

RK611/RK06

DRIVE DIAGNOSTIC PART 3
MD-11-DZR6J-D

EP-DZR6J-D-DL-A

APR 1977

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DZR6J-D-D
PRODUCT NAME:	UNIBUS RK06 DISK DRIVE DIAGNOSTIC: PART 3
DATE:	JANUARY 1977
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	GARY PAPAIZIAN

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74		THIS PROGRAM PERFORMS PART 3 OF THE DRIVE DIAGNOSTICS TO
75		INSURE THAT THE DISK IS CAPABLE OF PROPERLY PERFORMING
76		ALL OPERATOR INTERVENTION FUNCTIONS.
77		ERROR DETECTION LOGIC IS CHECKED BY MANUAL & SOFTWARE ERROR FORCING.
78		AFTER A SUCCESSFUL RUN (WITH NO ERRORS) OF THIS PART,
79		PRECEDED BY THE SUCCESSFUL RUN OF PARTS 1 & 2,
80		IT CAN BE ASSERTED THAT THE RK06 DRIVE WILL WORK SUCCESSFULLY
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IN THE STAND-ALONE MODE. SYSTEMS INTERACTION, & ERROR RATE ANALYSIS ARE LEFT TO OTHER PROGRAMS.

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 MESSAGE 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 SUCCESSFUL FOLLOWED BY THE RK06 DRIVE DIAGNOSTICS - PARTS 1 & 2.

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 SHOULD NOT BE CHAINED BY XXDP.

CHAIN MODE OPERATION (MONITOR)

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

DUMP MODE OPERATION (MANUAL)

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

3.3 ACT/APT

THIS PROGRAM IS ACT COMPATIBLE.
HOWEVER, IT SHOULD NOT BE RUN IN THE AUTO MODE.

AUTOMATIC MODE (MONITOR)

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

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

3.3.1 APT ETABLE DEFINITIONS

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

1. SOFTWARE ENVIRONMENT:
=1 IF APT SCRIPT MODE
=0 IF STANDALONE MODE
2. ENVIRONMENT MODE:
BIT 7 = 1 ETABLE DOES SIZING
 = 0 PROGRAM DOES SIZING
BIT 6 = 1 SPOOL MESSAGES TO APT IF SCRIPT MODE
 = 0 DON'T SPOOL TO APT
BIT 5 = 1 SUPPRESS CONSOLE OUTPUT
 = 0 ALLOW CONSOLE OUTPUT
BITS 4-0 NOT USED

3. SWITCH 1 (SOFTWARE SWITCH REGISTER)
IF ENVIRONMENT MODE BIT 7 (SIZING BIT) IS SET TO 1,
THE SOFTWARE SWITCH REGISTER WILL BE USED, INSTEAD
OF THE HARDWARE CONSOLE SWITCH REGISTER. REGARDLESS
OF WHICH ONE IS USED, ALL BITS DEFINED IN SECTIONS
4.3 & 4.4 (SWITCH REGISTER OPTIONS) MAY USED
WHEN RUNNING IN STANDALONE MODE. IN APT SCRIPT MODE,
HOWEVER, BIT 14 (LOOP ON TEST) MUST ALWAYS BE SET

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4. SWITCH 2 (USER SWITCH REGISTER)
NOT USED5. CPU OPTIONS:
NOT USED6. MEMORY TYPES 1-4 AND MAX MEMORY ADDRESSES
NOT USED7. INTERRUPT VECTOR 1:
USED WHEN ENVIRONMENT MODE BIT 7 = 1. DEFAULT = 2108. BUS PRIORITY 1:
USED WHEN ENVIRONMENT MODE BIT 7 = 1. DEFAULT = 59. INTERRUPT VECTOR 2:
NOT USED10. BUS PRIORITY 2:
NOT USED11. BASE ADDRESS:
USED WHEN ENVIRONMENT MODE BIT 7 = 1. DEFAULT = 17744012. 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.13. CONTROLLER DESCRIPTOR WORDS:
NOT USED14. 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 CONTENTION 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 CYLINDER 410, HEAD 2. PRINTOUTS OF DATA ERRORS DUE TO BAD SECTORS/TRACKS WILL BE MASKED OUT.

3.8 EXECUTION TIME

TOTAL TIME: APPROX 5 MINUTES TO DO ALL THE TESTS
(BASED ON THE PDP 11/50)

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 BUS ADDRESS	1264	177440
CONTROLLER INTERRUPT VECTOR	1334	210
CONTROLLER PRIORITY	1336	240
P-CLOCK STATUS REG	1340	172540
P-CLOCK SET BUFFER	1342	172542
P-CLOCK READ BUFFER	1344	172544
L-CLOCK STATUS REG	1346	177546
L-CLOCK INTERRUPT VECTOR	1350	100
P-CLOCK INTERRUPT VECTOR	1352	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' COMMAND 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).

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

IMPORTANT: FOR VARIATIONS OF THE ABOVE, SEE XXDP, ACT/APT

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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

4.3.1 SW<15>

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

4.3.2 SW<14>

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

4.3.3 SW<13>

THIS SWITCH INHIBITS ALL ERROR MESSAGES. NORMALLY USED WHEN LOOPING ON TEST (SW14) OR LOOPING ON ERROR (SW9).

4.3.4 SW<12>

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

4.3.5 SW<11>

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

4.3.6 SW<10>

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

4.3.7 SW(09)

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

4.4 'SOFTWARE' SWITCH REGISTER

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

SWR = NNNNNN NEW =

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

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

4.5 INPUT DIALOGUE

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

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

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 3

MAINDEC-11-DZR6J-D-PB

DRIVES TO BE TESTED: 1,3<CR>

TYPE IN BUSS ADDRESS IF NOT 177440 <CR>

TYPE IN CONTROLLER INTERRUPT VECTOR IF NOT 210 <CR>

WILL TEST DRIVES:

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DRIVE 1

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

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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 3

MAINDEC-11-DZR6J-D-PB

WILL TEST DRIVES:

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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 ON 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:

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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 CYLINDERS
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

OPERATOR INTERVENTION TESTS

THESE TESTS CHECK OUT ALL THE DRIVE INTERLOCKS, FRONT PANEL
SWITCHES AND LIGHTS.

THE OPERATOR IS INSTRUCTED TO PERFORM A TEST
AND TYPE A SPACE WHEN FINISHED.

OPERATOR INTERVENTION TESTS CAN BE INDIVIDUALLY
BYPASSED BY TYPING A CONTROL-E (<E>). ONLY AT THE
BEGINNING OF EACH TEST, AS INSTRUCTED BY THE TYPEOUT.

IF THE PROGRAM DETERMINES IT WAS LOADED UNDER
ACT APT, OPERATOR INTERVENTION TESTS WILL BE
BYPASSED UNLESS THE 'LOAD & DUMP MODE' IS BEING
USED.

THEY WILL BE BYPASSED IN 'MONITOR MODE' AS OPERATOR
INTERVENTION MAY NOT BE FEASIBLE IN OVER-NITE
TESTING.

5.2 TEST DESCRIPTIONS

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BASIC CONTROLLER TESTS, SIZING & SETUP

TEST 1 REFERENCE ALL CONTROLLER REGISTERS

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

TEST 2 SIZE THE BUSS

THIS TEST IS ENTERED ONLY IF 'DRIVE SELECTION' IS DEFAULTED EITHER BY RUNNING IN THE AUTO MODE OR A 200 START IN THE MANUAL MODE.

EVERY 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 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 6 SET VV WITH PACK COMMAND

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

TEST 7 UNLOAD DRIVE TO BE TESTED

THIS TEST UNLOADS THE DRIVE TO BE TESTED NEXT.
WAITS FOR ATTN & VERIFIES IT CAME FROM THE CORRECT DRIVE.

OPERATOR INTERVENTION TESTS

TEST 10 INTERLOCKS TESTS

THIS TEST VERIFIES THAT THE DOOR & CARTRIDGE STATUS BITS
ARE OPERATING PROPERLY IN MESSAGE A0 & THAT THE REMOVAL
OF THE CARTRIDGE CLEARS VOLUME VALID.
IT FURTHER VERIFIES ALL REMAINING STATUS BITS OF
MESSAGE A & B, WORDS 0 & 1.
THIS TEST ALSO CHECKS THAT THE SPINDLE CANNOT BE STARTED
WHEN THE DOOR IS OPEN OR THE CARTRIDGE IS REMOVED.
IT ALSO VERIFIES THAT LOSS OF VOLUME VALID RESETS SACK WHICH
ASSERTS NON EXISTENT DRIVE IN RKCS2

TEST 11 UNIT SELECT PLUG TEST

THIS TEST VERIFIES THAT WHEN THE UNIT SELECT PLUG IS PULLED
OUT, THE DUAL LOGIC RESETS ATTN & VOLUME VALID, THAT
THE DRIVE DE-SELECTS & NON EXISTENT DRIVE ASSERTS.
FURTHER, THE OPERATOR IS ASKED TO INSERT ANY NUMBER OF
UNIT SELECT PLUGS. THE PROGRAM WILL RESPOND BY TYPING
THE PLUG CODE NUMBER AS SOON AS IT IS INSERTED.
THIS PORTION OF THE TEST IS TERMINATED AT ANY TIME BY A CONTROL-C

TEST 12 PORT SELECTION TESTS

THE OPERATOR IS ASKED TO SWITCH TO THE WRONG PORT
& THEN DESELECT BOTH PORTS.
IN BOTH CASES, NON EXISTENT DRIVE SHOULD ASSERT IN RKCS2

TEST 13 AC LOW DETECTION PART 1

A PRELIMINARY AC LOW TEST IS PERFORMED HERE WHILE HEADS ARE UNLOADED.
BATTERY RETRACT WILL BE TESTED LATER.
ACLO CANNOT BE TESTED DIRECTLY SINCE IT REQUIRES

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770 SECTOR PULSES, I.E. HEADS LOADED.
771 THEREFORE THE INDICATOR CHECKED IS NON-EXISTENT
772 DRIVE (NED) ASSERTING IN RKCS2 AS A RESULT OF DCLO.
773 AFTER POWER UP, VOLUME VALID IS CHECKED TO BE CLEARED.
774

775
776 TEST 14 CHECK NXF LOGIC
777

778 THIS TEST VERIFIES NON-EXECUTABLE FUNCTION (NXF) IS DETECTED
779 AS A RESULT OF DOING A SEEK WITH VOLUME VALID RESET.
780

781
782 TEST 15 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #
783

784 THIS TEST VERIFIES THAT CYL 410, TRACK 2 CAN BE READ.
785 THIS AREA CONTAINS BAD SECTOR INFOR WHICH IS WRITTEN BY THE
786 FACTORY DURING MANF. ALL BAD SECTOR INFOR (BSE) WILL BE STORED
787 AT THIS TIME TO MASK FUTURE READ HEADER OR DATA ERROR PRINTOUTS.
788 IF BSE INFO CANNOT BE READ, OR IF AFTER READING THE BSE INFO
789 IT IS DETERMINED THAT AN ALIGNMENT CARTRIDGE IS USED,
790 A MESSAGE WILL BE TYPED INDICATING THAT ALL
791 FUTURE FORMAT AND READ-WRITE TESTS WILL BE BYPASSED.
792 THIS IS DONE SO AS NOT TO DESTROY BSE INFOR OR AN ALIGNMENT PACK BY WRIT
793 THE PACK SERIAL # IS TYPED IN OCTAL & FOR THE FIRST PASS ONLY.
794

795
796 TEST 16 WRITE LOCK TEST
797

798 THIS TEST VERIFIES THAT DATA WRITTEN ON A SECTOR CANNOT BE
799 ALTERED ONCE THE WRITE LOCK SWITCH HAS BEEN ENABLED.
800 IT ALSO CHECKS THAT WRITE PROTECT TAKES EFFECT ONLY AT
801 SECTOR BOUNDRIES WHEN DOING CONTINUOUS WRITING ON CYL 0, HEAD 0
802

803
804 TEST 17 AC LOW DETECTION PART 2
805

806 THIS TEST VERIFIES THAT WHEN AC POWER IS LOST, THAT WRITING CEASES
807 AT SECTOR BOUNDRIES & THAT THE BATTERY RETRACT IS FUNCTIONAL.
808 THERE IS APPROX 4 MS BETWEEN AC LOW ASSERTING AND NED ASSERTING
809 WHEN THE INTERFACE SHUTS DOWN.
810

811
812 TEST 20 END OF PROGRAM
813

814 THIS IS NOT A TEST BUT A LINKAGE TO PERFORM ALL THE
815 ABOVE TESTS FOR THE NEXT DRIVE PRESENT.
816 THE NEXT TEST IS ENTERED ONLY AFTER ALL DRIVES PRESENT
817 HAVE BEEN TESTED.
818 DO NOT LOOP ON THIS 'TEST'.
819

820
821 TEST 21 MULTIPLE DRIVE DETECTION TEST
822
823
824
825

THIS TEST IS PERFORMED ONLY ONCE AT THE END OF PASS 1
AND IS BYPASSED IF ONLY ONE DRIVE IS PRESENT.

