430

7086 031376 013765 001430 000006

7087 031404 000337 001430

7088

7089 031410 012765 000027 000000

7090 031416 013737 001426 003372

7091 031424 004737 043612

7092 031430 104200

7093 031432 004737 045150

7094 031436 032737 100000 003334

7095 031444 001405

7096 031446 104201

7097 031450 104401 056333

FORM:

*TEST 34 FORMAT PACK

THIS TEST FORMATS THE ENTIRE PACK IN 22 SECTOR FORMAT BY
DOING 1 CYL INCREMENTAL SEEKS
FROM 0 TO 410 WITH WRITE HEADER CMDS (ALL TRACKS).
HEADERS WILL BE READ IN THE NEXT TEST

TST34: SCOPE
MOV #1, \$TIMES ; DO 1 ITERATION

MOV #STACK, SP ; RESTORE STK PTR
TST MODTST ; SEE IF MODULE TESTING
BEQ 22\$; BR IF NO
TYPE ,MSG20 ; RUNNING MODIFIED VERSION OF TEST

22\$: TST LIMERR ; CHECK IF FOUND LIMIT DETECT ERROR
BEQ 1\$
ERROR 170 ; FATAL ERROR
JMP \$EOP ; ABORT BAL OF TESTS
1\$: TST BSERR ; CHECK IF FOUND BSE INFO OK
BEQ 2\$
ERROR 177 ; FORMAT TEST BYPASSED-BSE ERROR
JMP 13\$

2\$: JSR PC, SUBCLR
ERROR 24 ; CERR AFTER SCLR
TYPE ,MSG12 ; FORMATTING PACK, PLEASE WAIT

CLR TOCYL
MOV TOCYL, CALADD ; SETUP
MOV #0, HEAD ; TO FILL
MOV #0, FORMAT ; HEADER
JSR PC, FHDTAB ; TABLE

9\$: MOV #HDTAB, RKBA(R5) ; THIS SECTION
MOV #-66., RKWC(R5) ; OF CODE
SWAB HEAD ; IS TO RESTORE STANDARD FORMAT
MOV HEAD, RKDA(R5) ; TO CYL 0
SWAB HEAD ; HEAD 0, 1 & 2

MOV #<WRHEAD>, RKCS1(R5) ; WRITE HEADER CMD
MOV T50000, TEMP1 ; SETUP TIMEOUT
JSR PC, FRDY ; FIND RDY
ERROR 200 ; NO RDY AFTER WRITE HEADER CMD
JSR PC, GSTAT ; GET FRESH STATUS

BIT #CERR, HCS1
BEQ 64\$
ERROR 201 ; CERR AFTER WRITE HEADER CMD
TYPE ,MSG18 ; ADJUSTING BALANCE OF TESTS

B11

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T34 FORMAT PACK

SEQ 0131

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7098 031454 000137 043076          JMP      $EOP          ;ABORT DRIVE
7099 031460          64$:
7100
7101 031460 005237 001430          INC      HEAD
7102 031464 023727 001430 000003    CMP      HEAD,#3
7103 031472 001403          BEQ      11$          ;BR IF ALL HEADS DONE
7104
7105 031474 004737 046632          JSR      PC,FHD*AB
7106 031500 000726          BR      9$
7107
7108 031502 012737 000001 001366 11$: MOV      #1,CALADD      ;SETUP
7109 031510 005037 001430          CLR      HEAD          ;FOR
7110 031514 005037 001436          CLR      FORMAT        ;FHD*AB ROUTINE
7111
7112 031520 012737 000001 001360          MOV      #1,CALDIF      ;SETUP
7113 031526 005037 001350          CLR      FRCYL          ;FOR
7114 031532 012737 000001 001352          MOV      #1,TOCYL        ;ERROR REPORT
7115                                     ;START FORMATTING CYL 1 TO 410 HERE
7116
7117
7118 031540          3$:
7119 031540 104415          SCOP1
7120 031542 012706 001100          MOV      #STACK,SP      ;RESTORE STK PTR
7121
7122 031546 004737 045522          JSR      PC,SUBCLR
7123 031552 104024          ERROR    24          ;CERR AFTER SCLR
7124
7125 031554 005737 001342          TST      MODTST
7126 031560 001404          BEQ      18$          ;SEE IF MODULE TESTING
7127 031562 012737 033316 001176          MOV      #16$,$ESCAPE ;BR IF NO
7128 031570 000403          BR      19$
7129 031572 012737 033006 001176 18$: MOV      #10$,$ESCAPE
7130 031600 013765 001366 000020 19$: MOV      CALADD,RKDC(R5) ;CYL #
7131 031606 000337 001430          SWAB     HEAD
7132 031612 013765 001430 000006          MOV      HEAD,RKDA(R5) ;HEAD #
7133 031620 000337 001430          SWAB     HEAD
7134
7135 031624 012765 000017 000000          MOV      #SEEK,RKCS1(R5) ;SEEK CMD
7136 031632 013737 001414 003372          MOV      T10,TEMP1      ;SETUP TIMEOUT
7137 031640 004737 043612          JSR      PC,FRDY          ;FIND RDY
7138 031644 104131          ERROR    131         ;NO RDY AFTER SEEK CMD
7139 031646 012737 030140 003424          MOV      #<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0 ;EXPECTED A0
7140 031654 005037 003426          CLR      E.B0
7141 031660 012737 003720 003430          MOV      #<D.FWD!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
7142 031666 012737 000001 003432          MOV      #1,E.B1
7143
7144 031674 004737 044334          JSR      PC,CHKMSG      ;CHECK MSGS A0,B0,A1,B1
7145 031700 000003          .WORD    T.A2!T.B2!0      ;& MSGS SPECIFIED HERE
7146 031702 104203          ERROR    203         ;MSG A0 ERROR DURING SEEK CMD
7147 031704 104204          ERROR    204         ;MSG B0 ERROR
7148 031706 104205          ERROR    205         ;MSG A1 ERROR
7149 031710 104206          ERROR    206         ;MSG B1 ERROR
7150
7151 031712 023727 001362 000001          CMP      CYLDIF,#1
7152 031720 001401          BEQ      4$
7153 031722 104212          ERROR    212          ;CYL DIFF INCORRECT DURING SEEK

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7154											
7155	031724	005737	001342		4\$:	TST	MODTST			;SEE IF MODULE TESTING	
7156	031730	001404				BEQ	20\$			;BR IF NO	
7157	031732	012737	033336	001176		MOV	#17\$, \$ESCAPE				
7158	031740	000403				BR	21\$				
7159											
7160	031742	012737	033026	001176	20\$:	MOV	#12\$, \$ESCAPE				
7161	031750	012737	004704	003372	21\$:	MOV	#2500., TEMP1			;SETUP TIMEOUT	
7162											
7163	031756	004737	044222			JSR	PC, FATT2			;FIND ATTN	
7164	031762	104132				ERROR	132			;NO ATTN AFTER SEEK CMD	
7165	031764	032737	100000	003334		BIT	#CERR, HCS1				
7166	031772	001401				BEQ	65\$				
7167	031774	104210				ERROR	210			;CERR AFTER SEEK CMD	
7168	031776				65\$:						
7169											
7170	031776	012737	050340	003424		MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>, E.A0			;EXPECTED MSG A0	
7171	032004	005037	003426			CLR	E.B0			;EXPECTED MSG B0	
7172	032010	012737	001720	003430		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>, E.A1			;EXPECTED A1	
7173	032016	012737	000001	003432		MOV	#1, E.B1			;MSG ID FOR EXPECTED MSG B1	
7174	032024	005037	003434			CLR	E.A2			;EXPECTED MSG A2	
7175	032030	012737	000002	003436		MOV	#2, E.B2			;MSG ID FOR EXPECTED MSG B2	
7176	032036	012737	000003	003442		MOV	#3, E.B3			;MSG ID FOR EXPECTED MSG B3	
7177											
7178	032044	004737	044334			JSR	PC, CHKMSG			;CHECK MSGS A0, B0, A1, B1	
7179	032050	000003				.WORD	T.A2!T.B2!0			; & MSGS SPECIFIED HERE	
7180	032052	104133				ERROR	133			;MSG A0 ERROR AFTER SEEK CMD	
7181	032054	104134				ERROR	134			;MSG B0 ERROR	
7182	032056	104135				ERROR	135			;MSG A1 ERROR	
7183	032060	104136				ERROR	136			;MSG B1 ERROR	
7184	032062	005737	001362			TST	CYLDIF				
7185	032066	001401				BEQ	66\$				
7186	032070	104137				ERROR	137			;CYL DIFF NOT CLEARED AFTER SEEK CMD	
7187											
7188	032072				66\$:						
7189											
7190	032072	012765	100000	000000		MOV	#CLR, RKCS1(R5)				
7191	032100	013765	001222	000010		MOV	\$UNIT, RKCS2(R5)			;DRIVE#	
7192	032106	012765	000005	000000		MOV	#CLEAR, RKCS1(R5)			;DRIVE CLEAR CMD	
7193	032114	013737	001414	003372		MOV	T10, TEMP1				
7194	032122	004737	043612			JSR	PC, FRDY			;FIND RDY	
7195	032126	104151				ERROR	151			;NO RDY AFTER DRIVE CLEAR CMD	
7196	032130	004737	044074			JSR	PC, TSTATN			;TEST FOR ATTN	
7197	032134	000401				BR	67\$				
7198	032136	104154				ERROR	154			;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD	
7199	032140				67\$:						
7200											
7201	032140	012737	010340	003424		MOV	#<D.SPIN!D.DRDY!D.VV!D.DRA>, E.A0			;EXPECTED MSG A0	
7202	032146	005037	003426			CLR	E.B0			;EXPECTED MSG B0	
7203	032152	012737	001720	003430		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>, E.A1			;EXPECTED A1	
7204	032160	012737	000001	003432		MOV	#1, E.B1			;MSG ID FOR EXPECTED MSG B1	
7205	032166	005037	003434			CLR	E.A2			;EXPECTED MSG A2	
7206	032172	012737	000002	003436		MOV	#2, E.B2			;MSG ID FOR EXPECTED MSG B2	
7207	032200	012737	000003	003442		MOV	#3, E.B3			;MSG ID FOR EXPECTED MSG B3	
7208											
7209	032206	004737	044334			JSR	PC, CHKMSG			;CHECK MSGS A0, B0, A1, B1	

D11

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T34 FORMAT PACK

SEQ 0133

7210	032212	000003			.WORD	T.A2!T.B2!0		& MSGS SPECIFIED HERE
7211	032214	104273			ERROR	273		;MSG A0 ERROR AFTER DRIVE CLEAR CMD
7212	032216	104265			ERROR	265		;MSG B0 ERROR
7213	032220	104274			ERROR	274		;MSG A1 ERROR
7214	032222	104266			ERROR	266		;MSG B1 ERROR
7215								
7216	032224	023737	001364	001366	CMP	CYLADD,CALADD		
7217	032232	001401			BEQ	55		
7218	032234	104232			ERROR	232		;CYL ADDR IN RKMR2 NOT=RKDC
7219								
7220	032236				5\$: SCOP1			
7221	032236	104415			MOV	#STACK,SP		;RESTORE STK PTR
7222	032240	012706	001100					
7223								
7224	032244	004737	045522		JSR	PC,SUBCLR		
7225	032250	104024			ERROR	24		;CERR AFTER SCLR
7226								
7227	032252	005037	001176		CLR	\$ESCAPE		
7228	032256	004737	046632		JSR	PC,FHDTAB		;FILL HEADER TABLE
7229	032262	000337	001430		SWAB	HEAD		
7230	032266	013765	001430	000006	MOV	HEAD,RKDA(R5)		;SET TRACK #
7231	032274	000337	001430		SWAB	HEAD		
7232	032300	012765	001470	000004	MOV	#HDTAB,RKBA(R5)		;HEADER WORD TABLE
7233	032306	012765	177676	000002	MOV	#-66,RKWC(R5)		;WORD CT
7234	032314	013765	001366	000020	MOV	CALADD,RKDC(R5)		;CYL #
7235								
7236								
7237	032322	012765	000027	000000	MOV	#(WRHEAD),RKCS1(R5)		;WRITE HEADER CMD
7238	032330	013737	001426	003372	MOV	T50000,TEMP1		;SETUP TIMEOUT
7239	032336	004737	043612		JSR	PC,FRDY		;FIND RDY
7240	032342	104200			ERROR	200		;NO RDY AFTER WRITE HEADER CMD
7241	032344	004737	045150		JSR	PC,GSTAT		;GET FRESH STATUS
7242	032350	032737	100000	003334	BIT	#CERR,HCS1		
7243	032356	001405			BEQ	685		
7244	032360	104201			ERROR	201		;CERR AFTER WRITE HEADER CMD
7245	032362	104401	056333		TYPE	MSG18		;ABORTING BALANCE OF TESTS
7246	032366	000137	043076		JMP	\$EOP		;ABORT DRIVE
7247	032372				68\$:			
7248								
7249	032372	012737	010340	003424	MOV	#(D!D.SPIN!D.DRDY!D.VV!D.DRA),E.A0		;EXPECTED MSG A0
7250	032400	005037	003426		CLR	E.B0		;EXPECTED MSG B0
7251	032404	012737	001720	003430	MOV	#(D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP),E.A1		;EXPECTED A1
7252	032412	012737	000001	003432	MOV	#1,E.B1		;MSG ID FOR EXPECTED MSG B1
7253	032420	005037	003434		CLR	E.A2		;EXPECTED MSG A2
7254	032424	012737	000002	003436	MOV	#2,E.B2		;MSG ID FOR EXPECTED MSG B2
7255	032432	012737	000003	003442	MOV	#3,E.B3		;MSG ID FOR EXPECTED MSG B3
7256								
7257	032440	004737	044334		JSR	PC,CHKMSG		;CHECK MSGS A0,B0,A1,B1
7258	032444	000003			.WORD	T.A2!T.B2!0		& MSGS SPECIFIED HERE
7259	032446	104277			ERROR	277		;MSG A0 ERROR AFTER WRITE HEADER CMD
7260	032450	104267			ERROR	267		;MSG B0 ERROR
7261	032452	104300			ERROR	300		;MSG A1 ERROR
7262	032454	104270			ERROR	270		;MSG B1 ERROR
7263								
7264								
7265	032456	005737	001342		TST	MODTST		;SEE IF MODULE TESTING

E11

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T34 FORMAT PACK

SEQ 0134

7266	032462	001402			BEQ	23\$		;BR IF NO
7267	032464	000137	033046		JMP	14\$		;ELSE RESTORE HEADERS ONLY
7268								
7269	032470	005237	001430		23\$: INC	HEAD		
7270	032474	023727	001430	000002	CMP	HEAD, #2		
7271	032502	001006			BNE	6\$		
7272	032504	023727	001366	000632	CMP	CALADD, #410.		;HEAD 2, SEE IF CYL 410
7273	032512	001002			BNE	6\$		;DO NOT WRITE ON CYL 410 HEAD 2
7274	032514	000137	032746		JMP	7\$		
7275								
7276	032520	023727	001430	000003	6\$: CMP	HEAD, #3		;ALL HEADS DONE?
7277	032526	001243			BNE	5\$		;BR IF NO
7278	032530	005037	001430		CLR	HEAD		;ALL HEADS ON CYL DONE
7279	032534	005237	001366		INC	CALADD		;GO TO NEXT CYL
7280	032540	005237	001350		INC	FRCYL		;FOR ERROR REPORT
7291	032544	005237	001352		INC	TOCYL		;FOR ERROR REPORT
7282	032550	005737	003322		TST	HPEND		;SEE IF HALT PENDING
7283	032554	001002			BNE	24\$		;BR IF YES
7284	032556	000137	031540		JMP	3\$		;ELSE KEEP FORMATTING
7285								
7286	032562	005037	003322		24\$: CLR	HPEND		;CLEAR FOR FUTURE FORMATTING
7287	032566	005037	003320		CLR	BADHDR		;HEADERS NOW OK
7288	032572	000137	047576		JMP	STOP		;GO & HALT THE CPU
7289								
7290	032576	005037	001366		8\$: CLR	CALADD		
7291	032602	005037	001350		CLR	FRCYL		
7292								
7293	032606	004737	045522		JSR	PC, SUBCLR		
7294	032612	104024			ERROR	24		;CERR AFTER SCRL
7295								
7296	032614	013765	001352	000020	69\$: MOV	TOCYL, RKDC(R5)		;CYL#
7297								
7298	032622	012765	000017	000000	MOV	#SEEK, RKCS1(R5)		;SEEK CMD TO RECONDITION DRIVE.
7299	032630	013737	001414	003372	MOV	T10, TEMP1		;SETUP TIMEOUT
7300	032636	004737	043612		JSR	PC, FRDY		;FIND RDY
7301	032642	104131			ERROR	131		;NO RDY AFTER SEEK CMD.
7302								
7303	032644	013737	001426	003372	MOV	T50000, TEMP1		
7304	032652	004737	044222		JSR	PC, FAT12		;FIND ATTN
7305	032656	104132			ERROR	132		;NO ATTN AFTER SEEK CMD
7306	032660	032737	100000	003334	BIT	#CERR, HCS1		
7307	032666	001401			BEQ	71\$		
7308	032670	104210			ERROR	210		;CERR AFTER SEEK CMD.
7309								
7310	032672	004737	045522		71\$: JSR	PC, SUBCLR		
7311	032676	104024			ERROR	24		;CERR AFTER SCRL
7312								
7313	032700	023727	001352	000000	CMP	TOCYL, #0		;ALL CYL DONE?
7314	032706	001403			BEQ	70\$		;BR IF YES
7315	032710	005337	001352		DEC	TOCYL		;ELSE DO ANOTHER
7316	032714	000737			BR	69\$		
7317								
7318	032716	004737	045522		70\$: JSR	PC, SUBCLR		
7319	032722	104024			ERROR	24		;CERR AFTER SCRL
7320								
7321	032724	005037	001176		CLR	\$ESCAPE		

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SEQ 0135

7322	032730	005737	001410		TST	LPFLG	
7323	032734	001402			BEQ	72\$	
7324	032736	000177	146146		JMP	2\$LPERR	;SW 9 WAS SET.
7325	032742	000177	146140	72\$:	JMP	2\$LPADR	;SW 14 OR 8 WAS SET
7326							
7327							
7328	032746	004737	050126	7\$:	JSR	PC HPEN	;SEE IF HALT PENDING
7329	032752	000137	032562		JMP	24\$	;RET HERE IF YES & EXIT
7330							;ELSE RET HERE
7331	032756	004737	047526		JSR	PC SWTSI	;SEE IF SW 14 OR 8 IS SET
7332	032762	000575			BR	T\$135	;GO TO NEXT TEST
7333							;RETURN HERE IF SW 14 IS SET OR
7334							;SW 8 WITH SWR <7:0> APPLY
7335	032764	005037	001176		CLR	\$ESCAPE	
7336	032770	005737	001410		TST	LPFLG	
7337	032774	001402			BEQ	73\$	
7338	032776	000177	146106		JMP	2\$LPERR	;SW 9 WAS SET.
7339	033002	000177	146100	73\$:	JMP	2\$LPADR	;SW 14 OR 8 WAS SET
7340							
7341	033006			10\$:			
7342	033006	005237	001410		INC	LPFLG	
7343	033012	032777	001000	146120	BIT	#SW9, 2\$WR	;LOOP ON ERROR?
7344	033020	001266			BNE	8\$	;YES, RECONDITION DRIVE
7345	033022	000137	031724		JMP	4\$	;RETURN TO MAINLINE
7346							
7347	033026			12\$:			
7348	033026	005237	001410		INC	LPFLG	
7349	033032	032777	001000	146100	BIT	#SW9, 2\$WR	;LOOP ON ERROR?
7350	033040	001256			BNE	8\$	;YES, RECONDITION DRIVE
7351	033042	000137	032236		JMP	5\$	;RETURN TO MAINLINE
7352							
7353							
7354	033046	005237	001430		INC	HEAD	
7355	033052	023727	001430	000003	CMP	HEAD, #3	;SEE IF ALL HEADS DONE
7356	033060	001402			BEQ	15\$	;BR IF YES TO GO BACK TO CYL 0
7357	033062	000137	032236		JMP	5\$	;ELSE REPEAT FOR NEXT HEAD
7358							
7359	033066	005065	000006		15\$:	CLR RKDA(R5)	;SEEK TO CYL 0 & READ HEADERS
7360	033072	005037	001352		CLR	TOCYL	;TO RECONDITION DRIVE
7361							
7362	033076	012765	000017	000000	MOV	#SEEK, RKCS1(R5)	;SEEK CMD TO RECONDITION DRIVE.
7363	033104	013737	001414	003372	MOV	T10, TEMP1	;SETUP TIMEOUT
7364	033112	004737	043612		JSR	PC FRDY	;FIND RDY
7365	033116	104131			ERROR	131	;NO RDY AFTER SEEK CMD.
7366							
7367	033120	013737	001426	003372	MOV	T50000, TEMP1	
7368	033126	004737	044222		JSR	PC, FATT2	;FIND ATTN
7369	033132	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
7370	033134	032737	100000	003334	BIT	#CERR, HCS1	
7371	033142	001401			REQ	74\$	
7372	033144	104210			ERROR	210	;CERR AFTER SEEK CMD.
7373							
7374	033146	004737	045522	74\$:	JSR	PC, SUBCLR	
7375	033152	104024			ERROR	24	;CERR AFTER SCLR
7376							
7377							

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T34 FORMAT PACK

SEQ 0136

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7378
7379 033154 012700 001674      MOV      #RHTAB,RO
7380 033160 012765 000025 000000  MOV      #<RDHEAD>,RKCS1(R5)      ;READ HEADER CMD
7381 033166 013737 001426 003372  MOV      T50000,TEMP1      ;SETUP TIMEOUT
7382 033174 004737 043612      JSR      PC,FRDY      ;FIND RDY
7383 033200 104171      ERROR  171      ;NO RDY AFTER READ HEADER CMD
7384 033202 032737 100000 003334  BIT      #CERR,HCS1
7385 033210 001405      BEQ      76$
7386 033212 104174      ERROR  174      ;CERR AFTER READ HEADER CMD
7387 033214 104401 056333      TYPE    MSG18      ;ABORT BALANCE OF TESTS
7388 033220 000137 043076      JMP      $EOP      ;ABORT DRIVE
7389
7390 033224 016520 000024      76$:  MOV      RK08(R5),(RO)+      ;1'ST WORD FROM SILO TO RHTAB
7391 033230 016520 000024      MOV      RK08(R5),(RO)+      ;2'ND WORD
7392 033234 016520 000024      MOV      RK08(R5),(RO)+      ;3'RD WORD
7393
7394
7395 033240 032765 100000 000010  BIT      #DLT,RKCS2(R5)
7396 033246 001407      BEQ      77$
7397 033250 004737 045150      JSR      PC,GSTAT
7398 033254 104173      ERROR  173      ;DLT AFTER READ HEADER CMD
7399 033256 104401 056333      TYPE    MSG18      ;ABORTING BALANCE OF TESTS
7400 033262 000137 043076      JMP      $EOP      ;ABORT DRIVE
7401 033266
7402      77$:
7403 033266 023737 001674 001352  CMP      RHTAB,TOCYL      ;CHECK WORD 0 (CYL#) ONLY
7404 033274 001401      BEQ      75$      ;BR IF SAME
7405 033276 104310      ERROR  310      ;READ CYL WORD HEADER ERROR
7406 033300      75$:
7407
7408 033300 004737 050126      JSR      PC,HPEN      ;SEE IF HALT PENDING
7409 033304 000137 032562      JMP      24$      ;RET HERE IF YES
7410      ;ELSE RET HERE & EXIT
7411 033310 004737 047526      JSR      PC,SWTST      ;SEE IF SW 14 OR 8 IS SET
7412 033314 000420      BR      T5135      ;GO TO NEXT TEST
7413      ;RETURN HERE IF SW 14 IS SET OR
7414      ;SW 8 WITH SWR <7:0> APPLY
7415 033316      16$:
7416 033316 005237 001410      INC      LPFLG
7417 033322 032777 001000 145610  BIT      #SW9,2SWR      ;LOOP ON ERROR?
7418 033330 001256      BNE      15$      ;YES, RECONDITION DRIVE
7419 033332 000137 031724      JMP      4$      ;RETURN TO MAINLINE
7420 033336      17$:
7421 033336 005237 001410      INC      LPFLG
7422 033342 032777 001000 145570  BIT      #SW9,2SWR      ;LOOP ON ERROR?
7423 033350 001246      BNE      15$      ;YES, RECONDITION DRIVE
7424 033352 000137 032236      JMP      5$      ;RETURN TO MAINLINE
7425
7426
7427 033356      13$:
7428
7429
7430
7431      ;*****
7432      ;*TEST 35      DECREMENT FROM CYL 410 TO 0 & READ HEADERS
7433      ;*

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SEQ 0137

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7434      *      THIS TEST VERIFIES MOTION IN THE NEGATIVE DIRECTION BY
7435      *      SINGLE CYL INCREMENTAL SEEKS.
7436      *
7437      * *****
7438 033356 000004      ST35: SCOPE
7439 033360 012737 000001 001174      MOV      #1,STIMES      ;;DO 1 ITERATION
7440 033366 012706 001100      MOV      #STACK,SP      ;RESTORE STK PTR
7441
7442 033372 104401 056646      TYPE      MSG22      ;FORMATTING FINISHED
7443 033376 104737 001342      TST      MODTST      ;SEE IF MODULE TESTING
7444 033402 001404      BEQ      5$      ;BR IF NO
7445 033404 104401 056566      TYPE      MSG21      ;BYP TESTS 36,40,41
7446 033410 000137 034452      JMP      13$
7447 033414 012737 000632 001350 5$:      MOV      #410.,FRCYL      ;FROM CYL
7448 033422 012737 000631 001352      MOV      #409.,TOCYL      ;TO CYL
7449
7450 033430      1$:
7451 033430 104415      SCOP1
7452 033432 012706 001100      MOV      #STACK,SP      ;RESTORE STK PTR
7453
7454 033436 004737 045522      JSR      PC,SUBCLR
7455 033442 104024      ERROR      24      ;CERR AFTER SCLR
7456
7457 033444 012737 034412 001176      MOV      #10$,SESCAPE
7458 033452 013765 001352 000020      MOV      TOCYL,RKDC(R5)      ;CYL #
7459
7460 033460 012765 000017 000000      MOV      #SEEK,RKCS1(R5)      ;SEEK CMD
7461 033466 013737 001414 003372      MOV      T10,TEMP1      ;SETUP TIMEOUT
7462 033474 004737 043612      JSR      PC,FRDY      ;FIND RDY
7463 033500 104131      ERROR      131      ;NO RDY AFTER SEEK CMD
7464 033502 012737 030140 003424      MOV      #<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0      ;EXPECTED AO
7465 033510 005037 003426      CLR      E.B0
7466 033514 012737 005720 003430      MOV      #<D.REV!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
7467 033522 012737 000001 003432      MOV      #1,E.B1
7468
7469 033530 004737 044334      JSR      PC,CHKMSG      ;CHECK MSGS AO,B0,A1,B1
7470 033534 000003      .WORD      T.A2!T.B2!0      ;& MSGS SPECIFIED HERE
7471 033536 104203      ERROR      203      ;MSG AO ERROR DURING SEEK CMD
7472 033540 104204      ERROR      204      ;MSG B0 ERROR
7473 033542 104205      ERROR      205      ;MSG A1 ERROR
7474 033544 104206      ERROR      206      ;MSG B1 ERROR
7475
7476 033546 023727 001362 000001      CMP      CYLDIF,#1
7477 033554 001401      BEQ      2$
7478 033556 104212      ERROR      212      ;CYL DIFF INCORRECT DURING SEEK<
7479
7480 033560 012737 034432 001176 2$:      MOV      #12$,SESCAPE
7481 033566 012737 004704 003372      MOV      #2500.,TEMP1      ;SETUP TIMEOUT
7482
7483 033574 004737 044222      JSR      PC,FATT2      ;FIND ATTN
7484 033600 104132      ERROR      132      ;NO ATTN AFTER SEEK CMD
7485 033602 032737 100000 003334      BIT      #CERR,HCS1
7486 033610 001401      BEQ      64$
7487 033612 104210      ERROR      210      ;CERR AFTER SEEK CMD
7488
7489      64$:

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SEQ 0139

7490	033614	012737	050340	003424	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
7491	033622	005037	003426		CLR	E.B0	;EXPECTED MSG B0
7492	033626	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
7493	033634	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7494	033642	005037	003434		CLR	E.A2	;EXPECTED MSG A2
7495	033646	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7496	033654	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7497							
7498	033662	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
7499	033666	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
7500	033670	104133			ERROR	133	;MSG A0 ERROR AFTER SEEK CMD
7501	033672	104134			ERROR	134	;MSG B0 ERROR
7502	033674	104135			ERROR	135	;MSG A1 ERROR
7503	033676	104136			ERROR	136	;MSG B1 ERROR
7504	033700	005737	001362		TST	CYLDIF	
7505	033704	001401			BEQ	65\$	
7506	033706	104137			ERROR	137	;CYL DIFF NOT CLEARED AFTER SEEK CMD
7507							
7508	033710					65\$:	
7509							
7510	033710	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
7511	033716	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
7512	033724	012765	000005	000000	MOV	#CLR,RKCS1(R5)	;DRIVE CLEAR CMD
7513	033732	013737	001414	003372	MOV	T10,TEMP1	
7514	033740	004737	043612		JSR	PC,FRDY	;FIND RDY
7515	033744	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
7516	033746	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
7517	033752	000401			BR	66\$	
7518	033754	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
7519	033756					66\$:	
7520							
7521	033756	012737	010340	003424	MOV	#<D!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
7522	033764	005037	003426		CLR	E.B0	;EXPECTED MSG B0
7523	033770	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
7524	033776	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7525	034004	005037	003434		CLR	E.A2	;EXPECTED MSG A2
7526	034010	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7527	034016	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7528							
7529	034024	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
7530	034030	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
7531	034032	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
7532	034034	104265			ERROR	265	;MSG B0 ERROR
7533	034036	104274			ERROR	274	;MSG A1 ERROR
7534	034040	104266			ERROR	266	;MSG B1 ERROR
7535							
7536	034042	023737	001364	001352	CMP	CYLADD,TOCYL	
7537	034050	001401			BEQ	3\$	
7538	034052	104207			ERROR	207	;CYL ADDR IN RKMR3 NOT = RKDC
7539							
7540	034054					3\$:	
7541	034054	104415			SCOP1		
7542	034056	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
7543							
7544	034062	004737	045522		JSR	PC,SUBCLR	
7545	034066	104024			ERROR	24	;CERR AFTER SCLR

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SEQ 0139

7546							
7547	034070	005037	001176		CLR	\$ESCAPE	
7548							
7549	034074	013765	001352	000020	MOV	TOCYL,RKDC(R5) ;CYL #	
7550							
7551							
7552	034102	012700	001674		MOV	#RHTAB,RO	
7553	034106	012765	000025	000000	MOV	#<RDHEAD>,RKCS1(R5) ;READ HEADER CMD	
7554	034114	013737	001426	003372	MOV	T50000,TEMP1 ;SETUP TIMEOUT	
7555	034122	004737	043612		JSR	PC,FRDY ;FIND RDY	
7556	034126	104171			ERROR	171 ;NO RDY AFTER READ HEADER CMD	
7557	034130	032737	100000	003334	BIT	#CERR,HCS1	
7558	034136	001405			BEQ	68\$	
7559	034140	104174			ERROR	174 ;CERR AFTER READ HEADER CMD	
7560	034142	104401	056333		TYPE	MSG18 ;ABORT BALANCE OF TESTS	
7561	034146	000137	043076		JMP	\$EOP ;ABORT DRIVE	
7562							
7563	034152	016520	000024		68\$: MOV	RKDB(R5),(R0)+ ;1'ST WORD FROM SILO TO RHTAB	
7564	034156	016520	000024		MOV	RKDB(R5),(R0)+ ;2'ND WORD	
7565	034162	016520	000024		MOV	RKDB(R5),(R0)+ ;3'RD WORD	
7566							
7567							
7568	034166	032765	100000	000010	BIT	#DLT,RKCS2(R5)	
7569	034174	001407			BEQ	69\$	
7570	034176	004737	045150		JSR	PC,GSTAT	
7571	034202	104173			ERROR	173 ;DLT AFTER READ HEADER CMD	
7572	034204	104401	056333		TYPE	MSG18 ;ABORTING BALANCE OF TESTS	
7573	034210	000137	043076		JMP	\$EOP ;ABORT DRIVE	
7574	034214				69\$:		
7575							
7576	034214	023737	001674	001352	CMP	RHTAB,TOCYL ;CHECK WORD 0 (CYL#) ONLY	
7577	034222	001401			BEQ	67\$;BR IF SAME	
7578	034224	104310			ERROR	310 ;READ CYL WORD HEADER ERROR	
7579	034226				67\$:		
7580							
7581	034226	005337	001350		DEC	FRCYL	
7582	034232	001404			BEQ	4\$	
7583	034234	005337	001352		DEC	TOCYL	
7584	034240	000137	033430		JMP	1\$	
7585							
7586	034244				4\$:		
7587	034244	004737	047526		JSR	PC,SWTST ;SEE IF SW 14 OR 8 IS SET	
7588	034250	000500			BR	TS136 ;GO TO NEXT TEST	
7589							
7590							
7591							
7592							
7593	034252				6\$:		
7594							
7595	034252	004737	045522		JSR	PC,SUBCLR	
7596	034256	104024			ERROR	24 ;CERR AFTER SCRL	
7597							
7598	034260	013765	001352	000020	70\$: MOV	TOCYL,RKDC(R5) ;CYL#	
7599							
7600	034266	012765	000017	000000	MOV	#SEEK,RKCS1(R5) ;SEEK CMD TO RECONDITION DRIVE.	
7601	034274	013737	001414	003372	MOV	T10,TEMP1 ;SETUP TIMEOUT	

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SEQ 0140

7602	034302	004737	043612		JSR	PC,FRDY		;FIND RDY
7603	034306	104131			ERROR	131		;NO RDY AFTER SEEK CMD.
7604								
7605	034310	013737	001426	003372	MOV	T50000,TEMP1		
7606	034316	004737	044222		JSR	PC,FAT12		;FIND ATTN
7607	034322	104132			ERROR	132		;NO ATTN AFTER SEEK CMD
7608	034324	032737	100000	003334	BIT	#CERR,HCS1		
7609	034332	001401			BEQ	72\$		
7610	034334	104210			ERROR	210		;CERR AFTER SEEK CMD.
7611								
7612	034336	004737	045522		72\$: JSR	PC,SUBCLR		
7613	034342	104024			ERROR	24		;CERR AFTER SCLR
7614								
7615	034344	023727	001352	000632	CMP	TOCYL,#410.		;ALL CYL DONE?
7616	034352	001403			BEQ	71\$		;BR IF YES
7617	034354	005237	001352		INC	TOCYL		;ELSE DO ANOTHER
7618	034360	000737			BR	70\$		
7619								
7620	034362	004737	045522		71\$: JSR	PC,SUBCLR		
7621	034366	104024			ERROR	24		;CERR AFTER SCLR
7622								
7623	034370	005037	001176		CLR	\$ESCAPE		
7624	034374	005737	001410		TST	LPFLG		
7625	034400	001402			BEQ	73\$		
7626	034402	000177	144502		JMP	\$SLPERR		;SW 9 WAS SET.
7627	034406	000177	144474		73\$: JMP	\$SLPADR		;SW 14 OR 8 WAS SET
7628								
7629								
7630								
7631	034412				10\$: INC	LPFLG		
7632	034412	005237	001410		BIT	#SW9,\$SWR		;LOOP ON ERROR?
7633	034416	032777	001000	144514	BNE	6\$		;YES, RECONDITION DRIVE
7634	034424	001312			JMP	2\$		;RETURN TO MAINLINE
7635	034426	000137	033560					
7636								
7637	034432				12\$: INC	LPFLG		
7638	034432	005237	001410		BIT	#SW9,\$SWR		;LOOP ON ERROR?
7639	034436	032777	001000	144474	BNE	6\$		;YES, RECONDITION DRIVE
7640	034444	001302			JMP	3\$		;RETURN TO MAINLINE
7641	034446	000137	034054					
7642								
7643	034452				13\$:			
7644								
7645								
7646								
7647								
7648								
7649								
7650								
7651								
7652								
7653								
7654								
7655								
7656								
7657								

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*****
*TEST 36      SEEK FROM CYL 0 TO ALL MAJOR CYLS & READ HEADERS
*
*      THIS TEST SEEKS FROM CYL 0 TO ALL THE MAJOR CYLS & READS HEADERS.
*      IT THEN SEEKS CYL 0 & READS HEADERS.
*
*      MAJOR CYLS ARE: 1 (DECIMAL) = 1 (OCTAL)
*                      2           2
*                      4           4
*                      8          10
*                     16          20
*                     32          40
*

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T36 SEEK FROM CYL 0 TO ALL MAJOR CYLS & READ HEADERS

SEQ 0141

7658					;		64	100
7659					;		128	200
7660					;		256	400
7661					;			
7662					*****			
7663	034452	000004			T36: SCOPE			
7664	034454	012737	000001	001174	MOV #1,\$TIMES	;;DO 1 ITERATION		
7665	034462	012706	001100		MOV #STACK,SP	;RESTORE STK PTR		
7666								
7667	034466	012737	000000	001350	MOV #0,FRCYL	;SETUP FROM CYL		
7668	034474	012737	000001	001352	MOV #1,TOCYL	;SETUP TO CYL		
7669								
7670	034502				15: SCOP1			
7671	034502	104415			MOV #STACK,SP	;RESTORE STK PTR		
7672	034504	012706	001100					
7673								
7674	034510	004737	045522		JSR PC,SUBCLR			
7675	034514	104024			ERROR 24	;CERR AFTER SCLR		
7676								
7677	034516	012737	036276	001176	MOV #10\$, \$ESCAPE			
7678	034524	013737	001350	003376	MOV FRCYL,TEMP3	;SETUP		
7679	034532	013737	001352	003400	MOV TOCYL,TEMP4	;CYL DIFF		
7680	034540	163737	003376	003400	SUB TEMP3,TEMP4	;FOR		
7681	034546	013737	003400	001360	MOV TEMP4,CALDIF	;ERROR PRINTOUT		
7682								
7683	034554	013765	001352	000020	MOV TOCYL,RKDC(R5)	;GO TO CYL #		
7684								
7685	034562	012765	000017	000000	MOV #SEEK,RKCS1(R5)	;SEEK CMD		
7686	034570	013737	001414	003372	MOV T10,TEMP1	;SETUP TIMEOUT		
7687	034576	004737	043612		JSR PC,FRDY	;FIND RDY		
7688	034602	104131			ERROR 131	;NO RDY AFTER SEEK CMD		
7689	034604	012737	030140	003424	MOV #<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0	;EXPECTED A0		
7690	034612	005037	003426		CLR E.B0			
7691	034616	012737	003720	003430	MOV #<D.FWD!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1			
7692	034624	012737	000001	003432	MOV #1,E.B1			
7693								
7694	034632	004737	044334		JSR PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1		
7695	034636	000003			.WORD T.A2!T.B2!0	; & MSGS SPECIFIED HERE		
7696	034640	104203			ERROR 203	;MSG A0 ERROR DURING SEEK CMD		
7697	034642	104204			ERROR 204	;MSG B0 ERROR		
7698	034644	104205			ERROR 205	;MSG A1 ERROR		
7699	034646	104206			ERROR 206	;MSG B1 ERROR		
7700								
7701	034650	012737	036316	001176	25: MOV #12\$, \$ESCAPE			
7702	034656	013737	001426	003372	MOV T50000,TEMP1	;SETUP TIMEOUT		
7703								
7704	034664	004737	044222		JSR PC,FATT2	;FIND ATTN		
7705	034670	104132			ERROR 132	;NO ATTN AFTER SEEK CMD		
7706	034672	032737	100000	003334	BIT #CERR,HCS1			
7707	034700	001401			BEQ 645			
7708	034702	104210			ERROR 210	;CERR AFTER SEEK CMD		
7709	034704				645:			
7710								
7711	034704	012737	050340	003424	MOV #<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0		
7712	034712	005037	003426		CLR E.B0	;EXPECTED MSG B0		
7713	034716	012737	001720	003430	MOV #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1		

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SEQ 0142

7714	034724	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7715	034732	005037	003434		CLR	E.A2	;EXPECTED MSG A2
7716	034736	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7717	034744	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7718							
7719	034752	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
7720	034756	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
7721	034760	104133			ERROR	133	;MSG A0 ERROR AFTER SEEK CMD
7722	034762	104134			ERROR	134	;MSG B0 ERROR
7723	034764	104135			ERROR	135	;MSG A1 ERROR
7724	034766	104136			ERROR	136	;MSG B1 ERROR
7725	034770	005737	001362		TST	CYLDIF	
7726	034774	001401			BEQ	65\$	
7727	034776	104137			ERROR	137	;CYL DIFF NOT CLEARED AFTER SEEK CMD
7728							
7729	035000						
7730							
7731	035000	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
7732	035006	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
7733	035014	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
7734	035022	013737	001414	003372	MOV	T10,TEMP1	
7735	035030	004737	043612		JSR	PC,FRDY	;FIND RDY
7736	035034	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
7737	035036	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
7738	035042	000401			BR	66\$	
7739	035044	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
7740	035046						
7741							
7742	035046	012737	010340	003424	MOV	#<D!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
7743	035054	005037	003426		CLR	E.B0	;EXPECTED MSG B0
7744	035060	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
7745	035066	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
7746	035074	005037	003434		CLR	E.A2	;EXPECTED MSG A2
7747	035100	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
7748	035106	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
7749							
7750	035114	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
7751	035120	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
7752	035122	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
7753	035124	104265			ERROR	265	;MSG B0 ERROR
7754	035126	104274			ERROR	274	;MSG A1 ERROR
7755	035130	104266			ERROR	266	;MSG B1 ERROR
7756							
7757	035132	023737	001364	001352	CMP	CYLADD,TOCYL	
7758	035140	001401			BEQ	3\$	
7759	035142	104207			ERROR	207	;CYL ADDR IN RKMR3 NOT
7760							
7761	035144						
7762	035144	104415			SCOP1		
7763	035146	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
7764							
7765	035152	004737	045522		JSR	PC,SUBCLR	
7766	035156	104024			ERROR	24	;CERR AFTER SCLR
7767							
7768	035160	005037	001176		CLR	\$ESCAPE	
7769	035164	013765	001352	000020	MOV	TOCYL,RKDC(R5)	;CYL #

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SEQ 0143

7770							
7771							
7772	035172	012700	001674		MOV	#RHTAB,RO	
7773	035176	012765	000025	000000	MOV	#<RDHEAD>,RKCS1(R5)	;READ HEADER CMD
7774	035204	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
7775	035212	004737	043612		JSR	PC,FRDY	;FIND RDY
7776	035216	104171			ERROR	171	;NO RDY AFTER READ HEADER CMD
7777	035220	032737	100000	003334	BIT	#CERR,HCS1	
7778	035226	001405			BEQ	68\$	
7779	035230	104174			ERROR	174	;CERR AFTER READ HEADER CMD
7780	035232	104401	056333		TYPE	MSG18	;ABORT BALANCE OF TESTS
7781	035236	000137	043076		JMP	\$EOP	;ABORT DRIVE
7782							
7783	035242	016520	000024		68\$: MOV	RKDB(R5),(RO)+	;1'ST WORD FROM SILO TO RHTAB
7784	035246	016520	000024		MOV	RKDB(R5),(RO)+	;2'ND WORD
7785	035252	016520	000024		MOV	RKDB(R5),(RO)+	;3'RD WORD
7786							
7787							
7788	035256	032765	100000	000010	BIT	#DLT,RKCS2(R5)	
7789	035264	001407			BEQ	69\$	
7790	035266	004737	045150		JSR	PC,GSTAT	
7791	035272	104173			ERROR	173	;DLT AFTER READ HEADER CMD
7792	035274	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
7793	035300	000137	043076		JMP	\$EOP	;ABORT DRIVE
7794	035304				69\$:		
7795							
7796	035304	023737	001674	001352	CMP	RHTAB,TOCYL	;CHECK WORD 0 (CYL#) ONLY
7797	035312	001401			BEQ	67\$	;BR IF SAME
7798	035314	104310			ERROR	310	;READ CYL WORD HEADER ERROR
7799	035316				67\$:		
7800							
7801							
7802	035316	104415			SCOP1		
7803	035320	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
7804							
7805	035324	004737	045522		JSR	PC,SUBCLR	
7806	035330	104024			ERROR	24	;CERR AFTER SCLR
7807							
7808	035332	012737	036336	001176	MOV	#14\$, \$ESCAPE	
7809	035340	013765	001350	000020	MOV	FRCYL,RKDC(R5)	;RETURN TO CYL #
7810	035346	013737	001350	001354	MOV	FRCYL,CCYL	;CURRENT CYL FOR TRUERROR ROUTINE
7811							
7812	035354	012765	000017	000000	MOV	#SEEK,RKCS1(R5)	;SEEK CMD
7813	035362	013737	001414	003372	MOV	T10,TEMP1	;SETUP TIMEOUT
7814	035370	004737	043612		JSR	PC,FRDY	;FIND RDY
7815	035374	104131			ERROR	131	;NO RDY AFTER SEEK CMD
7816	035376	012737	030140	003424	MOV	#<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0	;EXPECTED A0
7817	035404	005037	003426		CLR	E.B0	
7818	035410	012737	005720	003430	MOV	#<D.REV!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	
7819	035416	012737	000001	003432	MOV	#1,E.B1	
7820							
7821	035424	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
7822	035430	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
7823	035432	104203			ERROR	203	;MSG A0 ERROR DURING SEEK CMD
7824	035434	104204			ERROR	204	;MSG B0 ERROR
7825	035436	104205			ERROR	205	;MSG A1 ERROR

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T36 SEEK FROM CYL 0 TO ALL MAJOR CYLS & READ HEADERS

SEQ 0144

7826	035440	104206		ERROR	206		;MSG B1 ERROR
7827							
7828							
7829	035442	012737	036356	001176	45:	MOV	#16\$, \$ESCAPE
7830	035450	013737	001426	003372		MOV	T50000, TEMPI ;SETUP TIMEOUT
7831							
7832	035456	004737	044222			JSR	PC, FATT2 ;FIND ATTN
7833	035462	104132				ERROR	132 ;NO ATTN AFTER SEEK CMD
7834	035464	032737	100000	003334		BIT	#CERR, HCS1
7835	035472	001401				BEQ	70\$
7836	035474	104210				ERROR	210 ;CERR AFTER SEEK CMD
7837	035476				70\$:		
7838							
7839	035476	012737	050340	003424		MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>, E.A0 ;EXPECTED MSG A0
7840	035504	005037	003426			CLR	E.B0 ;EXPECTED MSG B0
7841	035510	012737	001720	003430		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>, E.A1 ;EXPECTED A1
7842	035516	012737	000001	003432		MOV	#1, E.B1 ;MSG ID FOR EXPECTED MSG B1
7843	035524	005037	003434			CLR	E.A2 ;EXPECTED MSG A2
7844	035530	012737	000002	003436		MOV	#2, E.B2 ;MSG ID FOR EXPECTED MSG B2
7845	035536	012737	000003	003442		MOV	#3, E.B3 ;MSG ID FOR EXPECTED MSG B3
7846							
7847	035544	004737	044334			JSR	PC, CHKMSG ;CHECK MSGS A0, B0, A1, B1
7848	035550	000003				.WORD	T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
7849	035552	104133				ERROR	133 ;MSG A0 ERROR AFTER SEEK CMD
7850	035554	104134				ERROR	134 ;MSG B0 ERROR
7851	035556	104135				ERROR	135 ;MSG A1 ERROR
7852	035560	104136				ERROR	136 ;MSG B1 ERROR
7853	035562	005737	001362			TST	CYLDIF
7854	035566	001401				BEQ	71\$
7855	035570	104137				ERROR	137 ;CYL DIFF NOT CLEARED AFTER SEEK CMD
7856							
7857	035572				71\$:		
7858							
7859	035572	012765	100000	000000		MOV	#CLR, RKCS1(R5)
7860	035600	013765	001222	000010		MOV	\$UNIT, RKCS2(R5) ;DRIVE#
7861	035606	012765	000005	000000		MOV	#CLEAR, RKCS1(R5) ;DRIVE CLEAR CMD
7862	035614	013737	001414	003372		MOV	T10, TEMPI
7863	035622	004737	043612			JSR	PC, FRDY ;FIND RDY
7864	035626	104151				ERROR	151 ;NO RDY AFTER DRIVE CLEAR CMD
7865	035630	004737	044074			JSR	PC, TSTATN ;TEST FOR ATTN
7866	035634	000401				BR	72\$
7867	035636	104154				ERROR	154 ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
7868	035640				72\$:		
7869							
7870	035640	012737	010340	003424		MOV	#<D!D.SPIN!D.DRDY!D.VV!D.DRA>, E.A0 ;EXPECTED MSG A0
7871	035646	005037	003426			CLR	E.B0 ;EXPECTED MSG B0
7872	035652	012737	001720	003430		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>, E.A1 ;EXPECTED A1
7873	035660	012737	000001	003432		MOV	#1, E.B1 ;MSG ID FOR EXPECTED MSG B1
7874	035666	005037	003434			CLR	E.A2 ;EXPECTED MSG A2
7875	035672	012737	000002	003436		MOV	#2, E.B2 ;MSG ID FOR EXPECTED MSG B2
7876	035700	012737	000003	003442		MOV	#3, E.B3 ;MSG ID FOR EXPECTED MSG B3
7877							
7878	035706	004737	044334			JSR	PC, CHKMSG ;CHECK MSGS A0, B0, A1, B1
7879	035712	000003				.WORD	T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
7880	035714	104273				ERROR	273 ;MSG A0 ERROR AFTER DRIVE CLEAR CMD
7881	035716	104265				ERROR	265 ;MSG B0 ERROR