THE MULTIPLE DRIVE DETECTION LOGIC IS TESTED BY THE FOLLOWING METHOD:

- A. HEADS MUST BE LOADED (SECTOR PULSES REQ'D)
- B. THE OPERATOR IS INSTRUCTED TO INSERT THE SAME UNIT SELECT
PLUG NUMBER (1 PAIR AT A TIME) ON ANY 2 DRIVES
TO BE TESTED
- C. THE OPERATOR THEN DEPRESSES THE SPACE BAR TO CONTINUE THE TEST
OR A CONTROL-C TO EXIT THE TEST

THE PROGRAM VERIFIES THAT MULTIPLE DRIVE SELECT & DRIVE UNSAFE
BOTH SET & THAT THE DRIVE UNLOADS

THE OPERATOR IS ASKED TO VERIFY THAT HEADS UNLOAD FROM BOTH DRIVES

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 CYLINDERS BACK TO STANDARD
FORMAT.

6.0 ERROR REPORTING

6.1 ERROR INTERPRETATION

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

EVERY ERROR MESSAGE CONTAINS A PC. THIS PC INDICATES THE
POSITION IN PROGRAM WHERE THE ERROR CALL IS LOCATED. THE
ERROR MESSAGE, BECAUSE OF PRACTICAL CONSIDERATIONS IS MADE
SHORT AND MEANINGFUL. THE USER IS ADVISED TO LOOK UP THE
PC IN THE PROGRAM LISTING, WHERE HE WILL FIND MORE INFORMATION
ABOUT THE ERROR. IN MANY INSTANCES, A SINGLE FAULT WILL
GIVE RISE TO MORE THAN ONE ERROR REPORT. A LITTLE DELIBERATION
AND CAREFUL EXAMINATION OF THE DATA GIVEN WILL BE CERTAINLY
VERY HELPFUL IN PINPOINTING THE FAULT. A BRIEF EXPLANATION
OF WHAT IS BEING CHECKED IN THE TEST IS GIVEN AT THE
BEGINNING OF EVERY TEST. ALL THE NUMBERS GIVEN WITH ERROR
MESSAGES ARE IN OCTAL.

NOTE

NO ERROR LOGGING OR OPERATION HISTORY IS PROVIDED.

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6.2 ERROR PRINTOUT EXAMPLE:

DEPRESS 'RUN-STOP' SWITCH TO 'RUN' WHILE DOOR OPEN
VERIFY SPINDLE DOES NOT START & HEADS DO NOT LOAD

DEPRESS SPACE BAR WHEN FINISHED

SPINDLE ON SET IN RKMR2
AFTER MANUALLY LOADING HEADS WITH DOOR OPEN

TEST NO. PC							
000010 015700							
RKMR2	RKMR3	RKER	RKDS	RKCS1	RKCS2	RKASOF	
050343	100000	000000	140301	040200	000103	004000	

MESSAGE AO ERROR
AFTER MANUALLY LOADING HEADS WITH DOOR OPEN

TEST NO. PC							
000010 015736							
EXPECT							
AO	BO	A1	B1	A2	B2	B3	
100143	100000	000543	000001				
ACTUAL							
050343	100000	001723	000001				
RKCS1	RKCS2	RKASOF	RKER	RKDS	RKDC		
040200	000103	004000	000000	140301	000000		

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

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

[END OF DOCUMENT]

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167400
000001

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*** PGM REV 033 ***
.NLIST CND,MC,MD
.LIST ME
.ENABL ABS,AMA

```

```

;DEFINE SYSMAC MACROS

```

```

$SWR= 167400
$TN= 1

```

```

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

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.TITLE UNIBUS RK6 DRIVE DIAGNOSTIC PART 3

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*MAYNARD, MASS. 01754

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*PROGRAM BY GARY PAPAZIAN

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*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>

```

.SBTTL SUMMARY OF STARTING LOCATIONS

```

200	DEFAULT PARAMETERS
220	INPUT PARAMETERS
240	ODT11

H02

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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BASIC DEFINITIONS

SEQ 0019

.SBTTL BASIC DEFINITIONS

;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***

STACK= 1100

.EQUIV EMT,ERROR ;;BASIC DEFINITION OF ERROR CALL

.EQUIV IOT,SCOPE ;;BASIC DEFINITION OF SCOPE CALL

;*MISCELLANEOUS DEFINITIONS

HT= 11 ;;CODE FOR HORIZONTAL TAB

LF= 12 ;;CODE FOR LINE FEED

CR= 15 ;;CODE FOR CARRIAGE RETURN

CRLF= 200 ;;CODE FOR CARRIAGE RETURN-LINE FEED

PS= 177776 ;;PROCESSOR STATUS WORD

.EQUIV PS,PSW

STKLMT= 177774 ;;STACK LIMIT REGISTER

PIRQ= 177772 ;;PROGRAM INTERRUPT REQUEST REGISTER

DSWR= 177570 ;;HARDWARE SWITCH REGISTER

DDISP= 177570 ;;HARDWARE DISPLAY REGISTER

;*GENERAL PURPOSE REGISTER DEFINITIONS

R0= %0 ;;GENERAL REGISTER

R1= %1 ;;GENERAL REGISTER

R2= %2 ;;GENERAL REGISTER

R3= %3 ;;GENERAL REGISTER

R4= %4 ;;GENERAL REGISTER

R5= %5 ;;GENERAL REGISTER

R6= %6 ;;GENERAL REGISTER

R7= %7 ;;GENERAL REGISTER

SP= %6 ;;STACK POINTER

PC= %7 ;;PROGRAM COUNTER

;*PRIORITY LEVEL DEFINITIONS

PR0= 0 ;;PRIORITY LEVEL 0

PR1= 40 ;;PRIORITY LEVEL 1

PR2= 100 ;;PRIORITY LEVEL 2

PR3= 140 ;;PRIORITY LEVEL 3

PR4= 200 ;;PRIORITY LEVEL 4

PR5= 240 ;;PRIORITY LEVEL 5

PR6= 300 ;;PRIORITY LEVEL 6

PR7= 340 ;;PRIORITY LEVEL 7

;*SWITCH REGISTER SWITCH DEFINITIONS

SW15= 100000

SW14= 40000

SW13= 20000

SW12= 10000

SW11= 4000

SW10= 2000

SW09= 1000

SW08= 400

SW07= 200

SW06= 100

SW05= 40

SW04= 20

SW03= 10

SW02= 4

968
969
970
971 001100
972
973
974
975
976 000011
977 000012
978 000015
979 000200
980 177776
981
982 177774
983 177772
984 177570
985 177570
986
987
988 000000
989 000001
990 000002
991 000003
992 000004
993 000005
994 000006
995 000007
996 000006
997 000007
998
999
1000 000000
1001 000040
1002 000100
1003 000140
1004 000200
1005 000240
1006 000300
1007 000340
1008
1009
1010 100000
1011 040000
1012 020000
1013 010000
1014 004000
1015 002000
1016 001000
1017 000400
1018 000200
1019 000100
1020 000040
1021 000020
1022 000010
1023 000004

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BASIC DEFINITIONS

SEQ 0020

1024 000002
1025 000001

SW01= 2
SW00= 1
.EQUIV SW09,SW9
.EQUIV SW08,SW8
.EQUIV SW07,SW7
.EQUIV SW06,SW6
.EQUIV SW05,SW5
.EQUIV SW04,SW4
.EQUIV SW03,SW3
.EQUIV SW02,SW2
.EQUIV SW01,SW1
.EQUIV SW00,SW0

1037
1038 100000
1039 040000
1040 020000
1041 010000
1042 004000
1043 002000
1044 001000
1045 000400
1046 000200
1047 000100
1048 000040
1049 000020
1050 000010
1051 000004
1052 000002
1053 000001

;*DATA BIT DEFINITIONS (BIT00 TO BIT15)

BIT15= 100000
BIT14= 40000
BIT13= 20000
BIT12= 10000
BIT11= 4000
BIT10= 2000
BIT09= 1000
BIT08= 400
BIT07= 200
BIT06= 100
BIT05= 40
BIT04= 20
BIT03= 10
BIT02= 4
BIT01= 2
BIT00= 1
.EQUIV BIT09,BIT9
.EQUIV BIT08,BIT8
.EQUIV BIT07,BIT7
.EQUIV BIT06,BIT6
.EQUIV BIT05,BIT5
.EQUIV BIT04,BIT4
.EQUIV BIT03,BIT3
.EQUIV BIT02,BIT2
.EQUIV BIT01,BIT1
.EQUIV BIT00,BIT0

1065
1066 000004
1067 000010
1068 000014
1069 000014
1070 000014
1071 000020
1072 000024
1073 000030
1074 000034
1075 000060
1076 000064
1077 000240
1078
1079

;*BASIC "CPU" TRAP VECTOR ADDRESSES

ERRVEC= 4 ;: TIME OUT AND OTHER ERRORS
RESVEC= 10 ;: RESERVED AND ILLEGAL INSTRUCTIONS
TBITVEC= 14 ;: "T" BIT
TRTVEC= 14 ;: TRACE TRAP
BPTVEC= 14 ;: BREAKPOINT TRAP (BPT)
IOTVEC= 20 ;: INPUT/OUTPUT TRAP (IOT) **SCOPE**
PWRVEC= 24 ;: POWER FAIL
EMTVEC= 30 ;: EMULATOR TRAP (EMT) **ERROR**
TRAPVEC= 34 ;: "TRAP" TRAP
TKVEC= 60 ;: TTY KEYBOARD VECTOR
TPVEC= 64 ;: TTY PRINTER VECTOR
PIRQVEC= 240 ;: PROGRAM INTERRUPT REQUEST VECTOR

.SBTTL RK06 CONTROLLER REGISTER DEFINITION

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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RK06 CONTROLLER REGISTER DEFINITION

SEQ 0021

```

1080
1081
1082
1083      000000      RKCS1= 0      ; CONTROL AND STATUS REGISTER 1
1084      000002      RKWC= 2      ; WORD COUNT REGISTER
1085      000004      RKBA= 4      ; BUS ADDRESS REGISTER
1086      000006      RKDA= 6      ; DESIRED TRACK SECTOR REGISTER
1087      000010      RKCS2= 10     ; CONTROL AND STATUS REGISTER 2
1088      000012      RKDS= 12     ; DRIVE STATUS REGISTER
1089      000014      RKER= 14     ; ERROR REGISTER
1090      000016      RKASOF= 16    ; ATTENTION SUMMARY AND OFFSET REGISTER
1091      000020      RKDC= 20     ; DESIRED CYLINDER REGISTER
1092      000024      RKDB= 24     ; DATA BUFFER
1093      000026      RKMR1= 26    ; MAINTENANCE REGISTER 1
1094      000034      RKMR2= 34    ; MAINTENANCE REGISTER 2 (MESSAGE LINE A)
1095      000036      RKMR3= 36    ; MAINTENANCE REGISTER 3 (MESSAGE LINE B)
1096      000030      RKECPS= 30   ; ECC POSITION INFORMATION
1097      000032      RKECPT= 32   ; ECC PATTERN INFORMATION
1098
1099      .SBTTL CONTROL AND STATUS REGISTER 1 BITS (RKCS1:0)
1100
1101      ; DRIVE COMMANDS
1102
1103      000001      SELDRV= 1      ; SELECT DRIVE (GET STATUS)
1104      000003      PACK= 3       ; PACK ACKNOWLEDGE
1105      000005      CLEAR= 5      ; DRIVE CLEAR
1106      000007      UNLOAD= 7     ; UNLOAD
1107      000011      SRTSPL= 11    ; START SPINDLE
1108      000013      RECAL= 13     ; RECALIBRATE
1109      000015      OFFSET= 15    ; OFFSET
1110      000017      SEEK= 17     ; SEEK
1111      000021      RCDATA= 21    ; READ DATA
1112      000023      WRDATA= 23    ; WRITE DATA
1113      000025      ROHEAD= 25    ; READ HEADER
1114      000027      WRHEAD= 27    ; WRITE HEADER AND DATA
1115      000031      WRTCHK= 31    ; WRITE CHECK
1116
1117      000001      GO= BIT0       ; GO BIT
1118      000100      IE= BIT6       ; INTERRUPT ENABLE
1119      000200      RDY= BIT7      ; CONTROLLER READY
1120      000400      BA16= BIT8    ; BUS ADDRESS BIT 16
1121      001000      BA17= BIT9    ; BUS ADDRESS BIT 17
1122      002000      CDT= BIT10    ; CONTROLLER DRIVE TYPE (0=RK06)
1123      004000      CTO= BIT11    ; CONTROLLER TIMEOUT
1124      010000      CFMT= BIT12   ; CONTROLLER DRIVE FORMAT (0=22 SECTOR, 1=20 SECTOR)
1125      020000      DCPAR= BIT13  ; SERCON PARITY ERROR DETECTED BY CONTROLLER
1126      040000      DI= BIT14    ; DRIVE INTERRUPT
1127      100000      CERR= BIT15   ; CONTROLLER ERROR
1128      100000      CCLR= BIT15   ; CONTROLLER CLEAR
1129
1130      .SBTTL CONTROL AND STATUS REGISTER 2 BITS (RKCS2:10)
1131
1132      000007      DRVMSK= 7      ; MASK FOR DRIVE SELECTION CODE
1133      000010      RLS= BIT3      ; DESELECT OR RELEASE DRIVE IN BITS 0-2
1134      000020      BAI= BIT4      ; BUS ADDRESS INCREMENT IN BIT
1135      000040      SCLR= BIT5     ; SUBSYSTEM CLEAR CONTROLLER AND ALL DRIVES

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K02

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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CONTROL AND STATUS REGISTER 2 BITS (RKCS2:10)

SEQ 0022

1136	000100	IR=	BIT6	; INPUT READY
1137	000200	OR=	BIT7	; OUTPUT READY
1138	000400	UFE=	BIT8	; UNIT FIELD ERROR
1139	001000	MDS=	BIT9	; MULTIPLE DRIVE SELECT
1140	002000	PGE=	BIT10	; PROGRAMMING ERROR
1141	004000	NEM=	BIT11	; NON-EXISTENT MEMORY
1142	010000	NED=	BIT12	; NON-EXISTENT DRIVE
1143	020000	UPE=	BIT13	; UNIBUS PARITY ERROR
1144	040000	WCE=	BIT14	; WRITE CHECK ERROR
1145	100000	DLT=	BIT15	; DATA LATE ERROR
1146				
1147		.SBTTL	ERROR REGISTER BIT DEFINITION (RKER:14)	
1148				
1149	000001	ILF=	BIT0	; ILLEGAL FUNCTION CODE
1150	000002	SKI=	BIT1	; SEEK INCOMPLETE
1151	000004	NXF=	BIT2	; NON-EXECUTABLE FUNCTION
1152	000010	DRPAR=	BIT3	; DRIVE DETECTED SERCON PARITY ERROR
1153	000020	FMTE=	BIT4	; FORMAT ERROR
1154	000040	DTYPE=	BIT5	; DRIVE TYPE ERROR
1155	000100	ECH=	BIT6	; ECC HARD
1156	000200	BSE=	BIT7	; BAD SECTOR ERROR
1157	000400	HVRC=	BIT8	; HEADER VRC ERROR
1158	001000	COE=	BIT9	; CYLINDER ADDRESS OVERFLOW ERROR
1159	002000	IDAE=	BIT10	; INVALID DISK ADDRESS ERROR: HEAD/CYL
1160	004000	WLE=	BIT11	; WRITE LOCK ERROR
1161	010000	DTE=	BIT12	; DRIVE TIMING ERROR
1162	020000	OPI=	BIT13	; OPERATION (SEARCH) INCOMPLETE
1163	040000	UNS=	BIT14	; DRIVE UNSAFE
1164	100000	DCK=	BIT15	; DATA CHECK
1165				
1166		.SBTTL	STATUS REGISTER BIT DEFINITION (RKDS:12)	
1167				
1168	000001	DRA=	BIT0	; DRIVE AVAILABLE (CONTROLLER IS SET IF THIS BIT IS RESET)
1169				
1170	000004	OFST=	BIT2	; DRIVE OFFSET
1171	000010	ACLO=	BIT3	; AC LOW
1172	000020	DCLO=	BIT4	; DC LOW
1173	000040	DROT=	BIT5	; DRIVE OFF TRACK
1174	000100	VV=	BIT6	; VOLUME VALID
1175	000200	DRDY=	BIT7	; DRIVE READY
1176	000400	DDT=	BIT8	; DRIVE TYPE (0=RK06)
1177	004000	WRL=	BIT11	; WRITE LOCK
1178	020000	PIP=	BIT13	; POSITIONING IN PROGRESS
1179	040000	DSC=	BIT14	; DRIVE STATUS CHANGE
1180	100000	SVAL=	BIT15	; STATUS VALID
1181				
1182		.SBTTL	MAINTENANCE REGISTER 1 BIT DEFINITION (RKMR1:22)	
1183				
1184	000017	MESMSK=	17	; MESSAGE MASK
1185	000020	PAT=	BIT4	; FORCE EVEN PARITY ON SERCON MESSAGE LINES
1186	000040	DMD=	BIT5	; DIAGNOSTIC MODE
1187	000100	MSP=	BIT6	; MAINTENANCE SECTOR PULSE
1188	000200	MIND=	BIT7	; MAINTENANCE INDEX
1189	000400	MCLK=	BIT8	; MAINTENANCE CLOCK
1190	001000	MERD=	BIT9	; MAINTENANCE ENCODED READ DATA
1191	002000	MEWD=	BIT10	; MAINTENANCE ENCODED WRITE DATA

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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MAINTENANCE REGISTER 1 BIT DEFINITION (RKMR1:22)

SEQ 0023

1192	004000	PCA= BIT11	;PRECOMPENSATION ADVANCE
1193	010000	PCD= BIT12	;PRECOMPENSATION DELAY
1194	020000	ECCW= BIT13	;ECC WORD IS BEING READ OR WRITTEN
1195	040000	WRTGAT= BIT14	;WRITE GATE
1196	100000	RDGATE= BIT15	;READ GATE
1197			
1198		.SBTTL	DEFINITION OF DRIVE STATUS BYTE 00 MESSAGE A (RKMR2:34)
1199			
1200	000040	D.DRA= BIT5	;DRIVE AVAILABLE
1201	000100	D.VV= BIT6	;VOLUME VALID
1202	000200	D.DRDY= BIT7	;DRIVE READY
1203	000400	D.DDT= BIT8	;DRIVE TYPE (0=RK06)
1204	001000	D.FORM= BIT9	;DRIVE FORMAT
1205	002000	D.OFF= BIT10	;OFFSET ON
1206	004000	D.WRL= BIT11	;WRITE LOCK
1207	010000	D.SPIN= BIT12	;SPINDLE ON
1208	020000	D.PIP= BIT13	;POSITIONING IN PROGRESS
1209	040000	D.DSC= BIT14	;DRIVE STATUS CHANGE
1210			
1211		.SBTTL	DEFINITION OF DRIVE STATUS BYTE 01 MESSAGE A (RKMR2:34)
1212			
1213	000020	D.SSP= BIT4	;SERVO SIG PRESENT
1214	000040	D.HOHM= BIT5	;HEADS HOME
1215	000100	D.BRHM= BIT6	;BRUSHES HOME
1216	000200	D.DOOR= BIT7	;DOOR INTERLOCKED
1217	000400	D.CART= BIT8	;CARTRIDGE INTERLOCK
1218	001000	D.SPOK= BIT9	;SPEED OK
1219	002000	D.FWD= BIT10	;FORWARD
1220	004000	D.REV= BIT11	;REVERSE
1221	010000	D.LOAD= BIT12	;HEADS LOADING
1222	020000	D.RTZ= BIT13	;RETURN TO ZERO
1223	040000	D.UNLD= BIT14	;HEADS UNLOADING
1224			
1225		.SBTTL	DEFINITION OF DRIVE STATUS BYTE 00 MESSAGE B (RKMR3:36)
1226			
1227	000040	D.IDAE= BIT5	;INVALID DISK ADDRESS ERROR:HEAD/CYL
1228	000100	D.ACLO= BIT6	;AC LOW
1229	000200	D.FLT= BIT7	;DRIVE FAULT
1230	000400	D.NXF= BIT8	;NON-EXECUTABLE FUNCTION CODE
1231	001000	D.PAR= BIT9	;DRIVE DETECTED SERCON PARITY ERROR
1232	002000	D.SKI= BIT10	;SEEK INCOMPLETE
1233	004000	D.WLE= BIT11	;WRITE LOCK ERROR
1234	010000	D.SPLS= BIT12	;SPEED LOSS
1235	020000	D.DROT= BIT13	;DRIVE OFF TRACK
1236	040000	D.UNS= BIT14	;R/W UNSAFE
1237			
1238		.SBTTL	DEFINITION OF DRIVE STATUS BYTE 01 MESSAGE B (RKMR3:36)
1239			
1240	000020	D.SECT= BIT4	;SECTOR ERROR
1241	000040	D.WCUR= BIT5	;WRITE CURRENT AND NO WRITE GATE
1242	000100	D.WGAT= BIT6	;WRITE GATE AND NO TRANSISTIONS
1243	000200	D.HDFL= BIT7	;HEAD FAULT
1244	000400	D.MHD= BIT8	;MULTIPLE HEAD SELECT
1245	001000	D.XERR= BIT9	;INDEX ERROR
1246	002000	D.TIB= BIT10	;TRIBIT ERROR
1247	004000	D.PLO= BIT11	;PLO ERROR

M02

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

SEQ 0024

1248	C10000	D.NMOV= BIT12	;SEEK AND NO MOTION
1249	020000	D.LIMO= BIT13	;LIMIT DETECT ON SEEK
1250	C40000	D.SUNS= BIT14	;SERVO UNSAFE
1251		.SBTTL COMMON MASKS AND OTHER BITS: MESSAGE A (RKMR2:34)	
1252			
1253			
1254	000007	M.DPV= 7	;DRIVE CODE, ALL BYTES
1255	017760	M.COIF= 17760	;CYLINDER DIFF, BYTE 10
1256	017760	M.OFST= 17760	;OFFSET VALUE, BYTE 10
1257	077770	M.SER= 77770	;DRIVE SERIAL #, BYTE 11
1258			
1259		.SBTTL COMMON MASKS AND OTHER BITS: MESSAGE B (RKMR3:36)	
1260			
1261	000003	M.ID= 3	;BYTE 10, ALL BYTES
1262	017760	M.CADD= 17760	;CYLINDER ADDRESS, BYTE 10
1263	040000	M.ALGN= BIT14	;ALIGN SIGN, BYTE 10
1264	000760	M.SECT= 760	;SECTOR COUNT, BYTE 11
1265	007000	M.HEAD= 7000	;HEAD DECODE, BYTE 11
1266	100000	M.PAR= BIT15	;PARITY, MESS A/B. ALL BYTES

N02

```

1267
1268
1269
1270      000000
1271
1272
1273
1274      000174
1275      000174 000000
1276      000176 000000
1277
1278      000200 000137 010060
1279      000220 000220
1280      000220 000137 010050
1281
1282      000240 000240
1283      000240 000137 055342
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1289      000244
1290      000046 000046
1291      000046 024030
1292      000052 000052
1293      000052 120000
1294      000244
1295      001000
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1301      001000
1302      000024 000024
1303      000024 000200
1304      000044 000044
1305      000044 001000
1306      001000
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1310
1311      001000
1312      001000 000000
1313      001002 001210
1314      001004 000454
1315      001006 001130
1316      001010 001130
1317      001012 000052
1318
1319
1320
1321
1322

.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
      .=220
      JMP PARSRT      ;INPUT ALL PARAMETERS & START TESTING
      .=240
      JMP 0.0DT        ;ENTER 00T11

.SBTTL ACT11 HOOKS
      ;*****
      ;HOOKS REQUIRED BY ACT11
      $SVPC=.          ;SAVE PC
      .=46
      $ENDAD           ;;1)SET LOC.46 TO ADDRESS OF $ENDAD IN .SEOP
      .=52
      .WORD 120000      ;;2)SET LOC.52 TO 120000
      .=$SVPC          ;; RESTORE PC
      .=1000
.SBTTL APT PARAMETER BLOCK
      ;*****
      ;SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
      ;*****
      .SX=.            ;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.
      $MADR:  .WORD $MAIL   ;ADDRESS OF APT MAILBOX (BITS 0-15)
      $STM:   .WORD 300.    ;RUN TIM OF LONGEST TEST
      $PSTM:  .WORD 600.    ;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
      $UNITM: .WORD 600.    ;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
      .WORD   SETEND-$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)

      .LIST MD
;

```

B03

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APT PARAMETER BLOCK

SEQ 0026

;USE LOOP X TO OMIT SUBCLR

```

;MACRO LOOP A
;SCOPI
;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 SEE 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.DROY!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 INFO INTO 'CYLADD'
;I=T.B3 TO READ MSG B3 & PUT INFO INTO 'SECTOR' & 'HEAD'

;USE F=<ERROR DESCRIPTION>

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

```

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

```

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

;MACRO CWD2 A,B,C,'D','E

```

;TST CYLDIF ;SEE IF MSG A2=0

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C03

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APT PARAMETER BLOCK

SEQ 0027