Address	Op Code	Op 2	Op 3	Op 4	Op 5	Op 6	Op 7	Op 8	Op 9	Op 10	Op 11	Op 12	Op 13	Op 14	Op 15	Op 16	Op 17	Op 18	Op 19	Op 20	Op 21	Op 22	Op 23	Op 24	Op 25	Op 26	Op 27	Op 28	Op 29	Op 30	Op 31	Op 32	Op 33	Op 34	Op 35	Op 36	Op 37	Op 38	Op 39	Op 40	Op 41	Op 42	Op 43	Op 44	Op 45	Op 46	Op 47	Op 48	Op 49	Op 50	Op 51	Op 52	Op 53	Op 54	Op 55	Op 56	Op 57	Op 58	Op 59	Op 60	Op 61	Op 62	Op 63	Op 64	Op 65	Op 66	Op 67	Op 68	Op 69	Op 70	Op 71	Op 72	Op 73	Op 74	Op 75	Op 76	Op 77	Op 78	Op 79	Op 80	Op 81	Op 82	Op 83	Op 84	Op 85	Op 86	Op 87	Op 88	Op 89	Op 90	Op 91	Op 92	Op 93	Op 94	Op 95	Op 96	Op 97	Op 98	Op 99	Op 100	Op 101	Op 102	Op 103	Op 104	Op 105	Op 106	Op 107	Op 108	Op 109	Op 110	Op 111	Op 112	Op 113	Op 114	Op 115	Op 116	Op 117	Op 118	Op 119	Op 120	Op 121	Op 122	Op 123	Op 124	Op 125	Op 126	Op 127	Op 128	Op 129	Op 130	Op 131	Op 132	Op 133	Op 134	Op 135	Op 136	Op 137	Op 138	Op 139	Op 140	Op 141	Op 142	Op 143	Op 144	Op 145	Op 146	Op 147	Op 148	Op 149	Op 150	Op 151	Op 152	Op 153	Op 154	Op 155	Op 156	Op 157	Op 158	Op 159	Op 160	Op 161	Op 162	Op 163	Op 164	Op 165	Op 166	Op 167	Op 168	Op 169	Op 170	Op 171	Op 172	Op 173	Op 174	Op 175	Op 176	Op 177	Op 178	Op 179	Op 180	Op 181	Op 182	Op 183	Op 184	Op 185	Op 186	Op 187	Op 188	Op 189	Op 190	Op 191	Op 192	Op 193	Op 194	Op 195	Op 196	Op 197	Op 198	Op 199	Op 200	Op 201	Op 202	Op 203	Op 204	Op 205	Op 206	Op 207	Op 208	Op 209	Op 210	Op 211	Op 212	Op 213	Op 214	Op 215	Op 216	Op 217	Op 218	Op 219	Op 220	Op 221	Op 222	Op 223	Op 224	Op 225	Op 226	Op 227	Op 228	Op 229	Op 230	Op 231	Op 232	Op 233	Op 234	Op 235	Op 236	Op 237	Op 238	Op 239	Op 240	Op 241	Op 242	Op 243	Op 244	Op 245	Op 246	Op 247	Op 248	Op 249	Op 250	Op 251	Op 252	Op 253	Op 254	Op 255	Op 256	Op 257	Op 258	Op 259	Op 260	Op 261	Op 262	Op 263	Op 264	Op 265	Op 266	Op 267	Op 268	Op 269	Op 270	Op 271	Op 272	Op 273	Op 274	Op 275	Op 276	Op 277	Op 278	Op 279	Op 280	Op 281	Op 282	Op 283	Op 284	Op 285	Op 286	Op 287	Op 288	Op 289	Op 290	Op 291	Op 292	Op 293	Op 294	Op 295	Op 296	Op 297	Op 298	Op 299	Op 300	Op 301	Op 302	Op 303	Op 304	Op 305	Op 306	Op 307	Op 308	Op 309	Op 310	Op 311	Op 312	Op 313	Op 314	Op 315	Op 316	Op 317	Op 318	Op 319	Op 320	Op 321	Op 322	Op 323	Op 324	Op 325	Op 326	Op 327	Op 328	Op 329	Op 330	Op 331	Op 332	Op 333	Op 334	Op 335	Op 336	Op 337	Op 338	Op 339	Op 340	Op 341	Op 342	Op 343	Op 344	Op 345	Op 346	Op 347	Op 348	Op 349	Op 350	Op 351	Op 352	Op 353	Op 354	Op 355	Op 356	Op 357	Op 358	Op 359	Op 360	Op 361	Op 362	Op 363	Op 364	Op 365	Op 366	Op 367	Op 368	Op 369	Op 370	Op 371	Op 372	Op 373	Op 374	Op 375	Op 376	Op 377	Op 378	Op 379	Op 380	Op 381	Op 382	Op 383	Op 384	Op 385	Op 386	Op 387	Op 388	Op 389	Op 390	Op 391	Op 392	Op 393	Op 394	Op 395	Op 396	Op 397	Op 398	Op 399	Op 400	Op 401	Op 402	Op 403	Op 404	Op 405	Op 406	Op 407	Op 408	Op 409	Op 410	Op 411	Op 412	Op 413	Op 414	Op 415	Op 416	Op 417	Op 418	Op 419
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T36 SEEK FROM CYL 0 TO ALL MAJOR CYLS & READ HEADERS

SEQ 0146

;SW 8 WITH SWR <7:0> APPLY

7938										
7939	036136				8\$:					
7940										
7941	036136	004737	045522			JSR	PC, SUBCLR			
7942	036142	104024				ERROR	24		;CERR AFTER SCRL	
7943										
7944	036144	013765	001352	000020	76\$:	MOV	TOCYL, RKDC(R5)		;CYL#	
7945										
7946	036152	012765	000017	000000		MOV	#SEEK, RKCS1(R5)		;SEEK CMD TO RECONDITION DRIVE.	
7947	036160	013737	001414	003372		MOV	T10, TEMP1		;SETUP TIMEOUT	
7948	036166	004737	043612			JSR	PC, FROD		;FIND RDY	
7949	036172	104131				ERROR	131		;NO RDY AFTER SEEK CMD.	
7950										
7951	036174	013737	001426	003372		MOV	T50000, TEMP1			
7952	036202	004737	044222			JSR	PC, FAT12		;FIND ATTN	
7953	036206	104132				ERROR	132		;NO ATTN AFTER SEEK CMD	
7954	036210	032737	100000	003334		BIT	#CERR, HCS1			
7955	036216	001401				BEQ	78\$			
7956	036220	104210				ERROR	210		;CERR AFTER SEEK CMD.	
7957										
7958	036222	004737	045522		78\$:	JSR	PC, SUBCLR			
7959	036226	104024				ERROR	24		;CERR AFTER SCLR	
7960										
7961	036230	023727	001352	000000		CMP	TOCYL, #0		;ALL CYL DONE?	
7962	036236	001403				BEQ	77\$		;BR IF YES	
7963	036240	005337	001352			DEC	TOCYL		;ELSE DO ANOTHER	
7964	036244	000737				BR	76\$			
7965										
7966	036246	004737	045522		77\$:	JSR	PC, SUBCLR			
7967	036252	104024				ERROR	24		;CERR AFTER SCLR	
7968										
7969	036254	005037	001176			CLR	\$ESCAPE			
7970	036260	005737	001410			TST	LPFLG			
7971	036264	001402				BEQ	79\$			
7972	036266	000177	142616			JMP	\$SLPERR		;SW 9 WAS SET.	
7973	036272	000177	142610		79\$:	JMP	\$SLPADR		;SW 14 OR 8 WAS SET	
7974										
7975	036276				10\$:					
7976	036276	005237	001410			INC	LPFLG			
7977	036302	032777	001000	142630		BIT	#SW9, \$SWR		;LOOP ON ERROR?	
7978	036310	001312				BNE	8\$		;YES, RECONDITION DRIVE	
7979	036312	000137	034650			JMP	2\$		;RETURN TO MAINLINE	
7980	036316				12\$:					
7981	036316	005237	001410			INC	LPFLG			
7982	036322	032777	001000	142610		BIT	#SW9, \$SWR		;LOOP ON ERROR?	
7983	036330	001302				BNE	8\$		;YES, RECONDITION DRIVE	
7984	036332	000137	035144			JMP	3\$		;RETURN TO MAINLINE	
7985	036336				14\$:					
7986	036336	005237	001410			INC	LPFLG			
7987	036342	032777	001000	142570		BIT	#SW9, \$SWR		;LOOP ON ERROR?	
7988	036350	001272				BNE	8\$		;YES, RECONDITION DRIVE	
7989	036352	000137	035442			JMP	4\$		;RETURN TO MAINLINE	
7990	036356				16\$:					
7991	036356	005237	001410			INC	LPFLG			
7992	036362	032777	001000	142550		BIT	#SW9, \$SWR		;LOOP ON ERROR?	
7993	036370	001262				BNE	8\$		;YES, RECONDITION DRIVE	

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T36 SEEK FROM CYL 0 TO ALL MAJOR CYLS & READ HEADERS

SEQ 0147

```

7994 036372 000137 035736      JMP      SS      ;RETURN TO MAINLINE
7995
7996
7997
7998
7999
8000
8001 036376 000004      ;*****
8002 036400 012737 000001 001174 ;*TEST 37      SEEK TO ALL CYLS FROM 0 & READ HEADERS
8003 036406 012706 001100      ;*****
8004      ST37: SCOPE
8005      MOV      #1,STIMES      ;DO 1 ITERATION
8006      MOV      #STACK,SP      ;RESTORE STK PTR
8007      TST      MODTST      ;SEE IF MODULE TESTING
8008      BEQ      DOSEEK      ;BR IF NO
8009      JMP      CYLINV      ;ELSE BYPASS TESTS 40 & 41
8010      DOSEEK:
8011      MOV      #0,FRCYL      ;SETUP FROM CYL
8012      MOV      #1,TOCYL      ;SETUP TO CYL
8013      1$:
8014      SCOP1
8015      MOV      #STACK,SP      ;RESTORE STK PTR
8016      JSR      PC,SUBCLR      ;CERR AFTER SCLR
8017      ERROR    24
8018
8019      MOV      #10$,SESCAPE
8020      MOV      FRCYL,TEMP3      ;SETUP
8021      MOV      TOCYL,TEMP4      ;CYL DIFF
8022      SUB      TEMP3,TEMP4      ;FOR
8023      MOV      TEMP4,CALDIF      ;ERROR PRINTOUT
8024
8025      MOV      TOCYL,RKDC(R5) ;GO TO CYL #
8026
8027      MOV      #SEEK,RKCS1(R5) ;SEEK CMD
8028      MOV      T10,TEMP1      ;SETUP TIMEOUT
8029      JSR      PC,FRDY      ;FIND RDY
8030      ERROR    131      ;NO RDY AFTER SEEK CMD
8031      MOV      #<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0 ;EXPECTED AO
8032      CLR      E.B0
8033      MOV      #<D.FWD!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
8034      MOV      #1,E.B1
8035
8036      JSR      PC,CHKMSG      ;CHECK MSGS AO,B0,A1,B1
8037      .WORD    T.A2!T.B2!0      ;& MSGS SPECIFIED HERE
8038      ERROR    203      ;MSG AO ERROR DURING SEEK CMD
8039      ERROR    204      ;MSG B0 ERROR
8040      ERROR    205      ;MSG A1 ERROR
8041      ERROR    206      ;MSG B1 ERROR
8042
8043      2$:
8044      MOV      #12$,SESCAPE
8045      MOV      T50000,TEMP1      ;SETUP TIMEOUT
8046
8047      JSR      PC,FATT2      ;FIND ATTN
8048      ERROR    132      ;NO ATTN AFTER SEEK CMD
8049      BIT      #CERR,HCS1

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T37 SEEK TO ALL CYLS FROM 0 & READ HEADERS

SEQ 0148

8050	036636	001401			BEQ	64\$	
8051	036640	104210			ERROR	210	;CERR AFTER SEEK CMD
8052	036642				64\$:		
8053							
8054	036642	012737	050340	003424	MOV	#(D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA),E.A0	;EXPECTED MSG A0
8055	036650	005037	003426		CLR	E.B0	;EXPECTED MSG B0
8056	036654	012737	001720	003430	MOV	#(D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP),E.A1	;EXPECTED A1
8057	036662	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
8058	036670	005037	003434		CLR	E.A2	;EXPECTED MSG A2
8059	036674	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
8060	036702	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
8061							
8062	036710	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
8063	036714	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
8064	036716	104133			ERROR	133	;MSG A0 ERROR AFTER SEEK CMD
8065	036720	104134			ERROR	134	;MSG B0 ERROR
8066	036722	104135			ERROR	135	;MSG A1 ERROR
8067	036724	104136			ERROR	136	;MSG B1 ERROR
8068	036726	005737	001362		TST	CYLDIF	
8069	036732	001401			BEQ	65\$	
8070	036734	104137			ERROR	137	;CYL DIFF NOT CLEARED AFTER SEEK CMD
8071							
8072	036736				65\$:		
8073							
8074	036736	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
8075	036744	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
8076	036752	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
8077	036760	013737	001414	003372	MOV	T10,TEMP1	
8078	036766	004737	043612		JSR	PC,FRDY	;FIND RDY
8079	036772	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
8080	036774	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
8081	037000	000401			BR	66\$	
8082	037002	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
8083	037004				66\$:		
8084							
8085	037004	012737	010340	003424	MOV	#(D!D.SPIN!D.DRDY!D.VV!D.DRA),E.A0	;EXPECTED MSG A0
8086	037012	005037	003426		CLR	E.B0	;EXPECTED MSG B0
8087	037016	012737	001720	003430	MOV	#(D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP),E.A1	;EXPECTED A1
8088	037024	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
8089	037032	005037	003434		CLR	E.A2	;EXPECTED MSG A2
8090	037036	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
8091	037044	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
8092							
8093	037052	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
8094	037056	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
8095	037060	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
8096	037062	104265			ERROR	265	;MSG B0 ERROR
8097	037064	104274			ERROR	274	;MSG A1 ERROR
8098	037066	104266			ERROR	266	;MSG B1 ERROR
8099							
8100	037070	023737	001364	001352	CMP	CYLADD,TOCYL	
8101	037076	001401			BEQ	3\$	
8102	037100	104207			ERROR	207	;CYL ADDR IN RKMR3 NOT=RKDC
8103							
8104	037102				3\$:		
8105	037102	104415			SCOP1		

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JNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T37 SEEK TO ALL CYLS FROM 0 & READ HEADERS

SEQ 0149

8106	037104	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
8107							
8108	037110	004737	045522		JSR	PC,SUBCLR	
8109	037114	104024			ERROR	24	;CERR AFTER SCLR
8110							
8111	037116	005037	001176		CLR	\$ESCAPE	
8112	037122	013765	001352	000020	MOV	TOCYL,RKDC(R5)	;CYL #
8113							
8114							
8115	037130	012700	001674		MOV	#RHTAB,RO	
8116	037134	012765	000025	000000	MOV	#(RDHEAD),RKCS1(R5)	;READ HEADER CMD
8117	037142	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
8118	037150	004737	043612		JSR	PC,FRDY	;FIND RDY
8119	037154	104171			ERROR	171	;NO RDY AFTER READ HEADER CMD
8120	037156	032737	100000	003334	BIT	#CERP,HCS1	
8121	037164	001405			BEQ	68\$	
8122	037166	104174			ERROR	174	;CERR AFTER READ HEADER CMD
8123	037170	104401	056333		TYPE	MSG18	;ABORT BALANCE OF TESTS
8124	037174	000137	043076		JMP	\$EOP	;ABORT DRIVE
8125							
8126	037200	016520	000024		MOV	RKDB(R5),(RO)+	;1'ST WORD FROM SILO TO RHTAB
8127	037204	016520	000024		MOV	RKDB(R5),(RO)+	;2'ND WORD
8128	037210	016520	000024		MOV	RKDB(R5),(RO)+	;3'RD WORD
8129							
8130							
8131	037214	032765	100000	000010	BIT	#DLT,RKCS2(R5)	
8132	037222	001407			BEQ	69\$	
8133	037224	004737	045150		JSR	PC,GSTAT	
8134	037230	104173			ERROR	173	;DLT AFTER READ HEADER CMD
8135	037232	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
8136	037236	000137	043076		JMP	\$EOP	;ABORT DRIVE
8137	037242						
8138							
8139	037242	023737	001674	001352	CMP	RHTAB,TOCYL	;CHECK WORD 0 (CYL#) ONLY
8140	037250	001401			BEQ	67\$	;BR IF SAME
8141	037252	104310			ERROR	310	;READ CYL WORD HEADER ERROR
8142	037254						
8143							
8144							
8145	037254	104415			SCOP1		
8146	037256	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
8147							
8148	037262	004737	045522		JSR	PC,SUBCLR	
8149	037266	104024			ERROR	24	;CERR AFTER SCLR
8150							
8151	037270	012737	040274	001176	MOV	#14\$, \$ESCAPE	
8152	037276	013765	001350	000020	MOV	FRCYL,RKDC(R5)	;RETURN TO CYL #
8153	037304	013737	001350	001354	MOV	FRCYL,CCYL	;CURRENT CYL FOR TRUE ERROR ROUTINE
8154							
8155	037312	012765	000017	000000	MOV	#SEEK,RKCS1(R5)	;SEEK CMD
8156	037320	013737	001414	003372	MOV	T10,TEMP1	;SETUP TIMEOUT
8157	037326	004737	043612		JSR	PC,FRDY	;FIND RDY
8158	037332	104131			ERROR	131	;NO RDY AFTER SEEK CMD
8159	037334	012737	030140	003424	MOV	#(D.PIP!D.SPIN!D.VV!D.DRA),E.A0	;EXPECTED A0
8160	037342	005037	003426		CLR	E.B0	
8161	037346	012737	005720	003430	MOV	#(D.REV!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP),E.A1	

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T37 SEEK TO ALL CYLS FROM 0 & READ HEADERS

SEQ 0150

8162	037354	012737	000001	003432	MOV	#1,E.B1	
8163							
8164	037362	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
8165	037366	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
8166	037370	104203			ERROR	203	;MSG A0 ERROR DURING SEEK CMD
8167	037372	104204			ERROR	204	;MSG B0 ERROR
8168	037374	104205			ERROR	205	;MSG A1 ERROR
8169	037376	104206			ERROR	206	;MSG B1 ERROR
8170							
8171							
8172	037400	012737	040314	001176	4\$: MOV	#16\$, \$ESCAPE	
8173	037406	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
8174							
8175	037414	004737	044222		JSR	PC,FATT2	;FIND ATTN
8176	037420	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
8177	037422	032737	100000	003334	BIT	#CERR,HCS1	
8178	037430	001401			BEQ	70\$	
8179	037432	104210			ERROR	210	;CERR AFTER SEEK CMD
8180	037434				70\$:		
8181							
8182	037434	012737	050340	003424	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
8183	037442	005037	003426		CLR	E.B0	;EXPECTED MSG B0
8184	037446	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
8185	037454	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
8186	037462	005037	003434		CLR	E.A2	;EXPECTED MSG A2
8187	037466	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
8188	037474	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
8189							
8190	037502	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
8191	037506	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
8192	037510	104133			ERROR	133	;MSG A0 ERROR AFTER SEEK CMD
8193	037512	104134			ERROR	134	;MSG B0 ERROR
8194	037514	104135			ERROR	135	;MSG A1 ERROR
8195	037516	104136			ERROR	136	;MSG B1 ERROR
8196	037520	005737	001362		TST	CYLDIF	
8197	037524	001401			BEQ	71\$	
8198	037526	104137			ERROR	137	;CYL DIFF NOT CLEARED AFTER SEEK CMD
8199							
8200	037530				71\$:		
8201							
8202	037530	012765	100000	000000	MOV	#CLR,RKCS1(R5)	
8203	037536	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
8204	037544	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
8205	037552	013737	001414	003372	MOV	T10,TEMP1	
8206	037560	004737	043612		JSR	PC,FRDY	;FIND RDY
8207	037564	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
8208	037566	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
8209	037572	000401			BR	72\$	
8210	037574	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
8211	037576				72\$:		
8212							
8213	037576	012737	010340	003424	MOV	#<D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
8214	037604	005037	003426		CLR	E.B0	;EXPECTED MSG B0
8215	037610	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
8216	037616	012737	000001	003432	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
8217	037624	005037	003434		CLR	E.A2	;EXPECTED MSG A2

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SEQ 0151

8218	037630	012737	000002	003436	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
8219	037636	012737	000003	003442	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
8220							
8221	037644	001737	044334		JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
8222	037650	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
8223	037652	104273			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
8224	037654	104265			ERROR	265	;MSG B0 ERROR
8225	037656	104274			ERROR	274	;MSG A1 ERROR
8226	037660	104266			ERROR	266	;MSG B1 ERROR
8227							
8228	037662	023737	001364	001350	CMP	CYLADD,FRCYL	
8229	037670	001401			BEQ	5\$	
8230	037672	104243			ERROR	243	;CYL ADDR IN RKMR3 NOT=RKDC
8231							
8232	037674				5\$:		
8233	037674	104415			SCOP1		
8234	037676	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
8235							
8236	037702	004737	045522		JSR	PC,SUBCLR	
8237	037706	104024			ERROR	24	;CERR AFTER SCLR
8238							
8239	037710	005037	001176		CLR	\$ESCAPE	
8240	037714	013765	001350	000020	MOV	FRCYL,RKDC(R5)	;CYL #
8241							
8242							
8243	037722	012700	001674		MOV	#RHTAB,RO	
8244	037726	012765	000025	000000	MOV	#(ROHEAD),RKCS1(R5)	;READ HEADER CMD
8245	037734	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
8246	037742	004737	043612		JSR	PC,FRDY	;FIND RDY
8247	037746	104171			ERROR	171	;NO RDY AFTER READ HEADER CMD
8248	037750	032737	100000	003334	BIT	#CERR,HCS1	
8249	037756	001405			BEQ	74\$	
8250	037760	104174			ERROR	174	;CERR AFTER READ HEADER CMD
8251	037762	104401	056333		TYPE	MSG18	;ABORT BALANCE OF TESTS
8252	037766	000137	043076		JMP	\$EOP	;ABORT DRIVE
8253							
8254	037772	016520	000024		74\$:	MOV	RKDB(R5),(RO)+
8255	037776	016520	000024		MOV	RKDB(R5),(RO)+	;2'ND WORD
8256	040002	016520	000024		MOV	RKDB(R5),(RO)+	;3'RD WORD
8257							
8258							
8259	040006	032765	100000	000010	BIT	#DLT,RKCS2(R5)	
8260	040014	001407			BEQ	75\$	
8261	040016	004737	045150		JSR	PC,GSTAT	
8262	040022	104173			ERROR	173	;DLT AFTER READ HEADER CMD
8263	040024	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
8264	040030	000137	043076		JMP	\$EOP	;ABORT DRIVE
8265	040034				75\$:		
8266							
8267	040034	023737	001674	001350	CMP	RHTAB,FRCYL	;CHECK WORD 0 (CYL#) ONLY
8268	040042	001401			BEQ	73\$	;BR IF SAME
8269	040044	104311			ERROR	311	;READ CYL WORD HEADER ERROR
8270	040046				73\$:		
8271							
8272							
8273	040046	023727	001352	000632	CMP	TOCYL,#410.	;ALL CYL DONE?

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SEQ 0152

8274	040054	001404			BEQ	6\$		;BR IF YES
8275	040056	005237	001352		INC	TOCYL		;ELSE DO ANOTHER
8276	040062	000137	036440		JMP	1\$		
8277	040066			6\$:				
8278	040066	004737	047526		JSR	PC,SWTST		;SEE IF SW 14 OR 8 IS SET
8279	040072	000520			BR	TST40		;GO TO NEXT TEST
8280								;RETURN HERE IF SW 14 IS SET OR
8281								;SW 8 WITH SWR (7:0) APPLY
8282	040074			8\$:				
8283								
8284	040074	004737	045522		JSR	PC,SUBCLR		
8285	040100	104024			ERROR	24		;CERR AFTER SCRL
8286								
8287	040102	013765	001352	000020	76\$:	MOV	TOCYL,RKDC(R5)	;CYL#
8288								
8289	040110	012765	000017	000000		MOV	#SEEK,RKCS1(R5)	;SEEK CMD TO RECONDITION DRIVE.
8290	040116	013737	001414	003372		MOV	T10,TEMP1	;SETUP TIMEOUT
8291	040124	004737	043612			JSR	PC,FRDY	;FIND RDY
8292	040130	104131				ERROR	131	;NO RDY AFTER SEEK CMD.
8293								
8294	040132	013737	001426	003372		MOV	T50000,TEMP1	
8295	040140	004737	044222			JSR	PC,FATT2	;FIND ATTN
8296	040144	104132				ERROR	132	;NO ATTN AFTER SEEK CMD
8297	040146	032737	100000	003334		BIT	#CERR,HCS1	
8298	040154	001401				BEQ	78\$	
8299	040156	104210				ERROR	210	;CERR AFTER SEEK CMD.
8300								
8301	040160	004737	045522		78\$:	JSR	PC,SUBCLR	
8302	040164	104024				ERROR	24	;CERR AFTER SCLR
8303								
8304	040166	023727	001352	000000		CMP	TOCYL,#0	;ALL CYL DONE?
8305	040174	001403				BEQ	77\$	;BR IF YES
8306	040176	005337	001352			DEC	TOCYL	;ELSE DO ANOTHER
8307	040202	000737				BR	76\$	
8308								
8309	040204	004737	045522		77\$:	JSR	PC,SUBCLR	
8310	040210	104024				ERROR	24	;CERR AFTER SCLR
8311								
8312	040212	005037	001176			CLR	\$ESCAPE	
8313	040216	005737	001410			TST	LPFLG	
8314	040222	001402				BEQ	79\$	
8315	040224	000177	140660			JMP	\$SLPERR	;SW 9 WAS SET.
8316	040230	000177	140652		79\$:	JMP	\$SLPADR	;SW 14 OR 8 WAS SET
8317								
8318	040234				10\$:			
8319	040234	005237	001410			INC	LPFLG	
8320	040240	032777	001000	140672		BIT	#SW9,\$SWR	;LOOP ON ERROR?
8321	040246	001312				BNE	8\$	;YES, RECONDITION DRIVE
8322	040250	000137	036606			JMP	2\$	;RETURN TO MAINLINE
8323	040254				12\$:			
8324	040254	005237	001410			INC	LPFLG	
8325	040260	032777	001000	140652		BIT	#SW9,\$SWR	;LOOP ON ERROR?
8326	040266	001302				BNE	8\$	;YES, RECONDITION DRIVE
8327	040270	000137	037102			JMP	3\$	;RETURN TO MAINLINE
8328	040274				14\$:			
8329	040274	005237	001410			INC	LPFLG	

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SEQ 0153

8330	040300	032777	001000	140632	BIT	#SW9,JSWR	;LOOP ON ERROR?
8331	040306	001272			BNE	85	;YES, RECONDITION DRIVE
8332	040310	000137	037400		JMP	45	;RETURN TO MAINLINE
8333	040314				16\$:		
8334	040314	005237	001410		INC	LPFLG	
8335	040320	032777	001000	140612	BIT	#SW9,JSWR	;LOOP ON ERROR?
8336	040326	001262			BNE	85	;YES, RECONDITION DRIVE
8337	040330	000137	037674		JMP	55	;RETURN TO MAINLINE
8338							
8339							
8340							
8341							
8342	040334	000004					
8343	040336	012737	000001	001174	MOV	#1,STIMES	;DO 1 ITERATION
8344	040344	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
8345							
8346							
8347	040350	004737	045522		JSR	PC,SUBCLR	
8348	040354	104024			ERROR	24	;CERR AFTER SCLR
8349							
8350	040356	012765	000632	000020	MOV	#410.,RKDC(R5)	;QUICK SEEK TO CYL 410
8351							
8352	040364	012765	000017	000000	MOV	#SEEK,RKCS1(R5)	;SEEK CMD TO RECONDITION DRIVE.
8353	040372	013737	001414	003372	MOV	T10,TEMP1	;SETUP TIMEOUT
8354	040400	004737	043612		JSR	PC,FRDY	;FIND RDY
8355	040404	104131			ERROR	131	;NO RDY AFTER SEEK CMD.
8356							
8357	040406	013737	001426	003372	MOV	T50000,TEMP1	
8358	040414	004737	044222		JSR	PC,FATT2	;FIND ATTN
8359	040420	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
8360	040422	032737	100000	003334	BIT	#CERR,HCS1	
8361	040430	001401			BEQ	645	
8362	040432	104210			ERROR	210	;CERR AFTER SEEK CMD.
8363							
8364	040434	004737	045522		JSR	PC,SUBCLR	
8365	040440	104024			ERROR	24	;CERR AFTER SCLR
8366							
8367							
8368	040442	012737	000632	001350	MOV	#410.,FRCYL	;SETUP FROM CYL
8369	040450	012737	000631	001352	MOV	#409.,TOCYL	;SETUP TO CYL
8370							
8371	040456				1\$:		
8372	040456	104415			SCOP1		
8373	040460	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
8374							
8375	040464	004737	045522		JSR	PC,SUBCLR	
8376	040470	104024			ERROR	24	;CERR AFTER SCLR
8377							
8378	040472	012737	042252	001176	MOV	#105,SESCAPE	
8379	040500	013737	001350	003376	MOV	FRCYL,TEMP3	;SETUP
8380	040506	013737	001352	003400	MOV	TOCYL,TEMP4	;CYL DIFF
8381	040514	163737	003400	003376	SUB	TEMP4,TEMP3	;FOR
8382	040522	013737	003376	001360	MOV	TEMP3,C.LDIF	;ERROR PRINTOUT
8383							
8384	040530	013765	001352	000020	MOV	TOCYL,RKDC(R5)	;GO TO CYL #
8385							

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SEQ 0154

8386	040536	012765	000017	000000		MOV	#SEEK,RKCS1(R5)	;SEEK CMD
8387	040544	013737	001414	003372		MOV	T10,TEMP1	;SETUP TIMEOUT
8388	040552	004737	043612			JSR	PC,FRDY	;FIND RDY
8389	040556	104131				ERROR	131	;NO RDY AFTER SEEK CMD
8390	040560	012737	030140	003424		MOV	#<D.PIP!D.SPIN!D.VV!D.DRA>,E.A0	;EXPECTED A0
8391	040566	005037	003426			CLR	E.B0	
8392	040572	012737	005720	003430		MOV	#<D.REV!D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	
8393	040600	012737	000001	003432		MOV	#1,E.B1	
8394								
8395	040606	004737	044334			JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
8396	040612	000003				.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
8397	040614	104203				ERROR	203	;MSG A0 ERROR DURING SEEK CMD
8398	040616	104204				ERROR	204	;MSG B0 ERROR
8399	040620	104205				ERROR	205	;MSG A1 ERROR
8400	040622	104206				ERROR	206	;MSG B1 ERROR
8401								
8402	040624	012737	042272	001176	2\$:	MOV	#12\$,SESCAPE	
8403	040632	013737	001426	003372		MOV	T50000,TEMP1	;SETUP TIMEOUT
8404								
8405	040640	004737	044222			JSR	PC,FATT2	;FIND ATTN
8406	040644	104132				ERROR	132	;NO ATTN AFTER SEEK CMD
8407	040646	032737	100000	003334		BIT	#CERR,HCS1	
8408	040654	001401				BEQ	65\$	
8409	040656	104210				ERROR	210	;CERR AFTER SEEK CMD
8410	040660				65\$:			
8411								
8412	040660	012737	050340	003424		MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
8413	040666	005037	003426			CLR	E.B0	;EXPECTED MSG B0
8414	040672	012737	001720	003430		MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
8415	040700	012737	000001	003432		MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
8416	040706	005037	003434			CLR	E.A2	;EXPECTED MSG A2
8417	040712	012737	000002	003436		MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
8418	040720	012737	000003	003442		MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
8419								
8420	040726	004737	044334			JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
8421	040732	000003				.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
8422	040734	104133				ERROR	133	;MSG A0 ERROR AFTER SEEK CMD
8423	040736	104134				ERROR	134	;MSG B0 ERROR
8424	040740	104135				ERROR	135	;MSG A1 ERROR
8425	040742	104136				ERROR	136	;MSG B1 ERROR
8426	040744	005737	001362			TST	CYLDIF	
8427	040750	001401				BEQ	66\$	
8428	040752	104137				ERROR	137	;CYL DIFF NOT CLEARED AFTER SEEK CMD
8429								
8430	040754				66\$:			
8431								
8432	040754	012765	100000	000000		MOV	#CCLR,RKCS1(R5)	
8433	040762	013765	001222	000010		MOV	#UNIT,RKCS2(R5)	;DRIVE#
8434	040770	012765	000005	000000		MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
8435	040776	013737	001414	003372		MOV	T10,TEMP1	
8436	041004	004737	043612			JSR	PC,FRDY	;FIND RDY
8437	041010	104151				ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
8438	041012	004737	044074			JSR	PC,TSTATN	;TEST FOR ATTN
8439	041016	000401				BR	67\$	
8440	041020	104154				ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
8441	041022				67\$:			

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SEQ 0155

8442					MOV	#<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
8443	041022	012737	010340	003424	CLR	E.B0	;EXPECTED MSG B0
8444	041030	005037	003426		MOV	#<0!D.SPOK!D.CART!D.D00R!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
8445	041034	012737	001720	003430	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
8446	041042	012737	000001	003432	CLR	E.A2	;EXPECTED MSG A2
8447	041050	005037	003434		MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
8448	041054	012737	000002	003436	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
8449	041062	012737	000003	003442			
8450					JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
8451	041070	004737	044334		.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
8452	041074	000003			ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
8453	041076	104273			ERROR	265	;MSG B0 ERROR
8454	041100	104265			ERROR	274	;MSG A1 ERROR
8455	041102	104274			ERROR	266	;MSG B1 ERROR
8456	041104	104266					
8457							
8458	041106	023737	001364	001352	CMP	CYLADD,TOCYL	
8459	041114	001401			BEQ	3\$	
8460	041116	104207			ERROR	207	;CYL ADDR IN RKMR3 NOT=RKDC
8461							
8462	041120						
8463	041120	104415			SCOP1		
8464	041122	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
8465							
8466	041126	004737	045522		JSR	PC,SUBCLR	
8467	041132	104024			ERROR	24	;CERR AFTER SCLR
8468							
8469	041134	005037	001176		CLR	\$ESCAPE	
9470	041140	013765	001352	000020	MOV	TOCYL,RKDC(R5)	;CYL #
8471							
8472							
8473	041146	012700	001674		MOV	#RHTAB,R0	
8474	041152	012765	000025	000000	MOV	#<RDHEAD>,RKCS1(R5)	;READ HEADER CMD
8475	041160	013737	001426	003372	MOV	T50000,TEMP1	;SETUP TIMEOUT
8476	041166	004737	043612		JSR	PC,FRDY	;FIND RDY
8477	041172	104171			ERROR	171	;NO RDY AFTER READ HEADER CMD
8478	041174	032737	100000	003334	BIT	#CERR,HCS1	
8479	041202	001405			BEQ	69\$	
8480	041204	104174			ERROR	174	;CERR AFTER READ HEADER CMD
8481	041206	104401	056333		TYPE	,MSG18	;ABORT BALANCE OF TESTS
8482	041212	000137	043076		JMP	\$EOP	;ABORT DRIVE
8483							
8484	041216	016520	000024		MOV	RKDB(R5),(R0)+	;1'ST WORD FROM SILO TO RHTAB
8485	041222	016520	000024		MOV	RKDB(R5),(R0)+	;2'ND WORD
8486	041226	016520	000024		MOV	RKDB(R5),(R0)+	;3'RD WORD
8487							
8488							
8489	041232	032765	100000	000010	BIT	#DLT,RKCS2(R5)	
8490	041240	001407			BEQ	70\$	
8491	041242	004737	045150		JSR	PC,GSTAT	
8492	041246	104173			ERROR	173	;DLT AFTER READ HEADER CMD
8493	041250	104401	056333		TYPE	,MSG18	;ABORTING BALANCE OF TESTS
8494	041254	000137	043076		JMP	\$EOP	;ABORT DRIVE
8495	041260						
8496							
8497	041260	023737	001674	001352	CMP	RHTAB,TOCYL	;CHECK WORD 0 (CYL#) ONLY

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SEQ 0156

Address	Offset	Label	OpCode	OpName	Comments
8498	041266	001401			
8499	041270	104310			
8500	041272		68\$:		
8501					
8502					
8503	041272	104415			
8504	041274	012706	001100		
8505					
8506	041300	004737	045522		
8507	041304	104024			
8508					
8509	041306	012737	042312	001176	
9510	041314	013765	001350	000020	
8511	041322	013737	001350	001354	
8512					
8513	041330	012765	000017	000000	
8514	041336	013737	001414	003372	
8515	041344	004737	043612		
8516	041350	104131			
8517	041352	012737	030140	003424	
8518	041360	005037	003426		
8519	041364	012737	003720	003430	
8520	041372	012737	000001	003432	
8521					
8522	041400	004737	044334		
8523	041404	000003			
8524	041406	104203			
8525	041410	104204			
8526	041412	104205			
8527	041414	104206			
8528					
8529					
8530	041416	012737	042332	001176	4\$:
8531	041424	013737	001426	003372	
8532					
8533	041432	004737	044222		
8534	041436	104132			
8535	041440	032737	100000	003334	
8536	041446	001401			
8537	041450	104210			
8538	041452				71\$:
8539					
8540	041452	012737	050340	003424	
8541	041460	005037	003426		
8542	041464	012737	001720	003430	
8543	041472	012737	000001	003432	
8544	041500	005037	003434		
8545	041504	012737	000002	003436	
8546	041512	012737	000003	003442	
8547					
8548	041520	004737	044334		
8549	041524	000003			
8550	041526	104133			
8551	041530	104134			
8552	041532	104135			
8553	041534	104136			

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SEQ 0157

8554	041536	005737	001362	TST	CYLDIF	
8555	041542	001401		BEQ	72\$	
8556	041544	104137		ERROR	137	;CYL DIFF NOT CLEARED AFTER SEEK CMD
8557						
8558	041546			72\$:		
8559						
8560	041546	012765	100000	MOV	#CCLR,RKCS1(R5)	
8561	041554	013765	001222	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
8562	041562	012765	000005	MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
8563	041570	013737	001414	MOV	T10,TEMP1	
8564	041576	004737	043612	JSR	PC,FRDY	;FIND RDY
8565	041602	104151		ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
8566	041604	004737	044074	JSR	PC,TSTATN	;TEST FOR ATTN
8567	041610	000401		BR	73\$	
8568	041612	104154		ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
8569	041614			73\$:		
8570						
8571	041614	012737	010340	MOV	#<O!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
8572	041622	005037	003426	CLR	E.B0	;EXPECTED MSG B0
8573	041626	012737	001720	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	;EXPECTED A1
8574	041634	012737	000001	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
8575	041642	005037	003434	CLR	E.A2	;EXPECTED MSG A2
8576	041646	012737	000002	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
8577	041654	012737	000003	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
8578						
8579	041662	004737	044334	JSR	PC,CHKMSG	;CHECK MSGS A0,B0,A1,B1
8580	041666	000003		.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
8581	041670	104273		ERROR	273	;MSG A0 ERROR AFTER DRIVE CLEAR CMD
8582	041672	104265		ERROR	265	;MSG B0 ERROR
8583	041674	104274		ERROR	274	;MSG A1 ERROR
8584	041676	104266		ERROR	266	;MSG B1 ERROR
8585						
8586	041700	023737	001364	CMP	CYLADD,FRCYL	
8587	041706	001401		BEQ	5\$	
8588	041710	104243		ERROR	243	;CYL ADDR IN RKMR3 NOT=RKDC
8589						
8590	041712			5\$:		
8591	041712	104415		SCOP1		
8592	041714	012706	001100	MOV	#STACK,SP	;RESTORE STK PTR
8593						
8594	041720	004737	045522	JSR	PC,SUBCLR	
8595	041724	104024		ERROR	24	;CERR AFTER SCLR
8596						
8597	041726	005037	001176	CLR	\$ESCAPE	
8598	041732	013765	001350	MOV	FRCYL,RKDC(R5)	;CYL #
8599			000020			
8600						
8601	041740	012700	001674	MOV	#RHTAB,R0	
8602	041744	012765	000025	MOV	#<RDHEAD>,RKCS1(R5)	;READ HEADER CMD
8603	041752	013737	001426	MOV	T50000,TEMP1	;SETUP TIMEOUT
8604	041760	004737	043612	JSR	PC,FRDY	;FIND RDY
8605	041764	104171		ERROR	171	;NO RDY AFTER READ HEADER CMD
8606	041766	032737	100000	BIT	#CERR,HCS1	
8607	041774	001405		BEQ	75\$	
8608	041776	104174		ERROR	174	;CERR AFTER READ HEADER CMD
8609	042000	104401	056333	TYPE	,MSG18	;ABORT BALANCE OF TESTS

C13

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SEQ 0158

8610	042004	000137	043076		JMP	\$EOP	;ABORT DRIVE
8611							
8612	042010	016520	000024	75\$:	MOV	RK08(R5),(R0)+	;1'ST WORD FROM SILO TO RHTAB
8613	042014	016520	000024		MOV	RK08(R5),(R0)+	;2'ND WORD
8614	042020	016520	000024		MOV	RK08(R5),(R0)+	;3'RD WORD
8615							
8616							
8617	042024	032765	100000	000010	BIT	#DLT,RKCS2(R5)	
8618	042032	001407			BEQ	76\$	
8619	042034	004737	045150		JSR	PC,GSTAT	
8620	042040	104173			ERROR	173	;DLT AFTER READ HEADER CMD
8621	042042	104401	056333		TYPE	MSG18	;ABORTING BALANCE OF TESTS
8622	042046	000137	043076		JMP	\$EOP	;ABORT DRIVE
8623	042052			75\$:			
8624							
8625	042052	023737	001674	001350	CMP	RHTAB,FRCYL	;CHECK WORD 0 (CYL#) ONLY
8626	042060	001401			BEQ	74\$	;BR IF SAME
8627	042062	104311			ERROR	311	;READ CYL WORD HEADER ERROR
8628	042064			74\$:			
8629							
8630							
8631	042064	023727	001352	000000	CMP	TOCYL,#0	;ALL CYL DONE?
8632	042072	001404			BEQ	6\$	;BR IF YES
8633	042074	005337	001352		DEC	TOCYL	;ELSE DO ANOTHER
8634	042100	000137	040456		JMP	1\$	
8635	042104			6\$:			
8636	042104	004737	047526		JSR	PC,SWTST	;SEE IF SW 14 OR 8 IS SET
8637	042110	000520			BR	TST41	;GO TO NEXT TEST
8638							;RETURN HERE IF SW 14 IS SET OR
8639							;SW 8 WITH SWR <7:0> APPLY
8640	042112			8\$:			
8641							
8642	042112	004737	045522		JSR	PC,SUBCLR	
8643	042116	104024			ERROR	24	;CERR AFTER SCRL
8644							
8645	042120	013765	001352	000020	77\$:	MOV	TOCYL,RKDC(R5) ;CYL#
8646							
8647	042126	012765	000017	000000	MOV	#SEEK,RKCS1(R5)	;SEEK CMD TO RECONDITION DRIVE.
8648	042134	013737	001414	003372	MOV	T10,TEMP1	;SETUP TIMEOUT
8649	042142	004737	043612		JSR	PC,FRDY	;FIND RDY
8650	042146	104131			ERROR	131	;NO RDY AFTER SEEK CMD.
8651							
8652	042150	013737	001426	003372	MOV	T50000,TEMP1	
8653	042156	004737	044222		JSR	PC,FAT12	;FIND ATTN
8654	042162	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
8655	042164	032737	100000	003334	BIT	#CERR,HCS1	
8656	042172	001401			BEQ	79\$	
8657	042174	104210			ERROR	210	;CERR AFTER SEEK CMD.
8658							
8659	042176	004737	045522		79\$:	JSR	PC,SUBCLR
8660	042202	104024			ERROR	24	;CERR AFTER SCLR
8661							
8662	042204	023727	001352	000632	CMP	TOCYL,#410.	;ALL CYL DONE?
8663	042212	001403			BEQ	78\$	;BR IF YES
8664	042214	005237	001352		INC	TOCYL	;ELSE DO ANOTHER
8665	042220	000737			BR	77\$	

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SEQ 0159

8666						
8667	042222	004737	045522	78\$:	JSR	PC, SUBCLR
8668	042226	104024			ERROR	24 ;CERR AFTER SCLR
8669						
8670	042230	005037	001176		CLR	\$ESCAPE
8671	042234	005737	001410		TST	LPFLG
8672	042240	001402			BEQ	80\$
8673	042242	000177	136642		JMP	\$SLPERR ;SW 9 WAS SET.
8674	042246	000177	136634	80\$:	JMP	\$SLPADR ;SW 14 OR 8 WAS SET
8675						
8676	042252			10\$:		
8677	042252	005237	001410		INC	LPFLG
8678	042256	032777	001000	136654	BIT	\$SW9, \$SWR ;LOOP ON ERROR?
8679	042264	001312			BNE	8\$;YES, RECONDITION DRIVE
8680	042266	000137	040624		JMP	2\$;RETURN TO MAINLINE
8681	042272			12\$:		
8682	042272	005237	001410		INC	LPFLG
8683	042276	032777	001000	136634	BIT	\$SW9, \$SWR ;LOOP ON ERROR?
8684	042304	001302			BNE	8\$;YES, RECONDITION DRIVE
8685	042306	000137	041120		JMP	3\$;RETURN TO MAINLINE
8686	042312			14\$:		
8687	042312	005237	001410		INC	LPFLG
8688	042316	032777	001000	136614	BIT	\$SW9, \$SWR ;LOOP ON ERROR?
8689	042324	001272			BNE	8\$;YES, RECONDITION DRIVE
8690	042326	000137	041416		JMP	4\$;RETURN TO MAINLINE
8691	042332			16\$:		
8692	042332	005237	001410		INC	LPFLG
8693	042336	032777	001000	136574	BIT	\$SW9, \$SWR ;LOOP ON ERROR?
8694	042344	001262			BNE	8\$;YES, RECONDITION DRIVE
8695	042346	000137	041712		JMP	5\$;RETURN TO MAINLINE

CYLINV:

8696						
8697	042352					
8698						
8699						
8700						
8701						
8702						
8703						
8704						
8705						
8706						
8707						
8708						
8709						
8710						
8711						
8712						
8713	042352	000004				
8714	042354	012737	000001	001174		
8715	042362	012706	001100			
8716						
8717	042366	004737	045522			
8718	042372	104024				
8719						
8720	042374	012765	000017	000000		
8721	042402	013737	001414	003372		

 TEST 41 SEEK TO ALL KEY INVALID CYLS

 THIS TEST VERIFIES THAT 'INV ADDR' & 'SEEK INCOMPLETE' IS
 PRODUCED & THAT HEADS DO NOT MOVE OR UNLOAD IF AN ILLEGAL
 CYL IS SPECIFIED IN A SEEK.

 INVALID CYLS ARE 411 THRU 511 (10) IE. 633 THRU 777 (8)

 THIS TEST CHECKS KEY INVALID CYLS 411, 412, 416, 448 & 480
 FOR A FULL LOGIC TEST

 TEST 41: SCOPE
 MOV #1, \$TIMES ;DO 1 ITERATION
 MOV #STACK, SP ;RESTORE STK PTR
 JSR PC, SUBCLR
 ERROR 24 ;CERR AFTER SCLR
 MOV #SEEK, RKCS1(R5) ;SEEK CMD TO RECONDITION DRIVE.
 MOV T10, TEMP1 ;SETUP TIMEOUT

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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T41 SEEK TO ALL KEY INVALID CYLS

SEQ 0160

8722	042410	004737	043612		JSR	PC,FRDY	;FIND RDY
8723	042414	104131			ERROR	131	;NO RDY AFTER SEEK CMD.
8724							
8725	042416	013737	001426	003372	MOV	T50000,TEMP1	
8726	042424	004737	044222		JSR	PC,FAT12	;FIND ATTN
8727	042430	104132			ERROR	132	;NO ATTN AFTER SEEK CMD
8728	042432	032737	100000	003334	BIT	#CERR,HCS1	
8729	042440	001401			BEQ	64\$	
8730	042442	104210			ERROR	210	;CERR AFTER SEEK CMD.
8731							
8732	042444	004737	045522	64\$:	JSR	PC,SUBCLR	
8733	042450	104024			ERROR	24	;CERR AFTER SCLR
8734							
8735	042452	005000			CLR	RO	
8736	042454	005037	001350		CLR	FRCYL	;FROM CYL 0
8737							
8738	042460			1\$:			
8739	042460	104415			SCOP1		
8740	042462	012706	001100		MOV	#STACK,SP	;RESTORE STK PTR
8741							
8742	042466	004737	045522		JSR	PC,SUBCLR	
8743	042472	104024			ERROR	24	;CERR AFTER SCLR
8744							
8745	042474	016037	003304	001352	MOV	INVCYL(RO),TOCYL	;GET INVALID CYL ADDR
8746	042502	013737	001352	001360	MOV	TOCYL,CALDIF	
8747	042510	013765	001352	000020	MOV	TOCYL,RKDC(R5)	
8748	042516	012765	000017	000000	MOV	#SEEK,RKCS1(R5)	;SEEK CMD
8749	042524	012737	000005	003372	MOV	#5,TEMP1	;SETUP 100US TIMEOUT
8750	042532	004737	043612		JSR	PC,FRDY	;FIND RDY
8751	042536	104131			ERROR	131	;NO RDY AFTER SEEK CMD
8752	042540	004737	044074		JSR	PC,TSTATN	
8753	042544	104245			ERROR	245	;NO ATTN AFTER SEEK TO INV CYL
8754							
8755	042546	032737	000040	003364	BIT	#D.IDAE,HMR3	
8756	042554	001001			BNE	2\$	
8757	042556	104246			ERROR	246	;IDAE NOT SET AFTER SEEK TO INVALID ADDR
8758	042560	032737	000200	003364	BIT	#D.FLT,HMF3	
8759	042566	001001			BNE	4\$	
8760	042570	104247			ERROR	247	;FLT NOT SET AFTER SEEK TO INV ADDR
8761	042572	032737	020000	003362	BIT	#D.PIP,HMR2	
8762	042600	001401			BEQ	5\$	
8763	042602	104250			ERROR	251	;PIP SET AFTER SEEK TO INV ADDR
8764	042604	032737	040000	003362	BIT	#D.DSC,HMR2	
8765	042612	001001			BNE	6\$	
8766	042614	104251			ERROR	251	;DSC NOT SET AFTER SEEK TO INV ADDR
8767							
8768	042616	005237	001462	6\$:	INC	BYPCERR	;BYPASS CHECKING FOR CERR IN GSTAT1
8769	042622	012737	050340	003424	MOV	#<D.DSC!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED AO
8770	042630	012737	002240	003426	MOV	#<D.SKI!D.FLT!D.IDAE>,E.B0	
8771	042636	012737	001720	003430	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1	
8772	042644	012737	000001	003432	MOV	#1,E.B1	
8773							
8774	042652	004737	044334		JSR	PC,CHKMSG	;CHECK MSGS AO,B0,A1,B1
8775	042656	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
8776	042660	104252			ERROR	252	;MSG AO ERROR AFTER SEEK TO INV CYL
8777	042662	104253			ERROR	253	;MSG B0 ERROR

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T41 SEEK TO ALL KEY INVALID CYLS

SEQ 0161

8778	042664	104254			ERROR	254	;MSG A1 ERROR
8779	042666	104255			ERROR	255	;MSG B1 ERROR
8780	042670	023737	001362	001352	CMP	CYLDIF,TOCYL	
8781	042676	001401			BEQ	7\$	
8782	042700	104256			ERROR	256	;CYL DIFF IN RKMR2 NOT=CYL DIF
8783	042702	023737	001364	001352	CMP	CYLADD,TOCYL	
8784	042710	001401			BEQ	8\$	
8785	042712	104257			ERROR	257	;CYL ADDR IN RKMR3 NOT=RKDC
8786							
8787	042714				8\$:		
8788							
8789	042714	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
8790	042722	013765	001222	000010	MOV	SUNIT,RKCS2(R5)	
8791	042730	012765	000013	000000	MOV	#RECAL,RKCS1(R5)	;RECAL CMD
8792	042736	013737	001414	003372	MOV	T10,TEMP1	
8793	042744	004737	043612		JSR	PC,FRDY	;FIND RDY
8794	042750	104124			ERROR	124	;RDY NOT FOUND AFTER RECAL CMD
8795							
8796	042752	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
8797	042760	013765	001222	000010	MOV	SUNIT,RKCS2(R5)	;DRIVE#
8798	042766	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
8799	042774	013737	001414	003372	MOV	T10,TEMP1	
8800	043002	004737	043612		JSR	PC,FRDY	;FIND RDY
8801	043006	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
8802	043010	004737	044074		JSR	PC,TSTATN	;TEST FOR ATTN
8803	043014	000401			BR	66\$	
8804	043016	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
8805	043020				66\$:		
8806							
8807							
8808	043020	004737	045150		JSR	PC,GSTAT	
8809	043024	032737	000040	003364	BIT	#D.IDAE,HMR3	;SEE IF IDAE IS CLEARED
8810	043032	001401			BEQ	65\$	;BR IF YES
8811	043034	104155			ERROR	155	;IDAE NOT CLEARED AFTER RECAL CMD
8812							
8813	043036	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
8814	043044	013737	001412	003374	MOV	T1,TEMP2	;LOOK FOR ATTN FROM RECAL
8815	043052	004737	044126		JSR	PC,FATT1	
8816	043056	104055			ERROR	55	;NO ATTN AFTER RECAL CMD
8817							
8818							
8819	043060	062700	000002		ADD	#2,R0	
8820	043064	020027	000012		CMP	R0,#10.	
8821	043070	001402			BEQ	\$EOP	
8822	043072	000137	042460		JMP	1\$	
8823							
8824							

G13

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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END OF PASS ROUTINE

SEQ 0162

.SBTTL END OF PASS ROUTINE

```

*****
; INCREMENT THE PASS NUMBER ($PASS)
; TYPE "END PASS #XXXXX" (WHERE XXXXX IS A DECIMAL NUMBER)
; IF THERES A MONITOR GO TO IT
; IF THERE ISN'T JUMP TO STS

```

\$EOP:

```

SCOPE
MOV #1,$TIMES
MOV #STACK,SP
INC $DEVCT ; INCR COUNT FOR # OF DRIVES THAT ARE CHECKED
CMP DRVS,$DEVCT ; ARE ALL DRIVES PRESENT TESTED?
BEQ $EOP1+2 ; BR IF YES
JMP NUDRV ; IF NOT , TEST NEXT DRIVE PRESENT

$EOP1: SCOPE
CLR $STNM ; ZERO THE TEST NUMBER
CLR $TIMES ; ZERO THE NUMBER OF ITERATIONS
INC $PASS ; INCREMENT THE PASS NUMBER
BIC #100000,$PASS ; DON'T ALLOW A NEG. NUMBER
DEC (PC)+ ; LOOP?