```

1379      BEQ      D      ;BR IF YES
1380      ERROR    A      ;MSG A2 NOT CLEARED C
1381      D:      TST     CYLADD ;SEE IF MSG B2=0
1382      BEQ      E      ;BR IF YES
1383      ERROR    B      ;MSG B2 NOT CLEARED C
1384      E:
1385      .ENDM     CMD2
1386
1387      .MACRO    DRCLR   ?A
1388
1389      MOV      #CCLR,RKCS1(R5)
1390      MOV      $UNIT,RKCS2(R5) ;DRIVE#
1391      MOV      #CLEAR,RKCS1(R5) ;DRIVE CLEAR CMD
1392      MOV      T10,TEMP1 ;SETUP TIMEOUT
1393      JSR      PC,FRDY ;FIND RDY
1394      ERROR    151 ;NO RDY AFTER DRIVE CLEAR CMD
1395      JSR      PC,TSTATN ;TEST FOR ATTN
1396      BR      A
1397      ERROR    154 ;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
1398      A:
1399
1400      .ENDM     DRCLR
1401
1402      .MACRO    CALIB   ?A
1403
1404      MOV      #CCLR,RKCS1(R5)
1405      MOV      $UNIT,RKCS2(R5)
1406      MOV      #RECAL,RKCS1(R5) ;RECAL CMD
1407      ;RESET CYL DIFF/OFFSET & CYL ADDR REG
1408      ;IN RKMR2 & RKMR3 RESP.
1409      MOV      T10,TEMP1 ;SETUP TIMEOUT
1410      JSR      PC,FRDY ;FIND RDY
1411      ERROR    124 ;RDY NOT SET AFTER RECAL CMD
1412
1413      MOV      #1,RKMR1(R5) ;SELECT WORD 1
1414      JSR      PC,GSTAT
1415      BIT      #D.RTZ,HMR2
1416      BNE     A
1417      ERROR    214 ;RTZ NOT SET DURING RECAL CMD
1418      A:      MOV      T10,TEMP2 ;SETUP TIMEOUT
1419      JSR      PC,FATT1 ;FIND ATTN
1420      ERROR    55 ;NO ATTN AFTER RECAL CMD
1421      DRCLR
1422
1423      .ENDM     CALIB
1424
1425      ;
1426      ; A=WRHEAD/(CFMT!WRHEAD)
1427      ; USE WRHDR <A>,X TO OMIT CHECKING A0, B0, A1, B1
1428      ;
1429      .MACRO    WRHDR   A,C,?D
1430
1431      MOV      #<A>,RKCS1(R5) ;WRITE HEADER CMD
1432      MOV      T5000,TEMP1 ;SETUP TIMEOUT
1433      JSR      PC,FRDY ;FIND RDY
1434

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1435          ERROR 200          ;NO RDY AFTER WRITE HEADER CMD
1436          JSR    PC_GSTAT      ;GET FRESH STATUS
1437          BIT     #CERR,HCS1
1438          BEQ     0
1439          ERROR 201          ;CERR AFTER WRITE HEADER CMD
1440
D:
1441      .IF B      C
1442          F.EAB  0
1443          CHECK  215,216,217,220,<AFTER WRITE HEADER CMD>,0,0,0
1444      .ENDC
1445
1446      .ENDM      WRHDR
1447
1448      ;
1449      ; A=RDHEAD/<CFMT!RDHEAD>
1450      ; USE RDHDR <A>,X TO OMIT CHECKING A0, B0, A1, B1
1451      ;
1452      .MACRO      RDHDR      A,C,'D','E'
1453
1454          MOV     #RHTAB RD
1455          MOV     #<A>,RKCS1(R5) ;READ HEADER CMD
1456          MOV     T50000,TEMP1 ;SETUP TIMEOUT
1457          JSR     PC_FRDY        ;FIND RDY
1458          ERROR 171          ;NO RDY AFTER READ HEADER CMD
1459          BIT     #CERR,HCS1
1460          BEQ     0
1461          ERROR 174          ;CERR AFTER READ HEADER CMD
1462          TYPE    MSG26        ;ABORTING DATA TESTS TO DO TIMING TESTS
1463          JMP     TIMING
1464
D:
1465      MOV     RKDB(R5),(R0)+ ;1'ST WORD FROM SILO TO RHTAB
1466      MOV     RKDB(R5),(R0)+ ;2'ND WORD
1467      MOV     RKDB(R5),(R0)+ ;3'RD WORD
1468
1469
1470          BIT     #DLT,RKCS2(R5)
1471          BEQ     E
1472          JSR     PC_GSTAT
1473          ERROR 173          ;DLT AFTER READ HEADER CMD
1474
E:
1475      .IF      B      C
1476          NOP
1477      .ENDC
1478
1479      .ENDM      RDHDR
1480
1481
1482      .MACRO      HDCHK3      'A'
1483
1484          RDHDR      RDHEAD,X
1485          CMP     RHTAB,↑CYL ;CHECK WORD 0 ONLY, CYL#
1486          BEQ     A          ;BR IF SAME
1487          ERROR 51          ;WRONG CYL# ON HEADER
1488
A:
1489
1490      .ENDM      HDCHK3

```

E03

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APT PARAMETER BLOCK

SEQ 0029

; A=Y0CYL/FRCYL , B=HEAD#, C = 0 FOR 22 SECTOR, 1 FOR 20 SECTOR

.MACRO HDTBL A,B,C

MOV A,CALADD ; SETUP
MOV #B,HEAD ; TO FILL
MOV #C,FORMAT ; HEADER
JSR PC,FHDTAB ; TABLE

.ENDM HDTBL

; QUICK SEEK. ENTER WITH CYL# IN RKDC

.MACRO QKSEEK ?A

MOV #SEEK,RKCS1(R5) ; SEEK CMD
MOV T50,TEMP1 ; SETUP TIMEOUT
JSR PC,FRDY ; FIND RDY
ERROR 131 ; NO RDY AFTER SEEK CMD

MOV T50000,TEMP1 ; SETUP TIMEOUT
JSR PC,FAT2 ; FIND ATTN
ERROR 132 ; NO ATTN AFTER SEEK CMD

BIT #CERR,HCS1
BEQ A
ERROR 210 ; CERR AFTER SEEK CMD

A:

.ENDM QKSEEK

; A=WRDATA/<CFMT!WRDATA>

; C=ADDR TO JMP TO ATTEMPT TO WRITE ON ANOTHER SECTOR

; D=ADDR TO JMP TO BYPASS TEST

; E: IF BLANK WILL CHECK A0, B0, A1 & B1 AT THE END OF WRITING

; E: IF NON BLANK WILL OMIT CHECKING A0 THRU B1

.MACRO WDATA A,C,D,E,?F,?G,?H,?I

MOV #<A>,RKCS1(R5) ; WRITE DATA CMD
MOV T50000,TEMP1 ; SETUP TIMEOUT
JSR PC,FRDY ; FIND RDY
ERROR 11 ; NO RDY AFTER WRITE DATA CMD

JSR PC,GSTAT ; GET FRESH STATUS

BIT #CERR,HCS1
BEQ I ; BR IF NO ERRORS

BIT #BSE,HER ; SEE IF BAD SECTOR FLAG
BEQ G ; BR IF NO

F03

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APT PARAMETER BLOCK

SEQ 0030

```

1547          JSR      PC,TRUERR      ;ELSE SEE IF SECTOR LISTED IN BSE TABLE
1548          BR       H               ;RETURN HERE IF NO
1549
1550          INC       SECTOR          ;RETURN HERE IF YES
1551          CMP       SECTOR,#10.     ;ARE 10 CONSEC. SECTORS BAD
1552          BNE       F               ;BR IF NO
1553          ERROR     40              ;ABORTING TEST DETECTED 10 BAD SECTORS
1554          JMP       D               ;BYPASS TEST
1555
1556 F:          MOV     #CCLR,RKCS1(R5) ;TRY ANOTHER SECTOR
1557          JMP       C
1558
1559 G:          ERROR     12              ;CERR WITH WRITE DATA CMD
1560          F.EAB      0
1561          CHECK      52,23,53,25,<AFTER WRITE DATA CMD>,T.A2,T.B2,0
1562          TYPE       MSG72          ;ABORTING BALANCE OF TESTS
1563          JMP       $EOP
1564 H:          ERROR     47              ;BAD SECTOR NOT LISTED IN TABLE
1565 I:
1566 .IF        B        E
1567          F.EAB      0
1568          CHECK      52,23,53,25,<AFTER WRITE DATA CMD>,T.A2,T.B2,0
1569 .ENDC
1570 .ENDM      WDATA
1571
1572
1573 ;A=RDDATA/<CFMT!RDDATA>
1574 ;USE RDATA   <A>,X TO OMIT CKWD12
1575 ;
1576
1577 .MACRO      RDATA   A,C,'D','E','F','G','H
1578
1579          MOV     #<A>,RKCS1(R5)    ;READ DATA CMD
1580          MOV     T50000,TEMP1      ;SETUP TIMEOUT
1581          JSR     PC,FRDY           ;FIND RDY
1582          ERROR   13                ;NO RDY AFTER READ DATA CMD
1583          JSR     PC,GSTAT          ;GET FRESH STATUS
1584          BIT     #CERR,HCS1
1585          BEQ     G
1586          BIT     #BSE,HER          ;SEE IF BAD SECTOR
1587          BEQ     E
1588          ERROR   50                ;DETECTED BSE IN READ BUT NOT IN WRITE CMD.
1589          BR      H
1590          TYPE     MSG72            ;ABORTING BALANCE OF TESTS
1591          JMP     $EOP
1592
1593 E:          BIT     #DCK,HER        ;SEE IF DATA CHECK ERROR
1594          BEQ     F
1595          ERROR   21                ;DATA CHECK ERROR AFTER READ CMD (ECC)
1596          BR      H
1597
1598 F:          ERROR   14              ;CERR AFTER READ DATA CMD.
1599
1600 H:          F.EAB      0
1601          CHECK      54,26,56,30,<AFTER READ DATA CMD>,T.A2,T.B2,0
1602

```

G03

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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APT PARAMETER BLOCK

SEQ 0031

```

1603          BR      D
1604
1605 G:
1606 .IF      B      C
1607         F.EAB  0
1608         CHECK  54,26,56,30,<AFTER READ DATA CMD>,T.A2,T.B2,0
1609 .ENDC
1610 .ENDM      RDATA
1611
1612
1613 ;
1614 ;A=WRCHK/<CFMT!WRCHK>
1615 ;C=16 FOR STD ERROR MSG
1616 ;C=134/135/136/137 FOR ERROR MSG USED IN 'SBOUND' ROUTINE
1617 ;USE WRCHK      <A>,C X TO OMIT CKWD12
1618 ;
1619
1620 .MACRO  WRCHK  A,C,D,?E,?F
1621
1622         MOV      #<A>,RKCS1(R5) ;WRITE CHECK CMD
1623         MOV      T5000,TEMP1 ;SETUP TIMEOUT
1624         JSR      PC,FRDY ;FIND RDY
1625         ERROR    15 ;NO RDY AFTER WRITE CHECK CMD
1626         JSR      PC,GSTAT ;GET FRESH STATUS
1627         BIT      #CERR,HCS1
1628         BEQ      F
1629         BIT      #WCE,HCS2 ;SEE IF WRITE CHECK ERROR
1630         BEQ      E
1631         MOV      RKDB(R5),WD1 ;ACTUAL WORD FOR PRINTOUT
1632         ERROR    C ;WCE AFTER WRITE CMD
1633         BR      F
1634
1635 E:      ERROR    22 ;CERR AFTER WRITE CHECK CMD
1636         F.EAB  0
1637         CHECK  57,31,60,32,<AFTER WRITE CHECK CMD>,T.A2,T.B2,0
1638         TYPE    MSG72 ;ABORTING BALANCE OF TESTS
1639         JMP      ENDRV
1640
1641 F:
1642 .IF      B      D
1643         F.EAB  0
1644         CHECK  57,31,60,32,<AFTER WRITE CHECK CMD>,T.A2,T.B2,0
1645 .ENDC
1646 .ENDM      WRCHK
1647
1648 ;
1649 ;MACRO TO TEST THAT WRITE CHECK OCCURRED AT SECTOR BOUNDARY
1650 ;A&B=134,135 FOR WRITE PROTECT SW TEST
1651 ;A&B=136,137 FOR AC LOW TEST PART 2
1652 ;C=JUMP ADDR TO REPEAT TEST
1653 ;
1654 .MACRO  SBOUND  A,B,C,?D,?E,?F,?G,?H,?I,?J,?K
1655
1656         JSR      PC,SUBCLR
1657         ERROR    24 ;CERR AFTER SCLR
1658

```

H03

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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APT PARAMETER BLOCK

SEQ 0032

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1659          TST      STMP2          ;SEE IF TRK/SECTOR 0
1660          BEQ      K              ;REPEAT,NO NEW DATA XFER TOOK PLACE
1661          CMP      STMP2,#1023     ;SEE IF TRK 2,SECTOR 19
1662          BEQ      K              ;REPEAT,NO OLD DATA TO CHECK AGAINST
1663          BIT      #BIT0,STMP1
1664          BNE      D              ;BR IF WRITING 1'S WHEN WLE OCCURRED
1665          MOV      #DATA1,RKBA(R5) ;WRITING 0'S:WLE SECTOR SHOULD HAVE ALL 1'S
1666          BR      E
1667
1668          K:      JMP      C
1669
1670          D:      MOV      #DATA0,RKBA(R5) ;WRITING 1'S:WLE SECTOR SHOULD HAVE ALL 0'S
1671          E:      BIS      #BA1,RKCS2(R5)
1672          MOV      #-256,RKWC(R5)
1673          MOV      STMP3,RKDA(R5) ;REFRESH RKDA
1674          MOV      @RKBA(R5),WD2 ;EXPECTED WORD FOR TRUERR TYPEOUT
1675          MOV      TOCYL,RKDC(R5)
1676          WRCHK    WRTCHK,A,X
1677          NOP
1678          NOP
1679
1680          CMP      STMP2,#400        ;SEE IF WRL AT TRK 1, SECTOR 0
1681          BNE      F              ;BR IF NO
1682          MOV      #21.,RKDA(R5)    ;ELSE SECTOR BEFORE WRL IS TRK 0, SEC 21
1683          BR      H
1684          F:      CMP      STMP2,#1000 ;SEE IF WRL AT TRK 2,SECTOR 0
1685          BNE      G              ;BR IF NO
1686          MOV      #425,RKDA(R5)    ;ELSE SECTOR BEFORE WRL IS TRK 1, SEC 21
1687          BR      H
1688
1689          G:      DEC      STMP2      ;GET SECTOR BEFORE WRL
1690          MOV      STMP2,RKDA(R5)
1691          H:      MOV      RKDA(R5),STMP3 ;FOR ERROR PRINTOUT
1692          BIT      #BIT0,STMP1
1693          BNE      I              ;BR IF WRITING 1'S WHEN WLE OCCURRED
1694          MOV      #DATA0,RKBA(R5) ;WRITING 0'S:WLE SECTOR -1 SHOULD HAVE ALL 0'S
1695          BR      J
1696
1697          I:      MOV      #DATA1,RKBA(R5) ;WRITING 1'S:WLE SECTOR -1 SHOULD HAVE ALL 1'S
1698          J:      BIS      #BA1,RKCS2(R5)
1699          MOV      #-256,RKWC(R5)
1700          MOV      @RKBA(R5),WD2 ;EXPECTED WORD FOR TRUERR TYPEOUT
1701          MOV      TOCYL,RKDC(R5)
1702          WRCHK    WRTCHK,B,X
1703
1704          .ENDM    SBOUND
1705
1706          ;
1707          ;QUICK START SPINDLE
1708          ;
1709          .MACRO   QKSRT    ?A
1710
1711          JSR      PC,SUBCLR
1712          ERROR    24          ;CERR AFTER SCLR
1713
1714          BIT      #D.SPIN,HMR2 ;SEE IF SPINDLE ALREADY ON

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1715      BNE      A          ;BR IF YES
1716      TYPE     ,MSG29      ;PLEASE WAIT, HEADS BEING LOADED
1717
1718      MOV      #SRTSPL,RKCS1(R5) ;START SPINDLE CMD
1719      MOV      T10,TEMP1
1720      JSR      PC,FRDY        ;FIND CONTR RDY
1721      ERROR     143          ;CONTR RDY NOT SET AFTER CMD
1722
1723      MOV      T100,TEMP2
1724      JSR      PC,FATT1       ;FIND ATTN
1725      ERROR     144          ;NO ATTN AFTER CMD
1726
1727      CLR      UNLD
1728
1729      A:
1730      .ENDM      QKSRT
1731
1732      ;ROUTINE TO ISSUE PACK COMMAND
1733      ;
1734      .MACRO      QKPACK      ?A
1735      MOV      #CCLR,RKCS1(R5)
1736      MOV      $UNIT,RKCS2(R5) ;DRIVE #
1737      MOV      #PACK,RKCS1(R5) ;PACK CMD
1738      MOV      T10,TEMP1
1739      JSR      PC,FRDY        ;FIND CONTR RDY
1740      ERROR     116          ;CONTR NOT RDY
1741
1742      BIT      #D.VV,HMR2
1743      BNE      A
1744      ERROR     27          ;VOLUME VALID NOT SET AFTER PACK CMD
1745
1746      A:
1747      .ENDM      QKPACK
1748
1749      ;QUICK UNLOAD
1750      ;
1751      .MACRO      QKUNLD
1752
1753      JSR      PC,SUBCLR
1754      ERROR     24          ;CERR AFTER SCLR
1755
1756      MOV      #UNLOAD,RKCS1(R5) ;UNLOAD CMD
1757      MOV      T10,TEMP1
1758      JSR      PC,FRDY        ;FIND CONTR RDY
1759      ERROR     17          ;NO RDY AFTER UNLD CMD
1760      JSR      PC,TSTATN
1761      ERROR     20          ;NO ATTN AFTER UNLOAD CMD
1762
1763      .ENDM      QKUNLD
1764
1765      .NLIST      MD
1766
1767
1768

```

1769
1770
1771
1772
1773
1774
1775 001100
1776 001100
1777 001100 000000
1778 001102 000
1779 001103 000
1780 001104 000000
1781 001106 000000
1782 001110 000000
1783 001112 000000
1784 001114 000
1785 001115 001
1786 001116 000000
1787 001120 000000
1788 001122 000000
1789 001124 000000
1790 001126 000000
1791 001130 000000
1792 001132 000000
1793 001134 000
1794 001135 000
1795 001136 000000
1796 001140 177570
1797 001142 177570
1798 001144 177560
1799 001146 177562
1800 001150 177564
1801 001152 177566
1802 001154 000
1803 001155 002
1804 001156 012
1805 001157 000
1806 001160 000000
1807 001162 000000
1808 001164 000000
1809 001166 000000
1810 001170 000000
1811 001172 000000
1812 001174 000000
1813 001176 000000
1814 001200 177607 000377
1815 001204 077
1816 001205 015
1817 001206 000012
1818
1819
1820
1821
1822
1823 001210
1824 001210 000000

.SBTTL COMMON TAGS

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

.=1100

SCMTAG: .WORD 0
STSTNM: .BYTE 0
SERFLG: .BYTE 0
SICNT: .WORD 0
SLPADR: .WORD 0
SLPERR: .WORD 0
SERTTL: .WORD 0
SITEMB: .BYTE 0
SERMAX: .BYTE 1
SERRPC: .WORD 0
SGDADR: .WORD 0
SBDADR: .WORD 0
SGDAT: .WORD 0
SBDAT: .WORD 0
SAUTOB: .BYTE 0
SINTAG: .BYTE 0
SWR: .WORD 0
DISPLAY: .WORD 0
\$TKS: 177560
\$TKB: 177562
\$TPS: 177564
\$TPB: 177566
\$NULL: .BYTE 0
\$FILLS: .BYTE 2
\$FILLC: .BYTE 12
\$STPFLG: .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>

;;START OF COMMON TAGS

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

K03

SEQ 0035

1825	001212	000000	\$FATAL: .WORD	AFATAL	:: FATAL ERROR NUMBER
1826	001214	000000	\$TESTN: .WORD	ATESTN	:: TEST NUMBER
1827	001216	000000	\$PASS: .WORD	APASS	:: PASS COUNT
1828	001220	000000	\$DEVCT: .WORD	ADEVCT	:: DEVICE COUNT
1829	001222	000000	\$UNIT: .WORD	AUNIT	:: I/O UNIT NUMBER
1830	001224	000000	\$MSGAD: .WORD	AMSGAD	:: MESSAGE ADDRESS
1831	001226	000000	\$MSGLG: .WORD	AMSGLG	:: MESSAGE LENGTH
1832	001230		\$ETABLE: .WORD		:: APT ENVIRONMENT TABLE
1833	001230	000	\$ENV: .BYTE	AENV	:: ENVIRONMENT BYTE
1834	001231	000	\$ENVM: .BYTE	AENVM	:: ENVIRONMENT MODE BITS
1835	001232	000000	\$SWREG: .WORD	ASWREG	:: APT SWITCH REGISTER
1836	001234	000000	\$USWR: .WORD	AUSWR	:: USER SWITCHES
1837	001236	000000	\$CPUOP: .WORD	ACPUOP	:: CPU TYPE, OPTIONS
1838			*		BITS 15-11=CPU TYPE
1839			*		11/04=01, 11/05=02, 11/20=03, 11/40=04, 11/45=05
1840			*		11/70=06, PDQ=07, Q=10
1841			*		BIT 10=REAL TIME CLOCK
1842			*		BIT 9=FLOATING POINT PROCESSOR
1843			*		BIT 8=MEMORY MANAGEMENT
1844	001240	000	\$MAMS1: .BYTE	AMAMS1	:: HIGH ADDRESS, M.S. BYTE
1845	001241	000	\$MTYP1: .BYTE	AMTYP1	:: MEM. TYPE, BLK#1
1846			*		MEM. TYPE BYTE -- (HIGH BYTE)
1847			*		900 NSEC CORE=001
1848			*		300 NSEC BIPOLAR=002
1849			*		500 NSEC MOS=003
1850	001242	000000	\$MAOR1: .WORD	AMAOR1	:: HIGH ADDRESS, BLK#1
1851			*		MEM. LAST ADDR.=3 BYTES, THIS WORD AND LOW OF "TYPE" ABOVE
1852	001244	000	\$MAMS2: .BYTE	AMAMS2	:: HIGH ADDRESS, M.S. BYTE
1853	001245	000	\$MTYP2: .BYTE	AMTYP2	:: MEM. TYPE, BLK#2
1854	001246	000000	\$MAOR2: .WORD	AMAOR2	:: MEM. LAST ADDRESS, BLK#2
1855	001250	000	\$MAMS3: .BYTE	AMAMS3	:: HIGH ADDRESS, M.S. BYTE
1856	001251	000	\$MTYP3: .BYTE	AMTYP3	:: MEM. TYPE, BLK#3
1857	001252	000000	\$MAOR3: .WORD	AMAOR3	:: MEM. LAST ADDRESS, BLK#3
1858	001254	000	\$MAMS4: .BYTE	AMAMS4	:: HIGH ADDRESS, M.S. BYTE
1859	001255	000	\$MTYP4: .BYTE	AMTYP4	:: MEM. TYPE, BLK#4
1860	001256	000000	\$MAOR4: .WORD	AMAOR4	:: MEM. LAST ADDRESS, BLK#4
1861	001260	000000	\$VECT1: .WORD	AVECT1	:: INTERRUPT VECTOR#1, BUS PRIORITY#1
1862	001262	000000	\$VECT2: .WORD	AVECT2	:: INTERRUPT VECTOR#2, BUS PRIORITY#2
1863	001264	177440	\$BASE: .WORD	ABASE	:: BASE ADDRESS OF EQUIPMENT UNDER TEST
1864	001266	000000	\$DEVN: .WORD	ADEVN	:: DEVICE N#P
1865	001270	000000	\$CDW1: .WORD	ACDW1	:: CONTROLLER DESCRIPTION WORD#1
1866	001272	000000	\$CDW2: .WORD	ACDW2	:: CONTROLLER DESCRIPTION WORD#2
1867	001274	000000	\$DDW0: .WORD	ADDW0	:: DEVICE DESCRIPTOR WORD#0
1868	001276	000000	\$DDW1: .WORD	ADDW1	:: DEVICE DESCRIPTOR WORD#1
1869	001300	000000	\$DDW2: .WORD	ADDW2	:: DEVICE DESCRIPTOR WORD#2
1870	001302	000000	\$DDW3: .WORD	ADDW3	:: DEVICE DESCRIPTOR WORD#3
1871	001304	000000	\$DDW4: .WORD	ADDW4	:: DEVICE DESCRIPTOR WORD#4
1872	001306	000000	\$DDW5: .WORD	ADDW5	:: DEVICE DESCRIPTOR WORD#5
1873	001310	000000	\$DDW6: .WORD	ADDW6	:: DEVICE DESCRIPTOR WORD#6
1874	001312	000000	\$DDW7: .WORD	ADDW7	:: DEVICE DESCRIPTOR WORD#7
1875	001314	000000	\$DDW8: .WORD	ADDW8	:: DEVICE DESCRIPTOR WORD#8
1876	001316	000000	\$DDW9: .WORD	ADDW9	:: DEVICE DESCRIPTOR WORD#9
1877	001320	000000	\$DDW10: .WORD	ADDW10	:: DEVICE DESCRIPTOR WORD#10
1878	001322	000000	\$DDW11: .WORD	ADDW11	:: DEVICE DESCRIPTOR WORD#11
1879	001324	000000	\$DDW12: .WORD	ADDW12	:: DEVICE DESCRIPTOR WORD#12
1880	001326	000000	\$DDW13: .WORD	ADDW13	:: DEVICE DESCRIPTOR WORD#13