$EOPCT: .WORD 1
BGT $DOAGN ; YES
MOV (PC)+,$(PC)+ ; RESTORE COUNTER

$ENDCT: .WORD 1
$EOPCT
TYPE $ENDMG ; TYPE "END PASS #"
MOV $PASS,-(SP) ; SAVE $PASS FOR TYPEOUT
TYPDS ; GO TYPE--DECIMAL ASCII WITH SIGN
TYPE $ENULL ; TYPE A NULL CHARACTER
$GET42: MOV #42,R0 ; GET MONITOR ADDRESS
BEQ $DOAGN ; BRANCH IF NO MONITOR
RESET ; CLEAR THE WORLD
$ENDAD: JSR PC,(R0) ; GO TO MONITOR
NOP ; SAVE ROOM
NOP ; FOR
NOP ; ACT11

$DOAGN: JMP $(PC)+ ; RETURN

$RTNAD: .WORD STS
$ENULL: .BYTE -1,-1,0 ; NULL CHARACTER STRING
$ENDMG: .ASCII <15><12>/END PASS #/

```

```

8825
8826
8827
8828
8829
8830
8831
8832
8833 043076
8834
8835 043076 000004
8836 043100 012737 000001 001174
8837 043106 012706 001100
8838 043112 005237 001220
8839 043116 023737 003454 001220
8840 043124 001403
8841 043126 000137 011362
8842 043132 000004
8843 043134 005037 001102
8844 043140 005037 001174
8845 043144 005237 001216
8846 043150 042737 100000 001216
8847 043156 005327
8848 043160 000001
8849 043162 003022
8850 043164 012737
8851 043166 000001
8852 043170 043160
8853 043172 104401 043237
8854 043176 013746 001216
8855 043202 104405
8856 043204 104401 043234
8857 043210 013700 000042
8858 043214 001405
8859 043216 000005
8860 043220 004710
8861 043222 000240
8862 043224 000240
8863 043226 000240
8864 043230
8865 043230 000137
8866 043232 007740
8867 043234 377 377 000
8868 043237 015 042412 042116
8869 043244 050040 051501 020123
8870 043252 000043

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H13

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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SUBROUTINES

SEQ 0163

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8871      .SBTTL SUBROUTINES
8872
8873      ;SUBROUTINE TO CLEAR ALL FLAGS FROM DDUMP THRU DOTIM
8874      ;
8875
8876      043254 012700 003444      CLRFLG: MOV      #DDUMP, R0
8877      043260 012701 177757      MOV      #-17., R1
8878      043264 005020      1$:      CLR      (R0)+
8879      043266 005201      INC      R1
8880      043270 001375      BNE      1$
8881      043272 000207      RTS      PC
8882
8883
8884      ;TYPE PROGRAM ID IF FTITLE=0
8885      ;
8886
8887      043274 005737 001344      TITLE: TST      FTITLE
8888      043300 001024      BNE      1$
8889      043302 005237 001344      INC      FTITLE
8890      043306 104401 054636      TYPE     MSG1      ;PROGRAM ID
8891      .SBTTL GET VALUE FOR SOFTWARE SWITCH REGISTER
8892      043312 005737 000042      TST      0#42      ;ARE WE RUNNING UNDER XXDP/ACT?
8893      043316 001012      BNE      64$      ;BRANCH IF YES
8894      043320 123727 001230 000001      CMPB     $ENV, #1      ;ARE WE RUNNING UNDER APT?
8895      043326 001406      BEQ      64$      ;BRANCH IF YES
8896      043330 023727 001140 000176      CMP      SWR, #SWREG      ;SOFTWARE SWITCH REG SELECTED?
8897      043336 001005      BNE      65$      ;BRANCH IF NO
8898      043340 104406      GTSWR      ;GET SOFT-SWR SETTINGS
8899      043342 000403      BR      65$
8900      043344 112737 000001 001134      64$:      MOVB     #1, $AUTOB      ;SET AUTO-MODE INDICATOR
8901      043352      65$:
8902      043352 000207      1$:      RTS      PC
8903
8904
8905      ;ROUTINE TO INPUT DRIVE NOS. TYPED IN & SET
8906      ;DRIVS, DRIVO-DRIV7 REGISTERS APPROPRIATELY
8907      ;
8908
8909      043354 104411      GDRVS:      RDLIN
8910      043356 012600      MOV      (SP)+, R0      ;GET STARTING ADDR OF ASCII STRING
8911      043360 012701 177770      MOV      #-8., R1      ;SET UP COUNT
8912      043364 112002      1$:      MOVB     (R0)+, R2      ;GET ASCII CHAR
8913      043366 042702 177400      BIC      #177400, R2      ;MASK HI BYTE
8914      043372 012703 003456      MOV      #DRIVO, R3      ;DRIVE FLAG ADDR
8915      043376 012704 000060      MOV      #60, R4
8916
8917      043402 020402      2$:      CMP      R4, R2      ;WAS TYPED CHAR 0 THRU 7?
8918      043404 001415      BEQ      3$      ;BRANCH IF YES
8919      043406 005723      TST      (R3)+      ;NO, INCREMENT DR FLAG ADDR
8920      043410 005204      INC      R4
8921      043412 020427 000070      CMP      R4, #70
8922      043416 001371      BNE      2$      ;S/B 0-7 OR TERMINATOR
8923      043420 005702      TST      R2
8924      043422 001022      BNE      4$
8925      043424 020127 177770      CMP      R1, #-8.
8926      043430 001426      BEQ      6$      ;DEFAULT ALL DRIVES

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8927	043432	005037	003504	7\$:	CLR	SIZFLG	;BYPASS TEST 1 (SIZING)
8928	043436	000207			RTS	PC	;FOUND TERMINATOR, EXIT
8929				3\$:	INC	DR3	;SET UP FLAG FOR THE DRIVE
8930	043440	005213			INC	DRIVS	;INCREMENT TOTAL # DRIVES TO BE TESTED
8931	043442	005237	003454		MOVB	(R0)+,R2	;GET NEXT ASCII CHAR.
8932	043446	112002			BIC	#177400,R2	;MASK
8933	043450	042702	177400		CMP	#54,R2	;IS IT A COMMA?
8934	043454	022702	000054		BEQ	5\$	;YES, GO TO NEXT WORD.
8935	043460	001407			TST	R2	;NO, IS IT A TERMINATOR?
8936	043462	005702			BNE	4\$	;IF NOT, SOMETHING WRONG.
8937	043464	001001			BR	7\$	;FOUND TERMINATOR, EXIT
8938	043466	000761					
8939				4\$:	TYPE	EM1	;ONLY 0-7 ALLOWED.
8940	043470	104401	057002		JMP	PRGSRT	;START ALL OVER
8941	043474	000137	007146				
8942				5\$:	INC	R1	;S/B NO MORE THAN 8 DIFF
8943	043500	005201			BNE	1\$	;DRIVES TYPED IN.
8944	043502	001330			BR	4\$	;IF MORE, HAVE ERROR.
8945	043504	000771					
8946				6\$:	INC	SIZFLG	;DO TEST 1 (SIZING)
8947	043506	005237	003504		RTS	PC	;EXIT.
8948	043512	000207					
8949							
8950							
8951							
8952							
8953							
8954	043514	104412		GBA:	RDOCT		
8955	043516	012600			MOV	(SP)+,R0	;GET LOW ORDER FROM STACK
8956	043520	005700			TST	R0	
8957	043522	001403			BEQ	1\$	;BRANCH IF DEFAULT.
8958	043524	010037	001264		MOV	R0,\$BASE	
8959	043530	000207			RTS	PC	
8960	043532	012737	177440 001264	1\$:	MOV	#177440,\$BASE	;DEFAULT VALUE
8961	043540	000207			RTS	PC	
8962							
8963							
8964							
8965							
8966							
8967	043542	104412		GINT:	RDOCT		
8968	043544	012600			MOV	(SP)+,R0	;GET LOW ORDER FROM STACK
8969	043546	005700			TST	R0	
8970	043550	001405			BEQ	1\$	;BRANCH IF DEFAULT
8971	043552	010037	001314		MOV	R0,RKVEC	
8972	043556	004737	043574	2\$:	JSR	PC,SETINT	
8973	043562	000207			RTS	PC	
8974	043564	012737	000210 001314	1\$:	MOV	#210,RKVEC	;DEFAULT VALUE
8975	043572	000771			BR	2\$	
8976							
8977							
8978							
8979							
8980							
8981	043574	013700	001314	SETINT:	MOV	RKVEC,R0	
8982	043600	012720	050276		MOV	#INTER,(R0)+	;INTER ADDR TO RKVEC

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8983 043604 013710 001316      MOV      RKPRI,(R0)      ;PR5 TO RKVEC+2
8984 043610 000207      RTS      PC
8985
8986
8987
8988      ; ROUTINE TO FIND CONTROLLER READY (RDY) DURING A DELAY
8989      ; ENTER WITH A COUNT IN TEMP1
8990      ; RETURN IF RDY NOT PRESENT (ERROR CONDITION)
8991      ; RETURN +2 IF RDY PRESENT (SKIP OVER ERROR)
8992      ; STATUS IS OBTAINED BEFORE THE RETURN FOR EITHER CASE
8993
8994 043612 032765 000200 000000  FRDY:  BIT      #RDY,RKCS1(R5)
8995 043620 001010      BNE      1$
8996 043622 005337 003372      DEC      TEMP1
8997 043626 001371      BNE      FRDY
8998 043630 004737 043746      JSR      PC,HOLD      ;STORE ALL RK611 REGS IN HOLDING REGS.
8999 043634 004737 045066      JSR      PC,CKCERR      ;CHECK FOR SPECIAL CERR
9000 043640 000207      RTS      PC      ;NO RDY, EXIT
9001 043642 062716 000002      1$:  ADD      #2,(SP)      ;SKIP OVER ERROR
9002 043646 004737 043746      JSR      PC,HOLD
9003 043652 004737 045066      JSR      PC,CKCERR      ;CHECK FOR SPECIAL CERR
9004 043656 000207      RTS      PC
9005
9006
9007      ; ROUTINE TO FIND CONTROLLER READY & STORE DRIVE REGS ONLY
9008
9009 043660 032765 000200 000000  FRDY1: BIT      #RDY,RKCS1(R5)
9010 043666 001014      BNE      1$
9011 043670 005337 003372      DEC      TEMP1
9012 043674 001371      BNE      FRDY1
9013 043676 016537 000034 003362  MOV      RKMR2(R5),HMR2
9014 043704 016537 000036 003364  MOV      RKMR3(R5),HMR3
9015 043712 004737 045066      JSR      PC,CKCERR      ;CHECK FOR SPECIAL CERR CONDITIONS
9016 043716 000207      RTS      PC      ;NO RDY, EXIT
9017 043720 062716 000002      1$:  ADD      #2,(SP)      ;SKIP OVER ERROR
9018 043724 016537 000034 003362  MOV      RKMR2(R5),HMR2
9019 043732 016537 000036 003364  MOV      RKMR3(R5),HMR3
9020 043740 004737 045066      JSR      PC,CKCERR      ;CHECK FOR SPECIAL CERR CONDITIONS
9021 043744 000207      RTS      PC
9022
9023      ; STORE ALL RK611 REGISTERS IN HOLDING REGS
9024
9025
9026 043746 016537 000000 003334  HOLD:  MOV      RKCS1(R5),HCS1
9027 043754 016537 000010 003336  MOV      RKCS2(R5),HCS2
9028 043762 016537 000002 003340  MOV      RKWC(R5),HWC
9029 043770 016537 000004 003342  MOV      RKBA(R5),HBA
9030 043776 016537 000006 003344  MOV      RKDA(R5),HDA
9031 044004 016537 000012 003346  MOV      RKDS(R5),HDS
9032 044012 016537 000014 003350  MOV      RKER(R5),HER
9033 044020 016537 000016 003352  MOV      RKASOF(R5),HASOF
9034 044026 016537 000020 003354  MOV      RKDC(R5),HDC
9035 044034 016537 000026 003360  MOV      RKMR1(R5),HMR1
9036 044042 016537 000034 003362  MOV      RKMR2(R5),HMR2
9037 044050 016537 000036 003364  MOV      RKMR3(R5),HMR3
9038 044056 016537 000030 003366  MOV      RKECPS(R5),HPOS

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9039 044064 016537 000032 003370      MOV    RKECPT(R5),HPAT
9040 044072 000207                      RTS    PC
9041
9042
9043      ;ROUTINE TO CHECK FOR CORRECT ATTN
9044      ;RETURN IF ATTN NOT PRESENT (ERROR CONDITION)
9045      ;RETURN +2 IF ATTN PRESENT (SKIP OVER ERROR)
9046
9047 044074 010446      TSTATN: MOV    R4, -(SP)          ;SAV R4
9048 044076 013704      MOV    $UNIT, R4
9049 044102 136437 001222 003324 003353  BITB   ATTN(R4), HASOF+1
9050 044110 001404      BEQ     1$                ;BRANCH IF ATTN NOT PRESENT
9051 044112 012604      MOV     (SP)+, R4          ;RESTOR R4
9052 044114 062716 000002      ADD     #2, (SP)        ;INCR RET ADDR TO JUMP OVER ERROR.
9053 044120 000207      RTS    PC
9054 044122 012604      1$:   MOV     (SP)+, R4          ;RESTOR R4
9055 044124 000207      RTS    PC
9056
9057
9058      ;ROUTINE TO FIND ATTN WITHIN TIMES GREATER THAN 1 SEC
9059      ;ENTER WITH TIME IN SECONDS IN TEMP2
9060      ;RETURN IF NO ATTN (ERROR CONDITION)
9061      ;RETURN +2 IF ATTN FOUND
9062      ;STATUS IS OBTAINED BEFORE THE RETURN FOR EITHER CASE
9063
9064
9065 044126 010446      FATT1:  MOV    R4, -(SP)          ;SAV R4
9066 044130 012737 177777 003372 3$:   MOV    #-1, TEMP1
9067 044136 013704      MOV    $UNIT, R4
9068 044142 136465 001222 003324 000017 1$:  BITB   ATTN(R4), RKASOF+1(R5) ;FIND CORRECT ATTN
9069 044150 001014      BNE     2$
9070 044152 005337 003372      DEC     TEMP1
9071 044156 001371      BNE     1$
9072 044160 005337 003374      DEC     TEMP2
9073 044164 001361      BNE     3$
9074 044166 005065      CLR     RKMR1(R5)          ;SELECT WORD 0
9075 044172 004737 045150      JSR     PC, GSTAT        ;GET LATEST STATUS
9076 044176 012604      MOV     (SP)+, R4          ;RESTOR R4
9077 044200 000207      RTS    PC
9078 044202 005065      2$:   CLR     RKMR1(R5)
9079 044206 004737 045150      JSR     PC, GSTAT        ;GET STATUS AFTER ATTN SEEN
9080 044212 012604      MOV     (SP)+, R4          ;RESTOR R4
9081 044214 062716 000002      ADD     #2, (SP)        ;SKIP OVER ERROR
9082 044220 000207      RTS    PC
9083
9084
9085      ;ROUTINE TO FIND ATTN WITHIN 1 SEC
9086      ;ENTER WITH COUNT IN TEMP1
9087      ;RETURN IF NO ATTN (ERROR)
9088      ;RETURN +2 IF ATTN FOUND
9089      ;STATUS IS OBTAINED BEFORE THE RETURN FOR EITHER CASE
9090
9091
9092 044222 010446      FATT2:  MOV    R4, -(SP)          ;SAV R4
9093 044224 013704      2$:   MOV    $UNIT, R4
9094 044230 136465 001222 003324 000017  BITB   ATTN(R4), RKASOF+1(R5) ;FIND CORRECT ATTN

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9095	044236	001011			BNE	1\$	
9096	044240	005337	003372		DEC	TEMP1	
9097	044244	001367			BNE	2\$	
9098	044246	005065	000026		CLR	RKMR1(R5)	; SELECT WORD 0
9099	044252	004737	045150		JSR	PC, GSTAT	; GET LATEST STATUS.
9100	044256	012604			MOV	(SP)+, R4	; RESTOR R4
9101	044260	000207			RTS	PC	
9102	044262	005065	000026	1\$:	CLR	RKMR1(R5)	
9103	044266	004737	045150		JSR	PC, GSTAT	
9104	044272	012604			MOV	(SP)+, R4	; RESTOR R4
9105	044274	062716	000002		ADD	#2, (SP)	; SKIP OVER ERROR
9106	044300	000207			RTS	PC	
9107							
9108							
9109							
9110							
9111							
9112	044302	005737	003372				
9113	044306	001403					
9114	044310	005337	003372				
9115	044314	000772					
9116	044316	000207					
9117							
9118							
9119							
9120							
9121	044320	104401	056226				
9122	044324	010046					
9123							
9124	044326	104403					
9125	044330	001					
9126	044331	000					
9127	044332	000207					
9128							
9129							
9130							
9131	044334	017637	000000	001466	CHKMSG:	MOV	#2, (SP), CHKFLG
9132	044342	062716	000002			ADD	#2, (SP)
9133	044346	004737	045212			JSR	PC, GSTAT1
9134							
9135	044352	053737	001222	003424		BIS	\$UNIT, E.A0
9136	044360	053737	001222	003430		BIS	\$UNIT, E.A1
9137	044366	053737	001222	003434		BIS	\$UNIT, E.A2
9138	044374	053737	001222	003440		BIS	\$UNIT, E.A3
9139							
9140	044402	013746	003372			MOV	TEMP1, -(SP)
9141							
9142	044406	013737	003424	003372		MOV	E.A0, TEMP1
9143	044414	004737	047422			JSR	PC, SBPAR
9144	044420	013737	003372	003424		MOV	TEMP1, E.A0
9145							
9146	044426	013737	003430	003372		MOV	E.A1, TEMP1
9147	044434	004737	047422			JSR	PC, SBPAR
9148	044440	013737	003372	003430		MOV	TEMP1, E.A1
9149							
9150	044446	013737	003434	003372		MOV	E.A2, TEMP1

; ENTER WITH A COUNT IN TEMP1
 ; THE DELAY IS APPROX 17 US/ITERATION + 12 US TO EXIT
 ; WHEN COUNT IS 0...BASED ON AN 11/05.
 DLY: TST TEMP1 ; 5.6 US
 BEQ 1\$; 2.5 US
 DEC TEMP1 ; 6.8 US
 BR DLY ; 2.5 US
 1\$: RTS PC ; 3.8 US
 ; THIS ROUTINE TYPES BYPASSED DRIVE#. ENTER WITH DRIVE# IN R0
 ;
 BYP: TYPE MSG14 ; BYPASS DRIVE
 MOV R0, -(SP) ; SAVE R0 FOR TYPEOUT
 ; TYPE DR#
 ; GO TYPE--OCTAL ASCII
 ; TYPE 1 DIGIT(S)
 ; SUPPRESS LEADING ZEROS
 ;
 ; THIS ROUTINE READS ALL MSG A&B WORDS & CHECKS THEM AS REQ'D
 ;
 ; PASS MSGS TO BE TESTED
 ; BUMP RETURN ADDR TO 1ST ERROR
 ; GET ALL ACTUAL DRIVE & CONTR STATUS
 ; SET UNIT #
 ; SAVE TEMP 1
 ; GET PARITY FOR MSG A0
 ; GET PARITY FOR MSG A1

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9151	044454	004737	047422			JSR	PC, SBPAR	;GET PARITY FOR MSG A2
9152	044460	013737	003372	003434		MOV	TEMP1, E.A2	
9153								
9154	044466	013737	003426	003372		MOV	E.B0, TEMP1	
9155	044474	004737	047422			JSR	PC, SBPAR	;GET PARITY FOR MSG B0
9156	044500	013737	003372	003426		MOV	TEMP1, E.B0	
9157								
9158	044506	013737	003432	003372		MOV	E.B1, TEMP1	
9159	044514	004737	047422			JSR	PC, SBPAR	;GET PARITY FOR MSG B1
9160	044520	013737	003372	003432		MOV	TEMP1, E.B1	
9161								
9162	044526	013737	003436	003372		MOV	E.B2, TEMP1	
9163	044534	004737	047422			JSR	PC, SBPAR	;GET PARITY FOR MSG B2
9164	044540	013737	003372	003436		MOV	TEMP1, E.B2	
9165								
9166	044546	013737	003442	003372		MOV	E.B3, TEMP1	
9167	044554	004737	047422			JSR	PC, SBPAR	;GET PARITY FOR MSG B3
9168	044560	013737	003372	003442		MOV	TEMP1, E.B3	
9169								
9170	044566	012637	003372			MOV	(SP)+, TEMP1	;RESTORE TEMP 1
9171	044572	013737	001176	001172		MOV	\$ESCAPE, \$TMP5	;SAVE ESCAPE
9172								
9173	044600	023737	003404	003424		CMP	H.A0, E.A0	;TEST MSG A0
9174	044606	001411				BEQ	2\$	;BR IF OK
9175	044610	012737	044622	001176		MOV	#1\$, \$ESCAPE	;ELSE SETUP ESCAPE
9176	044616	011646				MOV	(SP), -(SP)	;COPY RET ADDR
9177	044620	000207				RTS	PC	; & RETURN TO MAINLINE ERROR
9178								
9179	044622	032777	001000	134310	1\$:	BIT	#SW9, \$SWR	;RET HERE FROM MAINLINE ERROR
9180	044630	001107				BNE	20\$	; & BR IF LOOP ON ERROR
9181	044632	062716	000002		2\$:	ADD	#2, (SP)	;BUMP RET ADDR TO NEXT ERROR
9182								
9183	044636	023737	003406	003426		CMP	H.B0, E.B0	;TEST MSG B0
9184	044644	001411				BEQ	5\$	;BR IF OK
9185	044646	012737	044660	001176		MOV	#4\$, \$ESCAPE	;ELSE SETUP ESCAPE
9186	044654	011646				MOV	(SP), -(SP)	;COPY RET ADDR
9187	044656	000207				RTS	PC	; & RETURN TO MAINLINE ERROR
9188								
9189	044660	032777	001000	134252	4\$:	BIT	#SW9, \$SWR	;RETURN HERE FROM MAINLINE ERROR
9190	044666	001070				BNE	20\$	; & BR IF LOOP ON ERROR
9191	044670	062716	000002		5\$:	ADD	#2, (SP)	;BUMP RET ADDR TO NEXT ERROR
9192								
9193	044674	023737	003410	003430		CMP	H.A1, E.A1	;TEST MSG A1
9194	044702	001411				BEQ	8\$	;BR IF OK
9195	044704	012737	044716	001176		MOV	#7\$, \$ESCAPE	;ELSE SETUP ESCAPE
9196	044712	011646				MOV	(SP), -(SP)	;COPY RET ADDR
9197	044714	000207				RTS	PC	; & RETURN TO MAINLINE ERROR
9198								
9199	044716	032777	001000	134214	7\$:	BIT	#SW9, \$SWR	;RETURN HERE FROM MAINLINE ERROR
9200	044724	001051				BNE	20\$	; & BR IF LOOP ON ERROR
9201	044726	062716	000002		8\$:	ADD	#2, (SP)	;BUMP RET ADDR TO NEXT ERROR
9202								
9203	044732	023737	003412	003432		CMP	H.B1, E.B1	;TEST MSG B1
9204	044740	001411				BEQ	11\$	;BR IF OK
9205	044742	012737	044754	001176		MOV	#10\$, \$ESCAPE	;ELSE SETUP ESCAPE
9206	044750	011646				MOV	(SP), -(SP)	;COPY RET ADDR

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SEQ 0169

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9207 044752 000207          RTS      PC
9208
9209 044754 032777 001000 134156 10$:  BIT      #SW9,2SWR
9210 044762 001032          BNE      20$
9211 044764 062716 000002          11$:  ADD      #2,(SP)
9212
9213 044770 032737 000001 001466 12$:  BIT      #T.A2,CHKFLG ;TEST MSG A2?
9214 044776 001402          BEQ      13$ ;BR IF NO
9215 045000 004737 046162          JSR      PC,RCYLD ;PUT INFO IN CYLDIF, DO NOT CHECK
9216
9217 045004 032737 000002 001466 13$:  BIT      #T.B2,CHKFLG ;TEST MSG B2?
9218 045012 001402          BEQ      14$ ;BR IF NO
9219 045014 004737 046234          JSR      PC,RCYLA ;PUT INFO IN CYLADD, DO NOT CHECK
9220
9221 045020 032737 000004 001466 14$:  BIT      #T.B3,CHKFLG ;TEST MSG B3?
9222 045026 001404          BEQ      15$
9223 045030 004737 046272          JSR      PC,RSEC ;PUT INFO IN SECTOR, DO NOT CHECK
9224 045034 004737 046330          JSR      PC,RHEAD ;PUT INFO IN HEAD, DO NOT CHECK
9225
9226 045040 013737 001172 001176 15$:  MOV      $TMP5,$ESCAPE ;RESTORE ESCAPE
9227 045046 000207          RTS      PC
9228
9229 045050 012706 001100          MOV      #STACK,SP ;RESET STACK PTR
9230 045054 013737 001172 001176 20$:  MOV      $TMP5,$ESCAPE ;RESTORE ESCAPE
9231 045062 000177 134022          JMP      2$LPERR
9232
9233
9234 ; THIS ROUTINE CHECKS FOR CERTAIN ERROR CONDITIONS ONLY
9235 ; IE: IF NED, CTO OR MDS SET, MSG A&B ARE INVALID
9236
9237 045066 005737 001462          CKCERR: TST      BYPCERR
9238 045072 001025          BNE      4$
9239 045074 032737 100000 003334          BIT      #CERR,HCS1
9240 045102 001001          BNE      1$ ;BR IF CERR
9241 045104 000207          RTS      PC
9242
9243 045106 032737 004000 003334 1$:  BIT      #CTO,HCS1
9244 045114 001402          BEQ      2$ ;BR IF NOT CTO
9245 045116 104326          ERROR    326 ;CTO ERROR, MSG A&B INVALID
9246 045120 000207          RTS      PC
9247
9248 045122 032737 010000 003336 2$:  BIT      #NED,HCS2
9249 045130 001401          BEQ      3$ ;BR IF NOT NED
9250 045132 104327          ERROR    327 ;NED ERROR, MSG A&B INVALID
9251
9252 045134 032737 001000 003336 3$:  BIT      #MDS,HCS2
9253 045142 001401          BEQ      4$
9254 045144 104330          ERROR    330 ;MDS ERROR, MSG A&B INVALID
9255
9256 045146 000207          4$:  RTS      PC
9257
9258
9259 ; THIS ROUTINE DOES THE SELECT DRIVE CMD TO GET STATUS
9260 ; IT THEN WAITS FOR CONTROLLER READY.
9261 ; IF RDY NOT RECEIVED BY A TIMEOUT, AN ERROR IS FLAGGED
9262

```

```

9263 045150 013746 003372
9264 045154 013765 001222 000010
9265 045162 012765 000001 000000
9266 045170 013737 001414 003372
9267 045176 004737 043612
9268 045202 104117
9269 045204 012637 003372
9270 045210 000207
9271
9272
9273
9274
9275
9276 045212 013746 003372
9277 045216 004737 043746
9278 045222 012765 100000 000000
9279 045230 013765 001222 000010
9280 045236 012765 000003 000026
9281 045244 012765 000001 000000
9282 045252 013737 001414 003372
9283 045260 004737 043660
9284 045264 104117
9285 045266 013737 003362 003420
9286 045274 013737 003364 003422
9287
9288 045302 012765 100000 000000
9289 045310 013765 001222 000010
9290 045316 012765 000002 000026
9291 045324 012765 000001 000000
9292 045332 013737 001414 003372
9293 045340 004737 043660
9294 045344 104117
9295 045346 013737 003362 003414
9296 045354 013737 003364 003416
9297
9298 045362 012765 100000 000000
9299 045370 013765 001222 000010
9300 045376 012765 000001 000026
9301 045404 012765 000001 000000
9302 045412 013737 001414 003372
9303 045420 004737 043660
9304 045424 104117
9305 045426 013737 003362 003410
9306 045434 013737 003364 003412
9307
9308 045442 012765 100000 000000
9309 045450 013765 001222 000010
9310 045456 012765 000001 000000
9311 045464 013737 001414 003372
9312 045472 004737 043660
9313 045476 104117
9314 045500 013737 003362 003404
9315 045506 013737 003364 003406
9316
9317 045514 012637 003372
9318 045520 000207

```

```

GSTAT: MOV TEMP1, -(SP) ;SAVE TEMP1
        MOV $UNIT, RKCS2(R5) ;CURRENT DRIVE #
        MOV #SELD, RKCS1(R5) ;GET STATUS WITH SELECT DRIVE CMD
        MOV T10, TEMP1
        JSR PC, FRDY ;FIND RDY
        ERROR 117 ;RDY NOT SET BY END OF SELECT DRIVE CMD
        MOV (SP)+, TEMP1 ;RESTOR TEMP1
        RTS PC

```

```

; THIS ROUTINE GETS STATUS OF ALL DRIVE REGISTERS (MSG A0-A3, B0-B3)
; & ALL CONTROLLER REGISTERS

```

```

GSTAT1: MOV TEMP1, -(SP) ;SAVE TEMP 1
        JSR PC, HOLD ;GET ALL CONTR REGS
        MOV #CCLR, RKCS1(R5) ;CLEAR CONTR
        MOV $UNIT, RKCS2(R5) ;CURRENT DRIVE #
        MOV #3, RKMR1(R5) ;SELECT WORD 3
        MOV #SELD, RKCS1(R5) ;GET STATUS
        MOV T10, TEMP1
        JSR PC, FRDY1 ;FIND RDY & STORE DRIVE REGS ONLY
        ERROR 117 ;RDY NOT SET BY END OF SELECT DRV CMD
        MOV HMR2, H.A3 ;STORE MSG A3
        MOV HMR3, H.B3 ;STORE MSG B3

        MOV #CCLR, RKCS1(R5)
        MOV $UNIT, RKCS2(R5)
        MOV #2, RKMR1(R5) ;SELECT WORD 2
        MOV #SELD, RKCS1(R5)
        MOV T10, TEMP1
        JSR PC, FRDY1 ;FIND RDY & STORE DRIVE REGS ONLY
        ERROR 117 ;RDY NOT SET BY END OF SELECT DRV CMD
        MOV HMR2, H.A2 ;STORE MSG A2
        MOV HMR3, H.B2 ;STORE MSG B2

        MOV #CCLR, RKCS1(R5)
        MOV $UNIT, RKCS2(R5)
        MOV #1, RKMR1(R5) ;SELECT WORD 1
        MOV #SELD, RKCS1(R5)
        MOV T10, TEMP1
        JSR PC, FRDY1 ;FIND RDY & STORE DRIVE REGS ONLY
        ERROR 117 ;RDY NOT SET BY END OF SELECT DRV CMD
        MOV HMR2, H.A1 ;STORE MSG A1
        MOV HMR3, H.B1 ;STORE MSG B1

        MOV #CCLR, RKCS1(R5)
        MOV $UNIT, RKCS2(R5)
        MOV #SELD, RKCS1(R5) ;SELECT WORD 0
        MOV T10, TEMP1
        JSR PC, FRDY1 ;FIND RDY & STORE DRIVE REGS ONLY
        ERROR 117 ;RDY NOT SET BY END OF SEL DRV CMD
        MOV HMR2, H.A0 ;STORE MSG A0
        MOV HMR3, H.B0 ;STORE MSG B0

        MOV (SP)+, TEMP1 ;RESTORE TEMP1
        RTS PC

```

```

9319
9320
9321
9322
9323
9324
9325
9326
9327 045522 012765 000040 000010
9328 045530 013737 001414 003372
9329 045536 004737 043612
9330 045542 104120
9331 045544 013765 001222 000010
9332 045552 005065 000026
9333 045556 004737 045150
9334 045562 032737 100000 003334
9335 045570 001401
9336 045572 000207
9337 045574 062716 000002
9338 045600 000207
9339
9340
9341
9342
9343 045602 012765 000003 000026
9344 045610 004737 045150
9345 045614 013737 003364 001406
9346 045622 042737 177017 001406
9347 045630 006237 001406
9348 045634 006237 001406
9349 045640 006237 001406
9350 045644 006237 001406
9351 045650 000207
9352
9353
9354
9355
9356
9357
9358 045652 013746 003372
9359 045656 013737 001424 003372
9360 045664 004737 045602
9361 045670 005737 001406
9362 045674 001005
9363 045676 004737 045602
9364 045702 005737 001406
9365 045706 001406
9366 045710 005337 003372
9367 045714 001363
9368 045716 012637 003372
9369 045722 000207
9370 045724 012637 003372
9371 045730 062716 000002
9372 045734 000207
9373
9374

```

; THIS ROUTINE DOES A SUBSYSTEM CLEAR & WAITS FOR CONTROLLER READY
 ; IF RDY IS NOT RECEIVED BY THE END OF THE TIMEOUT, AN ERROR IS FLAGGED.
 ; THE ROUTINE THEN GETS CURRENT STATUS & CHECKS FOR CONTROLLER ERROR (CERR)
 ; RETURN IF CERR SET
 ; RETURN +2 IF CERR CLEAR
 SUBCLR: MOV #SCLR,RKCS2(R5) ; SUBSYS CLEAR
 MOV T10,TEMP1
 JSR PC,FRDY ; FIND RDY
 ERROR 120 ; RDY NOT SET BY END OF SCLR
 MOV \$UNIT,RKCS2(R5) ; CURRENT DRIVE #
 CLR RKMR1(R5) ; SELECT WORD 0
 JSR PC,GSTAT ; GET STATUS
 BIT #CERR,HCS1 ; CHECK FOR CONT ERROR
 BEQ 1\$
 RTS PC
 1\$: ADD #2,(SP) ; SKIP OVER ERROR
 RTS PC
 ; READ THE SECTOR COUNT IN RKMR3, RIGHT JUSTIFY IT & STORE IT IN 'SECTOR'
 RDSEC: MOV #3,RKMR1(R5) ; WORD 3
 JSR PC,GSTAT
 MOV HMR3,SECTOR
 BIC #1<M.SECT>,SECTOR
 ASR SECTOR ; RIGHT JUSTIFY
 ASR SECTOR ; SECTOR
 ASR SECTOR ; INFO
 ASR SECTOR
 RTS PC
 ; FIND SECTOR 0 IN 22 SECTOR FORMAT.
 ; ERROR FLAGGED IF NOT FOUND BY TIMEOUT
 F\$022: MOV TEMP1,-(SP) ; SAVE TEMP1
 MOV T\$000,TEMP1 ; SETUP TIMEOUT
 1\$: JSR PC,RDSEC ; READ SECTOR
 TST SECTOR ; LOOK FOR SECTOR 0
 BNE 2\$
 JSR PC,RDSEC
 TST SECTOR
 BEQ 3\$; BR IF SAME TWICE
 2\$: DEC TEMP1
 BNE 1\$; TRY AGAIN IF TIMEOUT NOT UP
 MOV (SP)+,TEMP1 ; ELSE RESTORE TEMP1
 RTS PC ; EXIT
 3\$: MOV (SP)+,TEMP1
 ADD #2,(SP) ; SKIP OVER ERROR
 RTS PC

```

9375 ;FIND NEXT SECTOR IN 22 SECTOR FORMAT
9376 ;ERROR FLAGGED IF NOT FOUND BY TIMEOUT
9377
9378 045736 013746 003372 FNS22: MOV TEMP1, -(SP) ;SAVE TEMP 1
9379 045742 013737 001420 003372 MOV T500, TEMP1 ;SETUP TIMEOUT
9380 045750 004737 045602 1$: JSR PC, RDSEC ;READ SECTOR
9381 045754 023737 001402 001406 CMP PSEC, SECTOR
9382 045762 001406 BEQ 3$ ;BR IF SAME
9383 045764 004737 045602 JSR PC, RDSEC ;ELSE TRY READ DIFFERENT TWICE
9384 045770 023737 001402 001406 CMP PSEC, SECTOR
9385 045776 001006 BNE 2$ ;BR IF DIFFERENT TWICE
9386 046000 005337 003372 3$: DEC TEMP1 ;ELSE TRY AGAIN IF TIME LEFT
9387 046004 001361 BNE 1$
9388 046006 012637 003372 MOV (SP)+, TEMP1 ;RESTORE TEMP 1
9389 046012 000207 RTS PC
9390 046014 012637 003372 2$: MOV (SP)+, TEMP1 ;RESTORE TEMP 1
9391 046020 062716 000002 ADD #2, (SP) ;SKIP OVER ERROR
9392 046024 000207 RTS PC
9393
9394 ;READ THE CYL DIFF/OFFSET IN RKMR2, RIGHT JUSTIFY IT & STORE IT IN 'CYLDIF'
9395
9396 046026 012765 000002 000026 RDCYLD: MOV #2, RKMR1(R5) ;WORD 2
9397 046034 004737 045150 JSR PC, GSTAT
9398 046040 013737 003362 001362 MOV HMR2, CYLDIF
9399 046046 042737 160017 001362 BIC #1<M.CDIF>, CYLDIF
9400 046054 006237 001362 ASR CYLDIF ;RIGHT JUSTIFY
9401 046060 006237 001362 ASR CYLDIF ;CYL DIFF/OFFSET
9402 046064 006237 001362 ASR CYLDIF ;INFO
9403 046070 006237 001362 ASR CYLDIF
9404 046074 023727 001362 000777 CMP CYLDIF, #777 ;CHK TO SEE IF RET IN COMPL. FORM
9405 046102 001002 BNE 1$ ;BR IF NOT
9406 046104 005037 001362 CLR CYLDIF ;CLR IF YES
9407 046110 000207 1$: RTS PC
9408
9409 ;READ THE CYL ADDR IN RKMR3, RIGHT JUSTIFY IT & STORE IT IN 'CYLADD'
9410
9411 046112 012765 000002 000026 RDCYLA: MOV #2, RKMR1(R5) ;WORD 2
9412 046120 004737 045150 JSR PC, GSTAT
9413 046124 013737 003364 001364 MOV HMR3, CYLADD
9414 046132 042737 160017 001364 BIC #1<M.CADD>, CYLADD
9415 046140 006237 001364 ASR CYLADD ;RIGHT JUSTIFY
9416 046144 006237 001364 ASR CYLADD ;CYL ADDR
9417 046150 006237 001364 ASR CYLADD ;INFO
9418 046154 006237 001364 ASR CYLADD
9419 046160 000207 RTS PC
9420
9421 ;READ THE CYL DIFF/OFFSET IN H.A2, RIGHT JUSTIFY IT & STORE IT IN 'CYLDIF'
9422
9423 046162 013737 003414 001362 RCYLD: MOV H.A2, CYLDIF
9424 046170 042737 160017 001362 BIC #1<M.CDIF>, CYLDIF ;CLEAR UNWANTED INFO
9425 046176 006237 001362 ASR CYLDIF ;RIGHT JUSTIFY
9426 046202 006237 001362 ASR CYLDIF
9427 046206 006237 001362 ASR CYLDIF
9428 046212 006237 001362 ASR CYLDIF
9429 046216 023727 001362 000777 CMP CYLDIF, #777 ;CHK TO SEE IF RET IN COMPL. FORM
9430 046224 001002 BNE 1$ ;BR IF NO

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SEQ 0173

9431 046226 005037 001362
9432 046232 000207

1\$: CLR CYLDIF ;ELSE CLEAR
RTS PC

; READ THE CYL ADDR IN H.B2, RIGHT JUSTIFY IT & STORE IT IN 'CYLADD'

9433
9434
9435
9436 046234 013737 003416 001364
9437 046242 042737 160017 001364
9438 046250 006237 001364
9439 046254 006237 001364
9440 046260 006237 001364
9441 046264 006237 001364
9442 046270 000207

RCYLA: MOV H.B2,CYLADD
BIC #1C<M.CADD>,CYLADD ;CLEAR UNWANTED INFO
ASR CYLADD ;RIGHT JUSTIFY
ASR CYLADD
ASR CYLADD
ASR CYLADD
RTS PC

; READ THE SECTOR COUNT IN H.B3, RIGHT JUSTIFY IT & STORE IT IN 'SECTOR'

9443
9444
9445
9446 046272 013737 003422 001406
9447 046300 042737 177017 001406
9448 046306 006237 001406
9449 046312 006237 001406
9450 046316 006237 001406
9451 046322 006237 001406
9452 046326 000207

RSEC: MOV H.B3,SECTOR
BIC #1C<M.SECT>,SECTOR ;CLEAR UNWANTED INFO
ASR SECTOR ;RIGHT JUSTIFY
ASR SECTOR
ASR SECTOR
ASR SECTOR
RTS PC

; READ THE HEAD ADDR IN H.B3, RIGHT IT & STORE IT IN 'HEAD'

9453
9454
9455
9456 046330 013737 003422 001432
9457 046336 042737 170777 001432
9458 046344 006237 001432
9459 046350 000337 001432
9460 046354 000207

RHEAD: MOV H.B3,HEAD
BIC #1C<M.HEAD>,HEAD ;CLEAR UNWANTED INFO
ASR HEAD ;RIGHT JUSTIFY IT
SWAB HEAD
RTS PC

; FIND LIMIT DETECT ON SEEK IN RKMR3 BEFORE TIMEOUT
; RETURN IF NOT FOUND: ERROR
; RETURN+2 IF FOUND: SKIP OVER ERROR

9461
9462
9463
9464
9465
9466 046356 005037 001460
9467 046362 012737 177777 003372
9468 046370 012765 000001 000026
9469 046376 004737 045150
9470 046402 032737 020000 003364
9471 046410 001006
9472 046412 005337 003372
9473 046416 001367
9474 046420 005237 001460
9475 046424 000207
9476 046426 062716 000002
9477 046432 000207

FLIM: CLR LIMERR ;LIMIT DETECT ERROR FLAG
MOV #-1,TEMP1 ;SETUP TIMEOUT
MOV #1,RKMR1(R5) ;WORD 1
1\$: JSR PC,GSTAT
BIT #D.LIMD,HMR3
BNE 2\$;EXIT IF SET
DEC TEMP1
BNE 1\$
INC LIMERR ;SET LIMIT DETECT FLAG
RTS PC
2\$: ADD #2,(SP) ;SKIP OVER ERROR
RTS PC

; ROUTINE TO FIND HEADS HOME IN RKMR2 WORD 1 BEFORE TIMEOUT
; ENTER WITH TIME IN SECONDS IN TEMP2
; RETURN IF NOT FOUND
; RETURN+2 IF FOUND - SKIP OVER ERROR

9478
9479
9480
9481
9482
9483
9484 046434 012737 177777 003372
9485 046442 012765 000001 000026
9486 046450 004737 045150

FHDHM: MOV #-1,TEMP1 ;ALL 1'S
MOV #1,RKMR1(R5) ;WORD 1
1\$: JSR PC,GSTAT

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SEQ 0174

9487	046454	032737	000040	003362	BIT	#D.HDMM,HMR2	
9488	046462	001007			BNE	2\$	
9489	046464	005337	003372		DEC	TEMP1	
9490	046470	001367			BNE	1\$	
9491	046472	005337	003374		DEC	TEMP2	
9492	046476	001356			BNE	FHDMM	
9493	046500	000207			RTS	PC	
9494	046502	062716	000002		2\$: ADD	#2,(SP)	;SKIP OVER ERROR
9495	046506	000207			RTS	PC	
9496							
9497							
9498							
9499							
9500							
9501	046510	012737	177777	003372	FLOAD: MOV	#-1,TEMP1	;SETUP TIMEOUT
9502	046516	012765	000001	000026	MOV	#1,RKMR1(R5)	;WORD 1
9503	046524	004737	045150		1\$: JSR	PC,GSTAT	
9504	046530	032737	010000	003362	BIT	#D.LOAD,HMR2	
9505	046536	001004			BNE	2\$	
9506	046540	005337	003372		DEC	TEMP1	
9507	046544	001367			BNE	1\$	
9508	046546	000207			RTS	PC	
9509	046550	062716	000002		2\$: ADD	#2,(SP)	;SKIP OVER ERROR
9510	046554	000207			RTS	PC	
9511							
9512							
9513							
9514							
9515							
9516							
9517	046556	012737	177777	003372	FSPOK: MOV	#-1,TEMP1	;ALL 1'S
9518	046564	012765	000001	000026	MOV	#1,RKMR1(R5)	;WORD 1
9519	046572	004737	045150		1\$: JSR	PC,GSTAT	
9520	046576	032737	001000	003362	BIT	#D.SPOK,HMR2	;SEE IF SPOK CLEARED
9521	046604	001407			BEQ	2\$	
9522	046606	005337	003372		DEC	TEMP1	
9523	046612	001367			BNE	1\$	
9524	046614	005337	003374		DEC	TEMP2	
9525	046620	001356			BNE	FSPOK	
9526	046622	000207			RTS	PC	
9527	046624	062716	000002		2\$: ADD	#2,(SP)	;SKIP OVER ERROR
9528	046630	000207			RTS	PC	
9529							
9530							
9531							
9532							
9533							
9534							
9535	046632	010046			FHDTab: MOV	RO,-(SP)	;SAV RO
9536	046634	010146			MOV	R1,-(SP)	;SAV R1
9537	046636	012700	001470		MOV	#HDTAB,RO	;HEADER WORD TABLE ADDR
9538	046642	005001			CLR	R1	;SECTOR COUNTER
9539	046644	013737	001430	001434	MOV	HEAD,HD1	
9540	046652	006337	001434		ASL	HD1	
9541	046656	006337	001434		ASL	HD1	
9542	046662	006337	001434		ASL	HD1	