1881	001330	000000	\$DDW14: .WORD	ADDW14	:::DEVICE DESCRIPTOR WORD#14
1882	001332	000000	\$DDW15: .WORD	ADDW15	:::DEVICE DESCRIPTOR WORD#15
1883					
1884					
1885	001334		SETEND:		
1886					
1887		177440	ABASE=	177440	;DEFAULT BUSS ADDRESS
1888	001334	000210	RKVEC:	210	;DEFAULT CONTROLLER INTERRUPT VECTOR
1889	001336	000240	RKPRI:	PRS	;PRIORITY
1890	001340	172540	PKS:	172540	;P-CLOCK STATUS REG
1891	001342	172542	PKSB:	172542	;P-CLOCK SET BUFFER
1892	001344	172544	PKRB:	172544	;P-CLOCK READ BUFFER
1893	001346	177546	LKS:	177546	;L-CLOCK STATUS REG.
1894					
1895	001350	000100	LCVEC:	100	;L-CLOCK INTERRUPT VECTOR
1896	001352	000104	PCVEC:	104	;P-CLOCK INTERRUPT VECTOR.
1897					
1898		000114	MEMVEC=	114	;MEMORY PARITY VECTOR
1899		172100	MEMBAS=	172100	;MEMORY PARITY OPTION CSR START ADDR
1900					
1901	001354	000000	TRAPPC:	0	;PC FOR MEMORY PARITY ERROR TRAP
1902					
1903	001356	000000	PARAM:	0	;1 FOR 220 START, NO DEFAULT
1904	001360	000000	FTITLE:	0	;FLAG FOR PRINTING OUT 1ST PROGRAM TITLE
1905					
1906	001362	000000	DRVPTR:	0	;CONTAINS THE POINTER TO THE DRIVE FLAG
1907					; (DRIVO-DRIV7) OF THE DRIVE TO BE CHECKED NEXT.
1908					
1909		000040	SPBAR=	40	;SPACE BAR
1910	001364	000000	FRCYL:	0	;FROM CYLINDER
1911	001366	000000	TOCYL:	0	;TO CYLINDER
1912	001370	000000	CCYL:	0	;CURRENT CYL, USED IN N SQUARE TEST
1913	001372	000000	PCYL:	0	;PREV CYL, USED IN N SQUARE TEST
1914	001374	000000	CALDIF:	0	;CALC CYL DIFF USED IN N SQUARE TEST
1915	001376	000000	CYLDIF:	0	;CYL DIFF, RIGHT JUSTIFIED FROM RKMR3
1916	001400	000000	CYLFJD:	0	;CYL ADDR, RIGHT JUSTIFIED FROM RKMR3
1917	001402	000000	CALADD:	0	;CYL ADDR USED IN FHD0AB ROUTINE
1918					
1919	001404	000074	HZ:	60.	;60 FOR 60 CPS
1920					;50 FOR 50 CPS
1921	001406	000000	COUNT:	0	;LOADED TO 50 OR 60 TO COUNT TO 1 SEC
1922					;OR ANY OTHER NUMBER TO COUNT OFF FRACTIONAL SECOND
1923	001410	000000	SEC:	0	;SECOND COUNTER
1924	001412	000000	TIMUP:	0	;FLAG TO INDICATE TIME IS UP
1925	001414	000000	SECNT:	0	;SECTOR COUNT
1926	001416	000000	PSEC:	0	;PREVIOUS SECTOR
1927	001420	000000	ESEC:	0	;EXPECTED SECTOR
1928	001422	000000	SECTOR:	0	;SECTOR COUNT, RIGHT JUSTIFIED FROM RKMR3
1929					
1930	001424	000001	T1:	1	;TIMEOUT CONSTANTS
1931	001426	000012	T10:	10.	
1932	001430	000062	T50:	50.	
1933	001432	000764	T500:	500.	
1934	001434	000144	T100:	100.	
1935	001436	011610	T5000:	5000.	
1936	001440	141520	T50000:	50000.	

M03

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SEQ 0037

1937				
1938	001442	000077	CYL:	63.
1939	001444	000177		127.
1940	001446	000277		191.
1941	001450	000377		255.
1942	001452	000477		319.
1943	001454	000577		383.
1944				
1945	001456	000000	TIM1:	0
1946	001460	000000	TIM2:	0
1947	001462	000000	TIM3:	0
1948	001464	000000	TIM4:	0
1949				
1950	001466	000000	LPCNT:	0
1951	001470	000000	LPTIM:	0
1952				
1953	001472	000000	SUM:	0
1954	001474	000000		0
1955	001476	000000	SUM1:	0
1956	001500	000000		0
1957				
1958	001502	000000	WD1:	0
1959	001504	000000	WD2:	0
1960				
1961	001506	000000	OFFERR:	0
1962				
1963				
1964	001510	000000	HEAD:	0
1965	001512	000000	HEADR:	0
1966	001514	000000	HD1:	0
1967	001516	000000	FORMAT:	0
1968	001520	000000	FMT1:	0
1969	001522	000000	WDCNT:	0
1970				
1971	001524	000000	DATA0:	0
1972	001526	052525	DATA01:	52525
1973	001530	177777	DATA1:	177777
1974	001532	133467	DPAT1:	133467
1975	001534	070627	DPAT2:	70627
1976				
1977	001536	000000	WORD:	0
1978	001540	000000	HDWD:	0
1979				
1980	001542	000000	BSERR:	0
1981	001544	000000	LIMERR:	0
1982	001546	000000	MDSERR:	0
1983	001550	000000	BYPERR:	0
1984	001552	000000	CHKFLG:	0
1985				
1986	001554	000102	HDTAB:	.BLKW 66.
1987	001760	000102	RHTAB:	.BLKW 66.
1988	002164	000102	SRTTAB:	.BLKW 66.
1989				
1990	002370	000400	BSE22H:	.BLKW 256.
1991	003370	000400	BSE22S:	.BLKW 256.
1992	004370	000400	ROTAB:	.BLKW 256.

;CYLINDER NUMBERS USED IN
;CURRENT CROSSOVER TEST

;USED IN TIMING TESTS

;LOOP CTR USED IN CALCLK
;LOOP TIME IN USEC;LO ORDER FOR TIMING TESTS
;HI ORDER FOR TIMING TESTS
;LO ORDER FOR TIMING TESTS
;HI ORDER FOR TIMING TESTS;ACTUAL HEADER/DATA WORD
;EXPECTED DATA WORD

;SET WHEN WRITE CHECK ERROR ON OFFSET

;HEAD NUMBER
;HEAD # FROM H.B3, RT, JUSTIFIED
;SHIFTED HEAD# F'3 FORMATTER ROUTINE
;FORMAT TYPE
;SHIFTED FORMAT FOR FORMATTER ROUTINE
;WORD COUNT;ALL 0'S
;0101 PATT
;ALL 1'S;HEADER/DATA WORD
;HEADER WORD FROM RKDB;CANNOT READ BSE INFO WHEN SET
;LIMIT DETECT ERROR FLAG
;MULT DRIVE SEL ERROR FLAG
;SET TO 1 TO BYPASS CKCERR IN 'GSTAT1'
;WORDS TO BE TESTED;CALCULATED HEADER WORD TABLE
;FILLED AFTER READ HEADER CMD
;ABOVE RHTAB SORTED STARTING FORM
;SECTOR 0 BY SORT ROUTINE
;22 SECTOR HARDWARE BSE INFO.
;22 SECTOR SOFTWARE BSE INFO.
;FILLED AFTER READ DATA CMD

N03

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SEQ 0038

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1993
1994 005370 000000 UNLD: 0 ;SET TO 0 IF HEADS ARE LOADED
1995 ;SET TO 1 IF HEADS UNLOADED
1996 005372 000000 BADHDR: 0 ;SET TO 0 IF FORMATTING OK
1997 ;SET TO 1 IF FORMATTING ALTERED
1998 005374 000000 HPEND: 0 ;SET TO 0 IF HALT NOT PENDING
1999 ;SET TO 1 IF HALT PENDING
2000
2001 ;THE ABOVE 3 FLAGS ARE USED
2002 ;BY 'STOP' ROUTINE TO BRING
2003 ;THE CPU TO A VALID HALT.
2004
2005
2006 005376 001 002 004 ATTN: .BYTE 1,2,4,10,20,40,100,200 ;ATN 0-7 RESP.
2007 005401 010 020 040
2008 005404 100 200
2009 .EVEN
2010
2011 ;THE FOLLOWING ARE HOLDING REGISTERS FOR THE RK611 REGISTERS
2012 ;THEY ARE LOADED AFTER RDY IS REC'D FROM WRDY ROUTINE.
2013
2014
2015 005406 000000 HCS1: 0 ;HOLD RKCS1
2016 005410 000000 HCS2: 0 ;HOLD RKCS2
2017 005412 000000 HWC: 0 ;HOLD RKWC
2018 005414 000000 HBA: 0 ;ETC.
2019 005416 000000 HDA: 0
2020 005420 000000 HDS: 0
2021 005422 000000 HER: 0
2022 005424 000000 HASOF: 0
2023 005426 000000 HDC: 0
2024 005430 000000 HDB: 0
2025 005432 000000 HMR1: 0
2026 005434 000000 HMR2: 0
2027 005436 000000 HMR3: 0
2028 005440 000000 HPOS: 0
2029 005442 000000 HPAT: 0
2030
2031 005444 000000 TEMP1: 0 ;TEMPORARY STORAGE.
2032 005446 000000 TEMP2: 0
2033 005450 000000 TEMP3: 0
2034 005452 000000 TEMP4: 0
2035 005454 000000 TEMP5: 0
2036
2037 ;THE FOLLOWING ARE HOLDING REGISTERS FOR MSGA(0-3) & MSGB(0-3).
2038
2039 005456 000000 H.A0: 0
2040 005460 000000 H.B0: 0
2041 005462 000000 H.A1: 0
2042 005464 000000 H.B1: 0
2043 005466 000000 H.A2: 0
2044 005470 000000 H.B2: 0
2045 005472 000000 H.A3: 0
2046 005474 000000 H.B3: 0
2047
2048 ;THE FOLLOWING ARE 'EXPECTED' REGISTER FOR THE ABOVE.

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SEQ 0039

2049			:	
2050	005476	000000	E.A0:	0
2051	005500	000000	E.B0:	0
2052	005502	000000	E.A1:	0
2053	005504	000000	E.B1:	0
2054	005506	000000	E.A2:	0
2055	005510	000000	E.B2:	0
2056	005512	000000	E.A3:	0
2057	005514	000000	E.B3:	0
2058			:	
2059			;THE FOLLOWING ARE IDENTIFIERS FOR DRIVE MSG WORDS TO BE TESTED.	
2060			:	
2061		000001	T.A2=BIT0	;TEST MSG A2 IF SET
2062		000002	T.B2=BIT1	
2063		000004	T.B3=BIT2	
2064			:	
2065			;ALL THE FLAGS BELOW ARE CLEARED INITIALLY BY THE CLRFLG ROUTINE.	
2066			:	
2067			:	
2068			:	
2069	005516	000000	DDUMP:	0 ;FLAG - SET WHEN IN DDP DUMP MODE
2070	005520	000000	DDPCH:	0 ;FLAG - SET WHEN IN DDP CHAIN MODE
2071	005522	000000	ACT11:	0 ;FLAG - SET WHEN IN ACT11 MODE OF OPERATION
2072	005524	000000	PPTP:	0 ;FLAG - SET WHEN PROGRAM LOADED BY PAPER TAPE
2073	005526	000000	DRIVS:	0 ;CONTAINS THE NUMBER OF DRIVES PRESENT
2074			:	
2075			;THE FLAGS BELOW ARE SET TO 1 TO INDICATE THAT A PARTICULAR DRIVE	
2076			;IS PRESENT AND IS TO BE TESTED.	
2077			:	
2078	005530	000000	DRIV0:	0 ;FLAG SET TO 1 WHEN DRIVE 0 PRESENT
2079	005532	000000	DRIV1:	0 ;FOR DRIVE 1
2080	005534	000000	DRIV2:	0 ;FOR DRIVE 2
2081	005536	000000	DRIV3:	0 ;FOR DRIVE 3
2082	005540	000000	DRIV4:	0 ;FOR DRIVE 4
2083	005542	000000	DRIV5:	0 ;FOR DRIVE 5
2084	005544	000000	DRIV6:	0 ;FOR DRIVE 6
2085	005546	000000	DRIV7:	0 ;FOR DRIVE 7
2086			:	
2087	005550	000000	LCLKF:	0 ;L-CLOCK FLAG PRESENT FLAG
2088	005552	000000	PCLKF:	0 ;P-CLOCK FLAG PRESENT FLAG
2089	005554	000000	DOTIM:	0 ;SET IF EITHER CLOCK PRESENT FOR TIMING TESTS.
2090	005556	000000	SIZFLG:	0 ;SET IF DEFAULT DO SIZING IN TEST 1

004

.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

2091		
2092		
2093		
2094		
2095		
2096		
2097		
2098		
2099		
2100		
2101		
2102		
2103		
2104		
2105	005560	
2106		
2107		
2108	005560	044315
2109	005562	050646
2110	005564	053764
2111	005566	054406
2112		
2113		
2114	005570	044534
2115	005572	050646
2116	005574	053764
2117	005576	054406
2118		
2119		
2120	005600	044555
2121	005602	050646
2122	005604	053764
2123	005606	054406
2124		
2125		
2126	005610	044576
2127	005612	050646
2128	005614	053764
2129	005616	054406
2130		
2131	005620	044665
2132	005622	050646
2133	005624	053764
2134	005626	054406
2135		
2136		
2137	005630	044741
2138	005632	050646
2139	005634	053764
2140	005636	054406
2141		
2142		
2143	005640	045015
2144	005642	050646
2145	005644	053764
2146	005646	054406

Address	Offset	Value	Comment
2147			
2148			
2149	005650	045100	;ERROR 10
2150	005652	050646	EM11
2151	005654	053764	DH1
2152	005656	054406	DT1
2153			DF1
2154	005660	045144	;ERR 11
2155	005662	051733	EM12
2156	005664	053764	DH27
2157	005666	054512	DT1
2158			DF10
2159	005670	045434	;ERR 12
2160	005672	051733	EM21
2161	005674	053764	DH27
2162	005676	054512	DT1
2163			DF10
2164	005700	045144	;ERR 13
2165	005702	051703	EM12
2166	005704	053764	DH26
2167	005706	054512	DT1
2168			DF10
2169	005710	045434	;ERR 14
2170	005712	051703	EM21
2171	005714	053764	DH26
2172	005716	054512	DT1
2173			DF10
2174	005720	045144	;ERR 15
2175	005722	052142	EM12
2176	005724	053764	DH32
2177	005726	054512	DT1
2178			DF10
2179	005730	050507	;ERR 16
2180	005732	052142	EM80
2181	005734	053764	DH32
2182	005736	054512	DT1
2183			DF10
2184	005740	045144	;ERR 17
2185	005742	051443	EM12
2186	005744	053764	DH18
2187	005746	054512	DT1
2188			DF10
2189	005750	045202	;ERR 20
2190	005752	051443	EM13
2191	005754	053764	DH18
2192	005756	054512	DT1
2193			DF10
2194	005760	050546	;ERR 21
2195	005762	051703	EM83
2196	005764	053764	DH26
2197	005766	054512	DT1
2198			DF10
2199	005770	045434	;ERR 22
2200	005772	052142	EM21
2201	005774	053764	DH32
2202	005776	054512	DT1
			DF10

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ERROR POINTER TABLE

SEQ 0043

2259			;ERR 35		
2260	006120	045330		EM17	;MSG A0 ERROR
2261	006122	051052		DH5	;AFTER AC SW OFF
2262	006124	054142		DT13	
2263	006126	054646		DF21	
2264			;ERR 36		
2265	006130	045372		EM19	;MSG A1 ERROR
2266	006132	051052		DH5	
2267	006134	054142		DT13	
2268	006136	054646		DF21	
2269			;ERR 37		
2270	006140	045413		EM20	;MSG A1 ERROR
2271	006142	051052		DH5	;AFTER OFFSET CMD
2272	006144	054142		DT13	
2273	006146	054646		DF21	
2274			;ERR 40		
2275	006150	050035		EM71	;DETECTED 10 BAD SECTORS
2276	006152	051733		DH27	;AFTER WRITE DATA CMD
2277	006154	053764		DT1	
2278	006156	054512		DF10	
2279			;ERR 41		
2280	006160	045224		EM14	;WRONG ATTN
2281	006162	051443		DH18	;AFTER UNLOAD CMD
2282					
2283	006164	053764		DT1	
2284	006166	054512		DF10	
2285			;ERR 42		
2286	006170	045251		EM15	;DRDY NOT CLEARED
2287	006172	051443		DH18	
2288					
2289	006174	053764		DT1	
2290	006176	054512		DF10	
2291			;ERR 43		
2292	006200	045303		EM16	;DSC NOT SET
2293	006202	051443		DH18	
2294	006204	053764		DT1	
2295	006206	054512		DF10	
2296			;ERR 44		
2297	006210	045456		EM22	;DOOR NOT CLEARED
2298	006212	051100		DH8	;AFTER DRIVE UNLOADED & DOOR OPENED
2299	006214	053764		DT1	
2300	006216	054512		DF10	
2301			;ERR 45		
2302	006220	045330		EM17	;MSG A0 ERROR
2303	006222	051100		DH8	
2304	006224	054142		DT13	
2305	006226	054646		DF21	
2306			;ERR 46		
2307	006230	045351		EM18	;MSG B0 ERROR
2308	006232	051100		DH8	
2309	006234	054142		DT13	
2310	006236	054646		DF21	
2311			;ERR 47		
2312	006240	050105		EM72	;BSE ERROR IN WRITE CMD NOT ON BSE TABLE
2313	006242	051733		DH27	;AFTER WRITE DATA CMD
2314	006244	053764		DT1	

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SEQ 0044

2315	006246	054512	DF10	
2316				
2317			;ERR 50	
2318	006250	050164	EM73	;DETECTED BSE IN READ BUT NOT IN WRITE CMD.
2319	006252	050646	DH1	
2320	006254	053764	DT1	
2321	006256	054406	DF1	
2322			;ERR 51	
2323	006260	050603	EM93	;WRONG CYL# IN HEADER WORD
2324	006262	051660	DH25	;AFTER SEEK CMD
2325	006264	054076	DT9	
2326	006266	054622	DF20	
2327			;ERR 52	
2328	006270	045330	EM17	;MSG AO ERROR
2329	006272	051733	DH27	;AFTER WRITE DATA CMD
2330	006274	054142	DT13	
2331	006276	054646	DF21	
2332			;ERR 53	
2333	006300	045372	EM19	;MSG A1 ERROR
2334	006302	051733	DH27	
2335	006304	054142	DT13	
2336	006306	054646	DF21	
2337			;ERR 54	
2338	006310	045330	EM17	;MSG AO ERROR
2339	006312	051703	DH26	;AFTER READ DATA CMD
2340	006314	054142	DT13	
2341	006316	054646	DF21	
2342			;ERROR 55	
2343	006320	045202	EM13	;NO ATTN
2344	006322	051417	DH17	;AFTER RECAL CMD
2345	006324	053764	DT1	
2346	006326	054512	DF10	
2347			;ERR 56	
2348	006330	045372	EM19	;MSG A1 ERROR
2349	006332	051703	DH26	
2350	006334	054142	DT13	
2351	006336	054646	DF21	
2352			;ERR 57	
2353	006340	045330	EM17	;MSG AO ERROR
2354	006342	052142	DH32	;AFTER WRITE CHECK CMD
2355	006344	054142	DT13	
2356	006346	054646	DF21	
2357			;ERR 60	
2358	006350	045372	EM19	;MSG A1 ERROR
2359	006352	052142	DH32	
2360	006354	054142	DT13	
2361	006356	054646	DF21	
2362			;ERR 61	
2363	006360	047645	EM69	;NO DRIVES PRESENT
2364	006362	050646	DH1	
2365	006364	053764	DT1	
2366	006366	054406	DF1	
2367			;ERR 62	
2368	006370	050330	EM75	;FOUND 10 BAD CYL
2369	006372	051733	DH27	;AFTER WRITE DATA CMD
2370	006374	053764	DT1	

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ERROR POINTER TABLE

SEQ 0045

2371	006376	054512		DF10	
2372			;ERR 63	EM19	;MSG A1 ERROR
2373	006400	045372		DH8	;AFTER DRIVE UNLOADED & DOOR OPENED
2374	006402	051100		DT13	
2375	006404	054142		DF21	
2376	006406	054646			
2377			;ERR 64	EM20	;MSG B1 ERROR
2378	006410	045413		DH8	
2379	006412	051100		DT13	
2380	006414	054142		DF21	
2381	006416	054646			
2382			;ERR 65	EM23	;SPIN SET
2383	006420	045517		DH11	;AFTER LOADING HEADS WITH DOOR OPEN
2384	006422	051143		DT1	
2385	006424	053764		DF10	
2386	006426	054512			
2387			;ERR 66	EM17	;MSG A0 ERROR
2388	006430	045330		DH11	
2389	006432	051143		DT13	
2390	006434	054142		DF21	
2391	006436	054646			
2392			;ERR 67	EM18	;MSG B0 ERROR
2393	006440	045351		DH11	
2394	006442	051143		DT13	
2395	006444	054142		DF21	
2396	006446	054646			
2397			;ERR 70	EM19	;MSG A1 ERROR
2398	006450	045372		DH11	
2399	006452	051143		DT13	
2400	006454	054142		DF21	
2401	006456	054646			
2402			;ERR 71	EM20	;MSG B1 ERROR
2403	006460	045413		DH11	
2404	006462	051143		DT13	
2405	006464	054142		DF21	
2406	006466	054646			
2407			;ERR 72	EM25	;CARTRIDGE NOT CLEARED
2408	006470	045605		DH12	;AFTER DISK PACK REMOVED
2409	006472	051217		DT1	
2410	006474	053764		DF10	
2411	006476	054512			
2412			;ERR 73	0	
2413	006500	000000		0	
2414	006502	000000		0	
2415	006504	000000		0	
2416	006506	000000		0	
2417			;ERR 74	EM17	;MSG A0 ERROR
2418	006510	045330		DH4	;AFTER PACK RE-INSERTED & HDS LOADED
2419	006512	051004		DT13	
2420	006514	054142		DF21	
2421	006516	054646			
2422			;ERR 75	EM18	;MSG B0 ERROR
2423	006520	045351		DH4	
2424	006522	051004		DT13	
2425	006524	054142		DF21	
2426	006526	054646			

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SEQ 0046

2427			;ERR 76		
2428	006530	045372		EM19	;MSG A1 ERROR
2429	006532	051004		DH4	
2430	006534	054142		DT13	
2431	006536	054646		DF21	
2432			;ERR 77		
2433	006540	045413		EM20	;MSG B1 ERROR
2434	006542	051004		DH4	
2435	006544	054142		DT13	
2436	006546	054646		DF21	
2437			;ERR 100		
2438	006550	045517		EM23	;SPIN SET
2439	006552	051247		DH13	;AFTER LOADING HEADS WITH CART. OUT
2440	006554	053764		DT1	
2441	006556	054512		DF10	
2442			;ERR 101		
2443	006560	000000		0	
2444	006562	000000		0	
2445	006564	000000		0	
2446	006566	000000		0	
2447			;ERR 102		
2448	006570	000000		0	
2449	006572	000000		0	
2450	006574	000000		0	
2451	006576	000000		0	
2452			;ERR 103		
2453	006600	000000		0	
2454	006602	000000		0	
2455	006604	000000		0	
2456	006606	000000		0	
2457			;ERR 104		
2458	006610	000000		0	
2459	006612	000000		0	
2460	006614	000000		0	
2461	006616	000000		0	
2462			;ERR 105		
2463	006620	047043		EM52	;UNS NOT SET
2464	006622	053374		DH64	;AFTER MDS FOUND
2465	006624	053764		DT1	
2466	006626	054512		DF10	
2467			;ERR 106		
2468	006630	045742		EM28	;VV SET
2469	006632	051333		DH15	;WITHOUT PACK CMD
2470	006634	053764		DT1	
2471	006636	054512		DF10	
2472			;ERR 107		
2473	006640	045774		EM29	;DSC NOT SET
2474	006642	053050		DH59	;AFTER EVEN PARITY ISSUED
2475	006644	053764		DT1	
2476	006646	054512		DF10	
2477			;ERR 110		
2478	006650	046632		EM48	;WRL NOT CLEARED
2479	006652	052655		DH48	;AFTER WRITE LOCK SWITCH DISABLED
2480	006654	053764		DT1	
2481	006656	054512		DF10	
2482			;ERR 111		

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SEQ 0047

2483	006660	046021	EM30	;ATTN NOT CLEARED
2484	006662	051360	DH16	;AFTER UNIT SELECT PLUG REMOVED
2485	006664	053764	DT1	
2486	006666	054512	DF10	
2487			;ERR 112	
2488	006670	045715	EM27	;NED NOT SET
2489	006672	051360	DH16	
2490	006674	053764	DT1	
2491	006676	054512	DF10	
2492			;ERR 113	
2493	006700	045202	EM13	;ATTN NOT SET
2494	006702	053050	DH59	;AFTER EVEN PARITY ISSUED
2495	006704	053764	DT1	
2496	006706	054512	DF10	
2497			;ERROR 114	
2498	006710	047315	EM58	;PARITY NOT SET
2499	006712	053050	DH59	
2500	006714	053764	DT1	
2501	006716	054512	DF10	
2502			;ERR 115	
2503	006720	046672	EM49	;WRL NOT SET
2504	006722	052716	DH49	;AFTER WRITE LOCK SW ENABLED
2505	006724	053764	DT1	
2506	006726	054512	DF10	
2507			;ERROR 116	
2508	006730	045144	EM12	;CONT NOT RDY
2509	006732	051470	DH19	;AFTER PACK CMD
2510	006734	053764	DT1	
2511	006736	054512	DF10	
2512			;ERROR 117	
2513	006740	045144	EM12	;CONT NOT RDY
2514	006742	051513	DH20	;AFTER SEL DR CMD
2515	006744	053764	DT1	
2516	006746	054512	DF10	
2517			;ERROR 120	
2518	006750	045144	EM12	
2519	006752	051546	DH21	;AFTER SUBSYS CLEAR
2520	006754	053764	DT1	
2521	006756	054512	DF10	
2522			;ERR 121	
2523	006760	046726	EM50	;WLE NOT SET
2524	006762	052756	DH50	;AFTER WRITING WITH WRITE LOCK SET
2525	006764	053764	DT1	
2526	006766	054512	DF10	
2527			;ERR 122	
2528	006770	045715	EM27	;NED NOT SET
2529	006772	051626	DH23	;AFTER WRONG PORT SELECTED
2530	006774	053764	DT1	
2531	006776	054512	DF10	
2532			;ERR 123	
2533	007000	045330	EM17	;MSG AD ERROR
2534	007002	052756	DH50	;AFTER WRITING WITH WRITE LOCK ENABLED
2535	007004	054142	DT13	
2536	007006	054646	DF21	
2537			;ERROR 124	
2538	007010	045144	EM12	