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SEQ 0175

```

9543 046666 006337 001434      ASL    HD1
9544 046672 006337 001434      ASL    HD1          ;SETUP HEAD # FOR WORD 2 OF HEADER
9545 046676 013737 001436 001440  MOV    FORMAT,FMT1
9546 046704 000337 001440      SWAB   FMT1
9547 046710 006337 001440      ASL    FMT1          ;SETUP FORMAT FOR WORD 2 OF HEADER
9548
9549 046714 013720 001366      1$:    MOV    CALADD,(R0)+ ;HEADER WORD 1-CYL ADDR
9550 046720 010110              MOV    R1,(R0)      ;HEADER WORD 2-SECTOR NO
9551 046722 053710 001434      BIS    HD1,(R0)      ;
9552 046726 053710 001440      BIS    FMT1,(R0)     ;
9553 046732 005737 001464      TST    BYPFMT
9554 046736 001403              BEQ     2$          ;BR IF TRUE FORMAT
9555 046740 052710 140000      BIS    <BIT14!BIT15>,(R0) ;SET GOOD SECTOR FLAGS
9556 046744 000402              BR      3$
9557 046746 004737 047026      2$:    JSR    PC,SECFLG ;GET SECTOR FLAGS
9558
9559 046752 013737 001366 003372 3$:    MOV    CALADD,TEMP1
9560 046760 011037 003374      MOV    (R0),TEMP2
9561 046764 043737 001366 003374      BIC    CALADD,TEMP2
9562 046772 042037 003372      BIC    (R0)+,TEMP1
9563 046776 053737 003372 003374      BIS    TEMP1,TEMP2
9564 047004 013720 003374      MOV    TEMP2,(R0)+ ;HEADER WORD 3-HEADER CHECK
9565
9566 047010 005201              INC     R1          ;SECTOR CTR
9567 047012 020127 000026      CMP     R1,#22.      ;ALL 22 SECTORS DONE? (66 WORDS)
9568 047016 001336              BNE     1$          ;BR IF NO
9569
9570 047020 012601              MOV    (SP)+,R1      ;RESTOR R1
9571 047022 012600              MOV    (SP)+,R0      ;RESTOR R0
9572 047024 000207              RTS     PC
9573
9574
9575 ; THIS ROUTINE GETS INFORMATION FROM THE BAD SECTOR TABLE FILLED BY A PREVIOUS TEST
9576 ; & SETS BITS 14 & 15 APPROPRIATELY.
9577
9578 047026 010246              SECFLG: MOV    R2,-(SP) ;SAVE R2
9579 047030 005737 001436      TST     FORMAT
9580 047034 001016              BNE     1$          ;BR IF 20 SECTOR FORMAT
9581 047036 012702 002314      MOV     #BSE22H+8.,R2
9582 047042 004737 047076      JSR     PC,FLGTST ;GET HARDWARE DETECTED FLAG
9583 047046 052710 100000      BIS     #BIT15,(R0) ;RETURN HERE IF GOOD SECTOR
9584
9585 047052 012702 054502      MOV     #BSE22S+8.,R2 ;ELSE RETURN HERE
9586 047056 004737 047076      JSR     PC,FLGTST ;GET SOFTWARE DETECTED FLAG
9587 047062 052710 040000      BIS     #BIT14,(R0) ;RETURN HERE IF GOOD SECTOR
9588
9589 047066 012602              MOV     (SP)+,R2 ;ELSE RETURN HERE
9590 047070 000207              RTS     PC
9591
9592
9593 047072 012602      1$:    MOV     (SP)+,R2 ;RESTORE R2
9594 047074 000207      RTS     PC
9595
9596 ; THIS ROUTINE DOES THE ACTUAL SCANNING OF THE BAD SECTOR TABLES
9597 ; ENTER WITH THE ADDRESS OF TABLE (BSE22H, BSE22S, ETC) IN TEMP1
9598

```

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SEQ 0176

```

9599      ; RETURN IF NO COMPARE
9600      ; RETURN +4 IF COMPARE
9601
9602 047076 010346      FLGTST: MOV      R3,-(SP)      ;SAVE R3
9603
9604 047100 021227 177777 1$:      CMP      (R2),#-1      ;SEE IF ALL 1'S
9605 047104 001002      BNE      2$      ;BR IF NO
9606 047106 012603      MOV      (SP)+,R3      ;RESTORE R3
9607 047110 000207      RTS      PC
9608
9609 047112 022237 001366 2$:      CMP      (R2)+,CALADD      ;SEE IF = CYL #, & ADV PTR TO TRACK/SECTOR WORD
9610 047116 001403      BEQ      3$
9611 047120 062702 000002      ADD      #2,R2      ;GO TO NEXT CYL WORD IN TABLE
9612 047124 000765      BR      1$
9613
9614 047126 013703 001430 3$:      MOV      HEAD,R3      ;GET HEAD # FROM FHDTAB ROUTINE
9615 047132 000303      SWAB      R3
9616 047134 050103      BIS      R1,R3      ;ADD SECTOR # FROM FHDTAB ROUTINE
9617 047136 022203      CMP      (R2)+,R3      ;SECTOR/HEAD COMPARE? & INCR TO NEXT CYL WORD
9618 047140 001401      BEQ      4$      ;BR IF YES
9619 047142 000756      BR      1$      ;TRY NEXT CYL
9620
9621 047144 012603 000004 4$:      MOV      (SP)+,R3      ;RESTORE R3
9622 047146 062716      ADD      #4,(SP)      ;INCREMENT RET ADDR
9623 047152 000207      RTS      PC
9624
9625      ;THIS ROUTINE SORTS THE RHTAB TABLE FROM WHATEVER SECTOR IT BEGINS
9626      ;WITH AND RE-WITES THE INFO IN SRTTAB TABLE TO BEGIN WITH SECTOR 0
9627
9628 047154 010046      SORT:  MOV      R0,-(SP)      ;SAVE R0
9629 047156 010146      MOV      R1,-(SP)      ;SAVE R1
9630 047160 004737 045602      JSR      PC,RDSEC
9631 047164 062737 000001 001406      ADD      #1,SECTOR
9632 047172 004737 047262      JSR      PC,MULT6      ;MULT SECTOR BY 6
9633
9634 047176 012700 000204      MOV      #132,R0
9635 047202 163700 001406      SUB      SECTOR,R0      ;R0-SECTOR TO R0 = INDEX
9636 047206 010037 001406      MOV      R0,SECTOR
9637 047212 062737 001674 001406      ADD      #RHTAB,SECTOR      ;SAVE INDEX
9638
9639 047220 062700 001674      ADD      #RHTAB,R0      ;INDEX TO BOT HALF OF RHTAB
9640 047224 012701 002100      MOV      #SRTTAB,R1      ;INDEX TO TOP HALF OF SRTTAB
9641
9642 047230 012021 002100 1$:      MOV      (R0)+,(R1)+      ;PUT BOTTOM OF RHTAB TO TOP OF SRTTAB
9643 047232 020027      CMP      R0,#RHTAB+132.
9644 047236 001374      BNE      1$
9645
9646 047240 012700 001674 2$:      MOV      #RHTAB,R0      ;PUT TOP OF RHTAB TO BOT OF SRTTAB
9647 047244 012021      MOV      (R0)+,(R1)+
9648 047246 020037 001406      CMP      R0,SECTOR
9649 047252 001374      BNE      2$
9650
9651 047254 012601      MOV      (SP)+,R1      ;RESTOR R1
9652 047256 012600      MOV      (SP)+,R0      ;RESTOR R0
9653 047260 000207      RTS      PC
9654

```

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9655
9656
9657
9658 047262 006337 001406
9659 047266 013746 001406
9660 047272 006337 001406
9661 047276 062637 001406
9662 047302 000207
9663
9664
9665
9666
9667 047304 005037 001376
9668 047310 005737 003500
9669 047314 001004
9670 047316 012777 000100 132002
9671 047324 000207
9672 047326 012777 177777 131766
9673 047334 012777 000135 131755
9674 047342 000207
9675
9676
9677
9678 047344 005037 001376
9679 047350 005337 001372
9680 047354 001010
9681 047356 013737 001370 001372
9682 047364 005337 001374
9683 047370 001002
9684 047372 005237 001376
9685 047376 000002
9686
9687
9688
9689 047400 005737 003500
9690 047404 001003
9691 047406 005077 131714
9692 047412 000207
9693 047414 005077 131700
9694 047420 000207
9695
9696
9697
9698
9699
9700
9701
9702
9703
9704
9705
9706 047422 010046
9707 047424 010146
9708 047426 012700 000021
9709 047432 005001
9710 047434 000241

```

```

;MULT BY 6. ENTER WITH DESIRED # IN 'SECTOR'
MULT6: ASL    SECTOR    ;2 X SECTOR
        MOV    SECTOR, -(SP)
        ASL    SECTOR    ;4 X SECTOR
        ADD    (SP)+, SECTOR ;(4 X 5)+(2 X 5) = 6 X SECTOR
        RTS    PC

;ROUTINE TO TURN L OR P CLOCK INTERRUPT ON
CLKON:  CLR    TIMUP
        TST    PCLKF
        BNE    IS
        MOV    #100, 2LKS ;BRANCH IF P-CLOCK PRESENT
        RTS    PC ;L-CLOCK, ENABLE INT
IS:      MOV    #-1, 2PKSB ;P-CLOCK, ALL 1'S
        MOV    #135, 2PKS ;ENABLE INT, CT UP, REP INT
        RTS    PC ;LINE FREQ & RUN

;KW11-L & KW11-P INTERRUPT HANDLER
CLOCK:  CLR    TIMUP
        DEC    COUNT
        BNE    IS
        MOV    HZ, COUNT
        DEC    SEC
        BNE    IS
        INC    TIMUP ;SORRY, TIME IS UP
IS:      RTI

;ROUTINE TO TURN L OR P CLOCK INTERRUPT OFF
CLKOF:  TST    PCLKF
        BNE    IS
        CLR    2LKS ;BRACH IF P-CLOCK PRESENT
        RTS    PC ;L-CLOCK, CLEAR INTERRUPT
IS:      CLR    2PKS ;P-CLOCK, CLEAR INTERRUPT
        RTS    PC

;THIS ROUTINE GENERATES PARITY FOR THE EXPECTED MSGS
;ENTER WITH THE EXPECTED WORD IN TEMP1
;TEMP1 IS ROTATED LEFT 17 TIMES. EACH TIME THE CARRY BIT IS SET,
;R1 IS INCREMENTED. AT THE END OF 17 ROTATES (TEMP1 BACK TO ORIG),
;R1 BIT 0 IS EXAMINED. IF IT IS SET, INDICATING AN ODD # OF 1'S,
;THE PARITY BIT IS NOT SET IN B.
;IF IT IS NOT SET, INDICATING AN EVEN # OF 1'S, THE PARITY BIT IS
;SET IN TEMP1
SBPAR:  MOV    R0, -(SP) ;SAVE R0
        MOV    R1, -(SP) ;SAVE R1
        MOV    #17, R0 ;SHIFT COUNTER
        CLR    R1 ;COUNT # OF 1'S IN TEMP1
        CLC ;CLEAR CARRY

```

J14

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SEQ 0178

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9711
9712 047436 006137 003372 1$: ROL TEMP1
9713 047442 103001 BCC 2$ ;BR IF CARRY CLEAR
9714 047444 005201 INC R1 ;COUNT # OF 1'S
9715 047446 005300 2$: DEC R0 ;SHIFT COUNTER
9716 047450 001372 BNE 1$
9717
9718 047452 032701 000001 BIT #BIT0,R1
9719 047456 001003 BNE 3$ ;BR IF ODD # IN R0
9720 047460 052737 100000 003372 BIS #M.PAR,TEMP1 ;SET PARITY BIT
9721 047466 012601 3$: MOV (SP)+,R1 ;RESTORE R1
9722 047470 012600 MOV (SP)+,R0 ;RESTORE R0
9723 047472 000207 RTS PC
9724
9725 ;ROUTINE TO ENABLE LOOPING ON INTERMITTANT ERRORS
9726 ;WHEN SLPERR SET BY OTHER THAN SCOPE ROUTINE
9727 ;IE: MY LOOP MACRO
9728
9729
9730 047474 032777 001000 131436 SCOP1$: BIT #SW9,ASWR ;LOOP ON ERROR?
9731 047502 001406 BEQ 1$ ;BR IF NO
9732 047504 105737 001103 TSTB $ERFLG ;HAD ERROR?
9733 047510 001403 BEQ 1$ ;BR IF NO
9734 047512 013716 001110 MOV SLPERR,(SP)
9735 047516 000002 RTI
9736
9737 047520 011637 001110 1$: MOV (SP),SLPERR ;SET LOOP ADDR FOR TIGHT SCOPE LOOP
9738 047524 000002 RTI
9739
9740
9741 ;CHECK FOR SW14 (LOOP ON TEST) OR SW8 (LOOP ON SPECIFIC TEST)
9742
9743 ;RETURN IF NEITHER SET
9744 ;RETURN +2 IF EITHER SET
9745
9746 ;THIS SUBROUTINE IS USED AT THE END OF ANY TEST THAT REQUIRES
9747 ;RECONDITIONING OF THE DRIVE BEFORE LOOPING ON AN ERROR OR TEST
9748
9749 047526 005037 001176 SWTST: CLR $ESCAPE
9750 047532 005037 001410 CLR LPFLG
9751 047536 032777 040000 131374 BIT #SW14,ASWR ;LOOP ON TEST?
9752 047544 001403 BEQ 3$ ;BR IF NO
9753 047546 062716 000002 1$: ADD #2,(SP)
9754 047552 000207 2$: RTS PC
9755
9756 047554 032777 000400 131356 3$: BIT #SW8,ASWR ;LOOP ON SPECIFIC TEST?
9757 047562 001773 BEQ 2$ ;BR IF NO
9758 047564 127737 131350 001102 CMPB ASWR,$TSTNM ;RIGHT TEST? SWR <7:0>
9759 047572 001765 BEQ 1$ ;BR IF YES
9760 047574 000207 RTS PC
9761
9762
9763 ;THIS ROUTINE IS ENTERED BY TYPING A CONTROL-C.
9764 ;IT IS USED TO ALLOW THE OPERATOR TO HALT THE CPU WHILE INSURING
9765 ;THAT HEADS ARE LOADED & FORMATTING IS VALID BEFORE ACTUALLY HALTING
9766 ;THE CPU.

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9767
9768 047576 022626          STOP:  CMP      (SP)+,(SP)+      ;RESTORE STACK FROM INTERRUPT
9769
9770 047600 004737 045522      JSR      PC,SUBCLR      ;
9771 047604 104024              ERROR    24              ;CERR AFTER
9772
9773 047606 005737 003316      TST      UNLD              ;SEE IF HEADS UNLOADED
9774 047612 001434              BEQ      3$              ;BR IF NO
9775 047614 005737 000042      TST      42              ;SEE IF MANUAL OR AUTO MODE
9776 047620 001403              BEQ      1$              ;BR IF MANUAL MODE
9777 047622 104401 056676      TYPE     MSG74            ;PGM ABORT PENDING
9778 047626 000402              BR       2$              ;
9779 047630 104401 056725      1$:    TYPE     ,MSG75            ;HALT PENDING
9780 047634
9781
9782 047634 004737 045522      JSR      PC,SUBCLR      ;
9783 047640 104024              ERROR    24              ;CERR AFTER SCLR
9784
9785 047642 012765 000011 000000 MOV     #SRTSPL,RKCS1(R5)      ;START SPINDLE CMD
9786 047650 013737 001414 003372 MOV     T10,TEMP1            ;SET TIMEOUT
9787 047656 004737 043612      JSR      PC,FRDY            ;FIND RDY
9788 047662 104121              ERROR    121            ;RDY NOT FOUND AFTER ST SPIN CMD.
9789
9790 047664 013737 001420 003374 MOV     T500,TEMP2          ;SETUP TIMEOUT
9791 047672 004737 044126      JSR      PC,FATT1            ;FIND ATTN
9792 047676 104067              ERROR    67              ;NO ATTN AFTER ST SPIN CMD.
9793
9794 047700 005037 003316      CLR      UNLD              ;
9795
9796 047704 005737 003320      3$:    TST      BADHDR            ;SEE IF HEADERS VALID
9797 047710 001466              BEQ      4$              ;BR IF YES
9798 047712 005237 003322      INC      HPEND            ;
9799
9800 047716 012765 100000 000000 MOV     #CCLR,RKCS1(R5)      ;
9801 047724 013765 001222 000010 MOV     $UNIT,RKCS2(R5)      ;
9802 047732 012765 000013 000000 MOV     #RECAL,RKCS1(R5)      ;RECAL CMD
9803                                ;RESET CYL DIFF/OFFSET & CYL ADDR REG
9804                                ;IN RKMR2 & RKMR3 RESP.
9805 047740 013737 001414 003372 MOV     T10,TEMP1            ;
9806 047746 004737 043612      JSR      PC,FRDY            ;FIND RDY
9807 047752 104124              ERROR    124            ;RDY NOT SET AFTER RECAL CMD
9808
9809 047754 012765 000001 000026 MOV     #1,RKMR1(R5)        ;SELECT WORD 1
9810 047762 004737 045150      JSR      PC,GSTAT          ;
9811 047766 032737 020000 003362 BIT      #D.RTZ,HMR2          ;
9812 047774 001001              BNE     64$              ;
9813 047776 104244              ERROR    244            ;RTZ NOT SET DURING RECAL CMD
9814 050000 013737 001414 003374 64$: MOV     T10,TEMP2          ;SETUP TIMEOUT
9815 050006 004737 044126      JSR      PC,FATT1            ;FIND ATTN
9816 050012 104055              ERROR    55              ;NO ATTN AFTER RECAL CMD
9817
9818 050014 012765 100000 000000 MOV     #CCLR,RKCS1(R5)      ;
9819 050022 013765 001222 000010 MOV     $UNIT,RKCS2(R5)      ;DRIVE#
9820 050030 012765 000005 000000 MOV     #CLEAR,RKCS1(R5)      ;DRIVE CLEAR CMD
9821 050036 013737 001414 003372 MOV     T10,TEMP1            ;
9822 050044 004737 043612      JSR      PC,FRDY            ;FIND RDY

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SEQ 0180

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9823 050050 104151          ERROR 151          ;NO RDY AFTER DRIVE CLEAR CMD
9824 050052 004737 044074   JSR    PC,TSTATN    ;TEST FOR ATTN
9825 050056 000401          BR      65$          ;
9826 050060 104154          ERROR 154          ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
9827 050062          65$:
9828
9829
9830 050062 000137 031234   JMP     FORM          ;WRITE VALID FORMATS
9831
9832 050066 005737 000042   4$:   TST     42          ;SEE IF MANUAL OR AUTO MODE
9833 050072 001410          BEQ     5$          ;BR IF MANUAL MODE
9834 050074 104401 056747   TYPE    MSG76        ;PGM ABORTED
9835 050100 005037 043160   CLR     $EOPCT      ;SET UP EOP TO EXIT TO MONITOR
9836 050104 005037 001176   CLR     $ESCAPE
9837 050110 000137 043132   JMP     $EOP1        ;ABORT PROGRAM
9838
9839 050114 104401 056765   5$:   TYPE    ,MSG77        ;CPU HALTED
9840 050120 000000          HALT
9841 050122 000137 007740   JMP     ST5          ;START OVER IF CONTINUE PRESSED
9842
9843
9844          ;CHECK IF HALT PENDING
9845          ;RET IF YES
9846          ;RET+4 IF NO
9847
9848 050126 005037 003320   HPEN:  CLR     BADHDR        ;CLR VALID HALT FLAG
9849 050132 005737 003322   TST     HPEND        ;SEE IF HALT PENDING
9850 050136 001002          BNE     1$          ;BR IF YES
9851 050140 062716 000004   ADD     #4,(SP)      ;ELSE BUMP RET ADDR
9852 050144 000207          RTS     PC          ;& RET
9853
9854          .SBTTL UNEXPECTED TIMEOUT HANDLER
9855
9856          ;THIS ROUTINE IS ENTERED IF THERE IS
9857          ;A. NON EXISTANT MEMORY (NO SSYN)
9858          ;B. BOUNDARY EPROR
9859          ;C. STACK OVERFLOW
9860
9861
9862
9863 050146 011600          BADTMO: MOV     (SP),RO      ;SAVE PC WHERE TIMEOUT OCCURRED.
9864 050150 005740          TST     -(RO)          ;GET PC BEFORE UPDATE
9865 050152 032777 020000 130760  BIT     #SW13,$SWR    ;INHIBIT ERROR TYP0UT?
9866 050160 001005          BNE     1$          ;YES, DON'T TYPE
9867 050162 104401 057143   TYPE    EM3          ;ABORT TESTS,UNEXP T.O. @ PC=
9868 050166 010046          MOV     RO,-(SP)        ;SAVE RO FOR TYPEOUT
9869
9870          TYPE PC
9871 050170 104403          TYP0S
9872 050172 006           .BYTE    6          ;GO TYPE--OCTAL ASCII
9873 050173 000           .BYTE    0          ;TYPE 6 DIGIT(S)
9874 050174 032777 001000 130736 1$:  BIT     #SW9,$SWR    ;SUPPRESS LEADING ZEROS
9875 050202 001403          BEQ     2$          ;LOOP ON ERROR?
9876 050204 022626          CMP     (SP)+(SP)+      ;NO, BRANCH
9877 050206 000177 130674   JMP     $SLPADR      ;YES, RESTORE STACK
9878 050212 032777 040000 130720 2$:  BIT     #SW14,$SWR    ;GO TO STARTING ADDR CF TEST
;THAT GAVE BAD TIMEOUT
;LOOP ON TEST?

```

M14

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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UNEXPECTED TIMEOUT HANDLER

SEQ 0181

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9879 050220 001401          BEQ      3$          ;NO BRANCH
9880 050222 000002          RTI              ;YES
9881
9882 050224 000000          3$:  HALT          ;UNEXPECTED TIME OUT OCCURRED
9883                                     ;AS INDICATED. YOU CAN LOOP ON
9884                                     ;ERROR, LOOP ON TEST OR INHIBIT
9885                                     ;ERROR TYPEOUT BY SETTING THOSE
9886                                     ;SWITCHES.
9887
9888 050226 022626          CMP      (SP)+,(SP)+ ;RESTORE STACK
9889 050230 000137 043132    JMP      $EOP1     ;ABORT TESTS
9890
9891          .SBTTL  MEMORY CHECK ENABLE TRAP
9892
9893 050234 012737 050250 001176 MEMERR: MOV      #1$,$ESCAPE ;LOAD ESCAPE
9894 050242 011637 001334      MOV      (SP),TRAPPC ;STORE PC
9895 050246 104236          ERROR  236          ;UNEXP MEM PARITY TRAP
9896
9897 050250 005037 001176 1$:  CLR      $ESCAPE
9898 050254 032777 001000 130656      BIT      #SW9,$SWR ;CHECK IF LOOP ON ERROR
9899 050262 001001          BNE      2$          ;YES, FORCE STACK AND TRY AGAIN
9900 050264 000002          RTI              ;ELSE RETURN
9901
9902 050266 012706 001100 2$:  MOV      #STACK,SP ;INIT STACK
9903 050272 000177 130612      JMP      $SLPERA ;LOOP ON ERROR
9904
9905          .SBTTL  RK06 INTERRUPT HANDLER
9906
9907 050276 011600          INTER: MOV      (SP),RO ;SAVE PC WHERE INT OCCURRED.
9908 050300 005740          TST      -(RO) ;GET PC BEFORE UPDATE.
9909 050302 104401 055671      TYPE     MSG6 ;INT AT PC=
9910 050306 010046          MOV      RO,-(SP) ;SAVE RO FOR TYPEOUT
9911                                     ;TYPE PC
9912 050310 104403          TYPOS ;GO TYPE--OCTAL ASCII
9913 050312 006          .BYTE  6 ;TYPE 6 DIGIT(S)
9914 050313 000          .BYTE  0 ;SUPPRESS LEADING ZEROS
9915 050314 000002          RTI
9916
9917          .SBTTL  POWER DOWN AND UP ROUTINES
9918
9919          ;POWER DOWN ROUTINE
9920
9921 050316 012737 050330 000024 $PWRDN: MOV      #PWRUP,PWRVEC ;SET UP VECTOR
9922 050324 000000          HALT
9923 050326 000776          BR       .-2          ;HANG UP.
9924
9925          ;POWER UP ROUTINE
9926
9927 050330 005037 050402 $PWRUP: CLR      $PWRCT ;WAIT LOOP FOR TTY
9928 050334 005237 050402 1$:  INC      $PWRCT ;WAIT FOR THE INCR
9929 050340 001375          BNE      1$          ;OF WORD
9930 050342 012737 050316 000024      MOV      #PWRDN,PWRVEC ;SET POWER DOWN VECTOR
9931 050350 012737 000340 000026      MOV      #PR7,PWRVEC+2 ;PRIORITY 7
9932 050356 012737 000340 000036      MOV      #PR7,TRAPVEC+2 ;LOCKOUT ALL INTERRUPTS FOR TRAPS
9933 050364 012706 001100          MOV      #STACK,SP ;INITIALIZE STACK
9934 050370 104401 056057          TYPE     ,MSG11 ;REPORT POWER FAIL

```

N14

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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POWER DOWN AND UP ROUTINES

SEQ 0182

9935 050374 000005
9936 050376 000137 011620
9937
9938 050402 000000
9939

RESET
JMP PFSRT

\$PWRC: 0

;WAIT COUNT FOR TTY

```

9940 .SBTTL SCOPE HANDLER ROUTINE
9941
9942 ;*****
9943 ;THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
9944 ;AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
9945 ;AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
9946 ;THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
9947 ;SW14=1 LOOP ON TEST
9948 ;SW11=1 INHIBIT ITERATIONS
9949 ;SW09=1 LOOP ON ERROR
9950 ;SW08=1 LOOP ON TEST IN SWR<7:0>
9951 ;CALL
9952 ;* SCOPE ;;SCOPE=IOT
9953
9954 $SCOPE:
9955 050404 104407 040000 130524 1$: CKSWR ;TEST FOR CHANGE IN SOFT-SWR
9956 050406 032777 040000 130524 1$: BIT #BIT14,$SWR ;LOOP ON PRESENT TEST?
9957 050414 001114 040000 130524 1$: BNE $OVER ;YES IF SW14=1
9958 ;*****START OF CODE FOR THE XOR TESTER*****
9959 050416 000416 040000 130524 1$: XTSTR: BR 6$ ;IF RUNNING ON THE "XOR" TESTER CHANGE
9960 ;THIS INSTRUCTION TO A "NOP" (NOP=240)
9961 050420 013746 000004 000004 1$: MOV 2$ERRVEC, -(SP) ;SAVE THE CONTENTS OF THE ERROR VECTOR
9962 050424 012737 050444 000004 1$: MOV 2$,$ERRVEC ;SET FOR TIMEOUT
9963 050432 005737 177060 000004 1$: TST 2$177060 ;TIME OUT ON XOR?
9964 050436 012637 000004 000004 1$: MOV (SP)+, 2$ERRVEC ;RESTORE THE ERROR VECTOR
9965 050442 000463 000004 000004 1$: BR $SVLAD ;GO TO THE NEXT TEST
9966 050444 022626 000004 000004 5$: CMP (SP)+, (SP)+ ;CLEAR THE STACK AFTER A TIME OUT
9967 050446 012637 000004 000004 5$: MOV (SP)+, 2$ERRVEC ;RESTORE THE ERROR VECTOR
9968 050452 000423 000004 000004 5$: BR 7$ ;LOOP ON THE PRESENT TEST
9969 050454 000423 000004 000004 5$: ;*****END OF CODE FOR THE XOR TESTER*****
9970 050454 032777 000400 130456 5$: BIT #BIT08,$SWR ;LOOP ON SPEC. TEST?
9971 050462 001404 130450 001102 5$: BEQ 2$ ;BR IF NO
9972 050464 127737 130450 001102 5$: CMPB 2$SWR,$TSTNM ;ON THE RIGHT TEST? SWR<7:0>
9973 050472 001465 130450 001102 5$: BEQ $OVER ;BR IF YES
9974 050474 105737 001103 001103 2$: TSTB $ERFLG ;HAS AN ERROR OCCURRED?
9975 050500 001421 001103 001103 2$: BEQ 3$ ;BR IF NO
9976 050502 123737 001115 001103 2$: CMPB $ERMAX,$ERFLG ;MAX. ERRORS FOR THIS TEST OCCURRED?
9977 050510 101015 001103 001103 2$: BHI 3$ ;BR IF NO
9978 050512 032777 001000 130420 2$: BIT #BIT09,$SWR ;LOOP ON ERROR?
9979 050520 001404 001000 130420 2$: BEQ 4$ ;BR IF NO
9980 050522 013737 001110 001106 7$: MOV $LPERR,$LPADR ;SET LOOP ADDRESS TO LAST SCOPE
9981 050530 000446 001103 001106 7$: BR $OVER
9982 050532 105037 001103 001106 4$: CLRB $ERFLG ;ZERO THE ERROR FLAG
9983 050536 005037 001174 001106 4$: CLR $TIMES ;CLEAR THE NUMBER OF ITERATIONS TO MAKE
9984 050542 000415 001174 001106 4$: BR 1$ ;ESCAPE TO THE NEXT TEST
9985 050544 032777 004000 130366 3$: BIT #BIT11,$SWR ;INHIBIT ITERATIONS?
9986 050552 001011 004000 130366 3$: BNE 1$ ;BR IF YES
9987 050554 005737 001216 001214 3$: TST $PASS ;IF FIRST PASS OF PROGRAM
9988 050560 001406 001216 001214 3$: BEQ 1$ ;INHIBIT ITERATIONS
9989 050562 005237 001104 001214 3$: INC $ICNT ;INCREMENT ITERATION COUNT
9990 050566 023737 001174 001214 3$: CMP $TIMES,$ICNT ;CHECK THE NUMBER OF ITERATIONS MADE
9991 050574 002024 001174 001214 3$: BGE $OVER ;BR IF MORE ITERATION REQUIRED
9992 050576 012737 000001 001104 1$: MOV #1,$ICNT ;REINITIALIZE THE ITERATION COUNTER
9993 050604 013737 050662 001174 1$: MOV $MXCNT,$TIMES ;SET NUMBER OF ITERATIONS TO DO
9994 050612 105237 001102 001214 $SVLAD: INCB $TSTNM ;COUNT TEST NUMBERS
9995 050616 113737 001102 001214 1$: MOVB $TSTNM,$TESTN ;SET TEST NUMBER IN APT MAILBOX

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9996 050624 011637 001106      MOV      (SP), $LPADR      ;; SAVE SCOPE LOOP ADDRESS
9997 050630 011637 001110      MOV      (SP), $LPERR      ;; SAVE ERROR LOOP ADDRESS
9998 050634 005037 001176      CLR      $ESCAPE        ;; CLEAR THE ESCAPE FROM ERROR ADDRESS
9999 050640 112737 000001 001115  MOV      #1, $SERMAX        ;; ONLY ALLOW ONE(1) ERROR ON NEXT TEST
10000 050646 013777 001102 130266 SOVER: MOV      $TSTNM, $DISPLAY    ;; DISPLAY TEST NUMBER
10001 050654 013716 001106      MOV      $LPADR, (SP)        ;; FUDGE RETURN ADDRESS
10002 050660 000002          RTI          ;; FIXES PS
10003 050662 003720          $MXCNT: 2000.        ;; MAX. NUMBER OF ITERATIONS
10004          .SBTTL  ERROR HANDLER ROUTINE
10005
10006      ;*****
10007      ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
10008      ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
10009      ;*AND GO TO TYPERR ON ERROR
10010      ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
10011      ;*SW15=1      HALT ON ERROR
10012      ;*SW13=1      INHIBIT ERROR TYPEOUTS
10013      ;*SW10=1      BELL ON ERROR
10014      ;*SW09=1      LOOP ON ERROR
10015      ;*CALL
10016      ;*      ERROR      N      ;; ERROR=EMT AND N=ERROR ITEM NUMBER
10017
10018 050664          $ERROR:
10019 050664 104407 001103      7$:      CKSWR          ;; TEST FOR CHANGE IN SOFT-SWR
10020 050666 105237          INC      $ERFLG          ;; SET THE ERROR FLAG
10021 050672 001775          BEQ      7$              ;; DON'T LET THE FLAG GO TO ZERO
10022 050674 013777 001102 130240      MOV      $TSTNM, $DISPLAY    ;; DISPLAY TEST NUMBER AND ERROR FLAG
10023 050702 032777 002000 130230      BIT      #BIT10, $SWR        ;; BELL ON ERROR?
10024 050710 001402          BEQ      1$              ;; NO - SKIP
10025 050712 104401 001200          TYPE      $BELL          ;; RING BELL
10026 050716 005237 001112      1$:      INC      $ERTTL        ;; COUNT THE NUMBER OF ERRORS
10027 050722 011637 001116      MOV      (SP), $ERRPC        ;; GET ADDRESS OF ERROR INSTRUCTION
10028 050726 162737 000002 001116      SUB      #2, $ERRPC
10029 050734 117737 130156 001114      MOVB     $ERRPC, $ITEMB    ;; STRIP AND SAVE THE ERROR ITEM CODE
10030 050742 032777 020000 130170      BIT      #BIT13, $SWR        ;; SKIP TYPEOUT IF SET
10031 050750 001004          BNE      20$              ;; SKIP TYPEOUTS
10032 050752 004737 067352      JSR      PC, TYPERR        ;; GO TO USER ERROR ROUTINE
10033 050756 104401 001205      TYPE      , $CRLF
10034 050762          20$:
10035 050762 122737 000001 001230      CMPB     #APTENV, $ENV        ;; RUNNING IN APT MODE
10036 050770 001007          BNE      2$              ;; NO SKIP APT ERROR REPORT
10037 050772 113737 001114 051004      MOVB     $ITEMB, 21$    ;; SET ITEM NUMBER AS ERROR NUMBER
10038 051000 004737 051610      JSR      PC, SATY4        ;; REPORT FATAL ERROR TO APT
10039 051004          21$:      .BYTE      0
10040 051005          .BYTE      0
10041 051006 000777          22$:      BR      22$
10042 051010 005777 130124      2$:      TST      $SWR
10043 051014 100002          BPL      3$
10044 051016 000000          HALT
10045 051020 104407          CKSWR
10046 051022 032777 001000 130110      3$:      BIT      #BIT09, $SWR
10047 051030 001402          BEQ      4$
10048 051032 013716 001110      MOV      $LPERR, (SP)
10049 051036 005737 001176      4$:      TST      $ESCAPE
10050 051042 001402          BEQ      5$
10051 051044 013716 001176      MOV      $ESCAPE, (SP)    ;; FUDGE RETURN ADDRESS FOR ESCAPE

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10052	051050				5\$:				
10053	051050	022737	043220	000042		CMP	#\$ENDAD, 2#42	;;ACT-11 AUTO-ACCEPT?	
10054	051056	001001				BNE	6\$	;;BRANCH IF NO	
10055	051060	000000				HALT		;;YES	
10056	051062				6\$:				
10057	051062	000002				RTI		;;RETURN	
10058					.SBTTL	TYPE ROUTINE			
10059						*****			
10060						*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.			
10061						*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.			
10062						*NOTE1: \$NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.			
10063						*NOTE2: \$FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.			
10064						*NOTE3: \$FILLC CONTAINS THE CHARACTER TO FILL AFTER.			
10065						*			
10066						*CALL:			
10067						*1) USING A TRAP INSTRUCTION			
10068						* TYPE	,MESADR	;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING	
10069						*OR			
10070						* TYPE			
10071						* MESADR			
10072						*			
10073						*			
10074						*			
10075	051064	105737	001157		\$TYPE:	TSTB	\$TFPLG	;;IS THERE A TERMINAL?	
10076	051070	100002				BPL	1\$	;;BR IF YES	
10077	051072	000000				HALT		;;HALT HERE IF NO TERMINAL	
10078	051074	000430				BR	3\$	;;LEAVE	
10079	051076	010046			1\$:	MOV	RO, -(SP)	;;SAVE RO	
10080	051100	017600	000002			MOV	22(SP), RO	;;GET ADDRESS OF ASCIZ STRING	
10081	051104	122737	000001	001230		CMPB	#\$APTENV, \$ENV	;;RUNNING IN APT MODE	
10082	051112	001011				BNE	62\$	;;NO GO CHECK FOR APT CONSOLE	
10083	051114	132737	000100	001231		BITB	#\$APTPOOL, \$ENVM	;;SPOOL MESSAGE TO APT	
10084	051122	001405				BEQ	62\$	;;NO GO CHECK FOR CONSOLE	
10085	051124	010037	051134			MOV	RO, 61\$	;;SETUP MESSAGE ADDRESS FOR APT	
10086	051130	004737	051600			JSR	PC, \$ATY3	;;SPOOL MESSAGE TO APT	
10087	051134	000000			61\$:	.WORD	0	;;MESSAGE ADDRESS	
10088	051136	132737	000040	001231	62\$:	BITB	#\$APTCSUP, \$ENVM	;;APT CONSOLE SUPPRESSED	
10089	051144	001003				BNE	60\$	;;YES, SKIP TYPE OUT	
10090	051146	112046			2\$:	MOVB	(RO)+, -(SP)	;;PUSH CHARACTER TO BE TYPED ONTO STACK	
10091	051150	001005				BNE	4\$	;;BR IF IT ISN'T THE TERMINATOR	
10092	051152	005726				TST	(SP)+	;;IF TERMINATOR POP IT OFF THE STACK	
10093	051154	012600			60\$:	MOV	(SP)+, RO	;;RESTORE RO	
10094	051156	062716	000002		3\$:	ADD	2, (SP)	;;ADJUST RETURN PC	
10095	051162	000002				RTI		;;RETURN	
10096	051164	122716	000011		4\$:	CMPB	#\$HT, (SP)	;;BRANCH IF <HT>	
10097	051170	001430				BEQ	8\$		
10098	051172	122716	000200			CMPB	#\$CRLF, (SP)	;;BRANCH IF NOT <CRLF>	
10099	051176	001006				BNE	5\$		
10100	051200	005726				TST	(SP)+	;;POP <CR><LF> EQUIV	
10101	051202	104401				TYPE		;;TYPE A CR AND LF	
10102	051204	001205				\$CRLF			
10103	051206	105037	051342			CLRB	\$CHARCNT	;;CLEAR CHARACTER COUNT	
10104	051212	000755				BR	2\$	;;GET NEXT CHARACTER	
10105	051214	004737	051276		5\$:	JSR	PC, \$TYPEC	;;GO TYPE THIS CHARACTER	
10106	051220	123726	001156		6\$:	CMPB	\$FILLC, (SP)+	;;IS IT TIME FOR FILLER CHARS.?	
10107	051224	001350				BNE	2\$	;;IF NO GO GET NEXT CHAR.	

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10108 051226 013746 001154      MOV      $NULL,-(SP)      ;;GET # OF FILLER CHARS. NEEDED
10109                                     ;;AND THE NULL CHAR.
10110 051232 105366 000001      7$:   DECB      1(SP)      ;;DOES A NULL NEED TO BE TYPED?
10111 051236 002770                                     ;;BR IF NO--GO POP THE NULL OFF OF STACK
10112 051240 004737 051276      JSR      PC,$TYPEC      ;;GO TYPE A NULL
10113 051244 105337 051342      DECB      $CHARCNT      ;;DO NOT COUNT AS A COUNT
10114 051250 000770      BR      7$      ;;LOOP
10115
10116                                     ;HORIZONTAL TAB PROCESSOR
10117
10118 051252 112716 000040      8$:   MOVB      #' (SP)      ;;REPLACE TAB WITH SPACE
10119 051256 004737 051276      9$:   JSR      PC,$TYPEC      ;;TYPE A SPACE
10120 051262 132737 000007 051342  BITB      #7,$CHARCNT      ;;BRANCH IF NOT AT
10121 051270 001372                                     ;;TAB STOP
10122 051272 005726      TST      (SP)+      ;;POP SPACE OFF STACK
10123 051274 000724      BR      2$      ;;GET NEXT CHARACTER
10124 051276 105777 127646      $TYPEC: TSTB      2$TPS      ;;WAIT UNTIL PRINTER IS READ
10125 051302 100375      BPL      $TYPEC
10126 051304 116677 000002 127640  MOVB      2(SP),2$TPB      ;;LOAD CHAR TO BE TYPED INTO DATA REG.
10127 051312 122766 000015 000002  CMPB      #CR,2(SP)      ;;IS CHARACTER A CARRIAGE RETURN?
10128 051320 001003      BNE      1$      ;;BRANCH IF NO
10129 051322 105037 051342      CLRB      $CHARCNT      ;;YES--CLEAR CHARACTER COUNT
10130 051326 000406      BR      $TYPEX      ;;EXIT
10131 051330 122766 000012 000002  1$:   CMPB      #LF,2(SP)      ;;IS CHARACTER A LINE FEED?
10132 051336 001402      BEQ      $TYPEX      ;;BRANCH IF YES
10133 051340 105227      INCB      (PC)+      ;;COUNT THE CHARACTER
10134 051342 000000      $CHARCNT: WORD      0      ;;CHARACTER COUNT STORAGE
10135 051344 000207      $TYPEX: RTS      PC
10136
10137                                     .SBTTL CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
10138
10139                                     ;*****
10140                                     ;THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
10141                                     ;SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
10142                                     ;NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
10143                                     ;BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
10144                                     ;REPLACED WITH SPACES.
10145                                     ;CALL:
10146                                     ;*   MOV      NUM,-(SP)      ;;PUT THE BINARY NUMBER ON THE STACK
10147                                     ;*   TYPDS      ;;GO TO THE ROUTINE
10148
10149      $TYPDS:  MOV      R0,-(SP)      ;;PUSH R0 ON STACK
10150 051346 010046      MOV      R1,-(SP)      ;;PUSH R1 ON STACK
10151 051350 010146      MOV      R2,-(SP)      ;;PUSH R2 ON STACK
10152 051352 010246      MOV      R3,-(SP)      ;;PUSH R3 ON STACK
10153 051354 010346      MOV      R5,-(SP)      ;;PUSH R5 ON STACK
10154 051356 010546      MOV      #20200,-(SP)      ;;SET BLANK SWITCH AND SIGN
10155 051360 012746 020200      MOV      20(SP),R5      ;;GET THE INPUT NUMBER
10156 051364 016605 000020      BPL      1$      ;;BR IF INPUT IS POS.
10157 051370 100004      NEG      R5      ;;MAKE THE BINARY NUMBER POS.
10158 051372 005405      MOVB      #'-,1(SP)      ;;MAKE THE ASCII NUMBER NEG.
10159 051374 112766 000055 000001  1$:   CLR      R0      ;;ZERO THE CONSTANTS INDEX
10160 051402 005000      MOV      #DBLK,R3      ;;SETUP THE OUTPUT POINTER
10161 051404 012703 051562      MOVB      #' ,(R3)+      ;;SET THE FIRST CHARACTER TO A BLANK
10162 051410 112723 000040      2$:   CLR      R2      ;;CLEAR THE BCD NUMBER
10163 051414 005002

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10164 051416 016001 051552      MOV      $DTBL(R0),R1      ;; GET THE CONSTANT
10165 051422 160105      3$: SUB      R1,R5      ;; FORM THIS BCD DIGIT
10166 051424 002402      BLT      4$      ;; BR IF DONE
10167 051426 005202      INC      R2      ;; INCREASE THE BCD DIGIT BY 1
10168 051430 000774      BR      3$
10169 051432 060105      4$: ADD      R1,R5      ;; ADD BACK THE CONSTANT
10170 051434 005702      TST      R2      ;; CHECK IF BCD DIGIT=0
10171 051436 001002      BNE      5$      ;; FALL THROUGH IF 0
10172 051440 105716      TSTB     (SP)      ;; STILL DOING LEADING 0'S?
10173 051442 100407      BMI      7$      ;; BR IF YES
10174 051444 106316      5$: ASLB     (SP)      ;; MSD?
10175 051446 103003      BCC      6$      ;; BR IF NO
10176 051450 116663 000001 177777 MOVVB    1(SP),-1(R3)      ;; YES--SET THE SIGN
10177 051456 052702 000060      6$: BIS      #'0,R2      ;; MAKE THE BCD DIGIT ASCII
10178 051462 052702 000040      7$: BIS      #' ,R2      ;; MAKE IT A SPACE IF NOT ALREADY A DIGIT
10179 051466 110223      MOVVB    R2,(R3)+      ;; PUT THIS CHARACTER IN THE OUTPUT BUFFER
10180 051470 005720      TST      (R0)+      ;; JUST INCREMENTING
10181 051472 020027 000010      CMP      R0,#10      ;; CHECK THE TABLE INDEX
10182 051476 002746      BLT      2$      ;; GO DO THE NEXT DIGIT
10183 051500 003002      BGT      8$      ;; GO TO EXIT
10184 051502 010502      MOV      R5,R2      ;; GET THE LSD
10185 051504 000764      BR      6$      ;; GO CHANGE TO ASCII
10186 051506 105726      8$: TSTB     (SP)+      ;; WAS THE LSD THE FIRST NON-ZERO?
10187 051510 100003      BPL      9$      ;; BR IF NO
10188 051512 116663 177777 177776 9$: MOVVB    -1(SP),-2(R3)      ;; YES--SET THE SIGN FOR TYPING
10189 051520 105013      CLRB     (R3)      ;; SET THE TERMINATOR
10190 051522 012605      MOV      (SP)+,R5      ;; POP STACK INTO R5
10191 051524 012603      MOV      (SP)+,R3      ;; POP STACK INTO R3
10192 051526 012602      MOV      (SP)+,R2      ;; POP STACK INTO R2
10193 051530 012601      MOV      (SP)+,R1      ;; POP STACK INTO R1
10194 051532 012600      MOV      (SP)+,R0      ;; POP STACK INTO R0
10195 051534 104401 051562      TYPE     $DBLK      ;; NOW TYPE THE NUMBER
10196 051540 016666 000002 000004 MOV      2(SP),4(SP)      ;; ADJUST THE STACK
10197 051546 012616      MOV      (SP)+,(SP)
10198 051550 000002      RTI      ;; RETURN TO USER
10199 051552 023420      $DTBL: 10000.
10200 051554 001750      1000.
10201 051556 000144      100.
10202 051560 000012      10.
10203 051562 000004      $DBLK: .BLKW 4
10204      .SBTTL  APT COMMUNICATIONS ROUTINE
10205
10206 *****
10207 051572 112737 000001 052036 $ATY1: MOVVB    #1,$FFLG      ;; TO REPORT FATAL ERROR
10208 051600 112737 000001 052034 $ATY3: MOVVB    #1,$MFLG      ;; TO TYPE A MESSAGE
10209 051606 000403      BR      $ATYC
10210 051610 112737 000001 052036 $ATY4: MOVVB    #1,$FFLG      ;; TO ONLY REPORT FATAL ERROR
10211 051616      $ATYC:
10212 051616 010046      MOV      R0,-(SP)      ;; PUSH R0 ON STACK
10213 051620 010146      MOV      R1,-(SP)      ;; PUSH R1 ON STACK
10214 051622 105737 052034      TSTB     $MFLG      ;; SHOULD TYPE A MESSAGE?
10215 051626 001450      BEQ      5$      ;; IF NOT: BR
10216 051630 122737 000001 001230 CMPB     $APTENV,$ENV      ;; OPERATING UNDER APT?
10217 051636 001031      BNE      3$      ;; IF NOT: BR
10218 051640 132737 000100 001231 BITB     $APTPOOL,$ENV      ;; SHOULD SPOOL MESSAGES?
10219 051646 001425      BEQ      3$      ;; IF NOT: BR

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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APT COMMUNICATIONS ROUTINE

SEQ 0188

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10220 051650 017600 000004      MOV    24(SP),RO      ;;GET MESSAGE ADDR.
10221 051654 062766 000002 000004 ADD    2,4(SP)      ;;BUMP RETURN ADDR.
10222 051662 005737 001210 1$:    TST    $MSGTYPE      ;;SEE IF DONE W/ LAST XMISSION?
10223 051666 001375      BNE    1$      ;;IF NOT: WAIT
10224 051670 010037 001224      MOV    RO,$MSGAD      ;;PUT ADDR IN MAILBOX
10225 051674 105720 2$:    TSTB   (RO)+      ;;FIND END OF MESSAGE
10226 051676 001376      BNE    2$
10227 051700 163700 001224      SUB    $MSGAD,RO      ;;SUB START OF MESSAGE
10228 051704 006200      ASR     RO      ;;GET MESSAGE LNGTH IN WORDS
10229 051706 010037 001226      MOV    RO,$MSGGLT      ;;PUT LENGTH IN MAILBOX
10230 051712 012737 000004 001210 MOV    4,$MSGTYPE      ;;TELL APT TO TAKE MSG.
10231 051720 000413      BR     5$
10232 051722 017637 000004 051746 3$: MOV    24(SP),4$      ;;PUT MSG ADDR IN JSR LINKAGE
10233 051730 062766 000002 000004 ADD    2,4(SP)      ;;BUMP RETURN ADDRESS
10234 051736 013746      MOV    177776,-(SP)      ;;PUSH 177776 ON STACK
10235 051742 004737 051064      JSR    PC,$TYPE      ;;CALL TYPE MACRO
10236 051746 000000      4$:    .WORD 0
10237 051750      5$:
10238 051750 105737 052036 10$:    TSTB   $FFLG      ;;SHOULD REPORT FATAL ERROR?
10239 051754 001416      BEQ     12$      ;;IF NOT: BR
10240 051756 005737 001230      TST     $ENV      ;;RUNNING UNDER APT?
10241 051762 001413      BEQ     12$      ;;IF NOT: BR
10242 051764 005737 001210 11$:    TST     $MSGTYPE      ;;FINISHED LAST MESSAGE?
10243 051770 001375      BNE     11$      ;;IF NOT: WAIT
10244 051772 017637 000004 001212 MOV    24(SP),$FATAL      ;;GET ERROR #
10245 052000 062766 000002 000004 ADD    2,4(SP)      ;;BUMP RETURN ADDR.
10246 052006 005237 001210      INC     $MSGTYPE      ;;TELL APT TO TAKE ERROR
10247 052012 105037 052036 12$:    CLRB   $FFLG      ;;CLEAR FATAL FLAG
10248 052016 105037 052035      CLRB   $LFLG      ;;CLEAR LOG FLAG
10249 052022 105037 052034      CLRB   $MFLG      ;;CLEAR MESSAGE FLAG
10250 052026 012601      MOV     (SP)+,R1      ;;POP STACK INTO R1
10251 052030 012600      MOV     (SP)+,RO      ;;POP STACK INTO RO
10252 052032 000207      RTS     PC      ;;RETURN
10253 052034      000      $MFLG: .BYTE 0      ;;MESSG. FLAG
10254 052035      000      $LFLG: .BYTE 0      ;;LOG FLAG
10255 052036      000      $FFLG: .BYTE 0      ;;FATAL FLAG
10256      052040      .EVEN
10257      000200      APTSIZE=200
10258      000001      APTENV=001
10259      000100      APTSPool=100
10260      000040      APTCSUP=040
10261      .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
10262
10263      ;*****
10264      ;THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
10265      ;OCTAL (ASCII) NUMBER AND TYPE IT.
10266      ;$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
10267      ;CALL:
10268      ;      MOV    NUM,-(SP)      ;;NUMBER TO BE TYPED
10269      ;      TYPOS      ;;CALL FOR TYPEOUT
10270      ;      .BYTE  N      ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
10271      ;      .BYTE  M      ;;M=1 OR 0
10272      ;      ;;1=TYPE LEADING ZEROS
10273      ;      ;;0=SUPPRESS LEADING ZEROS
10274      ;
10275      ;$STYPON---ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST

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JNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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BINARY TO OCTAL (ASCII) AND TYPE

SEQ 0189

10276					;;\$TYPOS OR \$TYPOC	
10277					;;CALL:	
10278					;;* MOV NUM,-(SP)	;;NUMBER TO BE TYPED
10279					;;* TYPON	;;CALL FOR TYPEOUT
10280					;;*	
10281					;;\$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER	
10282					;;CALL:	
10283					;;* MOV NUM,-(SP)	;;NUMBER TO BE TYPED
10284					;;* TYPOC	;;CALL FOR TYPEOUT
10285						
10286	052040	017646	000000		\$TYPOS: MOV 2(SP),-(SP)	;;PICKUP THE MODE
10287	052044	116637	000001	052263	MOV 1(SP),\$OFILL	;;LOAD ZERO FILL SWITCH
10288	052052	112637	052265		MOV (SP)+,\$OMODE+1	;;NUMBER OF DIGITS TO TYPE
10289	052056	062716	000002		ADD #2,(SP)	;;ADJUST RETURN ADDRESS
10290	052062	000406			BR \$TYPON	
10291	052064	112737	000001	052263	\$TYPOC: MOV #1,\$OFILL	;;SET THE ZERO FILL SWITCH
10292	052072	112737	000006	052265	MOV #6,\$OMODE+1	;;SET FOR SIX(6) DIGITS
10293	052100	112737	000005	052262	\$TYPON: MOV #5,\$OCNT	;;SET THE ITERATION COUNT
10294	052106	010346			MOV R3,-(SP)	;;SAVE R3
10295	052110	010446			MOV R4,-(SP)	;;SAVE R4
10296	052112	010546			MOV R5,-(SP)	;;SAVE R5
10297	052114	113704	052265		MOV \$OMODE+1,R4	;;GET THE NUMBER OF DIGITS TO TYPE
10298	052120	005404			NEG R4	
10299	052122	062704	000006		ADD #6,R4	;;SUBTRACT IT FOR MAX. ALLOWED
10300	052126	110437	052264		MOV R4,\$OMODE	;;SAVE IT FOR USE
10301	052132	113704	052263		MOV \$OFILL,R4	;;GET THE ZERO FILL SWITCH
10302	052136	016605	000012		MOV 12(SP),R5	;;PICKUP THE INPUT NUMBER
10303	052142	005003			CLR R3	;;CLEAR THE OUTPUT WORD
10304	052144	006105			1\$: ROL R5	;;ROTATE MSB INTO "C"
10305	052146	000404			BR 3\$	;;GO DO MSB
10306	052150	006105			2\$: ROL R5	;;FORM THIS DIGIT
10307	052152	006105			ROL R5	
10308	052154	006105			ROL R5	
10309	052156	010503			MOV R5,R3	
10310	052160	006103			3\$: ROL R3	;;GET LSB OF THIS DIGIT
10311	052162	105337	052264		DECB \$OMODE	;;TYPE THIS DIGIT?
10312	052166	100016			BPL 7\$	;;BR IF NO
10313	052170	042703	177770		BIC #177770,R3	;;GET RID OF JUNK
10314	052174	001002			BNE 4\$	;;TEST FOR 0
10315	052176	005704			TST R4	;;SUPPRESS THIS 0?
10316	052200	001403			BEQ 5\$	;;BR IF YES
10317	052202	005204			4\$: INC R4	;;DON'T SUPPRESS ANYMORE 0'S
10318	052204	052703	000060		BIS #'0,R3	;;MAKE THIS DIGIT ASCII
10319	052210	052703	000040		5\$: BIS #'1,R3	;;MAKE ASCII IF NOT ALREADY
10320	052214	110337	052260		MOV R3,\$\$	;;SAVE FOR TYPING
10321	052220	104401	052260		TYPE 8\$	;;GO TYPE THIS DIGIT
10322	052224	105337	052262		7\$: DECB \$OCNT	;;COUNT BY 1
10323	052230	003347			BGT 2\$	;;BR IF MORE TO DO
10324	052232	002402			BLT 6\$	;;BR IF DONE
10325	052234	005204			INC R4	;;INSURE LAST DIGIT ISN'T A BLANK
10326	052236	000744			2\$: BR 2\$	;;GO DO THE LAST DIGIT
10327	052240	012605			6\$: MOV (SP)+,R5	;;RESTORE R5
10328	052242	012604			MOV (SP)+,R4	;;RESTORE R4
10329	052244	012603			MOV (SP)+,R3	;;RESTORE R3
10330	052246	016666	000002 000004		MOV 2(SP),4(SP)	;;SET THE STACK FOR RETURNING
10331	052254	012616			MOV (SP)+,(SP)	

10332 052256 000002
10333 052260 000
10334 052261 000
10335 052262 000
10336 052263 000
10337 052264 000000

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10340
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10342 052266 000000
10343 052270 000000
10344 052272 000000
10345 052274 000001
10346 052275
10347 052276

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10357 052276 005037 052266
10358 052302 012737 052274 052270
10359 052310 013737 052270 052272
10360 052316 012737 052346 000060
10361 052324 012737 000200 000062
10362 052332 005777 126610
10363 052336 012777 000100 126600
10364 052344 000207

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10373 052346 117746 126574
10374 052352 042716 177600
10375 052356 021627 000003
10376 052362 001007
10377 052364 104401 053474
10378 052370 004737 052276
10379 052374 005726
10380 052376 000137 047576
10381 052402 021627 000007
10382 052406 001004
10383 052410 022737 000176 001140
10384 052416 001500
10385
10386 052420
10387 052420 022737 000001 052266

RTI
8\$: .BYTE 0
SOCNT: .BYTE 0
\$OFILL: .BYTE 0
\$OMODE: .WORD 0
\$BTTL TTY INPUT ROUTINE

;; RETURN
;; STORAGE FOR ASCII DIGIT
;; TERMINATOR FOR TYPE ROUTINE
;; OCTAL DIGIT COUNTER
;; ZERO FILL SWITCH
;; NUMBER OF DIGITS TO TYPE

ENABL LSB
\$TKCNT: .WORD 0
\$TKQIN: .WORD 0
\$TKQOUT: .WORD 0
\$TKQSRT: .BLKB 1
\$TKQEND=
.EVEN

;; NUMBER OF ITEMS IN QUEUE
;; INPUT POINTER
;; OUTPUT POINTER
;; TTY KEYBOARD QUEUE

;; *TK INITIALIZE ROUTINE
;; *THIS ROUTINE WILL INITIALIZE THE TTY KEYBOARD INPUT QUEUE
;; *SETUP THE INTERRUPT VECTOR AND TURN ON THE KEYBOARD INTERRUPT

;; *CALL:
;; * JSR PC, \$TKINT
;; * RETURN

\$TKINT: CLR \$TKCNT
MOV \$TKQSRT, \$TKQIN
MOV \$TKQIN, \$TKQOUT
MOV \$TKSRV, \$TKVEC
MOV #200, \$TKVEC+2
TST \$TKB
MOV #100, \$TKS
RTS PC

;; CLEAR COUNT OF ITEMS IN QUEUE
;; MOVE THE STARTING ADDRESS OF THE
;; QUEUE INTO THE INPUT & OUTPUT POINTERS.
;; INITIALIZE THE KEYBOARD VECTOR
;; "BR" LEVEL 4
;; CLEAR DONE FLAG
;; ENABLE TTY KEYBOARD INTERRUPT
;; RETURN TO CALLER

;; *TK SERVICE ROUTINE
;; *THIS ROUTINE WILL SERVICE THE TTY KEYBOARD INTERRUPT
;; *BY READING THE CHARACTER FROM THE INPUT BUFFER AND PUTTING
;; *IT IN THE QUEUE.
;; *IF THE CHARACTER IS A "CONTROL-C" (1C) \$TKINT IS CALLED AND
;; *UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (STOP)

\$TKSRV: MOVB \$TKB, -(SP)
BIC #1C177, (SP)
CMP (SP), #3
BNE 1\$
TYPE \$CNTLC
JSR PC, \$TKINT
TST (SP)+
JMP STOP
1\$: CMP (SP), #7
BNE 2\$
CMP \$SWREG, SWR
BEQ 6\$

;; PICKUP THE CHARACTER
;; STRIP THE JUNK
;; IS IT A CONTROL C?
;; BRANCH IF NO
;; TYPE A CONTROL-C (1C)
;; INIT THE KEYBOARD
;; CLEAN UP STACK
;; CONTROL C RESTART
;; IS IT A CONTROL G?
;; BRANCH IF NO
;; IS SOFT-SWR SELECTED?
;; GO TO SWR CHANGE

2\$: CMP #1, \$TKCNT
;; IS THE QUEUE FULL?

10388	052426	001004			BNE	3\$	;; BRANCH IF NO
10389	052430	104401	001200		TYPE	\$BELL	;; RING THE TTY BELL
10390	052434	005726			TST	(SP)+	;; CLEAN CHARACTER OFF OF STACK
10391	052436	000451			BR	5\$	;; EXIT
10392	052440	021627	000023	3\$:	CMP	(SP), #23	;; IS IT A CONTROL-S?
10393	052444	001021			BNE	32\$	;; BRANCH IF NO
10394	052446	005077	126472		CLR	\$STKS	;; DISABLE TTY KEYBOARD INTERRUPTS
10395	052452	005726			TST	(SP)+	;; CLEAN CHAR OFF STACK
10396	052454	105777	126464	31\$:	TSTB	\$STKS	;; WAIT FOR A CHAR
10397	052460	100375			BPL	31\$	;; LOOP UNTIL ITS THERE
10398	052462	117746	126460		MOVB	\$STKB, -(SP)	;; GET THE CHARACTER
10399	052466	042716	177600		BIC	#1C177, (SP)	;; MAKE IT 7-BIT ASCII
10400	052472	022627	000021		CMP	(SP)+, #21	;; IS IT A CONTROL-Q?
10401	052476	001366			BNE	31\$	;; BRANCH IF NO
10402	052500	012777	000100	126436	MOV	#100, \$STKS	;; REENABLE TTY KEYBOARD INTERRUPTS
10403	052506	000002			RTI		;; RETURN
10404	052510	005237	052266	32\$:	INC	\$STKCN	;; COUNT THIS CHARACTER
10405	052514	021627	000140		CMP	(SP), #140	;; IS IT UPPER CASE?
10406	052520	002405			BLT	4\$	;; BRANCH IF YES
10407	052522	021627	000175		CMP	(SP), #175	;; IS IT A SPECIAL CHAR?
10408	052526	003002			BGT	4\$	;; BRANCH IF YES
10409	052530	042716	000040		BIC	#40, (SP)	;; MAKE IT UPPER CASE
10410	052534	112677	177530	4\$:	MOVB	(SP)+, \$STKQIN	;; AND PUT IT IN QUEUE
10411	052540	005237	052270		INC	\$STKQIN	;; UPDATE THE POINTER
10412	052544	023727	052270	052275	CMP	\$STKQIN, \$STKQEND	;; GO OFF THE END?
10413	052552	001003			BNE	5\$	;; BRANCH IF NO
10414	052554	012737	052274	052270	MOV	\$STKQSR, \$STKQIN	;; RESET THE POINTER
10415	052562	000002		5\$:	RTI		;; RETURN
10416							
10417							
10418							
10419							
10420							
10421							
10422	052564	022737	000176	001140	\$CKSWR: CMP	\$SWREG, SWR	;; IS THE SOFT-SWR SELECTED
10423	052572	001124			BNE	15\$	;; EXIT IF NOT
10424	052574	105777	126344		TSTB	\$STKS	;; IS A CHAR WAITING?
10425	052600	100121			BPL	15\$	;; IF NOT, EXIT
10426	052602	117746	126340		MOVB	\$STKB, -(SP)	;; YES
10427	052606	042716	177600		BIC	#1C177, (SP)	;; MAKE IT 7-BIT ASCII
10428	052612	021627	000007		CMP	(SP), #7	;; IS IT A CONTROL-G?
10429	052616	001300			BNE	2\$	;; IF NOT, PUT IT IN THE TTY QUEUE
10430							;; AND EXIT
10431							
10432							
10433							
10434							
10435							
10436	052620	123727	001134	000001	6\$:	CMPB	\$AUTOB, #1
10437	052626	001674			BEQ	2\$	;; ARE WE RUNNING IN AUTO-MODE?
10438	052630	005726			TST	(SP)+	;; BRANCH IF YES
10439	052632	004737	052276		JSR	PC, \$TKINT	;; CLEAR CONTROL-G OFF STACK
10440	052636	005077	126302		CLR	\$STKS	;; FLUSH THE TTY INPUT QUEUE
10441	052642	112737	000001	001135	MOVB	#1, \$INTAG	;; DISABLE TTY KEYBOARD INTERRUPTS
10442							;; SET INTERRUPT MODE INDICATOR
10443	052650	104401	053506		TYPE	, \$CNTLG	;; ECHO THE CONTROL-G (+G)

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10444	052654	104401	053513		\$GTSWR: TYPE	\$MSWR	:: TYPE CURRENT CONTENTS
10445	052660	013746	000176		MOV	\$WREG, -(SP)	:: SAVE SWREG FOR TYPEOUT
10446	052664	104402			TYPEOC		:: GO TYPE--OCTAL ASCII(ALL DIGITS)
10447	052666	104401	053524		TYPE	, \$MNEW	:: PROMPT FOR NEW SWR
10448	052672	005046			19\$: CLR	-(SP)	:: CLEAR COUNTER
10449	052674	005046			CLR	-(SP)	:: THE NEW SWR
10450	052676	105777	126242		7\$: TSTB	\$STKS	:: CHAR THERE?
10451	052702	100375			BPL	7\$	:: IF NOT TRY AGAIN
10452							
10453	052704	117746	126236		MOVB	\$STKB, -(SP)	:: PICK UP CHAR
10454	052710	042716	177600		BIC	#1C177, (SP)	:: MAKE IT 7-BIT ASCII
10455							
10456	052714	021627	000003		CMP	(SP), #3	:: IS IT A CONTROL-C?
10457	052720	001015			BNE	9\$	:: BRANCH IF NOT
10458	052722	104401	053474		TYPE	, \$CNTLC	:: YES, ECHO CONTROL-C (↑C)
10459	052726	062706	000006		ADD	#6, SP	:: CLEAN UP STACK
10460	052732	123727	001135	000001	CMPB	\$INTAG, #1	:: REENABLE TTY KEYBOARD INTERRUPTS?
10461	052740	001003			BNE	8\$	:: BRANCH IF NO
10462	052742	012777	000100	126174	MOV	#100, \$STKS	:: ALLOW TTY KEYBOARD INTERRUPTS
10463	052750	000137	047576		8\$: JMP	STOP	:: CONTROL-C RESTART
10464							
10465							
10466	052754	021627	000025		9\$: CMP	(SP), #25	:: IS IT A CONTROL-U?
10467	052760	001005			BNE	10\$	:: BRANCH IF NOT
10468	052762	104401	053501		TYPE	, \$CNTLU	:: YES, ECHO CONTROL-U (↑U)
10469	052766	062706	000006		20\$: ADD	#6, SP	:: IGNORE PREVIOUS INPUT
10470	052772	000737			BR	19\$	:: LET'S TRY IT AGAIN
10471							
10472							
10473	052774	021627	000015		10\$: CMP	(SP), #15	:: IS IT A <CR>?
10474	053000	001022			BNE	16\$	:: BRANCH IF NO
10475	053002	005766	000004		TST	4(SP)	:: YES, IS IT THE FIRST CHAR?
10476	053006	001403			BEQ	11\$	:: BRANCH IF YES
10477	053010	016677	000002	126122	MOV	2(SP), \$SWR	:: SAVE NEW SWR
10478	053016	062706	000006		11\$: ADD	#6, SP	:: CLEAR UP STACK
10479	053022	104401	001205		14\$: TYPE	, \$CRLF	:: ECHO <CR> AND <LF>
10480	053026	123727	001135	000001	CMPB	\$INTAG, #1	:: RE-ENABLE TTY KBD INTERRUPTS?
10481	053034	001003			BNE	15\$	:: BRANCH IF NOT
10482	053036	012777	000100	126100	MOV	#100, \$STKS	:: RE-ENABLE TTY KBD INTERRUPTS
10483	053044	000002			15\$: RTI		:: RETURN
10484	053046	004737	051276		16\$: JSR	PC, \$TYPEC	:: ECHO CHAR
10485	053052	021627	000060		CMP	(SP), #60	:: CHAR < 0?
10486	053056	002420			BLT	18\$	:: BRANCH IF YES
10487	053060	021627	000067		CMP	(SP), #67	:: CHAR > 7?
10488	053064	003015			BGT	18\$	:: BRANCH IF YES
10489	053066	042726	000060		BIC	#60, (SP)+	:: STRIP-OFF ASCII
10490	053072	005766	000002		TST	2(SP)	:: IS THIS THE FIRST CHAR
10491	053076	001403			BEQ	17\$	:: BRANCH IF YES
10492	053100	006316			ASL	(SP)	:: NO, SHIFT PRESENT
10493	053102	006316			ASL	(SP)	:: CHAR OVER TO MAKE
10494	053104	006316			ASL	(SP)	:: ROOM FOR NEW ONE.
10495	053106	005266	000002		17\$: INC	2(SP)	:: KEEP COUNT OF CHAR
10496	053112	056616	177776		BIS	-2(SP), (SP)	:: SET IN NEW CHAR
10497	053116	000667			BR	7\$	:: GET THE NEXT ONE
10498	053120	104401	001204		18\$: TYPE	, \$QUES	:: TYPE ?<CR><LF>
10499	053124	000720			BR	20\$	:: SIMULATE CONTROL-U

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TTY INPUT ROUTINE

SEQ 0193

.DSABL LSB

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10500
10501
10502
10503
10504
10505
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10511 053126 011646
10512 053130 016666 000004 000002
10513 053136 005066 000004
10514 053142 005046
10515 053144 012746 053152
10516 053150 000002
10517 053152
10518 053152 005737 052266
10519 053156 001775
10520 053160 005337 052266
10521 053164 117766 177102 000004
10522 053172 005237 052272
10523 053176 023727 052272 052275
10524 053204 001003
10525 053206 012737 052274 052272
10526 053214 000002
10527
10528
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10531
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10533
10534 053216 010346
10535 053220 005046
10536 053222 012703 053452
10537 053226 022703 053474
10538 053232 101456
10539 053234 104410
10540 053236 112613
10541 053240 122713 000177
10542 053244 001022
10543 053246 005716
10544 053250 001007
10545 053252 112737 000134 053450
10546 053260 104401 053450
10547 053264 012716 177777
10548 053270 005303
10549 053272 020327 053452
10550 053276 103434
10551 053300 111337 053450
10552 053304 104401 053450
10553 053310 000746
10554 053312 005716
10555 053314 001406

;*****
;THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
;CALL:
;RDCHR
;RETURN HERE
;GET A CHARACTER FROM THE QUEUE
;CHARACTER IS ON THE STACK
;WITH PARITY BIT STRIPPED OFF

SRDCHR: MOV (SP),-(SP) ;PUSH DOWN THE PC AND
MOV 4(SP),2(SP) ;THE PS
CLR 4(SP) ;GET READY FOR A CHARACTER
CLR -(SP) ;PUT NEW PS ON STACK
MOV #64$,-(SP) ;PUT NEW PC ON STACK
RTI ;POP NEW PC AND PS

64$:
1$: TST $TKCNT ;WAIT ON A CHARACTER
BEQ 1$
DEC $TKCNT ;DECREMENT THE COUNTER
MOVB $TKQOUT,4(SP) ;GET ONE CHARACTER
INC $TKQOUT ;UPDATE THE POINTER
CMP $TKQOUT,$$TKQEND ;DID IT GO OFF OF THE END?
BNE 2$ ;BRANCH IF NO
MOV $$TKQSRT,$TKQOUT ;RESET THE POINTER
RTI ;RETURN

2$:
;*****
;THIS ROUTINE WILL INPUT A STRING FROM THE TTY
;CALL:
;RDLIN
;RETURN HERE
;INPUT A STRING FROM THE TTY
;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
;TERMINATOR WILL BE A BYTE OF ALL 0'S

SRDLIN: MOV R3, -(SP) ;SAVE R3
CLR -(SP) ;CLEAR THE RUBOUT KEY
1$: MOV $$TTYIN,R3 ;GET ADDRESS
2$: CMP $$TTYIN+22,R3 ;BUFFER FULL?
BLOS 4$ ;BR IF YES
RDCHR ;GO READ ONE CHARACTER FROM THE TTY
MOVB (SP)+,(R3) ;GET CHARACTER
10$: CMPB #177,(R3) ;IS IT A RUBOUT
BNE 5$ ;BR IF NO
TST (SP) ;IS THIS THE FIRST RUBOUT?
BNE 6$ ;BR IF NO
MOVB #'\\,9$ ;TYPE A BACK SLASH
TYPE 9$
MOV #-1,(SP) ;SET THE RUBOUT KEY
6$: DEC R3 ;BACKUP BY ONE
CMP R3,$$TTYIN ;STACK EMPTY?
BLO 4$ ;BR IF YES
MOVB (R3),9$ ;SETUP TO TYPEOUT THE DELETED CHAR.
TYPE 9$ ;GO TYPE
2$: TST (SP) ;GO READ ANOTHER CHAR.
BEQ 7$ ;RUBOUT KEY SET?
;BR IF NO

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SEG 0194

10556	053316	112737	000134	053450	MOVB	#'\,9\$	;; TYPE A BACK SLASH
10557	053324	104401	053450		TYPE	9\$	
10558	053330	005016			CLR	(SP)	;; CLEAR THE RUBOUT KEY
10559	053332	122713	000025	7\$:	CMPB	#25,(R3)	;; IS CHARACTER A CTRL U?
10560	053336	001003			BNE	8\$	;; BR IF NO
10561	053340	104401	053501		TYPE	\$CNTLU	;; TYPE A CONTROL "U"
10562	053344	000726			BR	1\$	;; GO START OVER
10563	053346	122713	000022	8\$:	CMPB	#22,(R3)	;; IS CHARACTER A "r"?
10564	053352	001011			BNE	3\$	;; BRANCH IF NO
10565	053354	105013			CLRB	(R3)	;; CLEAR THE CHARACTER
10566	053356	104401	001205		TYPE	\$CRLF	;; TYPE A "CR" & "LF"
10567	053362	104401	053452		TYPE	\$TTYIN	;; TYPE THE INPUT STRING
10568	053366	000717			BR	2\$	;; GO PICKUP ANOTHER CHARACTER
10569	053370	104401	001204	4\$:	TYPE	\$QUES	;; TYPE A ' '
10570	053374	000712			BR	1\$	;; CLEAR THE BUFFER AND LOOP
10571	053376	111337	053450	3\$:	MOVB	(R3),9\$	;; ECHO THE CHARACTER
10572	053402	104401	053450		TYPE	9\$	
10573	053406	122723	000015		CMPB	#15,(R3)+	;; CHECK FOR RETURN
10574	053412	001305			BNE	2\$	;; LOOP IF NOT RETURN
10575	053414	105063	177777		CLRB	-1(R3)	;; CLEAR RETURN (THE 15)
10576	053420	104401	001206		TYPE	\$LF	;; TYPE A LINE FEED
10577	053424	005726			TST	(SP)+	;; CLEAN RUBOUT KEY FROM THE STACK
10578	053426	012603			MOV	(SP)+,R3	;; RESTORE R3
10579	053430	011646			MOV	(SP)-,(SP)	;; ADJUST THE STACK AND PUT ADDRESS OF THE
10580	053432	016666	000004	000002	MOV	4(SP),2(SP)	;; FIRST ASCII CHARACTER ON IT
10581	053440	012766	053452	000004	MOV	#TTYIN,4(SP)	
10582	053446	000002			RTI		;; RETURN
10583	053450	000				0	;; STORAGE FOR ASCII CHAR. TO TYPE
10584	053451	000				0	;; TERMINATOR
10585	053452	000022			\$TTYIN:	.BLKB 22	;; RESERVE 22 BYTES FOR TTY INPUT
10586	053474	041536	005015	000	\$CNTLC:	.ASCIZ /TC<15><12>	;; CONTROL "C"
10587	053501	136	006525	000012	\$CNTLU:	.ASCIZ /TU<15><12>	;; CONTROL "U"
10588	053506	043536	005015	000	\$CNTLG:	.ASCIZ /TG<15><12>	;; CONTROL "G"
10589	053513	015	051412	051127	\$MSWR:	.ASCIZ <15><12>/SWR = /	
10590	053520	036440	000040				
10591	053524	020040	042516	020127	\$MNEW:	.ASCIZ / NEW = /	
10592	053532	020075	000				
10593	053536				.EVEN		
10594					.SBTTL	READ AN OCTAL NUMBER FROM THE TTY	
10595							
10596							
10597							
10598							
10599							
10600							
10601							
10602							
10603							
10604							
10605							
10606							
10607							
10608	053536	011646			\$RDOCT:	MOV (SP)-,(SP)	;; PROVIDE SPACE FOR THE
10609	053540	016666	000004	000002	MOV	4(SP),2(SP)	;; INPUT NUMBER
10610	053546	010046			MOV	R0,-(SP)	;; PUSH R0 ON STACK
10611	053550	010146			MOV	R1,-(SP)	;; PUSH R1 ON STACK

 *THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND
 *CHANGE IT TO BINARY.
 *THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL
 *OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED
 *FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST
 *THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.
 *CALL:
 * RDOCT
 * RETURN HERE
 *
 * READ AN OCTAL NUMBER
 * LOW ORDER BITS ARE ON TOP OF THE STACK
 * HIGH ORDER BITS ARE IN \$HIOCT

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READ AN OCTAL NUMBER FROM THE TTY

SEQ 0195

10612 053552 010246
10613 053554 104411
10614 053556 012600
10615 053560 010037 053664
10616 053564 005001
10617 053566 005002
10618 053570 112046
10619 053572 001420
10620 053574 122716 000060
10621 053600 003026
10622 053602 122716 000067
10623 053606 002423
10624 053610 006301
10625 053612 005102
10626 053614 006301
10627 053616 006102
10628 053620 006301
10629 053622 006102
10630 053624 042716 177770
10631 053630 062601
10632 053632 000756
10633 053634 005726
10634 053636 010166 000012
10635 053642 010237 053674
10636 053646 012602
10637 053650 012601
10638 053652 012600
10639 053654 000002
10640 053656 005726
10641 053660 105010
10642 053662 104401
10643 053664 000000
10644 053666 104401 001204
10645 053672 000730
10646 053674 000000
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10658 053676 104413
10659 053700 016601 000002
10660 053704 012705 054015
10661 053710 012704 000014
10662 053714 012703 177770
10663 053720 012100
10664 053722 012101
10665 053724 005002
10666 053726 110245
10667 053730 010002

```

1$:  MOV R2,-(SP)          ;; PUSH R2 ON STACK
      RDLIN                ;; READ AN ASCII LINE
      MOV (SP)+,R0         ;; GET ADDRESS OF 1ST CHARACTER
      MOV R0,$$           ;; AND SAVE IT
      CLR R1               ;; CLEAR DATA WORD
      CLR R2
2$:  MOVB (R0)+,-(SP)      ;; PICKUP THIS CHARACTER
      BEQ 3$               ;; IF ZERO GET OUT
      CMPB #'0,(SP)        ;; MAKE SURE THIS CHARACTER
                          ;; IS AN OCTAL DIGIT
      CMPB #'7,(SP)
      BLT 4$
      ASL R1                ;; *2
      ROL R2
      ASL R1                ;; *4
      ROL R2
      ASL R1                ;; *8
      ROL R2
      BIC #'C7,(SP)        ;; STRIP THE ASCII JUNK
      ADD (SP)+,R1         ;; ADD IN THIS DIGIT
      BR 2$                ;; LOOP
3$:  TST (SP)+             ;; CLEAN TERMINATOR FROM STACK
      MOV R1,12(SP)        ;; SAVE THE RESULT
      MOV R2,$HIOCT
      MOV (SP)+,R2         ;; POP STACK INTO R2
      MOV (SP)+,R1         ;; POP STACK INTO R1
      MOV (SP)+,R0         ;; POP STACK INTO R0
      RTI                  ;; RETURN
4$:  TST (SP)+             ;; CLEAN PARTIAL FROM STACK
      CLRB (R0)            ;; SET A TERMINATOR
      TYPE                 ;; TYPE UP THRU THE BAD CHAR.
5$:  .WORD 0
      TYPE $QUES           ;; "?" "CR" & "LF"
      BR 1$               ;; TRY AGAIN
$HIOCT: .WORD 0            ;; HIGH ORDER BITS GO HERE
.SETTL DOUBLE LENGTH BINARY TO OCTAL ASCII CONVERT ROUTINE

*****
;THIS ROUTINE WILL CONVERT A 32-BIT UNSIGNED BINARY NUMBER TO AN
;UNSIGNED OCTAL ASCII NUMBER.
;CALL
;*
;* MOV #PNTR,-(SP)        ;; POINTER TO LOW WORD OF BINARY NUMBER
;* JSR PC,$DB20          ;; CALL THE ROUTINE
;* RETJRN                ;; THE ADDRESS OF THE FIRST ASCII CHAR. IS ON THE STACK

$DB20: SAVREG
      MOV 2(SP),R1         ;; SAVE ALL REGISTERS
      MOV #OCTVL+13.,R5   ;; PICKUP THE POINTER TO LOW WORD
      MOV #12.,R4         ;; POINTER TO DATA TABLE
      MOV #'C7,R3        ;; DO ELEVEN CHARACTERS
      MOV (R1)+,R0        ;; MASK
      MOV (R1)+,R1        ;; LOWER WORD
      MOV (R1)+,R1        ;; HIGH WORD
      CLR R2              ;; TERMINATOR
1$:  MOVB R2,-(R5)         ;; PUT CHARACTER IN DATA TABLE
      MOV R0,R2           ;; GET THIS DIGIT

```

```

10668 053732 005304          DEC      R4          ;; COUNT THIS CHARACTER
10669 053734 003007          BGT      3$          ;; BR IF NOT THE LAST DIGIT
10670 053736 001405          BEQ      2$          ;; BR IF IT IS THE LAST DIGIT
10671 053740 005205          INC      R5          ;; ALL DIGITS DONE-ADJUST POINTER FOR FIRST
10672 053742 010566 000002   MOV      R5,2(SP)    ;; ASCII CHAR. & PUT IT ON THE STACK
10673 053746 104414          RESREG          ;; RESTORE ALL REGISTERS
10674 053750 000207          RTS      PC          ;; RETURN TO USER
10675 053752 006203          2$: ASR      R3          ;; POSITION THE MASK FOR THE LAST DIGIT
10676 053754 006001          3$: ROR      R1          ;; POSITION THE BINARY NUMBER FOR
10677 053756 006000          ROR      R0          ;; THE NEXT OCTAL DIGIT
10678 053760 006001          ROR      R1
10679 053762 006000          ROR      R0
10680 053764 006001          ROR      R1
10681 053766 006000          ROR      R0
10682 053770 040302          BIC      R3,R2          ;; MASK OUT ALL JUNK
10683 053772 062702 000060   ADD      #0,R2          ;; MAKE THIS CHAR. ASCII
10684 053776 000753          BR       1$          ;; GO PUT IT IN THE DATA TABLE
10685 054000 000016          $OCTVL: .BLKB 14.          ;; RESERVE DATA TABLE
10686
10687          .SBTTL SINGLE LENGTH BINARY TO DECIMAL ASCII ROUTINE
10688
10689          ;;*****
10690          ;;THIS ROUTINE WILL CONVERT A 16-BIT UNSIGNED BINARY NUMBER TO AN
10691          ;;UNSIGNED DECIMAL ASCII NUMBER.
10692          ;;CALL
10693          ;;      MOV      NUMBER, -(SP)          ;; PUT BINARY NUMBER ON THE STACK
10694          ;;      JSR      PC, @#$SB2D          ;; CALL
10695          ;;      RETURN          ;; ADDRESS OF THE 1ST ASCII CHAR. IS ON THE STACK
10696
10697 054016 016637 000002 054046 $SB2D: MOV      2(SP), 1$          ;; SAVE BINARY NUMBER
10698 054024 012746 054046          MOV      #1$, -(SP)          ;; SET POINTER
10699 054030 004737 054052          JSR      PC, @#$SB2D          ;; CALL DOUBLE LENGTH CONVERT
10700 054034 062716 000005          ADD      #5, (SP)          ;; ONLY ALLOW FIVE CHARACTERS
10701 054040 012666 000002          MOV      (SP)+, 2(SP)          ;; PICKUP POINTER
10702 054044 000207          RTS      PC          ;; RETURN
10703 054046 000000 000000          1$: .WORD 0,0
10704          .SBTTL DOUBLE LENGTH BINARY TO DECIMAL ASCII CONVERT ROUTINE
10705
10706          ;;*****
10707          ;;THIS ROUTINE WILL CONVERT A 32-BIT BINARY NUMBER TO AN UNSIGNED
10708          ;;DECIMAL (ASCII) NUMBER. THE SIGN OF THE BINARY NUMBER MUST BE
10709          ;;POSITIVE.
10710          ;;CALL
10711          ;;      MOV      #PNTR, -(SP)          ;; POINTER TO LOW WORD OF BINARY NUMBER
10712          ;;      JSR      PC, @#$DB2D          ;; CALL
10713          ;;      RETURN          ;; THE FIRST ADDRESS OF ASCII
10714          ;;                      ;; IS ON THE STACK
10715
10716          $DB2D: SAVREG          ;; SAVE REGISTERS
10717 054052 104413          MOV      2(SP), R2          ;; PICKUP THE DATA POINTER
10718 054054 016602 000002          MOV      #$DECVL, R0          ;; GET ADDRESS OF "$DECVL" STRING
10719 054060 012700 054232          MOV      R0, 2(SP)          ;; PUT ADDRESS OF ASCII STRING ON STACK
10720 054064 010066 000002          MOV      (R2)+, R1          ;; PICKUP THE BINARY NUMBER
10721 054070 012201          MOV      (R2)+, R2
10722 054072 012202          MOV      #10., 4$          ;; SET UP TO DO 10 CONVERSIONS
10723 054074 012737 000012 054150          MOV

```

10724	054102	012704	054162		MOV	#STNPWR,R4	;; ADDRESS OF TEN POWER
10725	054106	012705	054164		MOV	#STNPWR+2,R5	
10726	054112	005003		1\$:	CLR	R3	;; CLEAR PARTIAL
10727	054114	161401		2\$:	SUB	(R4),R1	;; SUBTRACT TEN POWER
10728	054116	005602			SBC	R2	
10729	054120	161502			SUB	(R5),R2	
10730	054122	002402			BLT	3\$	;; BR IF TEN POWER TO LARGE
10731	054124	005203			INC	R3	;; ADD 1 TO PARTIAL
10732	054126	000772			BR	2\$	;; LOOP
10733	054130	062401		3\$:	ADD	(R4)+,R1	;; RESTORE SUBTRACTED VALUE
10734	054132	005502			ADC	R2	
10735	054134	062402			ADD	(R4)+,R2	
10736	054136	022525			CMP	(R5)+,(R5)+	;; MOVE TO NEXT TEN POWER
10737	054140	052703	000060		BIS	#'0,R3	;; CHANGE PARTIAL TO ASCII
10738	054144	110320			MOVB	R3,(R0)+	;; SAVE IT
10739	054146	005327			DEC	(PC)+	;; DONE?
10740	054150	000000		4\$:	.WORD	0	
10741	054152	001357			BNE	1\$	;; BR IF NO
10742	054154	105020			CLRB	(R0)+	;; TERMINATOR
10743	054156	104414			RESREG		;; RESTORE REGISTERS
10744	054160	000207			RTS	PC	;; RETURN
10745	054162	145000		STNPWR:	145000		;; 1.0E09
10746	054164	035632			35632		
10747	054166	160400			160400		;; 1.0E08
10748	054170	002765			2765		
10749	054172	113200			113200		;; 1.0E07
10750	054174	000230			230		
10751	054176	041100			041100		;; 1.0E06
10752	054200	000017			17		
10753	054202	103240			103240		;; 1.0E05
10754	054204	000001			1		
10755	054206	023420			23420		;; 1.0E04
10756	054210	000000			0		
10757	054212	001750			1750		;; 1.0E03
10758	054214	000000			0		
10759	054216	000144			144		;; 1.0E02
10760	054220	000000			0		
10761	054222	000012			12		;; 1.0E01
10762	054224	000000			0		
10763	054226	000001			1		;; 1.0E00
10764	054230	000000			0		
10765	054232	000014		\$DECVL:	.BLKB 12		;; RESERVE STORAGE FOR ASCII STRING
10766				.SBTTL	TYPE NUMERICAL ASCII STRING SUPPRESS LEADING ZEROS		
10767							
10768							
10769							
10770							
10771							
10772							
10773							
10774							
10775							
10776	054246	010046		\$SUPRS:	MOV R0,-(SP)		;; SAVE R0
10777	054250	016600	000004		MOV 4(SP),R0		;; PICKUP THE POINTER
10778	054254	105710		1\$:	TSTB (R0)		;; TERMINATOR?
10779	054256	001403			BEQ 2\$		;; BR IF YES

```

10780 054260 122720 000060
10781 054264 001773
10782 054266 005300
10783 054270 010037 054276
10784 054274 104401
10785 054276 000000
10786 054300 012600
10787 054302 012616
10788 054304 000207
10789
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10799
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10801
10802
10803
10804
10805
10806 054306
10807 054306 010046
10808 054310 010146
10809 054312 010246
10810 054314 010346
10811 054316 010446
10812 054320 010546
10813 054322 016646 000022
10814 054326 016646 000022
10815 054332 016646 000022
10816 054336 016646 000022
10817 054342 000002
10818
10819
10820
10821
10822 054344
10823 054344 012666 000022
10824 054350 012666 000022
10825 054354 012666 000022
10826 054360 012666 000022
10827 054364 012605
10828 054366 012604
10829 054370 012603
10830 054372 012602
10831 054374 012601
10832 054376 012600
10833 054400 000002
10834
10835

```

```

CMPB #0,(R0)+ ; IS THIS AN ASCII "0" ?
BEQ 1$ ; BR IF YES
2$: DEC R0 ; BACKUP BY "1"
MOV R0,3$ ; SAVE FOR TYPING
TYPE ; GO TYPE
3$: .WORD 0 ; ASCIZ POINTER GOES HERE
MOV (SP)+,R0 ; RESTORE R0
MOV (SP)+,(SP) ; RESTORE THE STACK
RTS PC ; RETURN
.SBTTL SAVE AND RESTORE R0-R5 ROUTINES

```

```

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

```

```

$SAVREG:
MOV R0,-(SP) ; PUSH R0 ON STACK
MOV R1,-(SP) ; PUSH R1 ON STACK
MOV R2,-(SP) ; PUSH R2 ON STACK
MOV R3,-(SP) ; PUSH R3 ON STACK
MOV R4,-(SP) ; PUSH R4 ON STACK
MOV R5,-(SP) ; PUSH R5 ON STACK
MOV 22(SP),-(SP) ; SAVE PS OF MAIN FLOW
MOV 22(SP),-(SP) ; SAVE PC OF MAIN FLOW
MOV 22(SP),-(SP) ; SAVE PS OF CALL
MOV 22(SP),-(SP) ; SAVE PC OF CALL
RTI

```

```

;*RESTORE R0-R5
;CALL:
;* RESREG
$RESREG:
MOV (SP)+,22(SP) ; RESTORE PC OF CALL
MOV (SP)+,22(SP) ; RESTORE PS OF CALL
MOV (SP)+,22(SP) ; RESTORE PC OF MAIN FLOW
MOV (SP)+,22(SP) ; RESTORE PS OF MAIN FLOW
MOV (SP)+,R5 ; POP STACK INTO R5
MOV (SP)+,R4 ; POP STACK INTO R4
MOV (SP)+,R3 ; POP STACK INTO R3
MOV (SP)+,R2 ; POP STACK INTO R2
MOV (SP)+,R1 ; POP STACK INTO R1
MOV (SP)+,R0 ; POP STACK INTO R0
RTI
.SBTTL TRAP DECODER

```

```

10836 ;*****
10837 ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
10838 ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
10839 ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
10840 ;*GO TO THAT ROUTINE.
10841
10842 054402 010046          STRAP:  MOV    RO, -(SP)          ;;SAVE RO
10843 054404 016600 000002      MOV    2(SP),RO          ;;GET TRAP ADDRESS
10844 054410 005740          TST     -(RO)              ;;BACKUP BY 2
10845 054412 111000          MOVB   (RO),RO             ;;GET RIGHT BYTE OF TRAP
10846 054414 006300          ASL     RO                  ;;POSITION FOR INDEXING
10847 054416 016000 054436      MOV    STRPAD(RO),RO      ;;INDEX TO TABLE
10848 054422 000200          RTS     RO                  ;;GO TO ROUTINE
10849
10850
10851 ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
10852
10853 054424 011646          STRAP2: MOV    (SP), -(SP)      ;;MOVE THE PC DOWN
10854 054426 016666 000004 000002  MOV    4(SP), 2(SP)    ;;MOVE THE PSW DOWN
10855 054434 000002          RTI                      ;;RESTORE THE PSW
10856
10857 .SBTTL  TRAP TABLE
10858
10859 ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
10860 ;*BY THE "TRAP" INSTRUCTION.
10861
10862 ;
10863 ; ROUTINE
10864 ;-----
10864 054436 054424  $TRPAD: .WORD  $TRAP2
10865 054440 051064  $TYPE  ;;CALL=TYPE  TRAP+1(104401) TTY TYPEOUT ROUTINE
10866 054442 052064  $TYPOC ;;CALL=TYPOC TRAP+2(104402) TYPE OCTAL NUMBER (WITH LEADING ZEROS)
10867 054444 052040  $TYPOS ;;CALL=TYPOS TRAP+3(104403) TYPE OCTAL NUMBER (NO LEADING ZEROS)
10868 054446 052100  $TYPON ;;CALL=TYPON TRAP+4(104404) TYPE OCTAL NUMBER (AS PER LAST CALL)
10869 054450 051346  $TYPDS ;;CALL=TYPDS TRAP+5(104405) TYPE DECIMAL NUMBER (WITH SIGN)
10870
10871 054452 052654  $GTSWR ;;CALL=GTSWR  TRAP+6(104406) GET SOFT-SWR SETTING
10872
10873 054454 052564  $CKSWR ;;CALL=CKSWR  TRAP+7(104407) TEST FOR CHANGE IN SOFT-SWR
10874 054456 053126  $RDCHR ;;CALL=RDCHR  TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
10875 054460 053216  $RDLIN ;;CALL=RDLIN  TRAP+11(104411) TTY TYPEIN STRING ROUTINE
10876 054462 053536  $RDOCT ;;CALL=RDOCT  TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
10877 054464 054306  $SAVREG ;;CALL=SAVREG TRAP+13(104413) SAVE RO-R5 ROUTINE
10878 054466 054344  $RESREG ;;CALL=RESREG TRAP+14(104414) RESTORE RO-R5 ROUTINE
10879 054470 047474  $SCOP1S ;;CALL=SCOP1 TRAP+15(104415) INTERNAL LOOP ON ERROR
10880

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F16

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
DZR6MD.P11 28-JAN-77 09:24MACY11 27(1006) 31-JAN-77 18:00 PAGE 200
TRAP TABLE

SEQ 0200

10881					
10882					.SBTTL SERVICE MSGS
10883					.EVEN
10884	054472	000062			BSE225: .BLKW 50. ;22 SECTOR SOFTWARE INFO
10885					
10886					
10887	054636	005015	047125	041111	MSG1: .ASCII <CR><LF>/UNIBUS RK06 DRIVE DIAGNOSTIC/
10888	054644	051525	051040	030113	
10889	054652	020066	051104	053111	
10890	054660	020105	044504	043501	
10891	054666	047516	052123	041511	
10892	054674	005015	040515	047111	.ASCII <CR><LF>/MAINDEC-11-DZR6H-D-PB/<CR><LF>
10893	054702	042504	026503	030461	
10894	054710	042055	051132	044066	
10895	054716	042055	050055	006502	
10896	054724	012			
10897	054725	015	004412	025052	.ASCII <CR><LF>/ *** CAUTION ***/<CR><LF>
10898	054732	020052	040503	052125	
10899	054740	047511	020116	025052	
10900	054746	006452	012		
10901	054751	015	052012	044510	.ASCII <CR><LF>/THIS PROGRAM SHOULD BE HALTED ONLY BY TYPING CONTROL-C/
10902	054756	020123	051120	043517	
10903	054764	040522	020115	044123	
10904	054772	052517	042114	041040	
10905	055000	020105	040510	052114	
10906	055006	042105	047440	046116	
10907	055014	020131	054502	052040	
10908	055022	050131	047111	020107	
10909	055030	047503	052116	047522	
10910	055036	026514	103		
10911	055041	015	047412	044124	.ASCII <CR><LF>/OTHERWISE, CARTRIDGE FORMATTING AND/OR THE DRIVE/
10912	055046	051105	044527	042523	
10913	055054	020054	040503	052122	
10914	055062	044522	043504	020105	
10915	055070	047506	046522	052101	
10916	055076	044524	043516	040440	
10917	055104	042116	047454	020122	
10918	055112	044124	020105	051104	
10919	055120	053111	105		
10920	055123	015	046412	054501	.ASCII <CR><LF>/MAY BE LEFT IN AN UNDETERMINED STATE/<CR><LF>
10921	055130	041040	020105	042514	
10922	055136	052106	044440	020116	
10923	055144	047101	052440	042116	
10924	055152	052105	051105	044515	
10925	055160	042516	020104	052123	
10926	055166	052101	006505	012	
10927	055173	015	044412	044516	.ASCII <CR><LF>/INITIALLY, DRIVES TO BE TESTED SHOULD HAVE:/<CR><LF>
10928	055200	044524	046101	054514	
10929	055206	020054	051104	053111	
10930	055214	051505	052040	020117	
10931	055222	042502	052040	051505	
10932	055230	042524	020104	044123	
10933	055236	052517	042114	044040	
10934	055244	053101	035105	005015	
10935	055252	005015	027101	020040	.ASCII <CR><LF>/A. HEADS MANUALLY LOADED/
10936	055260	042510	042101	020123	

G16

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
DZR6HD.P11 28-JAN-77 09:24MACY11 27(1006) 31-JAN-77 18:00 PAGE 201
SERVICE MSGS

SEQ 0201

10937	055266	040515	052516	046101
10938	055274	054514	046040	040517
10939	055302	042504	104	
10940	055305	015	041012	020056
10941	055312	041440	051117	042522
10942	055320	052103	050040	051117
10943	055326	020124	042523	042514
10944	055334	052103	042105	
10945	055340	005015	027103	020040
10946	055346	051127	052111	020105
10947	055354	047514	045503	042040
10948	055362	051511	041101	042514
10949	055370	104		
10950	055371	015	042012	020056
10951	055376	042040	044522	042526
10952	055404	051040	040505	054504
10953	055412	044440	042116	041511
10954	055420	052101	051117	047440
10955	055426	006516	012	
10956	055431	015	042012	044522
10957	055436	042526	020123	047516
10958	055444	020124	047524	041040
10959	055452	020105	042524	052123
10960	055460	042105	046440	051525
10961	055466	020124	040510	042526
10962	055474	041040	052117	110
10963	055501	015	050012	051117
10964	055506	051524	042040	051505
10965	055514	046105	041505	042524
10966	055522	006504	000012	
10967	055526	005015	052520	020124
10968	055534	041523	040522	041524
10969	055542	020110	040520	045503
10970	055550	044440	020116	051104
10971	055556	053111	020105	000060
10972	055564	005015	051104	053111
10973	055572	024105	024523	052040
10974	055600	020117	042502	052040
10975	055606	051505	042524	035104
10976	055614	000040		
10977	055616	005015	052502	020123
10978	055624	042101	051104	024040
10979	055632	033461	032067	030064
10980	055640	035051	000040	
10981	055644	005015	047503	052116
10982	055652	020122	042101	051104
10983	055660	024040	030462	024460
10984	055666	020072	000	
10985	055671	015	044412	052116
10986	055676	020122	052101	050040
10987	055704	036503	000	
10988	055707	015	042012	044522
10989	055714	042526	030040	053440
10990	055722	046111	020114	047516
10991	055730	020124	042502	052040
10992	055736	051505	042524	000104

.ASCII <CR><LF>/B. CORRECT PORT SELECTED/

.ASCII <CR><LF>/C. WRITE LOCK DISABLED/

.ASCII <CR><LF>/D. DRIVE READY INDICATOR ON/<CR><LF>

.ASCII <CR><LF>/DRIVES NOT TO BE TESTED MUST HAVE BOTH/

.ASCIIZ <CR><LF>/PORTS DESELECTED/<CR><LF>

MSG2: .ASCIIZ <CR><LF>/PUT SCRATCH PACK IN DRIVE 0/

MSG3: .ASCIIZ <CR><LF>/DRIVE(S) TO BE TESTED: /

MSG4: .ASCIIZ <CR><LF>/BUS ADDR (177440): /

MSG5: .ASCIIZ <CR><LF>/CONTR ADDR (210): /

MSG6: .ASCIIZ <CR><LF>/INTR AT PC=/

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

H16

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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SERVICE MSGS

SEQ 0202

10993	055744	005015	042524	052123	MSG8: .ASCIZ <CR><LF>/TEST 16 TAKES 2 TO 4 MIN./<CR><LF>
10994	055752	030440	020066	040524	
10995	055760	042513	020123	020062	
10996	055766	047524	032040	046440	
10997	055774	047111	006456	000012	
10998	056002	005015	054502	040520	MSG9: .ASCIZ <CR><LF>/BYPASSING TEST 16/<CR><LF>
10999	056010	051523	047111	020107	
11000	056016	042524	052123	030440	
11001	056024	006466	000012		
11002	056030	005015	053412	046111	MSG10: .ASCIZ <CR><LF><LF>/WILL TEST DRIVE(S):/
11003	056036	020114	042524	052123	
11004	056044	042040	044522	042526	
11005	056052	051450	035051	000	
11006	056057	015	005012	047520	MSG11: .ASCIZ <CR><LF><LF>/POWER UP RESTART TO TEST 1/<CR><LF>
11007	056064	042527	020122	050125	
11008	056072	051040	051505	040524	
11009	056100	052122	052040	020117	
11010	056106	042524	052123	030440	
11011	056114	005015	000		
11012	056117	015	050012	041501	MSG12: .ASCIZ <CR><LF>/PACK BEING FORMATTED/<CR><LF>
11013	056124	020113	042502	047111	
11014	056132	020107	047506	046522	
11015	056140	052101	042524	006504	
11016	056146	000012			
11017	056150	005015	047516	046040	MSG13: .ASCII <CR><LF>/NO L OR P CLOCKS/
11018	056156	047440	020122	020120	
11019	056164	046103	041517	051 3	
11020	056172	005015	046101	020114	.ASCIZ <CR><LF>/ALL TIMING TESTS BYPASSED/
11021	056200	044524	044515	043516	
11022	056206	052040	051505	051524	
11023	056214	041040	050131	051501	
11024	056222	042523	000104		
11025	056226	005015	054502	040520	MSG14: .ASCIZ <CR><LF>/BYPASSING DRIVE /
11026	056234	051523	047111	020107	
11027	056242	051104	053111	020105	
11028	056250	000			
11029	056251	015	005012	051104	MSG15: .ASCIZ <CR><LF><LF>/DRIVE /
11030	056256	053111	020105	000	
11031	056263	015	042012	044522	MSG16: .ASCIZ <CR><LF>/DRIVE SERIAL #/
11032	056270	042526	051440	051105	
11033	056276	040511	020114	000043	
11034	056304	005015	040503	052122	MSG17: .ASCIZ <CR><LF>/CARTRIDGE SERIAL NO./
11035	056312	044522	043504	020105	
11036	056320	042523	044522	046101	
11037	056326	047040	027117	000	
11038	056333	015	005012	041101	MSG18: .ASCIZ <CR><LF><LF>/ABORTING BAL OF TESTS/<CR><LF><LF>
11039	056340	051117	044524	043516	
11040	056346	041040	046101	047440	
11041	056354	020106	042524	052123	
11042	056362	006523	005012	000	
11043	056367	015	005012	046101	MSG19: .ASCIZ <CR><LF><LF>/ALL DRIVES TESTED/<CR><LF><LF>
11044	056374	020114	051104	053111	
11045	056402	051505	052040	051505	
11046	056410	042524	006504	005012	
11047	056416	000			
11048	056417	015	046412	042117	MSG20: .ASCII <CR><LF>/MODIFIED VERSION OF FORMAT PACK TEST FOR MODULE TESTING/

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SEQ 0203

11049	056424	043111	042511	020104
11050	056432	042526	051522	047511
11051	056440	020116	043117	043040
11052	056446	051117	040515	020124
11053	056454	040520	045503	052040
11054	056462	051505	020124	047506
11055	056470	020122	047515	052504
11056	056476	042514	052040	051505
11057	056504	044524	043516	
11058	056510	005015	047524	051040
11059	056516	051505	047524	042522
11060	056524	044040	040505	042504
11061	056532	051522	047440	020116
11062	056540	054503	020114	020060
11063	056546	020046	026061	040440
11064	056554	046114	052040	040522
11065	056562	045503	000123	
11066	056566	005015	054502	040520
11067	056574	051523	047111	020107
11068	056602	042524	052123	020123
11069	056610	033063	032054	026060
11070	056616	030464	043040	051117
11071	056624	046440	042117	046125
11072	056632	020105	042524	052123
11073	056640	047111	006507	000012
11074	056646	005015	047506	046522
11075	056654	052101	044524	043516
11076	056662	043040	047111	051511
11077	056670	042510	006504	000012
11078				
11079	056676	005015	043520	020115
11080	056704	041101	051117	020124
11081	056712	042520	042116	047111
11082	056720	027107	027056	000
11083	056725	015	044012	046101
11084	056732	020124	042520	042116
11085	056740	047111	027107	027056
11086	056746	000		
11087	056747	015	050012	046507
11088	056754	040440	047502	052122
11089	056762	042105	000	
11090	056765	015	041412	052520
11091	056772	044040	046101	042524
11092	057000	000104		
11093				
11094				
11095				
11096				
11097	057002	005015	051105	026122
11098	057010	047440	046116	020131
11099	057016	020060	044124	052522
11100	057024	033440	040440	046114
11101	057032	053517	042105	020054
11102	057040	051124	020131	043501
11103	057046	044501	006516	000012
11104	057054	042523	042514	052103

.ASCIZ <CR><LF>/TO RESTORE HEADERS ON CYL 0 & 1, ALL TRACKS/

MSG21: .ASCIZ <CR><LF>/BYPASSING TESTS 36,40,41 FOR MODULE TESTING/<CR><LF>

MSG22: .ASCIZ <CR><LF>/FORMATTING FINISHED/<CR><LF>

MSG74: .ASCIZ <CR><LF>/PGM ABORT PENDING.../

MSG75: .ASCIZ <CR><LF>/HALT PENDING.../

MSG76: .ASCIZ <CR><LF>/PGM ABORTED/

MSG77: .ASCIZ <CR><LF>/CPU HALTED/

.SBTTL ERR MSGS

EM1: .ASCIZ <CR><LF>/ERR, ONLY 0, THRU 7 ALLOWED. TRY AGAIN/<CR><LF>

EM2: .ASCIZ /SELECTED DRIVE * IN RKCS2 CANNOT BE READ BACK IN RKMR2/

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ERR MSGS

SEQ 0204

11105	057062	042105	042040	044522	
11106	057070	042526	021440	044440	
11107	057076	020116	045522	051503	
11108	057104	020062	040503	047116	
11109	057112	052117	041040	020105	
11110	057120	042522	042101	041040	
11111	057126	041501	020113	047111	
11112	057134	051040	046513	031122	
11113	057142	000			
11114	057143	015	040412	047502	EM3: .ASCIZ <CR><LF>/ABORT TESTS...UNEXP TIME OUT AT PC=
11115	057150	052122	052040	051505	
11116	057156	051524	027056	052456	
11117	057164	042516	050130	052040	
11118	057172	046511	020105	052517	
11119	057200	020124	052101	050040	
11120	057206	036503	000		
11121	057211	106	052101	046101	EM4: .ASCII /FATAL ERROR/<CR><LF>
11122	057216	042440	051122	051117	
11123	057224	005015			
11124	057226	041101	051117	044524	.ASCII /ABORTING BALANCE OF TESTS/<CR><LF>
11125	057234	043516	041040	046101	
11126	057242	047101	042503	047440	
11127	057250	020106	042524	052123	
11128	057256	006523	012		
11129	057261	110	040505	020104	.ASCIZ /HEAD POSITION CANNOT BE DETERMINED/
11130	057266	047520	044523	044524	
11131	057274	047117	041440	047101	
11132	057302	047516	020124	042502	
11133	057310	042040	052105	051105	
11134	057316	044515	042516	000104	
11135	057324	042115	020123	042523	EM5: .ASCIZ /MDS SET IN RKCS2/
11136	057332	020124	047111	051040	
11137	057340	041513	031123	000	
11138	057345	125	042506	051440	EM6: .ASCIZ /UFE SET IN RKCS2/
11139	057352	052105	044440	020116	
11140	057360	045522	051503	000062	
11141	057366	051104	020101	047111	EM7: .ASCIZ /DRA IN RKDS & NED IN RKCS2 RESET; WRONG PORT SELECTED?/
11142	057374	051040	042113	020123	
11143	057402	020046	042516	020104	
11144	057410	047111	051040	041513	
11145	057416	031123	051040	051505	
11146	057424	052105	020073	051127	
11147	057432	047117	020107	047520	
11148	057440	052122	051440	046105	
11149	057446	041505	042524	037504	
11150	057454	000			
11151	057455	104	044522	042526	EM8: .ASCIZ /DRIVE PRESENT BUT NOT TYPED BY OPERATOR/
11152	057462	050040	042522	042523	
11153	057470	052116	041040	052125	
11154	057476	047040	052117	052040	
11155	057504	050131	042105	041040	
11156	057512	020131	050117	051105	
11157	057520	052101	051117	000	
11158	057525	104	044522	042526	EM9: .ASCIZ /DRIVE NOT PRESENT BUT TYPED BY OPERATOR/
11159	057532	047040	052117	050040	
11160	057540	042522	042523	052116	

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ERR MSGS

SEQ 0205

11161	057546	041040	052125	052040	
11162	057554	050131	042105	041040	
11163	057562	020131	050117	051105	
11164	057570	052101	051117	000	
11165	057575	101	047502	052122	EM10: .ASCIZ /ABORT TESTS...CANNOT REF CONTR REG/
11166	057602	052040	051505	051524	
11167	057610	027056	041456	047101	
11168	057616	047516	020124	042522	
11169	057624	020106	047503	052116	
11170	057632	020122	042522	000107	
11171	057640	051104	020101	047111	EM11: .ASCIZ /DRA IN RKDS & NED IN RKCS2 BOTH SET/
11172	057646	051040	042113	020123	
11173	057654	020046	042516	020104	
11174	057662	047111	051040	041513	
11175	057670	031123	041040	052117	
11176	057676	020110	042523	000124	
11177	057704	047503	052116	020122	EM12: .ASCIZ /CONTR NOT READY IN RKCS1/
11178	057712	047516	020124	042522	
11179	057720	042101	020131	047111	
11180	057726	051040	041513	030523	
11181	057734	000			
11182	057735	116	020117	052101	EM13: .ASCIZ /NO ATTN IN RKASOF/
11183	057742	047124	044440	020116	
11184	057750	045522	051501	043117	
11185	057756	000			
11186	057757	127	047522	043516	EM14: .ASCIZ /WRONG ATTN IN RKASOF/
11187	057764	040440	052124	020116	
11188	057772	047111	051040	040513	
11189	060000	047523	000106		
11190	060004	051104	054504	047040	EM15: .ASCIZ /DRDY NOT CLEARED IN RKMR2/
11191	060012	052117	041440	042514	
11192	060020	051101	042105	044440	
11193	060026	020116	045522	051115	
11194	060034	000062			
11195	060036	051504	020103	047516	EM16: .ASCIZ /DSC NOT SET IN RKMR2/
11196	060044	020124	042523	020124	
11197	060052	047111	051040	046513	
11198	060060	031122	000		
11199	060063	115	043523	040440	EM17: .ASCIZ /MSG A0 ERROR/
11200	060070	020060	051105	047522	
11201	060076	000122			
11202	060100	051515	020107	030102	EM18: .ASCIZ /MSG B0 ERROR/
11203	060106	042440	051122	051117	
11204	060114	000			
11205	060115	115	043523	040440	EM19: .ASCIZ /MSG A1 ERROR/
11206	060122	020061	051105	047522	
11207	060130	000122			
11208	060132	051515	020107	030502	EM20: .ASCIZ /MSG B1 ERROR/
11209	060140	042440	051122	051117	
11210	060146	000			
11211	060147	103	051105	020122	EM21: .ASCIZ /CERR SET IN RKCS1/
11212	060154	042523	020124	047111	
11213	060162	051040	041513	030523	
11214	060170	000			
11215	060171	122	051514	044440	EM22: .ASCIZ /RLS IN RKCS2 SET CERR IN RKCS1/
11216	060176	020116	045522	051503	

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SEQ 0206

11217	060204	020062	042523	020124	
11218	060212	042503	051122	044440	
11219	060220	020116	045522	051503	
11220	060226	000061			
11221	060230	043125	020105	047111	EM23: .ASCIZ /UFE IN RKCS2 SET (SACK) AFTER RLS IN RKCS2 SENT/
11222	060236	051040	041513	031123	
11223	060244	051440	052105	024040	
11224	060252	040523	045503	020051	
11225	060260	043101	042524	020122	
11226	060266	046122	020123	047111	
11227	060274	051040	041513	031123	
11228	060302	051440	047105	000124	
11229	060310	053126	047040	052117	EM24: .ASCIZ /VV NOT SET IN RKMR2/
11230	060316	051440	052105	044440	
11231	060324	020116	045522	051115	
11232	060332	000062			
11233	060334	051104	020126	054524	EM25: .ASCIZ /DRV TYPE SET IN RKMR2/
11234	060342	042520	051440	052105	
11235	060350	044440	020116	045522	
11236	060356	051115	000062		
11237	060362	042104	020124	042523	EM26: .ASCIZ /DDT SET IN RKDS/
11238	060370	020124	047111	051040	
11239	060376	042113	000123		
11240	060402	052104	042531	051440	EM27: .ASCIZ /DTYE SET IN RKER/
11241	060410	052105	044440	020116	
11242	060416	045522	051105	000	
11243	060423	104	054524	020105	EM28: .ASCIZ /DTYE NOT SET IN RKER/
11244	060430	047516	020124	042523	
11245	060436	020124	047111	051040	
11246	060444	042513	000122		
11247	060450	052104	042531	044440	EM29: .ASCIZ /DTYE IN RKER DID NOT SET CERR IN RKCS1/
11248	060456	020116	045522	051105	
11249	060464	042040	042111	047040	
11250	060472	052117	051440	052105	
11251	060500	041440	051105	020122	
11252	060506	047111	051040	041513	
11253	060514	030523	000		
11254	060517	103	042055	050040	EM30: .ASCIZ /C-D PAR ERR SET IN RKMR3/
11255	060524	051101	042440	051122	
11256	060532	051440	052105	044440	
11257	060540	020116	045522	051115	
11258	060546	000063			
11259	060550	026504	020103	040520	EM31: .ASCIZ /D-C PAR SET IN RKCS1/
11260	060556	020122	042523	020124	
11261	060564	047111	051040	041513	
11262	060572	030523	000		
11263	060575	106	052114	047040	EM32: .ASCIZ /FLT NOT SET IN RKMR3/
11264	060602	052117	051440	052105	
11265	060610	044440	020116	045522	
11266	060616	051115	000063		
11267	060622	026503	020104	040520	EM33: .ASCIZ /C-D PAR ERR NOT SET IN RKMR3/
11268	060630	020122	051105	020122	
11269	060636	047516	020124	042523	
11270	060644	020124	047111	051040	
11271	060652	046513	031522	000	
11272	060657	104	041455	050040	EM34: .ASCIZ /D-C PAR NOT SET IN RKCS1/

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SEQ 0207

11273	060664	051101	047040	052117	
11274	060672	051440	052105	044440	
11275	060700	020116	045522	051503	
11276	060706	000061			
11277	060710	026504	020103	040520	EM35: .ASCIZ /D-C PAR IN RKCS1 DID NOT SET CERR IN RKCS1/
11278	060716	020122	047111	051040	
11279	060724	041513	030523	042040	
11280	060732	042111	047040	052117	
11281	060740	051440	052105	041440	
11282	060746	051105	020122	047111	
11283	060754	051040	041513	030523	
11284	060762	000			
11285	060763	103	046131	040440	EM36: .ASCIZ /CYL ADDR IN B2 NOT SAME AS RKDC/
11286	060770	042104	020122	047111	
11287	060776	041040	020062	047516	
11288	061004	020124	040523	042515	
11289	061012	040440	020123	045522	
11290	061020	041504	000		
11291	061023	103	046131	042040	EM37: .ASCIZ /CYL DIFF IN A2 NOT SAME AS RKDC/
11292	061030	043111	020106	047111	
11293	061036	040440	020062	047516	
11294	061044	020124	040523	042515	
11295	061052	040440	020123	045522	
11296	061060	041504	000		
11297	061063	103	046131	042040	EM38: .ASCIZ /CYL DIFF IN RKMR2 NOT SAME AS 'CYL DIFF'/
11298	061070	043111	020106	047111	
11299	061076	051040	046513	031122	
11300	061104	047040	052117	051440	
11301	061112	046501	020105	051501	
11302	061120	023440	054503	020114	
11303	061126	044504	043106	000047	
11304	061134	054503	020114	044504	EM39: .ASCIZ /CYL DIFF & OFST IN A2 NOT =0/
11305	061142	043106	023040	047440	
11306	061150	051506	020124	047111	
11307	061156	040440	020062	047516	
11308	061164	020124	030075	000	
11309	061171	103	046131	040440	EM40: .ASCIZ /CYL ADDR IN B2 NOT =0/
11310	061176	042104	020122	047111	
11311	061204	041040	020062	047516	
11312	061212	020124	030075	000	
11313	061217	103	046131	040440	EM41: .ASCIZ /CYL ADDR IN B2 DID NOT REMAIN =0/
11314	061224	042104	020122	047111	
11315	061232	041040	020062	044504	
11316	061240	020104	047516	020124	
11317	061246	042522	040515	047111	
11318	061254	036440	000060		
11319	061260	042510	042101	040440	EM43: .ASCIZ /HEAD ADDR IN B3 NOT =0/
11320	061266	042104	020122	047111	
11321	061274	041040	020063	047516	
11322	061302	020124	030075	000	
11323	061307	110	040505	020104	EM44: .ASCIZ /HEAD DECODE IN B3 INCORRECT/
11324	061314	042504	047503	042504	
11325	061322	044440	020116	031502	
11326	061330	044440	041516	051117	
11327	061336	042522	052103	000	
11328	061343	104	044522	042526	EM45: .ASCII /DRIVE READY IN RKMR2 NOT SET BY 1 SEC FROM FWD/

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SEQ 0208

11329	061350	051043	040505	054504
11330	061356	044440	020116	045522
11331	061364	051115	020062	047516
11332	061372	020124	042523	020124
11333	061400	054502	030440	051440
11334	061406	041505	043040	047522
11335	061414	020115	053506	104
11336	061421	015	044412	020116
11337	061426	052122	020132	047520
11338	061434	052122	047511	020116
11339	061442	043117	051440	040524
11340	061450	052122	051440	044520
11341	061456	020116	046503	000104
11342	061464	051515	020107	031101
11343	061472	042440	051122	000
11344	061477	115	043523	041040
11345	061504	020062	051105	000122
11346	061512	051515	020107	031502
11347	061520	042440	051122	000
11348	061525	106	042127	047040
11349	061532	052117	051440	052105
11350	061540	044440	020116	045522
11351	061546	051115	020062	047111
11352	061554	051040	055124	050040
11353	061562	051117	044524	047117
11354	061570	047440	020106	052123
11355	061576	051101	020124	050123
11356	061604	047111	041440	042115
11357	061612	000		
11358	061613	106	042127	047040
11359	061620	052117	051440	052105
11360	061626	044440	020116	045522
11361	061634	051115	020062	051106
11362	061642	046517	051440	040524
11363	061650	052122	051440	044520
11364	061656	020116	046503	000104
11365	061664	053506	020104	047516
11366	061672	020124	046103	040505
11367	061700	042522	020104	047111
11368	061706	051040	046513	031122
11369	061714	041040	020131	020065
11370	061722	042523	020103	043117
11371	061730	046440	052117	047511
11372	061736	020116	051106	046517
11373	061744	051440	040524	052122
11374	061752	051440	044520	020116
11375	061760	046503	000104	
11376	061764	030062	051440	041505
11377	061772	043040	051117	040515
11378	062000	020124	047516	020124
11379	062006	042523	020124	047111
11380	062014	051040	046513	031122
11381	062022	000		
11382	062023	123	041505	030040
11383	062030	047040	052117	043040
11384	062036	052517	042116	041040

.ASCIZ <CR><LF>/IN RTZ PORTION OF START SPIN CMD/

EM46: .ASCIZ /MSG A2 ERR/

EM47: .ASCIZ /MSG B2 ERR/

EM48: .ASCIZ /MSG B3 ERR/

EM49: .ASCIZ /FWD NOT SET IN RKMR2 IN RTZ PORTION OF START SPIN CMD/

EM50: .ASCIZ /FWD NOT SET IN RKMR2 FROM START SPIN CMD/

EM51: .ASCIZ /FWD NOT CLEARED IN RKMR2 BY 5 SEC OF MOTION FROM START SPIN CMD/

EM52: .ASCIZ /20 SEC FORMAT NOT SET IN RKMR2/

EM53: .ASCIZ /SEC 0 NOT FOUND BY 50 MS/

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SEQ 0209

11385	062044	020131	030065	046440	
11386	062052	000123			
11387	062054	044504	043106	051440	EM54: .ASCIZ /DIFF SEC NOT FOUND BY 3 MS/
11388	062062	041505	047040	052117	
11389	062070	043040	052517	042116	
11390	062076	041040	020131	020063	
11391	062104	051515	000		
11392	062107	101	052124	020116	EM55: .ASCIZ /ATTN NOT CLEARED IN RKASOF/
11393	062114	047516	020124	046103	
11394	062122	040505	042522	020104	
11395	062130	047111	051040	040513	
11396	062136	047523	000106		
11397	062142	047125	054105	020120	EM56: .ASCIZ /UNEXP MEM PAR TRAP/
11398	062150	042515	020115	040520	
11399	062156	020122	051124	050101	
11400	062164	000			
11401	062165	127	042503	040040	EM57: .ASCIZ /WCE @ CYL 411, TRK 2, SEC 2/
11402	062172	041440	046131	032040	
11403	062200	030461	020054	051124	
11404	062206	020113	026062	051440	
11405	062214	041505	031040	000	
11406	062221	015	051412	042520	EM58: .ASCIZ <CR><LF>/SPEED OK IN RKMR2 NOT =0 BY TIMEOUT/
11407	062226	042105	047440	020113	
11408	062234	047111	051040	046513	
11409	062242	031122	047040	052117	
11410	062250	036440	020060	054502	
11411	062256	052040	046511	047505	
11412	062264	052125	000		
11413	062267	114	046511	042040	EM59: .ASCIZ /LIM DET NOT SET IN RKMR3/
11414	062274	052105	047040	052117	
11415	062302	051440	052105	044440	
11416	062310	020116	045522	051115	
11417	062316	000063			
11418	062320	042510	042101	020123	EM60: .ASCIZ /HEADS HOME NOT SET IN RKMR2/
11419	062326	047510	042515	047040	
11420	062334	052117	051440	052105	
11421	062342	044440	020116	045522	
11422	062350	051115	000062		
11423	062354	047514	042101	044040	EM61: .ASCIZ /LOAD HEADS NOT SET IN RKMR2/
11424	062362	040505	051504	047040	
11425	062370	052117	051440	052105	
11426	062376	044440	020116	045522	
11427	062404	051115	000062		
11428	062410	046104	020124	042523	EM63: .ASCIZ /DLT SET IN RKCS2/
11429	062416	020124	047111	051040	
11430	062424	041513	031123	000	
11431	062431	115	043523	041040	EM64: .ASCIZ /MSG B3 HEAD REG NOT =0/
11432	062436	020063	042510	042101	
11433	062444	051040	043505	047040	
11434	062452	052117	036440	000060	
11435	062460	042522	042101	044040	EM65: .ASCIZ /READ HEADER ERR/
11436	062466	040505	042504	020122	
11437	062474	051105	000122		
11438	062500	054503	020114	042101	EM66: .ASCIZ /CYL ADDR IN RKMR3 INCORRECT/
11439	062506	051104	044440	020116	
11440	062514	045522	051115	020063	

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SEQ 0210

11441	062522	047111	047503	051122	
11442	062530	041505	000124		
11443	062534	042522	042101	047111	EM67: .ASCIZ /READING CYL 0 HEADERS ON CYL 1/
11444	062542	020107	054503	020114	
11445	062550	020060	042510	042101	
11446	062556	051105	020123	047117	
11447	062564	041440	046131	030440	
11448	062572	000			
11449	062573	122	040505	044504	EM68: .ASCIZ /READING CYL 1 HEADERS ON CYL 0/
11450	062600	043516	041440	046131	
11451	062606	030440	044040	040505	
11452	062614	042504	051522	047440	
11453	062622	020116	054503	020114	
11454	062630	000060			
11455	062632	046101	043511	020116	EM69: .ASCIZ /ALIGN CART USED/
11456	062640	040503	052122	052440	
11457	062646	042523	000104		
11458	062652	047125	054105	020120	EM70: .ASCIZ /UNEXP ATTN/
11459	062660	052101	047124	000	
11460	062665	104	041523	051440	EM71: .ASCIZ /DSC SET IN RKMR2/
11461	062672	052105	044440	020116	
11462	062700	045522	051115	000062	
11463	062706	047506	046522	052101	EM72: .ASCIZ /FORMAT TEST BYPASSED/
11464	062714	052040	051505	020124	
11465	062722	054502	040520	051523	
11466	062730	042105	000		
11467	062733	103	047524	051440	EM73: .ASCIZ /CTO SET IN RKCS1/
11468	062740	052105	044440	020116	
11469	062746	045522	051503	000061	
11470	062754	052122	020132	047516	EM74: .ASCIZ /RTZ NOT SET IN RKMR2/
11471	062762	020124	042523	020124	
11472	062770	047111	051040	046513	
11473	062776	031122	000		
11474	063001	111	040504	020105	EM75: .ASCIZ /IDAE NOT SET IN RKMR3/
11475	063006	047516	020124	042523	
11476	063014	020124	047111	051040	
11477	063022	046513	031522	000	
11478	063027	120	050111	051440	EM76: .ASCIZ /PIP SET IN RKMR2/
11479	063034	052105	044440	020116	
11480	063042	045522	051115	000062	
11481	063050	040506	046125	020124	EM77: .ASCIZ /FAULT NOT =0 IN RKMR3/
11482	063056	047516	020124	030075	
11483	063064	044440	020116	045522	
11484	063072	051115	000063		
11485	063076	054503	020114	044504	EM78: .ASCIZ /CYL DIFF IN RKMR2 DID NOT REMAIN = 1 IN SEEK TO SELF/
11486	063104	043106	044440	020116	
11487	063112	045522	051115	020062	
11488	063120	044504	020104	047516	
11489	063126	020124	042522	040515	
11490	063134	047111	036440	030440	
11491	063142	044440	020116	042523	
11492	063150	045505	052040	020117	
11493	063156	042523	043114	000	
11494	063163	116	042105	051440	EM79: .ASCIZ /NED SET IN RKCS2/
11495	063170	052105	044440	020116	
11496	063176	045522	051503	000062	

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SEQ 0211

11497	063204	047125	047514	042101	EM80:	.ASCIZ	/UNLOAD NOT SET IN RKMR2/
11498	063212	047040	052117	051440			
11499	063220	052105	044440	020116			
11500	063226	045522	051115	000062			
11501	063234	050123	047111	047040	EM81:	.ASCIZ	/SPIN NOT SET IN RKMR2/
11502	063242	052117	051440	052105			
11503	063250	044440	020116	045522			
11504	063256	051115	000062				
11505	063262	052122	020132	047516	EM82:	.ASCIZ	/RTZ NOT SET IN RKMR2/
11506	063270	020124	042523	020124			
11507	063276	047111	051040	046513			
11508	063304	031122	000				
11509	063307	122	040505	020104	EM83:	.ASCIZ	/READ HEADER ERR WORD 0 (CYL#)/
11510	063314	042510	042101	051105			
11511	063322	042440	051122	020040			
11512	063330	053440	051117	020104			
11513	063336	020060	041450	046131			
11514	063344	024443	000				
11515	063347	106	051117	040515	EM84:	.ASCIZ	/FORMAT IN RKMR3 NOT SET/
11516	063354	020124	047111	051040			
11517	063362	046513	031522	047040			
11518	063370	052117	051440	052105			
11519	063376	000					
11520	063377	111	046114	040440	EM85:	.ASCIZ	/ILL ADDR IN RKMR3 NOT =0/
11521	063404	042104	020122	047111			
11522	063412	051040	046513	031522			
11523	063420	047040	052117	036440			
11524	063426	000060					
11525	063430	044127	046111	020105	EM86:	.ASCIZ	/WHILE WAITING FOR CONTR RDY OR AFTER CONTR RDY REC'D/
11526	063436	040527	052111	047111			
11527	063444	020107	047506	020122			
11528	063452	047503	052116	020122			
11529	063460	042122	020131	051117			
11530	063466	040440	052106	051105			
11531	063474	041440	047117	051124			
11532	063502	051040	054504	051040			
11533	063510	041505	042047	000			
11534	063515	103	047101	047516	EM87:	.ASCIZ	/CANNOT READ BSE INFO/
11535	063522	020124	042522	042101			
11536	063530	041040	042523	044440			
11537	063536	043116	000117				
11538	063542	047516	042040	044522	EM88:	.ASCII	/NO DRIVES FOUND ON BUS/<CR><LF>
11539	063550	042526	020123	047506			
11540	063556	047125	020104	047117			
11541	063564	041040	051525	005015			
11542	063572	042523	052524	020120		.ASCIZ	/SETUP CORRECTLY & PRESS 'CONT'<CR><LF>
11543	063600	047503	051122	041505			
11544	063606	046124	020131	020046			
11545	063614	051120	051505	020123			
11546	063622	041447	047117	023524			
11547	063630	005015	000				
11548	063633	116	020117	051104	EM89:	.ASCII	/NO DRIVES FOUND IN DEVICE MAP (\$DEVN)/<CR><LF>
11549	063640	053111	051505	043040			
11550	063646	052517	042116	044440			
11551	063654	020116	042504	044526			
11552	063662	042503	046440	050101			

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SEQ 0212

11553	063670	024040	042044	053105
11554	063676	024515	005015	
11555	063702	042523	052524	020120
11556	063710	047503	051122	041505
11557	063716	046124	020131	020046
11558	063724	042522	052123	051101
11559	063732	006524	000012	

.ASCIZ /SETUP CORRECTLY & RESTART/<CR><LF>

11560				
11561				
11562				

.SBTTL DATA HEADERS

11563	063736	042524	052123	047040
11564	063744	027117	020040	041520

DH1: .ASCIZ /TEST NO. PC/

11565	063752	000		
11566	063753	122	046513	030522

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

11567	063760	051011	046513	031122
11568	063766	051011	046513	031522

11569	063774	051011	042513	004522
11570	064002	045522	051504	051011

11571	064010	041513	030523	051011
11572	064016	041513	031123	000

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

11573	064023	122	053513	004503
11574	064030	045522	040502	051011

11575	064036	042113	004501	045522
11576	064044	051501	043117	051011

11577	064052	042113	004503	045522
11578	064060	041505	051520	051011

11579	064066	042513	050103	000124
11580	064074	051106	046517	041440

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

11581	064102	046131	020040	047524
11582	064110	041440	046131	020040

11583	064116	054503	020114	044504
11584	064124	043106	000	

DH8: .ASCIZ /WHEN DRIVE UNLOADED/

11585	064127	127	042510	020116
11586	064134	051104	053111	020105

11587	064142	047125	047514	042101
11588	064150	042105	000	

DH9: .ASCIZ /AFTER START SPIN CMD REC'D BY DRIVE/

11589	064153	101	052106	051105
11590	064160	051440	040524	052122

11591	064166	051440	044520	020116
11592	064174	046503	020104	042522

11593	064202	023503	020104	054502
11594	064210	042040	044522	042526

11595	064216	000		
11596	064217	101	020124	047105

DH10: .ASCIZ /AT END OF HEAD LOADING/

11597	064224	020104	043117	044040
11598	064232	040505	020104	047514

11599	064240	042101	047111	000107
11600	064246	043101	042524	020122

DH11: .ASCIZ /AFTER START SPIN CMD & FWD SET/

11601	064254	052123	051101	020124
11602	064262	050123	047111	041440

11603	064270	042115	023040	043040
11604	064276	042127	051440	052105

11605	064304	000		
11606	064305	101	020124	047111

DH12: .ASCIZ /AT INNER LIM FROM START SPIN CMD/

11607	064312	042516	020122	044514
11608	064320	020115	051106	046517

GO1

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SEQ 0213

11609	064326	051440	040524	052122	
11610	064334	051440	044520	020116	
11611	064342	046503	000104		
11612	064346	051106	046517	047440	DH13: .ASCIZ /FROM OUTER LIM TO CYL 0 DURING LOADING/
11613	064354	052125	051105	046040	
11614	064362	046511	052040	020117	
11615	064370	054503	020114	020060	
11616	064376	052504	044522	043516	
11617	064404	046040	040517	044504	
11618	064412	043516	000		
11619	064415	101	052106	051105	DH14: .ASCIZ /AFTER SEEK WITH BAD PAR/
11620	064422	051440	042505	020113	
11621	064430	044527	044124	041040	
11622	064436	042101	050040	051101	
11623	064444	000			
11624	064445	101	052106	051105	DH16: .ASCIZ /AFTER LOADING HEAD REG & SEEK CMD/
11625	064452	046040	040517	044504	
11626	064460	043516	044040	040505	
11627	064466	020104	042522	020107	
11628	064474	020046	042523	045505	
11629	064502	041440	042115	000	
11630	064507	101	052106	051105	DH17: .ASCIZ /AFTER RECAL CMD/
11631	064514	051040	041505	046101	
11632	064522	041440	042115	000	
11633	064527	101	052106	051105	DH18: .ASCIZ /AFTER UNLOAD CMD/
11634	064534	052440	046116	040517	
11635	064542	020104	046503	000104	
11636	064550	043101	042524	020122	DH19: .ASCIZ /AFTER PACK CMD/
11637	064556	040520	045503	041440	
11638	064564	042115	000		
11639	064567	101	052106	051105	DH20: .ASCIZ /AFTER SELECT DRIVE CMD/
11640	064574	051440	046105	041505	
11641	064602	020124	051104	053111	
11642	064610	020105	046503	000104	
11643	064616	043101	042524	020122	DH21: .ASCIZ /AFTER SUBSYSTEM CLEAR/
11644	064624	052523	051502	051531	
11645	064632	042524	020115	046103	
11646	064640	040505	000122		
11647	064644	043101	042524	020122	DH22: .ASCIZ /AFTER DRIVE CLEAR CMD/
11648	064652	051104	053111	020105	
11649	064660	046103	040505	020122	
11650	064666	046503	000104		
11651	064672	042524	052123	047040	DH23: .ASCIZ /TEST NO. TRAP PC/
11652	064700	027117	052011	040522	
11653	064706	020120	041520	000	
11654	064713	101	052106	051105	DH25: .ASCIZ /AFTER SEEK CMD/
11655	064720	051440	042505	020113	
11656	064726	046503	000104		
11657	064732	043101	042524	020122	DH26: .ASCIZ /AFTER READ DATA CMD/
11658	064740	042522	042101	042040	
11659	064746	052101	020101	046503	
11660	064754	000104			
11661	064756	042411	050130	041505	DH28: .ASCIZ / EXPECT/
11662	064764	000124			
11663	064766	040411	052103	040525	DH29: .ASCIZ / ACTUAL/
11664	064774	000114			

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DATA HEADERS

SEQ 0214

11665	064776	043101	042524	020122	DH30:	.ASCIZ	/AFTER READ HEADER CMD/
11666	065004	042522	042101	044040			
11667	065012	040505	042504	020122			
11668	065020	046503	000104				
11669	065024	030101	041011	004460	DH32:	.ASCIZ	/A0 B0 A1 B1 A2 B2 B3/
11670	065032	030501	041011	004461			
11671	065040	031101	041011	004462			
11672	065046	031502	000				
11673	065051	104	051125	047111	DH33:	.ASCIZ	/DURING SEEK CMD/
11674	065056	020107	042523	045505			
11675	065064	041440	042115	000			
11676	065071	123	041505	047524	DH34:	.ASCIZ	/SECTOR REG UNSTABLE/
11677	065076	020122	042522	020107			
11678	065104	047125	052123	041101			
11679	065112	042514	000				
11680	065115	102	052105	042527	DH35:	.ASCIZ	/BETWEEN SECTOR COUNTS/
11681	065122	047105	051440	041505			
11682	065130	047524	020122	047503			
11683	065136	047125	051524	000			
11684	065143	106	047522	020115	DH36:	.ASCIZ	/FROM SECT TO SECT/
11685	065150	042523	052103	020040			
11686	065156	047524	051440	041505			
11687	065164	000124					
11688	065166	050123	042505	020104	DH37:	.ASCIZ	/SPEED OK NOT =0 10 SEC AFTER UNLOAD/
11689	065174	045517	047040	052117			
11690	065202	036440	020060	030061			
11691	065210	051440	041505	040440			
11692	065216	052106	051105	052440			
11693	065224	046116	040517	000104			
11694	065232	043101	042524	020122	DH38:	.ASCIZ	/AFTER LIM DET/
11695	065240	044514	020115	042504			
11696	065246	000124					
11697	065250	043101	042524	020122	DH39:	.ASCIZ	/AFTER WRITE HEADER CMD/
11698	065256	051127	052111	020105			
11699	065264	042510	042101	051105			
11700	065272	041440	042115	000			
11701	065277	127	051117	021504	DH40:	.ASCIZ	/WORD# HEADER WAS SHOULD BE/
11702	065304	044011	040505	042504			
11703	065312	020122	040527	020123			
11704	065320	051440	047510	046125			
11705	065326	020104	042502	000			
11706	065333	104	051125	047111	DH41:	.ASCIZ	/DURING RECAL CMD/
11707	065340	020107	042522	040503			
11708	065346	020114	046503	000104			
11709	065354	047117	051440	041505	DH42:	.ASCIZ	/ON SEC 0,2,4,6,8 CYL 410 TRK 2/
11710	065362	030040	031054	032054			
11711	065370	033054	034054	020040			
11712	065376	054503	020114	030464			
11713	065404	020060	051124	020113			
11714	065412	000062					
11715	065414	047506	046522	052101	DH44:	.ASCIZ	/FORMAT & ALL R-W TESTS WILL BE BYPASSED/
11716	065422	023040	040440	046114			
11717	065430	051040	053455	052040			
11718	065436	051505	051524	053440			
11719	065444	046111	020114	042502			
11720	065452	041040	050131	051501			

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DATA HEADERS

SEQ 0215

11721	065460	042523	000104		
11722	065464	042502	040503	051525	DH45: .ASCIZ /BECAUSE OF LIMIT DETECT ERROR ON PREVIOUS TEST/
11723	065472	020105	043117	046040	
11724	065500	046511	052111	042040	
11725	065506	052105	041505	020124	
11726	065514	051105	047522	020122	
11727	065522	047117	050040	042522	
11728	065530	044526	052517	020123	
11729	065536	042524	052123	000	
11730	065543	103	052517	042114	DH46: .ASCIZ /COULD NOT READ BSE INFO ON PREV TEST/
11731	065550	047040	052117	051040	
11732	065556	040505	020104	051502	
11733	065564	020105	047111	047506	
11734	065572	047440	020116	051120	
11735	065600	053105	052040	051505	
11736	065606	000124			
11737	065610	043101	042524	020122	DH48: .ASCIZ /AFTER SEEK CMD TO INV CYL/
11738	065616	042523	045505	041440	
11739	065624	042115	052040	020117	
11740	065632	047111	020126	054503	
11741	065640	000114			
11742	065642	051515	020107	023101	DH49: .ASCIZ /MSG A&B IN RKMR2 & RKMR3 RESP., ARE INVALID/
11743	065650	020102	047111	051040	
11744	065656	046513	031122	023040	
11745	065664	051040	046513	031522	
11746	065672	051040	051505	027120	
11747	065700	020054	051101	020105	
11748	065706	047111	040526	044514	
11749	065714	000104			
11750	065716	043101	042524	020122	DH51: .ASCIZ /AFTER SEEK TO SELF CMD/
11751	065724	042523	045505	052040	
11752	065732	020117	042523	043114	
11753	065740	041440	042115	000	
11754	065745	105	050130	041440	DH52: .ASCIZ /EXP CYL# CYL HEADER WAS/
11755	065752	046131	004443	054503	
11756	065760	020114	042510	042101	
11757	065766	051105	053440	051501	
11758	065774	000			
11759	065775	117	020116	042523	DH53: .ASCIZ /ON SEC 10,12,14,16,18,20 CYL 410 TRK 2/
11760	066002	020103	030061	030454	
11761	066010	026062	032061	030454	
11762	066016	026066	034061	031054	
11763	066024	020060	054503	020114	
11764	066032	030464	020060	051124	
11765	066040	020113	000062		
11766					.SBTTL ERR OUTPUT DATA
11767					
11768					
11769	066044	001214	001116		DT1: .EVEN
11770	066050	003360	003362	003364	\$TESTN,\$ERRPC
11771	066056	003350	003346	003334	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11772	066064	003336			
11773	066066	003340	003342	003344	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11774	066074	003352	003354	003366	
11775	066102	003370			
11776	066104	001214	001116	001350	DT4: \$TESTN,\$ERRPC,FRCYL,TOCYL,CALDIF

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ERR OUTPUT DATA

SEQ 0216

11777	066112	001352	001360			
11778	066116	003360	003362	003364		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11779	066124	003350	003346	003334		
11780	066132	003336				
11781	066134	003340	003342	003344		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11782	066142	003352	003354	003366		
11783	066150	003370				
11784	066152	001214	001116	001402	DT6:	\$TESTN, \$ERRPC, PSEC, ESEC
11785	066160	001404				
11786	066162	003360	003362	003364		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11787	066170	003350	003346	003334		
11788	066176	003336				
11789	066200	003340	003342	003344		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11790	066206	003352	003354	003366		
11791	066214	003370				
11792	066216	001214	001116	001442	DT7:	\$TESTN, \$ERRPC, WDCNT, HDWD, TEMP1
11793	066224	001454	003372			
11794	066230	003360	003362	003364		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11795	066236	003350	003346	003334		
11796	066244	003336				
11797	066246	003340	003342	003344		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11798	066254	003352	003354	003366		
11799	066262	003370				
11800	066264	001214	001116	001352	DT8:	\$TESTN, \$ERRPC, TOCYL, FRCYL, CALDIF
11801	066272	001350	001360			
11802	066276	003360	003362	003364		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11803	066304	003350	003346	003334		
11804	066312	003336				
11805	066314	003340	003342	003344		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11806	066322	003352	003354	003366		
11807	066330	003370				
11808	066332	001214	001116	001352	DT9:	\$TESTN, \$ERRPC, TOCYL, RHTAB
11809	066340	001674				
11810	066342	003360	003362	003364		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11811	066350	003350	003346	003334		
11812	066356	003336				
11813	066360	003340	003342	003344		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11814	066366	003352	003354	003366		
11815	066374	003370				
11816	066376	001214	001116	001350	DT10:	\$TESTN, \$ERRPC, FRCYL, RHTAB
11817	066404	001674				
11818	066406	003360	003362	003364		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11819	066414	003350	003346	003334		
11820	066422	003336				
11821	066424	003340	003342	003344		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT
11822	066432	003352	003354	003366		
11823	066440	003370				
11824	066442	001214	001334		DT11:	\$TESTN, TRAPPC
11825	066446	001214	001116	003424	DT13:	\$TESTN, \$ERRPC, E.A0, E.B0, E.A1, E.B1, H.A0, H.B0, H.A1, H.B1
11826	066454	003426	003430	003432		
11827	066462	003404	003406	003410		
11828	066470	003412				
11829	066472	003360	003362	003364		HMR1, HMR2, HMR3, HER, HDS, HCS1, HCS2
11830	066500	003350	003346	003334		
11831	066506	003336				
11832	066510	003340	003342	003344		HWC, HBA, HDA, HASOF, HDC, HPOS, HPAT

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ERR OUTPUT DATA

SEQ 0217

11833	066516	003352	003354	003366	
11834	066524	003370			
11835					
11836	066526	001214	001116	003424	DT14: \$TESTN,\$ERRPC,E.A0,E.B0,E.A1,E.B1,E.A2,E.B2
11837	066534	003426	003430	003432	
11838	066542	003434	003436		
11839	066546	003404	003406	003410	H.A0,H.B0,H.A1,H.B1,H.A2,H.B2
11840	066554	003412	003414	003416	
11841	066562	003360	003362	003364	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11842	066570	003350	003346	003334	
11843	066576	003336			
11844	066600	003340	003342	003344	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11845	066606	003352	003354	003366	
11846	066614	003370			
11847					
11848	066616	001214	001116	003424	DT15: \$TESTN,\$ERRPC,E.A0,E.B0,E.A1,E.B1,E.A2,E.B2,E.B3
11849	066624	003426	003430	003432	
11850	066632	003434	003436	003442	
11851	066640	003404	003406	003410	H.A0,H.B0,H.A1,H.B1,H.A2,H.B2,H.B3
11852	066646	003412	003414	003416	
11853	066654	003422			
11854	066656	003360	003362	003364	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
11855	066664	003350	003346	003334	
11856	066672	003336			
11857	066674	003340	003342	003344	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
11858	066702	003352	003354	003366	
11859	066710	003370			
11860					
11861					.SBTTL ERR DATA FORMATS
11862					
11863	066712	000003			DF1: 3
11864	066714	002	000		.BYTE 2,0
11865	066716	063753			DH2
11866	066720	007	000		.BYTE 7,0
11867	066722	064023			DH3
11868	066724	007	000		.BYTE 7,0
11869					
11870	066726	000005			DF2: 5
11871	066730	000	000		.BYTE 0,0
11872	066732	065642			DH49
11873	066734	000	000		.BYTE 0,0
11874	066736	063736			DH1
11875	066740	002	000		.BYTE 2,0
11876	066742	063753			DH2
11877	066744	007	000		.BYTE 7,0
11878	066746	064023			DH3
11879	066750	007	000		.BYTE 7,0
11880					
11881	066752	000001			DF3: 1
11882	066754	002	000		.BYTE 2,0
11883	066756	000003			DF4: 3
11884	066760	002	000		.BYTE 2,0
11885	066762	063753			DH2
11886	066764	007	000		.BYTE 7,0
11887	066766	064023			DH3
11888	066770	007	000		.BYTE 7,0

L01

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ERR DATA FORMATS

SEQ 0218

11889				
11890	066772	000004		DF5: 4
11891	066774	000	000	.BYTE 0,0
11892	066776	063736		DH1
11893	067000	002	000	.BYTE 2,0
11894	067002	063753		DH2
11895	067004	007	000	.BYTE 7,0
11896	067006	064023		DH3
11897	067010	007	000	.BYTE 7,0
11898				
11899	067012	000005		DF6: 5
11900	067014	000	000	.BYTE 0,0
11901	067016	063736		DH1
11902	067020	002	000	.BYTE 2,0
11903	067022	064074		DH6
11904	067024	003	000	.BYTE 3,0
11905	067026	063753		DH2
11906	067030	007	000	.BYTE 7,0
11907	067032	064023		DH3
11908	067034	007	000	.BYTE 7,0
11909				
11910				
11911				
11912	067036	000004		DF10: 4
11913	067040	000	000	.BYTE 0,0
11914	067042	063736		DH1
11915	067044	002	000	.BYTE 2,0
11916	067046	063753		DH2
11917	067050	007	000	.BYTE 7,0
11918	067052	064023		DH3
11919	067054	007	000	.BYTE 7,0
11920				
11921	067056	000005		DF12: 5
11922	067060	000	000	.BYTE 0,0
11923	067062	063736		DH1
11924	067064	002	000	.BYTE 2,0
11925	067066	065143		DH36
11926	067070	002	000	.BYTE 2,0
11927	067072	063753		DH2
11928	067074	007	000	.BYTE 7,0
11929	067076	064023		DH3
11930	067100	007	000	.BYTE 7,0
11931				
11932	067102	000004		DF14: 4
11933	067104	002	000	.BYTE 2,0
11934	067106	065277		DH40
11935	067110	003	000	.BYTE 3,0
11936	067112	063753		DH2
11937	067114	007	000	.BYTE 7,0
11938	067116	064023		DH3
11939	067120	007	000	.BYTE 7,0
11940				
11941				
11942	067122	000004		DF15: 4
11943	067124	000	000	.BYTE 0,0
11944	067126	063736		DH1

MO1

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ERR DATA FORMATS

SEQ 0219

11945	067130	002	000	.BYTE	2,0
11946	067132	063753		DH2	
11947	067134	007	000	.BYTE	7,0
11948	067136	064023		DH3	
11949	067140	007	000	.BYTE	7,0
11950					
11951	067142	000004		DF16:	4
11952	067144	000	000	.BYTE	0,0
11953	067146	063736		DH1	
11954	067150	002	000	.BYTE	2,0
11955	067152	063753		DH2	
11956	067154	007	000	.BYTE	7,0
11957	067156	064023		DH3	
11958	067160	007	000	.BYTE	7,0
11959					
11960	067162	000005		DF17:	5
11961	067164	000	000	.BYTE	0,0
11962	067166	065414		DH44	
11963	067170	000	000	.BYTE	0,0
11964	067172	063736		DH1	
11965	067174	002	000	.BYTE	2,0
11966	067176	063753		DH2	
11967	067200	007	000	.BYTE	7,0
11968	067202	064023		DH3	
11969	067204	007	000	.BYTE	7,0
11970	067206	000007		DF20:	7
11971	067210	000	000	.BYTE	0,0
11972	067212	063736		DH1	
11973	067214	002	000	.BYTE	2,0
11974	067216	064756		DH28	
11975	067220	000	000	.BYTE	0,0
11976	067222	065024		DH32	
11977	067224	004	000	.BYTE	4,0
11978	067226	064766		DH29	
11979	067230	004	000	.BYTE	4,0
11980	067232	063753		DH2	
11981	067234	007	000	.BYTE	7,0
11982	067236	064023		DH3	
11983	067240	007	000	.BYTE	7,0
11984	067242	000004		DF21:	4
11985	067244	002	000	.BYTE	2,0
11986	067246	065745		DH52	
11987	067250	002	000	.BYTE	2,0
11988	067252	063753		DH2	
11989	067254	007	000	.BYTE	7,0
11990	067256	064023		DH3	
11991	067260	007	000	.BYTE	7,0
11992	067262	000007		DF22:	7
11993	067264	000	000	.BYTE	0,0
11994	067266	063736		DH1	
11995	067270	002	000	.BYTE	2,0
11996	067272	064756		DH28	
11997	067274	000	000	.BYTE	0,0
11998	067276	065024		DH32	
11999	067300	006	000	.BYTE	6,0
12000	067302	064766		DH29	

NO1

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ERR DATA FORMATS

SEQ 0220

12001	067304	006	000		.BYTE	6,0
12002	067306	063753			DH2	
12003	067310	007	000		.BYTE	7,0
12004	067312	064023			DH3	
12005	067314	007	000		.BYTE	7,0
12006						
12007	067316	000007		DF23:	7	
12008	067320	000	000		.BYTE	0,0
12009	067322	063735			DH1	
12010	067324	002	000		.BYTE	2,0
12011	067326	064756			DH28	
12012	067330	000	000		.BYTE	0,0
12013	067332	065024			DH32	
12014	067334	007	000		.BYTE	7,0
12015	067336	064766			DH29	
12016	067340	007	000		.BYTE	7,0
12017	067342	063753			DH2	
12018	067344	007	000		.BYTE	7,0
12019	067346	064023			DH3	
12020	067350	007	000		.BYTE	7,0

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12021
12022
12023
12024
12025
12026
12027
12028
12029
12030
12031 067352 104413
12032 067354 113700 001114
12033 067360 042700 177400
12034 067364 005300
12035 067366 006300
12036 067370 006300
12037 067372 006300
12038 067374 062700 003506
12039 067400 012037 067414
12040 067404 001404
12041 067406 104401 001205
12042 067412 104401
12043 067414 000000
12044 067416 012037 067432
12045 067422 001404
12046 067424 104401 001205
12047 067430 104401
12048 067432 000000
12049 067434 012001
12050 067436 001455
12051 067440 005004
12052 067442 012000
12053 067444 012002
12054 067446 001446
12055 067450 005104
12056 067452 104401 001205
12057 067456 112003
12058 067460 105720
12059 067462 005703
12060 067464 001407
12061 067466 013146
12062 067470 104402
12063 067472 005303
12064 067474 001403
12065 067476 104401 067626
12066 067502 000771
12067 067504 005302
12068 067506 003431
12069 067510 104401 001205
12070 067514 005760 000002
12071 067520 001404
12072 067522 005104
12073 067524 001002
12074 067526 104401 067626
12075 067532 012037 067540
12076 067536 104401

```

```

*****
;SBTTL TYPE ERR ROUTINE
;ENTRY JSR PC,TYP ERR
;RETURN RTS PC
;
;THIS ROUTINE USES THE "ITEM CONTROL BYTE" ($ITEMB) TO DETERMINE WHICH
;ERR IS TO BE REPORTED. IT THEN USES THE "ERR TABLE" ($ERRTB)
;ENTRY TO DEFINE WHAT INFORMATION IS TO BE REPORTED CONCERNING
;THE ERR.
*****
TYPERR: SAVREG
        MOVB    $ITEMB,R0      ;ENTER ERR NUMBER
        BIC     #177400,R0     ;CLEAR SIGN EXTENSION
        DEC     R0             ;FORM INDEX FOR ERR TABLE
        ASL     R0
        ASL     R0
        ASL     R0
1$:      ADD     # $ERRTB,R0     ;FORM ADDRESS OF ERR ENTRY
        MOV     (R0)+,2$       ;GET EM POINTER
        BEQ     3$             ;BRANCH IF THERE ISN'T ONE
        TYPE    , $CRLF        ;TYPE CARRIAGE RETURN LINE FEED
        TYPE    , $CRLF        ;TYPE ERR MSG (EM)
2$:      .WORD   0              ;EM POINTER GOES HERE
3$:      MOV     (R0)+,4$       ;GET DH POINTER
        BEQ     5$             ;BRANCH IF THERE ISN'T ONE
        TYPE    , $CRLF        ;TYPE CR-LF
        TYPE    , $CRLF        ;TYPE DATA HEADER
4$:      .WORD   0              ;DH POINTER GOES HERE
5$:      MOV     (R0)+,R1       ;GET DT POINTER
        BEQ     20$            ;BRANCH IF THERE ARE NONE
        CLR     R4             ;SET INDENT SWITCH
        MOV     (R0)+,R0       ;GET DF POINTER
        MOV     (R0)+,R2       ;STORE NUMBER OF DH'S
        BEQ     17$            ;DH NUM IS 0-BRANCH
        COM     R4             ;NO INDENT
        TYPE    , $CRLF
10$:     MOVB    (R0)+,R3       ;GET & STORE NUMBER OF DATA WORDS
        TSTB    (R0)+         ;BUMP PAST FORMAT WORD
        TST     R3            ;TEST IF ANY DATA FOR THIS HEADER
        BEQ     14$            ;NO - SKIP DATA PRINT
11$:     MOV     2(R1)+,-(SP)   ;PUT FIRST DATA WORD ON STACK
        TYPOC   R3            ;TYPE IT
        DEC     R3            ;MORE DATA WORDS
        BEQ     14$            ;NO-BRANCH
        TYPE    , SPACE2      ;TYPE SEPARATORS
        BR      11$           ;LOOP
14$:     DEC     R2            ;MORE DH'S?
        BLE     20$            ;NO-BRANCH
        TYPE    , $CRLF
        TST     2(R0)         ;ONLY A DH IN THIS REQUEST?
        BEQ     15$            ;YES-BRANCH BYPASS INDENT
        COM     R4            ;INDENT?
        BNE     15$            ;NO-BRANCH
        TYPE    , SPACE2      ;YES-TYPE SPACES
15$:     MOV     (R0)+,16$     ;GET NEXT DH POINTER
        TYPE    , $CRLF        ;TYPE DH

```

C02

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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TYPE ERR ROUTINE

SEQ 0222

12077	067540	000000			16\$:	.WORD	0		;DH POINTER GOES HERE
12078	067542	105710				TSTB	(R0)		;TYPE A DT?
12079	067544	001003				BNE	21\$		;YES-BRANCH
12080	067546	062700	000002			ADD	#2,R0		;INCREMENT DF POINTER
12081	067552	000754				BR	14\$		;SEE IF END OF DF BLOCK
12082	067554	104401	001205		21\$:	TYPE	\$CRLF		
12083	067560	005704				TST	R4		;INDENT?
12084	067562	001335				BNE	10\$		;NO-BRANCH
12085	067564	104401	067626		17\$:	TYPE	SPACE2		;YES-TYPE SPACES
12086	067570	000732				BR	10\$		;LOOP
12087	067572	104414			20\$:	RESREG			
12088									
12089	067574	032777	010000	111336		BIT	#SW12,@SWR		;ABORT DRV AFTER 20 ERRS?
12090	067602	001410				BEQ	25\$		;BR IF NO
12091	067604	023727	001103	000024		CMP	\$ERFLG,#20.		;ELSE SEE IF 20 ERRS
12092	067612	001004				BNE	25\$		;BR IF NO
12093	067614	012706	001100			MOV	#STACK,SP		;ELSE RESTORE STK
12094	067620	000137	043076			JMP	\$EOP		;AND DROP DRIVE
12095	067624	000207			25\$:	RTS	PC		
12096	067626	020040	000		SPACE2:	.ASCIZ/	/		;2 SPACES

002

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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TYPE ERR ROUTINE

SEQ 0223

```

12097      ; ODT-11 -- VOOSA
12098
12099      ; DEC-11-UODPA-A-LA
12100
12101      ; COPYRIGHT 1969, 1970, 1972
12102      ; DIGITAL EQUIPMENT CORPORATION
12103      ; MAYNARD, MASSACHUSETTS 01754
12104      ; .ENABL ABS,AMA
12105      067632      ; .EVEN
12106      067712      ; .+.60
12107      000000      RO      =      %0      ; REGISTER
12108      000001      R1      =      %1      ; NAMING
12109      000002      R2      =      %2      ; CONVENTIONS
12110      000003      R3      =      %3
12111      000004      R4      =      %4
12112      000005      R5      =      %5
12113      000006      SP      =      %6
12114      000007      PC      =      %7
12115      177776      ST      =      177776      ; STATUS REGISTER
12116
12117      000014      O.TVEC =      14      ; TRT VECTOR LOCATION
12118      000340      O.STM  =      340      ; PRIORITY MASK - STATUS REGISTER
12119      000020      O.TBT  =      20      ; T-BIT MASK - STATUS REGISTER
12120      000003      TRT    =      000003      ; TRT INSTRUCTION
12121      000006      RTT    =      000006      ; RTT INSTRUCTION
12122
12123      ; R5 IS USUALLY CONSIDERED SAFE, THE CURRENT ADDRESS WORD
12124      ; RESIDES IN IT. AFTER A BREAKPOINT, IT IS SET TO ZERO, AND SEARCH
12125      ; OPERATIONS LEAVE IT RANDOMLY FILLED. OTHERWISE, IT SHOULD NOT
12126      ; BE USED EXCEPT FOR JSR'S AND THE CURRENT ADDRESS POINTER (CAD).
12127
12128      177562      O.RDB   =      177562      ; R DATA BUFFER
12129      177560      O.RCSR =      177560      ; R C/SR
12130      177566      O.TDB   =      177566      ; T DATA BUFFER
12131      177564      O.TCSR =      177564      ; T C/SR
12132
12133      ;
12134      ; INITIALIZE ODT
12135      ; USE O.ODT FOR A NORMAL ENTRY
12136      ; USE O.ODT+2 TO RESTART ODT - WIPING OUT ALL BREAKPOINTS
12137      ; USE O.ODT+4 TO RE-ENTER (I.E. - FAKE A BREAKPOINT)
12138
12139      067712      000413      O.ODT: BR      0.STRT      ; NORMAL ENTRY
12140      067714      000417      BR      0.RST        ; RESTART
12141      067716      013737      177776      067672      O.ENTR: MOV      ST,0.UST      ; RE-ENTER -- SAVE STATUS
12142      067724      013737      000016      177776      MOV      0.TVEC+2,ST      ; SET UP LOCAL STATUS
12143      067732      010737      067670      MOV      PC,0.UPC      ; FAKE THE PC
12144      067736      000137      071070      JMP      0.BK1
12145
12146      067742      012706      067652      O.STRT: MOV      #0,URD,SP      ; SET UP STACK
12147      067746      010637      067666      MOV      SP,0.USP      ; FAKE THE SAVED STACK
12148      067752      000414      BR      0.RST1      ; CLEAR BREAKPOINT TABLES
12149      067754      004037      071276      O.RST: JSR      0,0.SVR      ; SAVE REGISTERS
12150      067760      013777      067710      177716      MOV      0.UIN,20.ADR1      ; REMOVE THE BREAKPOINT
12151      067766      113704      067674      MOV8     0.PRI,R4      ; GET ODT PRIORITY
12152      067772      106004      ROR8     R4          ; SHIFT

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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TYPE ERR ROUTINE

SEQ 0224

12153	067774	106004		RORB	R4	; INTO
12154	067776	106004		RORB	R4	; POSITION
12155	070000	110437	177776	MOV	R4,ST	; STORE IN STATUS
Z 12156	070004	000127		0.RST1: JMP	(PC)+	
12157	070006	000403		BR	0.45	
12158	070010	012737	000002 071000	MOV	#RTI,0.RTIT	; SET TO RTI IF 11/20 OR /05
12159	070016	105037	071717	0.45: CLRB	0.P	; DISALLOW PROCEED
12160	070022	012737	000340 000016	MOV	#0.STM,0.TVEC+2	; STATUS WORD TO TRT VECTOR + 2
12161	070030	012737	071060 000014	MOV	#0.BRK,0.TVEC	; PC TO TRT V.CTOR
12162	070036	000447		BR	0.RALL	; CLEAR BREAKPOINT TABLES
12163						
12164						
12165						
12166						
12167	070040	004537	071520	0.REGT: JSR	5,0.GET	; SPECIAL NAME, GET ONE MORE CHARACTER
12168	070044	012704	071743	MOV	#0.TL,R4	; TABLE START ADDRESS
12169	070050	120024		0.RSP: CMPB	RD,(R4)+	; IS THIS THE CORRECT CHARACTER?
12170	070052	001413		BEQ	0.SP	; JUMP IF YES
12171	070054	022704	071751	CMP	#0.TL+0.LG,R4	; IS THE SEARCH DONE?
12172	070060	101373		BHI	0.RSP	; BRANCH IF NOT
12173	070062	042700	177770	BIC	#177770,R0	; MASK OFF OCTAL
12174	070066	010304		MOV	R0,R4	
12175	070070	006304		0.SP1: ASL	R4	
12176	070072	062704	067652	ADD	#0.URD,R4	; GENERATE ADDRESS
12177	070076	005202		INC	R2	; SET FOUND FLAG
12178	070100	000444		BR	0.SCAN	; GO FIND NEXT CHARACTER
12179	070102	162704	071734	0.SP: SUB	#0.TL-7,R4	; CORRECT CONSTANT
12180	070106	000770		BR	0.SP1	
12181						
12182						
12183						
12184	070110	004737	071644	0.0RPC: JSR	PC,0.TCLS	
12185	070114	010502		MOV	R5,R2	; CURRENT ADDRESS IN R2
12186	070116	061202		ADD	#R2,R2	; COMPUTE
12187	070120	006202		ASR	R2	; MOVE ONE BIT TO CARRY
12188	070122	103421		BCS	0.ERR	; ERR IF ODD NUMBER
12189	070124	006302		ASL	R2	; RESTORE WORD
12190	070126	005722		TST	(R2)+	; AND INCREMENT BY TWO
12191	070130	010205		MOV	R2,R5	; UPDATE CAD
12192	070132	000137	070404	JMP	0.OP2	; GO FINISH UP
12193						
12194						
12195						
12196	070136	005702		0.BKPT: TST	R2	; IF NO NUMBER TYPED
12197	070140	001406		BEQ	0.RALL	; REMOVE BREAKPOINT
12198	070142	006204		ASR	R4	; CHECK IF ODD
12199	070144	103410		BCS	0.ERR	; JUMP IF ODD
12200	070146	006304		ASL	R4	; RESTORE ONE BIT
12201	070150	010437	067704	MOV	R4,0.ADR1	; SET A BREAKPOINT
12202	070154	000412		BR	0.DCD	
12203	070156	012737	071760 067704	0.RALL: MOV	#0.TRTC,0.ADR1	; CLEAR BREAKPOINT
12204	070164	000406		BR	0.DCD	
12205						
12206						
12207						
12208						

; SPECIAL NAME HANDLER
 ; DEPENDS UPON THE EXPLICIT ORDER OF THE TWO TABLES 0.TL AND 0.URD
 ; HANDLER - OPEN INDEXED ON THE PC
 ; B HANDLER - SET AND REMOVE BREAKPOINTS
 ; CMD DECODER - ODT11
 ; REGISTERS R0-R4 MAY BE USED,

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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TYPE ERR ROUTINE

SEQ 0225

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12209
12210
12211 070166 052705 000001
12212 070172 012700 000077
12213 070176 004537 071576
12214 070202 004537 071676
12215 070206 005004
12216 070210 005002
12217 070212 004537 071520
12218 070216 022700 000060
12219 070222 101013
12220 070224 022700 000067
12221 070230 103410
12222 070232 042700 177770
12223 070236 006304
12224 070240 006304
12225 070242 006304
12226 070244 060004
12227 070246 005202
12228 070250 000760
12229 070252 005001
12230 070254 120061 071727
12231 070260 001405
12232 070262 005201
12233 070264 020127 000014
12234 070270 103336
12235 070272 000770
12236 070274 006301
12237 070276 000171 070302
12238
12239 070302 070332
12240 070304 070364
12241 070306 070040
12242 070310 070674
12243 070312 070376
12244 070314 070110
12245 070316 070430
12246 070320 070440
12247 070322 070516
12248 070324 070512
12249 070326 070136
12250 070330 071002
12251 000030
12252
12253
12254
12255 070332 005702
12256 070334 001410
12257 070336 010405
12258 070340 006205
12259 070342 103711
12260 070344 006305
12261 070346 011500
12262 070350 004537 071434
12263 070354 000714
12264 070356 042705 000001

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```

; REGISTER R5 WILL BE CONSIDERED SAFE
;
0.ERR: BIS #1,R5 ; CLOSE EVERYTHING
      MOV #1,R0 ; ' TO BE TYPED
      JSR 5,0,FTYP ; OUTPUT ?
0.DCD: JSR 5,0,CRLS ; TYPE <CR><LF>*
0.DCD1: CLR R4 ; R4 CONTAINS THE CONVERTED OCTAL
      CLR R2 ; R2 IS THE NUMBER FOUND FLAG
0.SCAN: JSR 5,0.GET ; GET A CHAR, RETURN IN R0
      CMP #0,R0 ; COMPARE WITH ASCII 0
      BHI 0,CLGL ; CHECK LEGALITY IF NON-NUMERIC
      CMP #7,R0 ; COMPARE WITH ASCII 7
      BLO 0,CLGL ; CHECK LEGALITY IF NOT OCTAL
      BIC #177770,R0 ; CONVERT TO BCD
      ASL R4 ; MAKE ROOM
      ASL R4 ; IN
      ASL R4 ; R4
      ADD R0,R4 ; PACK THREE BITS IN R4
      INC R2 ; R2 HAS NUMERIC FLAG
      BR 0,SCAN ; AND TRY AGAIN
0.CLGL: CLR R1 ; CLEAR INDEX
0.LGL1: CMPB R0,0,LGCH(R1) ; DO THE CODES MATCH?
      BEQ 0,LGL2 ; JUMP IF YES
      INC R1 ; SET INDEX FOR NEXT SEARCH
      CMP R1,#0,CLGT ; IS THE SEARCH DONE?
      BHIS 0,ERR ; OOPS!
      BR 0,LGL1 ; RE-LOOP
0.LGL2: ASL R1 ; MULTIPLY BY TWO
      JMP 20,LGDR(R1) ; GO TO PROPER ROUTINE
;
0.LGDR: 0.WRD ; / OPEN WORD
      0.CRET ; CARRIAGE RETURN CLOSE
      0.REGT ; $ REGISTER OPS
      0.GO ; G GO TO ADDRESS K
      0.OP1 ; <LF> MODIFY, CLOSE, OPEN NEXT
      0.ORPC ; + OPEN RELATED, INDEX - PC
      0.BACK ; - OPEN PREVIOUS
      0.OFST ; 0 OFFSET
      0.WSCH ; W SEARCH WORD
      0.EFF ; E SEARCH EFFECTIVE ADDRESS
      0.BKPT ; B BREAKPOINTS
      0.PROC ; P PROCEED
0.LGL = -0.LGDR ; LGL MUST EQUAL 2X CHLGT ALWAYS
;
; PROCESS / - OPEN WORD
;
0.WRD: TST R2 ; GET VALUE IF R2 IS NON-ZERO
      BEQ 0,WRDA ; SKIP OTHERWISE
      MOV R4,R5 ; PUT VALUE IN CAD
0.WRD1: ASR R5 ; MOVE ONE BIT TO CARRY
0.ERR2: BCS 0,ERR ; JUMP IF ODD ADDRESS
      ASL R5 ; RESTORE THE CARRY BIT
      MOV 2R5,R0 ; GET CONTENTS OF WORD
      JSR 5,0,CADV ; GO GET AND TYPE OUT 2CAD
      BR 0,DCD1 ; GO BACK TO DECODER
0.WRDA: BIC #1,R5 ; CLEAR CLOSED BIT

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G02

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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TYPE ERR ROUTINE

SEQ 0226

12265	070362	000766		BR	0.WRD1	;GO BACK TO MAIN-LINE
12266						
12267						
12268						
12269	070364	004737	071644	0.CRET:	JSR PC,0.TCLS	;CLOSE LOCATION
12270	070370	052705	000001		BIS #1,R5	;CLOSE EVERYTHING
12271	070374	000702			BR 0.DCD	;RETURN TO DECODER
12272						
12273						
12274						
12275	070376	004737	071644	0.OP1:	JSR PC,0.TCLS	;CLOSE PRESENT CELL
12276	070402	005725			TST (R5)+	;GENERATE NEW ADDRESS
12277	070404	004537	071670	0.OP2:	JSR 5,0.CRLF	<CR><LF>
12278	070410	010500			MOV R5,R0	;NUMBER TO TYPE
12279	070412	004537	071434		JSR 5,0.CADV	;TYPE OUT ADDRESS
12280	070416	012700	000057		MOV #1,R0	;TYPE A /
12281	070422	004537	071576		JSR 5,0.FTYP	
12282	070426	000744			BR 0.WRD1	;GO PROCESS IT
12283						
12284						
12285						
12286	070430	004737	071644	0.BACK:	JSR PC,0.TCLS	
12287	070434	005745			TST -(R5)	;GENERATE NEW ADDRESS
12288	070436	000762			BR 0.OP2	;GO DO THE REST
12289						
12290						
12291						
12292	070440	006205		0.OFST:	ASR R5	;GET LOW ORDER BIT
12293	070442	103737			BCS 0.ERR2	;ERR IF CLOSED
12294	070444	006305			ASL R5	;RESTORE WORD
12295	070446	012700	000040		MOV #1,R0	;TYPE ONE BLANK
12296	070452	004537	071576		JSR 5,0.FTYP	;AS A SEPARATOR
12297	070456	160504			SUB R5,R4	;COMPUTE
12298	070460	005304			DEC R4	
12299	070462	005304			DEC R4	;16 BIT OFFSET
12300	070464	010400			MOV R4,R0	;TYPE A
12301	070466	010402			MOV R4,R2	;SAVE R4
12302	070470	004537	071434		JSR 5,0.CADV	;NUMBER IN R0 - WORD MODE
12303	070474	010200			MOV R2,R0	
12304	070476	006200			ASR R0	;DIVIDE BY TWO
12305	070500	103402			BCS 0.OF1	;BRANCH IF ODD
12306	070502	004537	071434		JSR 5,0.CADV	;NUMBER IN R0 - BYTE MODE
12307	070506	000137	070206	0.OF1:	JMP 0.DCD1	;ALL DONE
12308						
12309						
12310						
12311						
12312						
12313	070512	005201		0.EFF:	INC R1	;SET EFFECTIVE SEARCH
12314	070514	000401			BR 0.WDS	
12315	070516	005001		0.WSCH:	CLR R1	;SET WORD SEARCH
12316	070520	005702		0.WDS:	TST R2	;CHECK FOR OBJECT FOUND
12317	070522	001621		0.ERR1:	BEQ 0.ERR	;ERR IF NO OBJECT
12318	070524	013702	067700		MOV 0.MSK+2,R2	;SET ORIGIN
12319	070530	013705	067676		MOV 0.MSK,R5	;SET MASK
12320	070534	005105			COM R5	;AND COMPLEMENT IT

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UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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TYPE ERR ROUTINE

SEG 0227

12321	070536	020237	067702	0.WDS2:	CMP	R2,0.MSK+4	; IS THE SEARCH ALL DONE?
12322	070542	101217			BHI	0.DCD	; YES
12323	070544	011200			MOV	2R2,R0	; GET OBJECT
12324	070546	005701			TST	R1	; NO
12325	070550	001027			BNE	0.EFF1	; BRANCH IF EFFECTIVE SEARCH
12326	070552	010046			MOV	R0,-(SP)	
12327	070554	010403			MOV	R4,R3	; EXCLUSIVE OR
12328	070556	040400			BIC	R4,R0	; IS DONE
12329	070560	042603			BIC	(SP)+,R3	; IN A VERY
12330	070562	050003			BIS	R0,R3	; FANCY MANNER HERE
12331	070564	040503			BIC	R5,R3	; AND RESULT WITH MASK
12332	070566	001016		0.WDS3:	BNE	0.WDS4	; RE-LOOP IF NO MATCH
12333	070570	010446			MOV	R4,-(SP)	; REGISTERS R2,R4, AND R5 ARE SAFE
12334	070572	004537	071670		JSR	5,0.CRLF	; TYPE (CR,LF)
12335	070576	010200			MOV	R2,R0	; GET READY TO TYPE
12336	070600	004537	071434		JSR	5,0.CADV	; TYPE ADDRESS
12337	070604	012700	000057		MOV	#1/,R0	; SLASH TO R0
12338	070610	004537	071576		JSR	5,0.FTYP	; TYPE IT
12339	070614	011200			MOV	2R2,R0	; GET CONTENTS
12340	070616	004537	071434		JSR	5,0.CADV	; TYPE CONTENTS
12341	070622	012604			MOV	(SP)+,R4	; RESTORE R4
12342	070624	005722		0.WDS4:	TST	(R2)+	; INCREMENT TO NEXT CELL AND
12343	070626	000743			BR	0.WDS2	; RETURN
12344	070630	020004		0.EFF1:	CMP	R0,R4	; IS (X)=K?
12345	070632	001755			BEQ	0.WDS3	; TYPE IF EQUAL
12346	070634	010003			MOV	R0,R3	; (X) TO R3
12347	070636	060203			ADD	R2,R3	; (X)+X
12348	070640	005203			INC	R3	
12349	070642	005203			INC	R3	; (X)+X+2
12350	070644	020304			CMP	R3,R4	; IS (X)+X+2=K?
12351	070646	001747			BEQ	0.WDS3	; BRANCH IF EQUAL
12352	070650	042700	177400		BIC	#177400,R0	; WIPE OUT EXTRANEIOUS BITS
12353	070654	110000			MOVB	R0,R0	; EXTEND SIGN
12354	070656	000257			CCC		
12355	070660	006300			ASL	R0	; MULTIPLY BY TWO
12356	070662	005200			INC	R0	; ADD TWO
12357	070664	005200			INC	R0	
12358	070666	060200			ADD	R2,R0	; ADD PC
12359	070670	020004			CMP	R0,R4	; IS THE RESULT A PROPER REL. BRANCH?
12360	070672	000735			BR	0.WDS3	
12361							
12362							
12363							
12364	070674	105037	071717		0.GO:	CLRB	0.P
12365	070700	006204			ASR	R4	; DISALLOW PROCEED
12366	070702	103617			BCS	0.ERR2	; CHECK LOW ORDER BIT
12367	070704	006304			ASL	R4	; ERR IF ODD NUMBER
12368	070706	010437	067670		MOV	R4,0.UPC	; RESTORE WORD
12369	070712	112737	000340	177776	MOVB	#0.STM,ST	; SET UP NEW PC
12370	070720	004537	071366		JSR	5,0.RSTT	; SET HIGH PRIORITY
12371	070724	105037	071716		0.TBIT:	CLRB	; RESTORE TELETYPE
12372	070730	042737	000020	067672		BIC	#0.TBT,0.UST
12373	070736	017737	176742	067710		MOV	20.ADR1,0.UIN
12374	070744	013777	071760	176732		MOV	0.TRTC,20.ADR1
12375	070752	012600			0.G02:	MOV	(SP)+,R0
12376	070754	012601				MOV	(SP)+,R1

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TYPE ERR ROUTINE

SEQ 0228

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12377 070756 012602      MOV      (SP)+,R2      ; THRU
12378 070760 012603      MOV      (SP)+,R3
12379 070762 012604      MOV      (SP)+,R4
12380 070764 012605      MOV      (SP)+,R5      ; R5
12381 070766 012606      MOV      (SP)+,SP      ; AND SP
12382 070770 013746 067672 MOV      0.UST,-(SP)      ; AND STATUS
12383 070774 013746 067670 MOV      0.UPC,-(SP)      ; AND PC
12384 071000 000006      O.RTIT: RTT      ; CHANGED TO RTI FOR 11/20 AND /05
12385
12386      ; PROCESS P - PROCEED
12387      ; ONLY ALLOWED AFTER A BREAKPOINT
12388
12389 071002 105737 071717 O.PROC: TSTB      0.P      ; CHECK LEGALITY OF PROCEED
12390 071006 001645      BEQ      0.ERR1      ; NOT LEGAL
12391 071010 105037 071717 CLRB      0.P      ; CLEAR PROCEED FLAG
12392 071014 005702      TST      R2      ; WAS COUNT SPECIFIED?
12393 071016 001402      BEQ      0.PR1      ; NO
12394 071020 010437 067706 MOV      R4,0.CT      ; YES, PUT AWAY COUNT
12395 071024 112737 000340 177775 O.PR1: MOVB      #0,STM,ST      ; FORCE HIGH PRIORITY
12396 071032 004537 071366 JSR      5,0.RSTT      ; RESTORE TTY
12397 071036 112737 000340 177776 O.C1: MOVB      #0,STM,ST      ; SET HIGH PRIORITY
12398 071044 105237 071716 INCB      0.T      ; SET T-BIT FLAG
12399 071050 052737 000020 067672 BIS      #0,TBT,0.UST      ; SET T-BIT
12400 071056 000735      BR      0.G02
12401
12402      ; BREAKPOINT HANDLER
12403      ; A TRT BREAKPOINT CAUSES 0.BRK TO BE ENTERED, WHICH SAVES
12404      ; VARIOUS ODDS AND ENDS, FINDS OUT IF THE BREAKPOINT WAS LEGAL,
12405      ; AND GIVES CONTROL TO THE CMD DECODER
12406
12407 071060 012637 067670 O.BRK: MOV      (SP)+,0.UPC      ; PRIORITY IS 7 UPON ENTRY
12408 071064 012637 067672 MOV      (SP)+,0.UST      ; SAVE STATUS AND PC
12409 071070 004037 071276 O.BK1: JSR      0,0.SVR      ; SAVE VARIOUS REGISTERS
12410 071074 105737 071716 TSTB      0.T      ; CHECK FOR T-BIT SET
12411 071100 001311      BNE      0.TBIT      ; JUMP IF SET
12412 071102 013777 067710 176574 MOV      0.UIN,20.ADR1      ; REMOVE BREAKPOINTS
12413 071110 105737 067674 TSTB      0.PR1      ; CHECK IF PRIORITY
12414 071114 100003      BPL      0.BK2      ; IS AS SAME AS USER PGM
12415 071116 113705 067672 MOVB      0.UST,R5      ; PICK UP USER UST IF SO
12416 071122 000407      BR      0.BK3      ; AND DON'T COMPUTE THE PRIORITY
12417 071124 113705 067674 O.BK2: MOVB      0.PRI,R5      ; OTHERWISE PICK UP ACTUAL PRIORITY
12418 071130 000257      CCC      ; CLEAR CARRY
12419 071132 106005      RORB      R5      ; SHIFT LOW ORDER BITS
12420 071134 106005      RORB      R5      ; INTO
12421 071136 106005      RORB      R5      ; HIGH ORDER
12422 071140 106005      RORB      R5      ; POSITION
12423 071142 110537 177776 O.BK3: MOVB      R5,ST      ; PUT THE STATUS AWAY WHERE IT BELONGS
12424 071146 013705 067670 MOV      0.UPC,R5      ; GET PC, IT POINTS TO THE TRT
12425 071152 005745      TST      -(R5)      ; SUBTRACT TWO
12426 071154 010537 067670 MOV      R5,0.UPC      ; FROM THE USER'S PC
12427 071160 020537 067704 CMP      R5,0.ADR1      ; COMPARE WITH LIST
12428 071164 001417      BEQ      0.B2      ; JUMP IF FOUND
12429 071166 004537 071334 JSR      5,0.SVTT      ; SAVE TELETYPE STATUS
12430 071172 004537 071670 JSR      5,0.CRLF
12431 071176 012704 071722 MOV      #0,BD,R4
12432 071202 012703 071723 MOV      #0,BD+1,R3

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12433 071206 004537 071562      JSR      5,0.TYPE      ;OUTPUT "BE" FOR BAD ENTRY
12434 071212 010500              MOV      R5,R0
12435 071214 042737 000020 067672 BIC      #0.TBT 0.UST    ;CLEAR OUT ANY POSSIBLE FAKE T-BIT
12436 071222 000420              BR        0.B3              ; AND CONTINUE
12437 071224 005337 067706      0.B2: DEC      0.CT
12438 071230 003302              BGT      0.C1              ;JUMP IF REPEAT
12439 071232 012737 000001 067706 MOV      #1,0.CT          ;RESET COUNT TO 1
12440 071240 105237 071717      INCB     0.P              ;ALLOW PROCEED
12441 071244 004537 071334      JSR      5,0.SVTT      ;SAVE TELETYPE STATUS, R4 IS SAFE
12442 071250 012700 000102      MOV      #1,B,R0
12443 071254 004537 071576      JSR      5,0.FTYP      ;TYPE "B"
12444 071260 013700 067704      MOV      0.ADR1,R0      ;GET ADDRESS OF BREAK
12445 071264 004537 071434      0.B3: JSR      5,0.CADV      ;TYPE ADDRESS
12446 071270 005005              CLR      R5              ;CLEAR CAD
12447 071272 000137 070202      JMP      0.DCD              ;GO TO DECODER
12448
12449      ; SAVE REGISTERS R0-R6 IN INTERNAL STACK
12450
12451 071276 012637 071714      0.SVR: MOV      (SP)+,0.XXX      ;PICK REGISTER FROM STACK AND SAVE
12452 071302 010637 067666      MOV      SP,0.USP      ;SAVE USER STACK ADDRESS
12453 071306 012706 067666      MOV      #0,USP,SP      ;SET TO INTERNAL STACK
12454 071312 010546              MOV      R5,-(SP)          ;SAVE
12455 071314 010446              MOV      R4,-(SP)          ;REGISTERS
12456 071316 010346              MOV      R3,-(SP)          ;1
12457 071320 010246              MOV      R2,-(SP)          ;THRU
12458 071322 010146              MOV      R1,-(SP)          ;5
12459 071324 013746 071714      MOV      0.XXX,-(SP)      ;PUT SAVED REGISTER ON STACK
12460 071330 005746              TST      -(SP)
12461 071332 000200              RTS      R0
12462
12463      ; SAVE TELETYPE STATUS
12464
12465 071334 113737 177560 071720 0.SVTT: MOVB     0.RCSR,0.CSR1      ;SAVE R C/SR
12466 071342 113737 177564 071721      MOVB     0.TCSR,0.CSR2      ;SAVE T C/SR
12467 071350 105037 177560              CLRB     0.RCSR          ;CLEAR ENABLE AND MAINTENANCE
12468 071354 105037 177564              CLRB     0.TCSR          ;BITS IN BOTH C/SR
12469 071360 004537 071670              JSR      5,0.CRLF      ;TYPE <CR,LF>
12470 071364 000205              RTS      R5
12471
12472      ; RESTORE TELETYPE STATUS
12473
12474 071366 004537 071670      0.RSTT: JSR      5,0.CRLF      ;<CR,LF> BEFORE RESTORING
12475 071372 105737 177564      TSTB     0.TCSR          ;WAIT READY ON PRINTER
12476 071376 100375              BPL      -4
12477 071400 032737 004000 177560      BIT      #4000,0.RCSR      ;CHECK BUSY FLAG ON READER
12478 071406 001403              BEQ      0.RSE1      ;SKIP READY LOOP IF NOT BUSY
12479 071410 105737 177560      TSTB     0.RCSR          ;WAIT READY
12480 071414 100375              BPL      -4              ;ON READER
12481 071416 113737 071720 177560 0.RSE1: MOVB     0.CSR1,0.RCSR      ;RESTORE
12482 071424 113737 071721 177564      MOVB     0.CSR2,0.TCSR      ;THE STATUS REGISTERS
12483 071432 000205              RTS      R5
12484
12485      ; TYPE OUT CONTENTS OF WORD OR BYTE WITH ONE TRAILING SPACE
12486      ; WORD IS IN R0
12487
12488 071434 010246      0.CADV: MOV      R2,-(SP)      ;SAVE R2

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K02

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SEQ 0230

12489	071436	012704	071757	MOV	#0,BUF+6,R4	;BUFFER START ADDRESS
12490	071442	012746	000060	MOV	#0,-(SP)	;CONSTANT ASCII C
12491	071446	010002		0.SPC: MOV	R0,R2	; GET
12492	071450	042702	177770	BIC	#177770,R2	; OCTAL CHARACTER
12493	071454	061602		ADD	2SP,R2	; CONVERT TO ASCII
12494	071456	110244		MOVB	R2,-(R4)	; STORE IN BUFFER
12495	071460	006200		ASR	R0	; SHIFT THIS MESS
12496	071462	006200		ASR	R0	; RIGHT
12497	071464	006200		ASR	R0	; THREE WHOLE PLACES
12498	071466	020427	071752	CMP	R4,#0.BUF+1	; DONE?
12499	071472	101365		BHI	0.SPC	; NO
12500	071474	042700	177776	BIC	#177776,R0	; GET LAST BIT
12501	071500	062600		ADD	(SP)+,R0	; CONVERT TO ASCII
12502	071502	110044		MOVB	R0,-(R4)	; AND PUT IT AWAY
12503	071504	012703	071757	MOV	#0.BUF+6,R3	; LWA
12504	071510	004537	071562	JSR	5,0.TYPE	; TYPE WHOLE STRING OF CHARACTERS
12505	071514	012602		MOV	(SP)+,R2	; RESTORE R2
12506	071516	000205		RTS	R5	
12507						
12508						
12509						
12510						
12511	071520	105737	177560	0.GET: TSTB	0.RCSR	; WAIT FOR
12512	071524	100375		BPL	-4	; INPUT FROM KEYBOARD
12513	071526	113700	177562	MOVB	0.RDB,R0	; GET A CHARACTER
12514	071532	004537	071576	JSR	5,0.FTYP	; ECHO CHARACTER
12515	071536	042700	177600	BIC	#177600,R0	; STRIP OFF PARITY FROM CHARACTER
12516	071542	001766		BEQ	0.GET	; IGNORE NULLS
12517	071544	122700	000040	CMPB	#40,R0	; CHECK FOR SPACES
12518	071550	001763		BEQ	0.GET	; IGNORE NULLS
12519	071552	122700	000073	CMPB	#',R0	; CHECK FOR SEMI-COLON
12520	071556	001760		BEQ	0.GET	; IGNORE THEM IF FOUND
12521	071560	000205		RTS	R5	
12522						
12523						
12524						
12525						
12526						
12527	071562	020304		0.TYPE: CMP	R3,R4	; CHECK FOR COMPLETION
12528	071564	103426		BLO	0.TYP1	; EXIT WHEN DONE
12529	071566	112400		MOVB	(R4)+,R0	; GET A CHARACTER
12530	071570	004537	071576	JSR	5,0.FTYP	; TYPE ONE CHARACTER
12531	071574	000772		BR	0.TYPE	; LOOP UNTIL DONE
12532						
12533						
12534						
12535	071576	105737	177564	0.FTYP: TSTB	0.TCSR	; CHECK STATUS
12536	071602	100375		BPL	-4	; WAIT UNTIL READY
12537	071604	110037	177566	MOVB	R0,0.TDB	; TYPE ONE CHARACTER
12538	071610	120037	000045	CMPB	R0,#45	; IS CHAR TO BE FILLED?
12539	071614	001012		BNE	0.TYP1	; NO
12540	071616	113746	000044	MOVB	2#44,-(SP)	; YES, INIT THE COUNT
12541	071622	105737	177564	0.TYP2: TSTB	0.TCSR	
12542	071626	100375		BPL	0.TYP2	
12543	071630	105037	177566	CLRB	0.TDB	; GENERATE NULL FILLER
12544	071634	105316		DECB	2SP	

12545	071636	003371		BGT	0.TYP2	
12546	071640	005726		TST	(SP)+	;POP STACK
12547	071642	000205		0.TYP1: RTS	R5	
12548						
12549						
12550						
12551						
12552	071644	006205		0.TCLS: ASR	R5	;GET LOW ORDER BIT
12553	071646	103405		BCS	0.TC	;JUMP IF ALREADY CLOSED
12554	071650	006305		ASL	R5	
12555	071652	005702		TST	R2	;IF NO NUMBER WAS TYPED THERE IS
12556	071654	001401		BEQ	0.CLS1	;NO CHANGE TO THE OPEN CELL
12557	071656	010415		MOV	R4,R5	;STORE WORD
12558	071660	000207		0.CLS1: RTS	PC	
12559	071662	005746		0.TC: TST	-(SP)	;POP EXTRA CELL FROM STACK
12560	071664	000137	070166	JMP	0.ERR	;AND SCREAM BLOODY MURDER
12561						
12562						
12563						
12564						
12565	071670	012703	071725	0.CRLF: MOV	#0.CR+1,R3	;LWA <CR,LF>
12566	071674	000402		BR	0.CRS	
12567	071676	012703	071726	0.CRLS: MOV	#0.CR+2,R3	;LWA <CR,LF>*
12568	071702	012704	071724	0.CRS: MOV	#0.CR,R4	;FWA
12569	071706	004537	071562	JSR	5 0.TYPE	;TYPE SOMETHING
12570	071712	000205		RTS	R5	
12571						
12572	071714	000000		0.XXX: .WORD	0	;TEMPORARY STORAGE
12573	071716	000		0.T: .BYTE	0	;T-BIT FLAG
12574	071717	000		0.P: .BYTE	0	;PROCEED FLAG = 0 IF PROCEED NOT ALLOWED
12575						= 1 IF PROCEED ALLOWED
12576	071720	000		0.CSR1: .BYTE	0	;SAVE CELL - R C/SR
12577	071721	000		0.CSR2: .BYTE	0	;SAVE CELL - T C/SR
12578						
12579						
12580	071722	042502		0.BD: .WORD	"BE	
12581						
12582	071724	015		0.CR: .BYTE	015	; <CR>
12583	071725	012		.BYTE	012	; <LF>
12584	071726	052		.BYTE	'*	*
12585						
12586	071727	057		0.LGCH: .BYTE	'/'	/
12587	071730	015		.BYTE	015	CARRIAGE RETURN
12588	071731	044		.BYTE	'\$	\$
12589	071732	107		.BYTE	'G	G
12590	071733	012		.BYTE	012	<LF>
12591	071734	137		.BYTE	'+'	+
12592	071735	136		.BYTE	'↑	↑
12593	071736	117		.BYTE	'O	O
12594	071737	127		.BYTE	'W	W
12595	071740	105		.BYTE	'E	E
12596	071741	102		.BYTE	'B	B
12597	071742	120		.BYTE	'P	P
12598		000014		0.CLGT =	.-0.LGCH	;TABLE LENGTH
12599						
12600	071743	123		0.TL: .BYTE	'S	;DO 1

M02

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SEQ 0232

12601	071744	120	.BYTE	'P	:NOT	2
12602	071745	115	.BYTE	'M	:CHANGE	3
12603	071746	000	.BYTE	0	:THE	4
12604	071747	000	.BYTE	0	:ORDER	5
12605	071750	102	.BYTE	'B	:HERE	6
12606		000006	O.LG	=	.-O.TL	
12607			O.BUF:			
12608	071751					;6 CHAR. BUFFER WITH
12609		071757		=	;+6	
12610	071757	040		.BYTE		;TRAILING BLANK
12611				.EVEN		
12612			O.TRTC: TRT			;TRACE TRAP PROTOTYPE
12613	071760	000003				
12614						
12615						
12616						
12617		067652				
12618	067652	000000	O.URO:	=	O.ODT-40	
12619	067654	000000		0	:USER R0	
12620	067656	000000		0	:R1	
12621	067660	000000		0	:R2	
12622	067662	000000		0	:R3	
12623	067664	000000		0	:R4	
12624	067666	000000		0	:R5	
12625	067670	000000	O.USP:	0	:USER SP	
12626	067672	000000	O.UPC:	0	:USER PC	
12627	067674	000007	O.UST:	0	:USER ST	
12628	067676	000000	O.PRI:	7	:ODT PRIORITY	
12629	067700	000000	O.MSK:	0	:MASK	
12630	067702	000000		0	:LOW LIMIT	
12631				0	:HIGH LIMIT	
12632						
12633						
12634						
12635	067704	000000	O.ADR1:	0		
12636	067706	000000	O.CT:	0		
12637	067710	000000	O.UIN:	0		
12638		000001			.END	

THE ORDER OF THE FOLLOWING ENTRIES IS CRITICAL

BREAK POINT LISTS, ADR1 = ADDRESS OF BREAKPOINT, CT = COUNT,
UIN = CONTENTS

N02

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0233

ABASE = 177440	2290	2331	2345*			
ACDW1 = 000000	2290	2333				
ACDW2 = 000000	2290	2334				
ACLO = 000010	1371*					
ACPUOP = 000000	2290	2305				
ACT11 = 003450	2516*	3808*				
ADDW0 = 000000	2290	2335				
ADDW1 = 000000	2290	2336				
ADDW10 = 000000	2290					
ADDW11 = 000000	2290					
ADDW12 = 000000	2290					
ADDW13 = 000000	2290					
ADDW14 = 000000	2290					
ADDW15 = 000000	2290					
ADDW2 = 000000	2290	2337				
ADDW3 = 000000	2290	2338				
ADDW4 = 000000	2290	2339				
ADDW5 = 000000	2290	2340				
ADDW6 = 000000	2290	2341				
ADDW7 = 000000	2290	2342				
ADDW8 = 000000	2290					
ADDW9 = 000000	2290					
ADEVCT = 000000	2290	2296				
ADEVH = 000000	2290	2332				
AENV = 000000	2290	2301				
AENVH = 000000	2290	2202				
AFATAL = 000000	2290	2293				
AMADR1 = 000000	2290	2319				
AMADR2 = 000000	2290	2322				
AMADR3 = 000000	2290	2325				
AMADR4 = 000000	2290	2328				
AMAMS1 = 000000	2290	2312				
AMAMS2 = 000000	2290	2320				
AMAMS3 = 000000	2290	2323				
AMAMS4 = 000000	2290	2326				
AMSGAD = 000000	2290	2299				
AMSGLG = 000000	2290	2299				
AMSGTY = 000000	2290	2292				
AMTYP1 = 000000	2290	2313				
AMTYP2 = 000000	2290	2321				
AMTYP3 = 000000	2290	2324				
AMTYP4 = 000000	2290	2327				
APASS = 000000	2290	2295				
APRIOR = 000000	2290					
APTCU = 000040	10088	10260*				
APTEHV = 000001	10035	10081	10216	10258*		
APTSIZ = 000200	3737	10257*				
APTSPO = 000100	10083	10218	10259*			
ASWREG = 000000	2290	2303				
ATESTN = 000000	2290	2294				
ATTN = 003324	2448*	5231	9049	9068	9094	
AUNIT = 000000	2290	2297				
AUSAR = 000000	2290	2304				
AVECT1 = 000000	2290	2329				
AVECT2 = 000000	2290	2330				
BACHOP = 003320	2439*	3816*	5621*	7287*	9796	9848*

B03

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0234

[illegible]

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0235

[illegible]

SEQ 0236

[illegible]

E03

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0237

DM41	065333	3255	3260	3265	3270	3275	3381	3557	11706#						
DM42	065354	3335	11709#												
DM44	065414	3345	11715#	11962											
DM45	065464	3160	11722#												
DM46	065543	3195	11730#												
DM48	065610	3386	3391	3396	3401	3406	3411	3416	3421	3426	3431	3436	11737#		
DM49	065642	11742#	11872												
DM51	065716	3110	3115	11750#											
DM52	065745	11754#	11986												
DM53	065775	3320	11759#												
DM6	064074	11580#	11903												
DM8	064127	2627	2632	2637	2642	2647	2652	2790	11585#						
DM9	064153	2795	2800	2805	2810	2965	3552	3592	11589#						
DI	= 040000	1326#													
DISPLA	001142	2265#	3725*	3733*	10000*	10022*									
DISPRE	000174	1475#	3733												
DLT	= 100000	1345#	5710	5846	5976	6143	6299	6458	7395	7568	7788	7916	8131	8259	
		8489	8617												
		9112#	9115												
DLY	044302	1386#													
DMD	= 000040	8006	8008#												
DOSEEK	036424	2534#	3837*	3846*	4510										
DOTIM	003502	1368#	4013	4106											
DRA	= 000001	1375#													
DRDY	= 000200	2518#	3921*	3928*	3945	3960*	3986*	4003	4094*	4158	8839	8931*			
DRIVS	003454	2523#	3819	3923	3962	4062	8914								
DRIVO	003456	2524#													
DRIVI	003460	2525#													
DRIV2	003462	2526#													
DRIV3	003464	2527#													
DRIV4	003466	2528#													
DRIV5	003470	2529#													
DRIV6	003472	2530#													
DRIV7	003474	1373#													
DR0T	= 000040	1352#													
DRPAR	= 000010	1332#	3979	4079											
DRVMSK	= 000007	2365#	3819*	4163	4173*										
DRVPTR	001346	1379#													
DSC	= 040000	1184#	2264	3724											
DSMR	= 177570	1361#													
DTE	= 010000	1354#	4393	4414											
DTYE	= 000040	2555	2561	2567	2573	2578	2584	2590	2596	2602	2608	2613	2618	2623	
DT1	066044	2659	2664	2670	2676	2681	2686	2691	2696	2701	2706	2711	2716	2721	
		2726	2731	2786	2836	2841	2866	2891	2916	2951	2956	2961	2966	2971	
		2976	2981	2986	2991	2996	3001	3006	3011	3046	3051	3056	3061	3081	
		3086	3101	3106	3111	3116	3121	3146	3151	3156	3161	3166	3176	3181	
		3196	3201	3206	3241	3246	3281	3296	3301	3306	3311	3316	3321	3331	
		3336	3346	3356	3361	3382	3387	3452	3548	3553	3558	3573	3578	3583	
		3588	3593	3598	3603	3608	3633	3638	3644	11769#					
		3568	11816#												
DT10	066376	3351	11824#												
DT11	066442	2628	2633	2638	2643	2766	2771	2796	2801	2806	2811	2816	2821	2826	
DT13	066446	2831	2846	2851	2856	2861	2871	2876	2881	2886	2896	2901	2906	2911	
		2931	2936	2941	2946	3016	3021	3026	3031	3126	3131	3136	3141	3216	
		3221	3226	3231	3256	3261	3266	3271	3286	3291	3412	3417	3422	3427	
		3467	3472	3477	3482	3487	3492	3497	3502	3507	3512	3517	3522	3527	

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1 MACY11 27(1006) 31-JAN-77 18:00 PAGE 239
DZR6MD.P11 28-JAN-77 09:24 CROSS REFERENCE TABLE -- USER SYMBOLS

UNIBUS RK06 DRIVE DIAGNOSTIC PART 1
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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0239

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CROSS REFERENCE TABLE -- USER SYMBOLS

DT14	066526	3532	3613	3618	11825#									
		2648	2653	2736	2741	2756	2761	2921	2926	3036	3041	3071	3076	3171
		3186	3191	3462	3537	3542	3623	3628	11836#					
DT15	066616	2776	2781	2791	11848#									
DT4	066104	2746	2751	3236	3251	3276	3392	3397	3402	3407	3432	3437	11776#	
DT6	066152	3066	11784#											
DT7	066216	3211	11792#											
DT8	066264	3366	3371	3377	3457	11800#								
DT9	066332	3563	11808#											
D.ACLO=	000100	1428#												
D.BRHM=	000100	1415#	4245	4501	4521	4555	4602	4629	4756	4790	4821	4902	4936	5122
		5156	5197	5317	5348	5436	5459	5491	5520	5554	5655	5720	5808	5866
		5938	6039	6067	6098	6187	6261	6366	6390	6424	6501	6567	6593	6624
		6756	6848	6871	6903	6932	6966	7141	7172	7203	7251	7466	7492	7523
		7691	7713	7744	7818	7841	7872	8034	8056	8087	8161	8184	8215	8392
		8414	8445	8519	8542	8573	8771							
D.CART=	000400	1417#	4245	4501	4521	4555	4602	4629	4756	4790	4821	4902	4936	5122
		5156	5197	5317	5348	5436	5459	5491	5520	5554	5655	5720	5808	5866
		5938	6039	6067	6098	6187	6261	6366	6390	6424	6501	6567	6593	6624
		6756	6848	6871	6903	6932	6966	7141	7172	7203	7251	7466	7492	7523
		7691	7713	7744	7818	7841	7872	8034	8056	8087	8161	8184	8215	8392
		8414	8445	8519	8542	8573	8771							
D.DOT =	000400	1403#	4387	4408										
D.DOOR=	000200	1416#	4245	4501	4521	4555	4602	4629	4756	4790	4821	4902	4936	5122
		5156	5197	5317	5348	5436	5459	5491	5520	5554	5655	5720	5808	5866
		5938	6039	6067	6098	6187	6261	6366	6390	6424	6501	6567	6593	6624
		6756	6848	6871	6903	6932	6966	7141	7172	7203	7251	7466	7492	7523
		7691	7713	7744	7818	7841	7872	8034	8056	8087	8161	8184	8215	8392
		8414	8445	8519	8542	8573	8771							
		1400#	4240	4243	4499	4519	4553	4600	4627	4754	4788	4819	4900	4934
D.DRA =	000040	5120	5154	5191	5315	5346	5434	5457	5489	5518	5552	5653	5718	5806
		5864	5936	6037	6065	6096	6185	6259	6364	6388	6422	6499	6565	6591
		6622	6754	6846	6869	6901	6930	6964	7139	7170	7201	7249	7464	7490
		7521	7689	7711	7742	7816	7839	7870	8032	8054	8085	8159	8182	8213
		83												

G03

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SEQ 0239

D.PAR = 001000	1431#	4439	4458	4820	5435	6847							
D.PIP = 020000	1408#	4600	4627	5489	6037	6364	6565	6901	7139	7464	7689	7816	8032
	8159	8390	8517	8761									
D.PLO = 004000	1447#												
D.REV = 004000	1420#	4602	5491	6366	6903	7466	7818	8161	8392				
D.RTZ = 020000	1422#	4602	4629	4747	4893	5113	6360	6366	9811				
D.SECT= 000020	1440#												
D.SKI = 002000	1432#	5196	5490	6902	8770								
D.SPIN= 010000	1407#	4491	4499	4519	4553	4600	4627	4659	4754	4788	4819	4900	4934
	5120	5154	5191	5315	5346	5434	5457	5489	5518	5552	5653	5718	5806
	5864	5936	6037	6065	6096	6185	6259	6364	6388	6422	6499	6565	6591
	6622	6754	6846	6869	6901	6930	6964	7139	7170	7201	7249	7464	7490
	7521	7689	7711	7742	7816	7839	7870	8032	8054	8085	8159	8182	8213
	8390	8412	8443	8517	8540	8571	8769						
D.SPLS= 010000	1434#												
D.SPOK= 001000	1418#	4521	4555	4602	4629	4756	4790	4821	4902	4936	5122	5156	5197
	5317	5348	5436	5459	5491	5520	5554	5655	5720	5808	5866	5938	6039
	6067	6098	6187	6261	6366	6390	6424	6501	6567	6593	6624	6756	6848
	6871	6903	6932	6966	7141	7172	7203	7251	7466	7492	7523	7691	7713
	7744	7818	7841	7872	8034	8056	8087	8161	8184	8215	8392	8414	8445
	8519	8542	8573	8771	9520								
D.SSP = 000020	1413#	4521	4555	4602	4629	4756	4790	4821	4902	4936	5122	5156	5197
	5317	5348	5436	5459	5491	5520	5554	5655	5720	5808	5866	5938	6039
	6067	6098	6187	6261	6366	6390	6424	6501	6567	6593	6624	6756	6848
	6871	6903	6932	6966	7141	7172	7203	7251	7466	7492	7523	7691	7713
	7744	7818	7841	7872	8034	8056	8087	8161	8184	8215	8392	8414	8445
	8519	8542	8573	8771									
D.SUNS= 040000	1450#												
D.TIB = 002000	1446#												
D.UNLD= 040000	1423#	5483	5491	6895	6903								
D.UNS = 040000	1436#												
D.VV = 000100	1401#	4238	4243	4323	4337	4499	4519	4553	4600	4627	4754	4788	4819
	4900	4934	5120	5154	5191	5315	5346	5434	5457	5489	5518	5552	5653
	5718	5806	5864	5936	6037	6065	6096	6185	6259	6364	6388	6422	6499
	6565	6591	6622	6754	6846	6869	6901	6930	6964	7139	7170	7201	7249
	7464	7490	7521	7689	7711	7742	7816	7839	7870	8032	8054	8085	8159
	8182	8213	8390	8412	8443	8517	8540	8571	8769				
D.WCUR= 000040	1441#												
D.WGAT= 000100	1442#												
D.WLE = 004000	1433#												
D.WRL = 004000	1406#												
D.XERR= 001000	1445#												
ECCW = 020000	1394#												
ECH = 000100	1355#												
EMTVEC= 000030	1273#	3708*	3709*										
EM1 057002	8940	11097#											
EM10 057575	2588	11165#											
EM11 057640	2594	11171#											
EM12 057704	2600	2949	2954	2959	2964	2969	2979	3004	3084	3109	3164	3199	3309
	11177#												
EM13 057735	2606	2784	2834	2984	3009	3114	3144	3385	11182#				
EM14 057757	2611	11186#											
EM15 060004	2616	11190#											
EM16 060036	2621	3405	11195#										
EM17 060063	2626	2764	2794	2814	2844	2869	2894	2919	2939	3014	3124	3214	3254
	3284	3410	3495	3515	3525	11199#							

SEQ 0240

EM18	060100	2631	2769	2799	2819	2849	2874	2899	2924	2944	3019	3129	3219	3259
		3415	3465	3475	3485	3505	11202#							
EM19	060115	2636	2804	2824	2854	2879	2904	2929	3024	3069	3079	3134	3224	3264
		3289	3420	3500	3520	3530	3611	11205#						
EM2	057054	2553	11104#											
EM20	060132	2641	2809	2829	2859	2884	2909	2934	3029	3074	3139	3229	3269	3425
		3470	3480	3490	3510	3616	11208#							
EM21	060147	2657	3179	3204	3239	3279	3314	11211#						
EM22	060171	2662	11215#											
EM23	060230	2668	11221#											
EM24	060310	2674	11229#											
EM25	060334	2679	11233#											
EM26	060362	2684	11237#											
EM27	060402	2689	11240#											
EM28	060423	2694	11243#											
EM29	060450	2699	11247#											
EM3	057143	9867	11114#											
EM30	060517	2704	11254#											
EM31	060550	2709	11259#											
EM32	060575	2714	3395	11263#										
EM33	060622	2719	11267#											
EM34	060657	2724	11272#											
EM35	060710	2729	11277#											
EM36	060763	2734	2744	3234	3329	3364	3375	3435	11285#					
EM37	061023	2739	11291#											
EM38	061063	2749	3249	3274	3369	3430	11297#							
EM39	061134	2754	2994	3034	3169	3184	3294	3535	11304#					
EM4	057211	3159	11121#											
EM40	061171	2759	2999	3039	3189	11309#								
EM41	061217	3460	3540	11313#										
EM43	061260	2774	11319#											
EM44	061307	2779	11323#											
EM45	061343	2914	11328#											
EM46	061464	2646	3621	11342#										
EM47	061477	2651	3626	11344#										
EM48	061512	3059	3064	11346#										
EM49	061525	2889	11348#											
EM5	057324	2559	3642	11135#										
EM50	061613	2839	11358#											
EM51	061664	2864	11365#											
EM52	061764	3044	11376#											
EM53	062023	3049	11382#											
EM54	062054	3054	11387#											

[illegible]

J03

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SEQ 0242

E.82	003436	6757*	6849*	6872*	6904*	6933*	6967*	7142*	7173*	7204*	7252*	7467*	7493*	7524*
		7692*	7714*	7745*	7819*	7842*	7873*	8035*	8057*	8088*	8162*	8185*	8216*	8393*
		8415*	8446*	8520*	8543*	8574*	8772*	9158	9160*	9203	11825	11836	11848	
		2499*	4248*	4524*	4558*	4759*	4793*	4824*	4825*	4905*	4939*	5125*	5159*	5200*
		5320*	5351*	5462*	5523*	5557*	5658*	5723*	5811*	5869*	5941*	6070*	6101*	6190*
		6264*	6393*	6427*	6504*	6506*	6596*	6627*	6759*	6874*	6935*	6969*	7175*	7206*
		7254*	7495*	7526*	7716*	7747*	7844*	7875*	8059*	8090*	8187*	8218*	8417*	8448*
		8545*	8576*	9162	9164*	11836	11848							
E.83	003442	2501*	4249*	4525*	4559*	4760*	4794*	4906*	4940*	5126*	5160*	5203*	5207*	5209*
		5321*	5352*	5463*	5524*	5558*	5659*	5724*	5812*	5870*	5942*	6071*	6102*	6191*
		6265*	6394*	6428*	6505*	6597*	6628*	6760*	6875*	6936*	6970*	7176*	7207*	7255*
		7496*	7527*	7717*	7748*	7845*	7876*	8060*	8091*	8188*	8219*	8418*	8449*	8546*
		8577*	9166	9168*	11848									
FATT1	044126	4515	4751	4897	5117	5272	5513	5586	6925	7032	8815	9065*	9791	9815
FATT2	044222	5308	6058	6175	6381	6488	6584	6669	6998	7163	7304	7368	7483	7606
		7704	7832	7952	8047	8175	8295	8358	8405	8533	8653	8726	9092*	
FHDMM	046434	5508	6920	9484*	9492									
FHDTab	046632	5920	6243	7080	7105	7228	9535*							
FLGTST	047076	9582	9586	9602*										
FLIM	046356	5480	6892	9466*										
FLOAD	046510	5510	6922	9501*										
FMTF =	000020	1353*												
FMT1	001440	2403*	9545*	9546*	9547*	9552								
FNS22	045736	5382	9378*											
FORM	031234	7042*	9830											
FORMAT	001436	2402*	5919*	6242*	7079*	7110*	9545	9579						
FRCYL	001350	2367*	4870*	5006	5007	5022	5024	5028	5067*	5068	5070	6027*	6349*	6547*
		6643*	7113*	7280*	7291*	7447*	7581*	7667*	7678	7809	7810	7885	7897	7924
		8010*	8021	8152	8153	8228	8240	8267	8368*	8379	8510	8511	8586	8598
		8625	8736*	11776	11800	11816								
FRDY	043612	3955	3969	3974	4069	4074	4204	4334	4406	4487	4546	4675	4742	4781
		4815	4888	4927	4969	4991	5017	5054	5108	5147	5187	5250	5257	5304
		5339	5430	5450	5476	5545	5582	5643	5697	5786	5798	5833	5856	5926
		5964	6035	6089	6130	6171	6249	6287	6355	6415	6445	6484	6563	6615
		6665	6747	6842	6862	6888	6957	6994	7028	7091	7137	7194	7239	7300
		7364	7382	7462	7514	7555	7602	7687	7735	7775	7814	7863	7903	7948
		8030	8078	8118	8157	8206	8246	8291	8354	8388	8436	8476	8515	8564
		8604	8649	8722	8750	8793	8800	8994*	8997	9267	9329	9787	9806	9822
FRDY1	043660	9009*	9012	9283	9293	9303	9312							
FSPOK	046556	4213	4684	9517*	9525									
FSQ22	045652	5378	9358*											
FTITLE	001344	2363*	8887	8889*										
GBA	043514	3790	8954*											
GDRVS	043354	3788	8909*											
GINT	043542	3792	8967*											
GNS =	***** U	1474	10865	10866	10867	10868	10869	10871	10873	10874	10875	10876	10877	10878
		10879												
GO =	000001	1317*												
GSTAT	045150	4237	4289	4322	4365	4454	4490	4575	4589	4616	4642	4658	4746	4892
		5112	5265	5479	5645	5712	5788	5848	5928	5978	6145	6251	6301	6359
		6460	6749	6891	7093	7241	7397	7570	7790	7918	8133	8261	8491	8619
		8808	9075	9079	9099	9103	9263*	9333	9344	9397	9412	9469	9486	9503
		9519	9810											
GSTAT1	045212	9133	9276*											
GTSWR =	104406	8898	10871*											
HASOF	003352	2466*	9033*	9049	11773	11781	11789	11797	11805	11913	11821	11832	11844	11857

SEQ 0243

[illegible]

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LCLKF 003476
LCVEC 001330
LF = 000012

[illegible]

LIMERR 001460
LKS 001326
LPFLG 001410

[illegible]

```

MCLK      = 000400
MDS       = 001000
MDTST     = 007070
MDTSTA    = 007110
MEMBAS=   172100
MEMERR    = 050234
MEMPAR    = 007442
MEMVEC=   000114
MERD      = 001000
MESMSK=   000017
MEWD      = 002000
MIND      = 000200
MODTST    = 001342
MSG1       = 054636
MSG10     = 056030
MSG11     = 056057
MSG12     = 056117
MSG13     = 056150
MSG14     = 056226
MSG15     = 056251
MSG16     = 056263
MSG17     = 056304
MSG18     = 056333

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8882#	8887*	8892*	9750*										
1389#													
1339#	4009	4102	9252										
1488	3664#												
1490	3669#												
2357#	3744	3753											
3747	9893#												
3741#													
2356#	3747*	3748*											
1390#													
1384#													
1391#													
1388#													
2362#	3651*	3656*	3661*	3666*	3671*	3675*	7057	7125	7155	7265	7443	8005	
8890	10887#												
3920	3959	11002#											
9934	11006#												
7073	11012#												
3847	11017#												
9121	11025#												
4029	4174	11029#											
4287	11031#												
6808	11034#												
5649	5702	5714	5792	5838	5850	5932	5969	5980	6135	6147	6255	6292	
6303	6450	6462	7097	7245	7387	7399	7560	7572	7780	7792	7908	7920	
8123	8135	8251	8263	8481	8493	8609	8621	11038#					

MSG19	056367
MSG2	055526
MSG20	056417
MSG21	056566
MSG22	056646
MSG3	055564
MSG4	055616
MSG5	055644
MSG6	055671
MSG7	055707
MSG74	056676
MSG75	056725
MSG76	056747
MSG77	056765
MSG8	055744
MSG9	056002
MSP	= 000100
MULT6	047262

8123	8133
4160	11043#
3772	10967#
7059	11048#
7445	11066#
7442	11074#
3787	10972#
3789	10977#
3791	10981#
9909	10985#
3806	10988#
9777	11079#
9779	11083#
9834	11087#
9839	11090#
4868	10993#
4865	10998#
1387#	
9632	9658#

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M.ALGN=	040000	1463#									
M.CADD=	017760	1462#	9414	9437							
M.COIF=	017760	1455#	9399	9424							
M.DRV =	000007	1454#									
M.HEAD=	007000	1465#	9457								
M.ID =	000003	1461#									
M.OFST=	017760	1456#									
M.PAR =	100000	1466#	9720								
M.SECT=	000760	1464#	9346	9447							
M.SER =	077770	1457#									
NED =	010000	1342#	4015	4027	4108	4111	9248				
NEM =	004000	1341#									
NUDRV	011362	3947	4041	4140#	8841						
NXF =	000004	1351#									
OFFSET=	000015	1309#									
OFST =	000004	1370#									
OPI =	020000	1362#									
OR =	000200	1337#									
O.ADR1	067704	12150#	12201#	12203#	12373	12374#	12412#	12427	12444	12635#	
O.BACK	070430	12245	12286#								
O.BD	071722	12431	12432	12580#							
O.BKPT	070136	12196#	12249								
O.BK1	071070	12144	12409#								
O.BK2	071124	12414	12417#								
O.BK3	071142	12416	12423#								
O.BRK	071060	12161	12407#								
O.BUF	071751	12489	12498	12503	12608#						
O.B2	071224	12428	12437#								
O.B3	071264	12436	12445#								
O.CADV	071434	12262	12279	12302	12306	12336	12340	12445	12488#		
O.CLGL	070252	12219	12221	12229#							
O.CLGT=	000014	12233	12598#								
O.CLS1	071660	12556	12558#								
O.CR	071724	12565	12567	12568	12582#						
O.CRET	070364	12240	12269#								
O.CRLF	071670	12277	12334	12430	12469	12474	12565#				
O.CRLS	071676	12214	12567#								
O.CRS	071702	12566	12568#								
O.CSR1	071720	12465#	12481	12576#							
O.CSR2	071721	12466#	12482	12577#							
O.CT	067706	12394#	12437#	12439#	12636#						
O.C1	071036	12397#	12438								
O.DCD	070202	12202	12204	12214#	12271	12322	12447				
O.DCD1	070206	12215#	12263	12307							
O.EFF	070512	12248	12313#								
O.EFF1	070630	12325	12344#								
O.ENTR	067716	12141#									
O.ERR	070166	12188	12199	12211#	12234	12259	12317	12560			
O.ERR1	070522	12317#	12390								
O.ERR2	070342	12259#	12293	12366							
O.FTYP	071576	12213	12281	12296	12338	12443	12514				

N03

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0246

O.LGDR 070302	12237	12239#	12251				
O.LGL = 000030	12251#						
O.LGL1 070254	12230#	12235					
O.LGL2 070274	12231	12236#					
O.MSK 067676	12318	12319	12321	12628#			
O.ODT 067712	1486	12139#	12617				
O.OFST 070440	12246	12292#					
O.OF1 070506	12305	12307#					
O.OP1 070376	12243	12275#					
O.OP2 070404	12192	12277#	12288				
O.ORPC 070110	12184#	12244					
O.P 071717	12159#	12364#	12389	12391#	12440#	12574#	
O.PRI 067674	12151	12413	12417	12627#			
O.PROC 071002	12250	12389#					
O.PRI 071024	12393	12395#					
O.RALL 070156	12162	12197	12203#				
O.RCSR= 177560	12129#	12465	12467#	12477	12479	12481#	12511
O.RDB = 177562	12128#	12513					
O.REGT 070040	12167#	12241					
O.RSE1 071416	12478	12481#					
O.RSP 070050	12169#	12172					
O.RST 067754	12140	12149#					
O.RSTT 071366	12370	12396	12474#				
O.RST1 070004	12148	12156#					
O.RTIT 071000	12158#	12384#					
O.SCAN 070212	12178	12217#	12228				
O.SP 070102	12170	12179#					
O.SPC 071446	12491#	12499					
O.SPI 070070	12175#	12180					
O.STM = 000340	12118#	12160	12369	12395	12397		
O.STRT 067742	12139	12146#					
O.SVR 071276	12149	12409	12451#				
O.SVTT 071334	12429	12441	12465#				
O.T 071716	12371#	12398#	12410	12573#			
O.TBIT 070724	12371#	12411					
O.TBT = 000020	12119#	12372	12399	12435			
O.TC 071662	12553	12559#					
O.TCLS 071644	12184	12269	12275	12286	12552#		
O.TCSR= 177564	12131#	12466	12468#	12475	12492#	12535	12541
O.TDB = 177566	12130#	12537#	12543#				
O.TL 071743	12168	12171	12179	12600#	12606		
O.TRTC 071760	12203	12374	12613#				
O.TVEC= 000014	12117#	12142	12160#	12161#			
O.TYPE 071562	12433	12504	12527#	12531	12569		
O.TYP1 071642	12528	12539	12547#				
O.TYP2 071622	12541#	12542	12545				
O.UIN 067710	12150	12373#	12412	12637#			
O.UPC 067670	12143#	12368#	12383	12407#	12424	12426#	12625#
O.URC 067652	12146	12176	12618#				
O.USP 067666	12147#	12452#	12453	12624#			
O.UST 067672	12141#	12372#	12382	12399#	12408#	12415	12435# 12626#
O.WDS 070520	12314	12316#					
O.WDS2 070536	12321#	12343					
O.WDS3 070566	12332#	12345	12351	12360			
O.WDS4 070624	12332	12342#					
O.WPD 070332	12239	12255#					

[illegible]

C04

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 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0248

 RKASOF = 000016
 RKBA = 000004
 RKCS1 = 000000

RKCS2 = 000010

RKDA = 000006

RKDB = 000024

RKDC = 000020

 RKDS = 000012
 RKECPS = 000030
 RKECPT = 000032
 RKER = 000014
 RKMR1 = 000026

RKMR2 = 000034

RKMR3 = 000036

RKPRI = 001316

RKVEC = 001314

RKWC = 000002

RLS = 000010

RSEC = 046272

RTT = 000006

SAVREG = 104413

SBPAR = 047422

SCLR = 000040

SCOP1 = 104415

SCOP1\$ = 047474

SDC = ***** U

SEC = 001374

SECFLG = 047026

SECNT = 001400

SECTOR = 001406

1290*	3880	9033	9068	9094									
1285*	3876	5631*	5780*	5913*	6236*	6739*	6782*	6801*	7083*	7232*	9029		
1283*	3873	3972*	4072*	4202*	4332*	4404*	4485*	4513*	4542*	4544*	4570*	4583*	
4656*	4673*	4736*	4738*	4777*	4779*	4813*	4882*	4884*	4923*	4925*	4967*	4973*	
4987*	4989*	5015*	5021*	5050*	5052*	5102*	5104*	5143*	5145*	5185*	5246*	5248*	
5253*	5255*	5270*	5302*	5335*	5337*	5428*	5446*	5448*	5474*	5478*	5541*	5543*	
5580*	5641*	5695*	5784*	5796*	5831*	5854*	5924*	5962*	6033*	6085*	6087*	6128*	
6169*	6247*	6285*	6353*	6357*	6411*	6413*	6443*	6482*	6561*	6611*	6613*	6663*	
6745*	6840*	6858*	6860*	6886*	6890*	6953*	6955*	6992*	7026*	7089*	7135*	7190*	
7192*	7237*	7298*	7362*	7380*	7460*	7510*	7512*	7553*	7600*	7685*	7731*	7733*	
7773*	7812*	7859*	7861*	7901*	7946*	8028*	8074*	8076*	8116*	8155*	8202*	8204*	
8244*	8289*	8352*	8386*	8432*	8434*	8474*	8513*	8560*	8562*	8602*	8647*	8720*	
8748*	8789*	8791*	8796*	8798*	8813*	8994	9009	9026	9265*	9278*	9281*	9288*	
9291*	9298*	9301*	9308*	9310*	9785*	9800*	9802*	9818*	9820*				
1287*	3874	3953*	3967*	3971*	4067*	4071*	4364*	4543*	4737*	4778*	4883*	4924*	
4988*	5051*	5103*	5144*	5247*	5254*	5336*	5447*	5542*	5630*	5710	5779*	5846	
5976	6086*	6143	6299	6412*	6458	6612*	6859*	6954*	7191*	7395	7511*	7568	
7732*	7788	7860*	7916	8075*	8131	8203*	8259	8433*	8489	8561*	8617	8790*	
8797*	9027	9264*	9279*	9289*	9299*	9309*	9327*	9331*	9801*	9819*			
1286*	3877	5182*	5634*	5691*	5742*	6741*	6784*	6803*	7086*	7132*	7230*	7359*	
9030													
1292*	3882	5705	5706	5707	5841	5842	5843	5972	5973	5974	6138	6139	
6140	6295	6296	6297	6453	6454	6455	7390	7391	7392	7563	7564	7565	
7783	7784	7785	7911	7912	7913	8126	8127	8128	8254	8255	8256	8484	
8485	8486	8612	8613	8614									
1291*	3881	4812*	4958*	4974*	5006*	5022*	5427*	5473*	5922*	5958*	6030*	6125*	
6245*	6281*	6480*	6559*	6661*	6743*	6839*	6885*	6990*	7130*	7234*	7296*	7458*	
7549*	7598*	7683*	7769*	7809*	7897*	7944*	8026*	8112*	8152*	8240*	8287*	8350*	
8384*	8470*	8510*	8598*	8645*	8747*	9034							
1288*	3878	9031											
1296*	3886	9038											
1297*	3887	9039											
1289*	3879	9032											
1293*	3883	4288*	4321*	4453*	4574*	4588*	4615*	4641*	4657*	4745*	4811*	4891*	
4957*	5005*	5111*	5426*	6358*	6838*	9035	9074*	9078*	9098*	9102*	9280*	9290*	
9300*	9332*	9343*	9396*	9411*	9468*	9485*	9502*	9518*	9809*				
1294*	3884	9013	9018	9036									
1295*	3885	9014	9019	9037									
2347*	8983												
2346*	3811*	8971*	8974*	8981									
1284*	3875	5632*	5781*	5914*	6237*	6744*	7084*	7233*	9028				
1333*	4364												
9223	9446*												
12121*													
10658	10717	10877*	12031										
9143	9147	9151	9155	9159	9163	9167	9706*						
1335*	3953	3967	4067	9327									
3964	4064	4326	4358	4398	4447	4729	4804	4875	4950	4999	5094	5175	
5296	5624	5682	5823	5952	6118	6275	6552	7119	7221	7451	7541	7671	
7762	7802	7890	8014	8105	8145	8233	8372	8463	8503	8591	8739	10879*	
9730*	10879												
1163	1485	12097											
2380*	4572*	4586*	4613*	4639*	9682*								
9557	9578*												
2382*	5376*	5398*	5821*	5951*	6274*								
2385*	5386	5388	5391	5395	9345*	9346*	9347*	9348*	9349*	9350*	9361	9364	

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0249

SEEK = 000017

```
SELDIV= 000001
SETINT 043574
SIZFLG  003504
SKI     = 000002
SORT    047154
SPACE2   067626
SRTSPL= 000011
SRTTAB   002100
ST       = 177776
STACK   = 001100
```

```
START      007132
START1     007550
STKLMT=    177774
STOP       047576
ST2        007616
ST3        007662
ST4        007714
ST5        007740
SUBCLR     045522
```

```
SVAL = 100000
SWR  001140
```

```
SWREG      000176
SWTST      047526
SW0        = 000001
SW00       = 000001
SW01       = 000002
SW02       = 000004
SW03       = 000010
SW04       = 000020
SW05       = 000040
SW06       = 000100
SW07       = 000200
SW08       = 000400
SW09       = 001000
```

9381	9384	9446*	9447*	9448*	9449*	9450*	9451*	9631*	9635	9636*	9637*	9648
9658*	9659	9660*	9661*									
1310#	4813	4967	5015	5185	5302	5428	5474	6033	6169	6482	6561	6663
6840	6886	6992	7135	7298	7362	7460	7600	7685	7812	7946	8028	8155
8289	8352	8386	8513	8647	8720	8748						
1303#	3972	4072	4404	5796	5854	9265	9281	9291	9301	9310		
3812	8972	8981#										
2535#	3813*	3957	8927*	8947*								
1350#												
5986	6309	9628#										
12065	12074	12085	12096#									
1307#	4485	5580	7026	9785								
2425#	5989	6312	9640									
12115#	12141	12142*	12155*	12369*	12395*	12397*	12423*					
1171#	3677	3704	3864	3913	3965	4060	4065	4154	4195	4232	4280	4319
4327	4349	4359	4383	4399	4435	4448	4480	4723	4730	4805	4861	4876
4951	5000	5090	5095	5176	5287	5297	5370	5417	5614	5625	5683	5775
5824	5906	5953	6024	6119	6229	6276	6345	6543	6553	6730	6829	7056
7120	7222	7440	7452	7542	7665	7672	7763	7803	7891	8003	8015	8106
8146	8234	8344	8373	8464	8504	8592	8715	8740	8837	9229	9902	9933
12093												
1478	3673#											
3766#												
1182#												
7288	9768#	10380	10463									
3773	3784#											
3774	3802#											
3786	3807	3810#										
3793	3815#	3951	4007	8866	9841							
4199	4209	4234	4284	4329	4351	4361	4385	4401	4437	4450	4482	4670
4680	4687	4732	4807	4878	4953	5002	5097	5178	5289	5299	5372	5419
5505	5577	5627	5685	5777	5826	5908	5955	6025	6121	6166	6181	6231
6278	6347	6437	6478	6494	6545	6555	6658	6675	6683	6732	6769	6831
6917	6987	7004	7012	7023	7070	7122	7224	7293	7310	7318	7374	7454
7544	7595	7612	7620	7674	7765	7805	7893	7941	7958	7966	8017	8108
8148	8236	8284	8301	8309	8347	8364	8375	8466	8506	8594	8642	8659
8667	8717	8732	8742	9327#	9770	9792						
1380#												
2264#	3702	3724*	3726	3732*	3739*	4700	4705	5591	6212	6217	6525	6530
6696	6702	7037	7343	7349	7417	7422	7633	7639	7977	7982	7987	7992
8320	8325	8330	8335	8678	8683	8688	8693	8896	9179	9189	9199	9209
9730	9751	9756	9758	9865	9873	9878	9898	9956	9970	9972		

SEQ 0250

TRY = 000003

1234*												
1215*												
1214*												
1213*	12089											
1212*	9865											
1211*	3751	9878										
1210*												
1233*												
1232*												
1231*												
1230*												
1229*												
1228*												
1227*	9756											
1226*	4700	4705	5591	6212	6217	6525	6530	6696	6702	7037	7343	7349
7417	7422	7633	7639	7977	7982	7987	7992	8320	8325	8330	8335	8678
8683	8688	8693	9179	9189	9199	9209	9730	9873	9898			
1268*												
2475*	3954*	3968*	3973*	3978*	3979*	3980	4068*	4073*	4078*	4079*	4080	4203*
4333*	4405*	4486*	4545*	4674*	4741*	4780*	4814*	4887*	4926*	4968*	4990*	5016*
5053*	5107*	5146*	5186*	5230*	5231*	5232	5249*	5256*	5303*	5306*	5338*	5429*
5449*	5475*	5544*	5581*	5642*	5696*	5750*	5752	5785*	5797*	5832*	5855*	5889*
5891	5925*	5963*	5993*	5994	6034*	6055*	6088*	6129*	6157*	6158	6170*	6174*
6248*	6286*	6316*	6317	6354*	6380*	6414*	6444*	6483*	6487*	6562*	6582*	6614*
6664*	6668*	6746*	6841*	6861*	6887*	6956*	6993*	6997*	7027*	7090*	7136*	7161*
7193*	7238*	7299*	7303*	7363*	7367*	7381*	7461*	7481*	7513*	7554*	7601*	7605*
7686*	7702*	7734*	7774*	7813*	7830*	7862*	7902*	7947*	7951*	8029*	8045*	8077*
8117*	8156*	8173*	8205*	8245*	8290*	8294*	8353*	8357*	8387*	8403*	8435*	8475*
8514*	8531*	8563*	8603*	8648*	8652*	8721*	8725*	8749*	8792*	8799*	8996*	9011*
9066*	9070*	9096*	9112	9114*	9140	9142*	9144	9146*	9148	9150*	9152	9154*
9156	9158*	9160	9162*	9164	9166*	9168	9170*	9263	9266*	9269*	9276	9282*
9292*	9302*	9311*	9317*	9328*	9358	9359*	9366*	9368*	9370*	9378	9379*	9386*
9388*	9390*	9467*	9472*	9484*	9489*	9501*	9506*	9517*	9522*	9559*	9562*	9563
9712*	9720*	9786*	9805*	9821*	11792							
2476*	4212*	4514*	4683*	4750*	4896*	5116*	5271*	5507*	5512*	5585*	6734*	6772*
6773	6799*	6919*	6924*	7031*	8814*	9071*	9491*	9524*	9560*	9561*	9563*	9564
9790*	9814*											
2477*	4960*	4962	5008*	5010	6735*	6775	6796*	6797	7678*	7680	8021*	8023
8379*	8381*	8382										
2478*	4961*	4962*	4964*	4965	5009*	5010*	5012*	5013	6738*	6739	6782	6800*
6801	7679*	7680*	7681	8022*	8023*	8024	8380*	8381				
2479*	4726*	4843*	6740*	6741	6783*	6784	6802*	6803				
2381*	4578	4592	4619	4645	9667*	9678*	9684*		</			

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SEQ 0251

TRTVEC= 000014	1269#													
TSTATN 044074	4206	4496	4548	4597	4624	4650	4677	4783	4817	4929	4971	4993	5019	
	5056	5149	5189	5259	5341	5432	5452	5501	5547	6091	6417	6617	6844	
	6864	6913	6959	7196	7516	7737	7865	8080	8208	8438	8566	8752	8802	
	9047#	9824												
TST1 010124	3840	3862#												
TST10 012142	4283	4317#												
TST11 012246	4324	4338	4347#											
TST12 012354	4371	4381#												
TST13 012542	4418	4433#												
TST14 012706	4465	4478#												
TST15 014262	4665	4721#												
TST16 015072	4847	4859#												
TST17 016362	5069	5088#												
TST2 010300	3890	3911#												
TST20 017424	5285#													
TST21 020004	5362	5368#												
TST22 020162	5415#													
TST23 021260	5568	5612#												
TST24 022170	5761	5773#												
TST25 022766	5904#													
TST26 023456	6022#													
TST27 024602	6163	6227#												
TST3 011040	3958	4058#												
TST30 025272	6343#													
TST31 026420	6475	6541#												
TST32 027342	6650	6728#												
TST33 030006	6788	6807	6827#											
TST34 031234	6980	7052#												
TST35 033356	7332	7412	7438#											
TST36 034452	7588	7663#												
TST37 036376	7936	8001#												
TST4 011366	4088	4152#												
TST40 040334	8279	8342#												
TST41 042352	8637	8713#												
TST5 011520	4193#													
TST6 011620	4230#													
TST7 012004	4266	4278#												
TYPDS = 104405	8855	10869#												
TYPE = 104401	3772	3787	3789	3791	3806	3847	3920	3930	3959	3988	4029	4160	4174	
	4182	4287	4308	4309	4865	4868	5649	5702	5714	5792	5838	5850	5932	
	5969	5980	6135	6147	6255	6292	6303	6450	6462	6808	6812	6813	7059	
	7073	7097	7245	7387	7399	7442	7445	7560	7572	7780	7792	7908	7920	
	8123	8135	8251	8263	8481	8493	8609	8621	8853	8856	8890	8940	9121	
	9777	9779	9834	9839	9867	9909	9934	10025	10033	10101	10195	10321	10377	
	10389	10443	10444	10447	10458	10468	10479	10498	10546	10552	10557	10561	10566	
	10567	10569	10572	10576	10642	10644	10784	10865#	12041	12042	12046	12047	12056	
	12065	12069	12074	12076	12082	12085								
	10032	12031#												
	10446	10866#	12062											
	10868#													
TYPERR 067352	3933	3991	4032	4178	9124	9870	9912	10867#						
TYP0C = 104402	2506#	4252	4528	4562	4763	4797	4828	4909	4943	5129	5163	5213	5324	
TYP0N = 104404	5355	5466	5527	5561	5662	5727	5873	5945	6043	6074	6105	6194	6268	
TYP0S = 104403	6370	6397	6431	6509	6571	6600	6631	6878	6939	6973	7145	7179	7210	
T.A2 = 000001	7258	7470	7499	7530	7695	7720	7751	7822	7848	7879	8038	8063	8094	

G04

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0252

T.82 = 000002

```
T.B3 = 000004
T1    001412
T10   001414
```

T100	001416
T2500	001422
T500	001420
T5000	001424
T50000	001426

```

LFE      = 000400
UNLD     003316
UNLOAD= 000007
UNS      = 040000
LFE      = 020000
VV       = 000100
WCE      = 040000
WDCNT    001442

```

```
WLE      = 004000
WORD     001452
WRDATA= 000023
WRHEAD= 000027
WRL      = 004000
WRTCHK= 000031
WRTGAT= 040000
SAPTHD   001000
SASTAT= *****
SATYC     051616
SATY1     051572
SATY3     051600
SATY4     051610
SAUTOB   001134
SBASE     001264
SBDAOR    001122
SBDOAT    001126
SBELL     001200
SCDW1     001270
SCDW2     001272
SCHARC    051342
$CKSWR    052564
$CMTAG    001100
$CM3      = 000000
```

[illegible]

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CROSS REFERENCE TABLE -- USER SYMBOLS

SCM4	=	000006	2274#	2275#	2276#	2277#	2278#	2279#	2280#							
SCNTLC		053474	10377	10458	10586#											
SCNTLG		053506	10443	10588#												
SCNTLU		053501	10468	10561	10587#											
SCPUOP		001236	2305#													
SCRLF		001205	2284#	3930	3988	4182	4308	4309	6812	6813	10033	10058	10102	10137	10479	
			10566	10586	10647	12041	12046	12056	12069	12082						
SDBLK		051562	10161	10195	10203#											
SDB2C		054052	10699	10717#												
SDB2O		053676	6810	10658#												
SDDW0		001274	2335#													
SDDW1		001276	2336#													
SDDW2		001300	2337#													
SDDW3		001302	2338#													
SDDW4		001304	2339#													
SDDW5		001306	2340#													
SDDW6		001310	2341#													
SDDW7		001312	2342#													
SDECVL		054232	10719	10765#												
SDEVCT		001220	2296#	3759#	3820#	4164	8838#	8839								
SDEVN		001266	2332#	3924												
SDDAGN		043230	8849	8858	8864#											
SOTBL		051552	10164	10199#												
SENDAD		043220	1498	8860#	10053											
SENDCT		043166	3714	8851#												
SENDMG		043237	8853	8868#												
SENULL		043234	8856	8867#												
SENV		001230	2301#	8894	10035	10081	10216	10240								
SENVN		001231	2302#	3737	3916	10083	10088	10218								
SEOP		043076	4662	5618	5650	5703	5715	5793	5839	5851	5933	5970	5981	6136	6148	
			6256	6293	6304	6451	6463	7064	7098	7246	7388	7400	7561	7573	7781	
			7793	7909	7921	8124	8136	8252	8264	8482	8494	8610	8622	8821	8833#	
			12094													
SEOPCT		043160	3714#	8848#	8852	9835#										
SEOP1		043132	3894	4161	8840	8842#	9837	9889								
SERFLG		001103	2247#	9732	9945	9974	9976	9982#	10004	10020#	10058	12091				
SERMAX		001115	2253#	3717#	9976	9999#	10004									
SERROR		050664	3708	10018#												
SERRPC		001116	2254#	10027#	10028#	10029	10058	11769	11776	11784	11792	11800				

[illegible]

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0255

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0256

[illegible]

L04

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CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0257

CALIB	1648#	4735	4881	5101	9799										
CHECK	1567#	4250	4503	4526	4560	4604	4631	4761	4795	4826	4907	4941	5127	5161	5210
	5322	5353	5438	5464	5493	5525	5559	5660	5725	5813	5871	5943	6041	6072	6103
	6192	6266	6368	6395	6429	6507	6569	6598	6629	6761	6850	6876	6905	6937	6971
	7143	7177	7208	7256	7468	7497	7528	7693	7718	7749	7820	7846	7877	8036	8061
	8092	8163	8189	8220	8394	8419	8450	8521	8547	8578	8773				
CIDAE	1679#	5244	8787												
COMEN	1278#														
CWD2	1581#	4257	4533	4768	4914	5134	5218	5532	5668	5733	5878	6402	6944		
DRCLR	1622#	4541	4776	4922	4985	5048	5142	5252	5333	5445	5540	6083	6410	6609	6857
	6952	7188	7508	7729	7857	8072	8200	8430	8558	8795	9817				
ENDCOM	1278#														
EOPGM	2224#	8834													
ERROR	1172#	3893	3949	3956	3970	3975	3997	4005	4020	4024	4035	4039	4070	4075	4091
	4099	4117	4121	4125	4129	4200	4205	4207	4210	4214	4235	4253	4254	4255	4256
	4260	4263	4267	4285	4330	4335	4339	4352	4355	4362	4369	4372	4386	4389	4392
	4395	4402	4407	4410	4413	4416	4419	4438	4441	4444	4451	4457	4460	4463	4466
	4483	4488	4493	4498	4506	4507	4508	4509	4516	4529	4530	4531	4532	4536	4539
	4547	4550	4563	4564	4565	4566	4580	4594	4599	4607	4608	4609	4610	4621	4626
	4634	4635	4636	4637	4647	4651	4661	4671	4676	4678	4681	4685	4688	4733	4743
	4749	4752	4764	4765	4766	4767	4771	4774	4782	4785	4798	4799	4800	4801	4808
	4816	4818	4829	4830	4831	4832	4836	4840	4879	4889	4895	4898	4910	4911	4912
	4913	4917	4920	4928	4931	4944	4945	4946	4947	4954	4970	4972	4978	4983	4992
	4995	5003	5018	5020	5026	5035	5041	5046	5055	5058	5098	5109	5115	5118	5130
	5131	5132	5133	5137	5140	5148	5151	5164	5165	5166	5167	5172	5179	5188	5190
	5214	5215	5216	5217	5221	5224	5236	5251	5258	5261	5268	5273	5290	5294	5300
	5305	5309	5312	5325	5326	5327	5328	5331	5340	5343	5356	5357	5358	5359	5363
	5373	5379	5383	5393	5397	5420	5431	5433	5441	5442	5443	5444	5451	5454	5467
	5468	5469	5470	5477	5481	5485	5496	5497	5498	5499	5502	5506	5509	5511	5514
	5528	5529	5530	5531	5535	5538	5546	5549	5562	5563	5564	5565	5578	5583	5587
	5617	5628	5644	5648	5663	5664	5665	5666	5671	5674	5686	5698	5701	5713	5728
	5729	5730	5731	5736	5739	5754	5778	5787	5791	5799	5802	5816	5817	5818	5819
	5827	5834	5837	5849	5857	5860	5874	5875	5876	5877	5881	5884	5893	5909	5927
	5931	5946	5947	5948	5949	5956	5965	5968	5979	5996	6026	6036	6044	6045	6046
	6047	6051	6059	6062	6075	6076	6077	6078	6081	6090	6093	6106	6107	6108	6109
	6114	6122	6131	6134	6146	6154	6160	6167	6172	6176	6179	6182	6195	6196	6197
	6198	6201	6232	6250	6254	6269	6270	6271	6272	6279	6288	6291	6302	6319	6348
	6356	6362	6371	6372	6373	6374	6377	6382	6385	6398	6399	6400	6401	6405	6408
	6416	6419	6432	6433	6434	6435	6438	6446	6449	6461	6468	6472	6479	6485	6489
	6492	6495	6510	6511	6512	6513	6516	6546	6556	6564	6572	6573	6574	6575	6579
	6585	6588	6601	6602	6603	6604	6607	6616	6619	6632	6633	6634	6635	6639	6659
	6666	6670	6673	6676	6684	6733	6748	6752	6764	6765	6766	6767	6770	6777	6779
	6792	6832	6843	6845	6853	6854	6855	6856	6863	6866	6879	6880	6881	6882	6889
	6893	6897	6908	6909	6910	6911	6914	6918	6921	6923	6926	6940	6941	6942	6943
	6947	6950	6958	6961	6974	6975	6976	6977	6988	6995	6999	7002	7005	7013	7024
	7029	7033	7063	7067	7071	7092	7096	7123	7138	7146	7147	7148	7149	7153	7164
	7167	7180	7181	7182	7183	7186	7195	7198	7211	7212	7213	7214	7218	7225	7240
	7244	7259	7260	7261	7262	7294	7301	7305	7308	7311	7319	7365	7369	7372	7375
	7383	7386	7398	7405	7455	7463	7471	7472	7473	7474	7478	7484	7487	7500	7501
	7502	7503	7506	7515	7518	7531	7532	7533	7534	7538	7545	7556	7559	7571	7578
	7596	7603	7607	7610	7613	7621	7675	7688	7696	7697	7698	7699	7705	7708	7721
	7722	7723	7724	7727	7736	7739	7752	7753	7754	7755	7759	7766	7776	7779	7791
	7798	7806	7815	7823	7824	7825	7826	7833	7836	7849	7850	7851	7852	7855	7864
	7867	7880	7881	7882	7883	7887	7894	7904	7907	7919	7926	7942	7949	7953	7956
	7959	7967	8018	8031	8039	8040	8041	8042	8048	8051	8064	8065	8066	8067	8070
	8079	8082	8095	8096	8097	8098	8102	8109	8119	8122	8134	8141	8149	8158	8166

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CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0258

	8167	8168	8169	8176	8179	8192	8193	8194	8195	8198	8207	8210	8223	8224	8225
	8226	8230	8237	8247	8250	8262	8269	8285	8292	8296	8299	8302	8310	8348	8355
	8359	8362	8365	8376	8389	8397	8398	8399	8400	8406	8409	8422	8423	8424	8425
	8428	8437	8440	8453	8454	8455	8456	8460	8467	8477	8480	8492	8499	8507	8516
	8524	8525	8526	8527	8534	8537	8550	8551	8552	8553	8556	8565	8568	8581	8582
	8583	8584	8588	8595	8605	8608	8620	8627	8643	8650	8654	8657	8660	8668	8718
	8723	8727	8730	8733	8743	8751	8753	8757	8760	8763	8766	8776	8777	8778	8779
	8782	8785	8794	8801	8804	8811	8816	9245	9250	9254	9268	9284	9294	9304	9313
	9330	9771	9783	9788	9792	9807	9813	9816	9823	9826	9895				
ESCAPE	1278#														
FSECA	1976#	9353													
FSECB	2002#	9373													
F.EAB	1548#	4517	4552	4753	4787	4899	4933	5119	5153	5313	5345	5456	5517	5551	5652
	5717	5804	5862	5935	6063	6095	6184	6258	6386	6421	6498	6589	6621	6753	6868
	6929	6963	7168	7200	7248	7488	7520	7709	7741	7837	7869	8052	8084	8180	8212
	8410	8442	8538	8570											
GETPRI	1278#														
GETSWR	1278#	8891													
HDCHK3	1903#	7377	7550	7770	7898	8113	8241	8471	8599						
HDTBL	1964#	5916	6239	7076											
HEADER	2136#	5900	6223												
LIMIT	2061#	5418	6830												
LOOP	1532#	3963	4063	4326	4357	4397	4446	4728	4804	4875	4950	4999	5093	5174	5295
	5624	5682	5822	5952	6117	6275	6551	7118	7220	7450	7540	7670	7761	7802	7889
	8013	8104	8145	8232	8371	8462	8503	8590	8738						
LPCHK	1593#	4690	6203	6517	6686	7015	7321	7335	7623	7969	8312	8670			
MSG	3852#	3854	3897#	3899	4043#	4045	4143#	4145	4184#	4186	4223#	4225	4271#	4273	4311#
	4313	4341#	4343	4374#	4376	4421#	4423	4468#	4470	4710#	4712	4850#	4852	5075#	5077
	5276#	5278	5404#	5406	5599#	5602	5764#	5766	6007#	6010	6329#	6332	6533#	6535	6706#
	6708	6815#	6817	7043#	7045	7431#	7433	7646#	7648	8700#	8702				
MULT	1278#														
NEWTST	1278#	3852	3897	4043	4143	4184	4223	4271	4311	4341	4374	4421	4468	4710	4850
	5075	5276	5365	5404	5600	5764	5901	6008	6224	6330	6533	6706	6815	7043	7431
	7646	7998	8339	8700											
OWNTAG	1526#	2345													
POP	1278#	10190	10250	10251	10636	10827									
PUSH	1278#	10149	10211	10213	10234	10610	10807								
QKRPSK	1784#	6656	6985	7292	7593	7939	8282	8640							
QKSEEK	1760#	6168	6481	6662	6991	7297	7361	7599	7945	8288	8351	8646	8719		
QKSRT	1737#	5575	7021	9780											
QKUNLD	1808#	4198	4669												
RALLHD	1913#	5959	6282												
RDHDR	1866#	5693	5829	6126	6441	7378	7551	7771	7899	8114	8242	8472	8600		
REPORT	1278#														
SCOPE	1173#	3862	3911	4058	4152	4193	4230	4278	4317	4347	4381	4433	4478	4721	4859
	5088	5285	5368	5415	5612	5773	5904	6022	6227	6343	6541	6728	6827	7052	7438
	7663	8001	8342	8713	8835	8842									
SECTST	2029#	5377													
SETPRI	1278#	10514													
SETTRA	10857#	10866	10867	10868	10869	10871	10873	10874	10875	10876	10877	10878	10879		
SETUP	1278#	3698													
SKH*TN	1718#	5307	6057	6583	7162	7482	7703	7831	8046	8174	8404	8532			
SKIP	1278#	3840	3890	3958	4088	4266	4283	4324	4338	4371	4418	4465	4665	4847	5069
	5362	5568	5761	6163	6475	6650	6788	6807	6980	7332	7412	7588	7936	8279	8637
SKOSC	2168#	7666	8009	8367											
SKRDY	1704#	6032	6560	7134	7459	7684	7811	8027	8154	8385	8512				

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CROSS REFERENCE TABLE -- MACRO NAMES

[illegible]

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CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0260

.STYPO 1125# 10261

.ABS. 071762 000

% ERRORS DETECTED: 0 HARD 2 SOFT
DEFAULT GLOBALS GENERATED: 0

DZR6HD,DZR6HD.SEQ/SOL/CRF/NL:TOC/DOC=DZR6HD.P11

RUN-TIME: 28 29 3 SECONDS

RUN-TIME RATIO: 465/61=7.5

CORE USED: 32K (64 PAGES)

DOCUMENT PAGES: 260