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SEQ 0048

2539	007012	051417	DH17	; AFTER RECAL CMD
2540	007014	053764	DT1	
2541	007016	054512	DF10	
2542			; ERR 125	
2543	007020	045351	E418	; MSG B0 ERROR
2544	007022	052756	DH50	; AFTER WITING WITH WRL ENABLED
2545	007024	054142	DT13	
2546	007026	054646	DF21	
2547			; ERR 126	
2548	007030	045372	EM19	; MSG A1 ERROR
2549	007032	052756	DH50	
2550	007034	054142	DT13	
2551	007036	054646	DF21	
2552			; ERR 127	
2553	007040	045413	EM20	; MSG B1 ERROR
2554	007042	052756	DH50	
2555	007044	054142	DT13	
2556	007046	054646	DF21	
2557			; ERR 130	
2558	007050	046052	EM31	; NED NOT CLEARED
2559	007052	052020	DH29	; AFTER CORRECT PORT SELECTED
2560	007054	053764	DT1	
2561	007056	054512	DF10	
2562			; ERROR 131	
2563	007060	045144	EM12	; NO RDY
2564	007062	051660	DH25	; AFTER SEEK CMD
2565	007064	053764	DT1	
2566	007066	054512	DF10	
2567			; ERROR 132	
2568	007070	045202	EM13	; NO ATTN
2569	007072	051660	DH25	
2570	007074	053764	DT1	
2571	007076	054512	DF10	
2572			; ERR 133	
2573	007100	045715	EM27	; NED NOT SET
2574	007102	051764	DH28	; AFTER BOTH PORTS DESELECTED
2575	007104	053764	DT1	
2576	007106	054512	DF10	
2577			; ERR 134	
2578	007110	046770	EM51	; WRITE LOCK NOT SET SECTOR BOUNDARY
2579	007112	052756	DH50	; AFTER WRITING WITH WRL ENABLED
2580	007114	054024	DT3	
2581	007116	054422	DF3	
2582			; ERR 135	
2583	007120	046770	EM51	
2584	007122	053124	DH60	; AFTER WRITE LOCK ENABLED WHILE WRITING
2585	007124	054024	DT3	
2586	007126	054446	DF4	
2587			; ERR 136	
2588	007130	046770	EM51	
2589	007132	053323	DH63	; AFTER WRITE LOCK ENABLED FROM AC OFF
2590	007134	054024	DT3	
2591	007136	054422	DF3	
2592			; ERR 137	
2593	007140	046770	EM51	
2594	007142	053323	DH63	

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SEQ 0049

2595	007144	054024	DT3	
2596	007146	054446	DF4	
2597			;ERR 140	
2598	007150	046103	EM32	;SPINDLE ON NOT SET
2599	007152	052106	DH31	;AFTER DRIVE MANUALLY LOADED
2600	007154	053764	DT1	
2601	007156	054512	DF10	
2602			;ERR 141	
2603	007160	046137	EM33	;DRIVE NOT READY
2604	007162	052315	DH38	;AFTER AC POWERED UP
2605	007164	053764	DT1	
2606	007166	054512	DF10	
2607			;ERR 142	
2608	007170	046170	EM34	
2609	007172	052106	DH31	
2610	007174	053764	DT1	
2611	007176	054512	DF10	
2612			;ERR 143	
2613	007200	045144	EM12	;CONT NOT READY
2614	007202	052174	DH34	;AFTER ST SPIN. CMD
2615	007204	053764	DT1	
2616	007206	054512	DF10	
2617			;ERR 144	
2618	007210	045202	EM13	;NO ATTN
2619	007212	052174	DH34	
2620	007214	053764	DT1	
2621	007216	054512	DF10	
2622			;ERR 145	
2623	007220	046231	EM35	;HEADS NOT HOME
2624	007222	052230	DH35	;AFTER MANUAL UNLOAD
2625	007224	053764	DT1	
2626	007226	054512	DF10	
2627			;ERR 146	
2628	007230	047267	EM57	;CERR NOT SET
2629	007232	052261	DH37	;AFTER TIMEOUT TO POWER DOWN
2630	007234	053764	DT1	
2631	007236	054512	DF10	
2632			;ERR 147	
2633	007240	046765	EM37	;AC LOW NOT SET
2634	007242	052261	DH37	
2635	007244	053764	DT1	
2636	007246	054512	DF10	
2637			;ERR 150	
2638	007250	046315	EM42	;NED NOT SET
2639	007252	052261	DH37	
2640	007254	053764	DT1	
2641	007256	054512	DF10	
2642			;ERROR 151	
2643	007260	045144	EM12	;NO RDY
2644	007262	051574	DH22	;AFTER CLEAR CMD
2645	007264	053764	DT1	
2646	007266	054512	DF10	
2647			;ERR 152	
2648	007270	046342	EM43	;AC LO NOT CLEARED
2649	007272	052315	DH38	;AFTER AC POWERED UP
2650	007274	053764	DT1	

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SEQ 0050

2651	007276	054512	DF10	
2652			;ERR 153	
2653	007300	046374	EM44	;VV NOT CLEARED
2654	007302	052315	DH38	
2655	007304	053764	DT1	
2656	007306	054512	DF10	
2657			;ERROR 154	
2658	007310	047170	EM55	;ATTN NOT CLEARED
2659	007312	051574	DH22	
2660	007314	053764	DT1	
2661	007316	054512	DF10	
2662			;ERR 155	
2663	007320	046436	EM45	;VV SET AFTER HDS LOADED
2664	007322	051333	DH15	;WITHOUT 'PACK' CMD
2665	007324	053764	DT1	
2666	007326	054512	DF10	
2667			;ERR 156	
2668	007330	046513	EM46	;NXF=0
2669	007332	052551	DH45	;AFTER SEEK WITH VV=0
2670	007334	053764	DT1	
2671	007336	054512	DF10	
2672			;ERR 157	
2673	007340	046572	EM47	;CYL ADDR CHANGED FROM 0
2674	007342	052551	DH45	
2675	007344	054222	DT14	
2676	007346	054702	DF22	
2677			;ERR 160	
2678	007350	045330	EM17	;MSG A0 ERROR
2679	007352	052551	DH45	
2680	007354	054142	DT13	
2681	007356	054646	DF21	
2682			;ERR 161	
2683	007360	045351	EM18	;MSG B0 ERROR
2684	007362	052551	DH45	
2685	007364	054142	DT13	
2686	007366	054646	DF21	
2687			;ERR 162	
2688	007370	045372	EM19	;MSG A1 ERROR
2689	007372	052551	DH45	
2690	007374	054142	DT13	
2691	007376	054646	DF21	
2692			;ERR 163	
2693	007400	045413	EM20	;MSG B1 ERROR
2694	007402	052551	DH45	
2695	007404	054142	DT13	
2696	007406	054646	DF21	
2697			;ERR 164	
2698	007410	046513	EM46	;NXF NOT SET
2699	007412	052610	DH46	;AFTER WRITE DATA WITH VV=0
2700	007414	053764	DT1	
2701	007416	054512	DF10	
2702			;ERR 165	
2703	007420	047603	EM68	;CANNOT READ BSE INFO
2704	007422	052421	DH42	;ON SECTORS 0, 2, 4, 6, 8
2705	007424	053764	DT1	
2706	007426	054576	DF17	

N04

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ERROR POINTER TABLE

SEQ 0051

2707			;ERR 166	
2708	007430	000000		0
2709	007432	000000		0
2710	007434	000000		0
2711	007436	000000		0
2712			;ERR 167	
2713	007440	047603		EM68
2714	007442	053700		DH74
2715	007444	053764		DT1
2716	007446	054576		DF17
2717			;ERR 170	
2718	007450	000000		0
2719	007452	000000		0
2720	007454	000000		0
2721	007456	000000		0
2722			;ERROR 171	
2723	007460	045144		EM12
2724	007462	052054		DH30
2725	007464	053764		DT1
2726	007466	054512		DF10
2727			;ERROR 172	
2728	007470	047366		EM61
2729	007472	052551		DH45
2730	007474	053764		DT1
2731	007476	054512		DF10
2732			;ERROR 173	
2733	007500	047414		EM63
2734	007502	052054		DH30
2735	007504	053764		DT1
2736	007506	054556		DF15
2737			;ERROR 174	
2738	007510	045434		EM21
2739	007512	052054		DH30
2740	007514	053764		DT1
2741	007516	054556		DF15
2742			;ERR 175	
2743	007520	047070		EM53
2744	007522	053374		DH64
2745	007524	053764		DT1
2746	007526	054512		DF10
2747			;ERR 176	
2748	007530	047120		EM54
2749	007532	053430		DH65
2750	007534	053764		DT1
2751	007536	054512		DF10
2752			;ERROR 177	
2753	007540	045653		EM26
2754	007542	051360		DH16
2755	007544	053764		DT1
2756	007546	054512		DF10
2757			;ERROR 200	
2758	007550	045144		EM12
2759	007552	052341		DH39
2760	007554	053764		DT1
2761	007556	054556		DF15
2762			;ERROR 201	

;ON SEC 10, 12....20

;NO RDY
;AFTER READ HEADER CMD

;NXF DID NOT SET FAULT
;AFTER SEEK WITH VV=0

;DLT SET

;CERR SET

;UNLD NOT SET
;AFTER MDS FOUND

;CANNOT FIND MDS
;AFTER SEARCHING ALL DRIVES

;VV NOT CLEARED
;AFTER UNIT SEL PLUG REMOVED

;NO RDY
;AFTER WRITE HEADER CMD

B05

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ERROR POINTER TABLE

SEQ 0052

2763	007560	045434	EM21	;CERR SET
2764	007562	052341	DH39	
2765	007564	053764	DT1	
2766	007566	054556	DF15	
2767			;ERROR 202	
2768	007570	047223	EM56	;UNEXP MEMORY PARITY ERROR
2769	007572	053473	DH65	;TEST #,PRAP PC
2770	007574	054072	DT6	
2771	007576	054472	DF5	
2772			;ERROR 203	
2773	007600	045351	EM18	;MSG 80 ERROR
2774	007602	051052	DH5	;AFTER AC SWITCHED OFF
2775	007604	054142	DT13	
2776	007606	054646	DF21	
2777			;ERR 204	
2778	007610	047267	EM57	;CERR NOT SET
2779	007612	053514	DH67	;AFTER TIMEOUT TO ENABLE WRL
2780	007614	053764	DT1	
2781	007616	054512	DF10	
2782			;ERR 205	
2783	007620	046726	EM50	;WRL NOT SET
2784	007622	053514	DH67	
2785	007624	053764	DT1	
2786	007626	054512	DF10	
2787			;ERROR 206	
2788	007630	047435	EM64	;WCE AT CYL 411,TRK 2, SEC 21
2789	007632	050646	DH1	
2790	007634	053764	DT1	
2791	007636	054476	DF7	
2792			;ERROR 207	
2793	007640	047267	EM57	;CERR NOT SET
2794	007642	052756	DH50	;AFTER WRITING WITH WRL ENABLED
2795	007644	053764	DT1	
2796	007646	054512	DF10	
2797			;ERROR 210	
2798	007650	045434	EM21	;CERR SET
2799	007652	051660	DH25	
2800	007654	053764	DT1	
2801	007656	054512	DF10	
2802			;ERR 211	
2803	007660	047345	EM59	;CTO SET
2804	007662	047744	EM70	;WHILE WAITING FOR OR REC'D CONTR RDY MSG A & B BAD
2805	007664	053764	DT1	
2806	007666	054532	DF12	
2807			;ERR 212	
2808	007670	047562	EM67	;NED SET
2809	007672	047744	EM70	
2810	007674	053764	DT1	
2811	007676	054532	DF12	
2812			;ERR 213	
2813	007700	044534	EM5	;MDS SET
2814	007702	047744	EM70	
2815	007704	053764	DT1	
2816	007706	054532	DF12	
2817			;ERR 214	
2818	007710	050303	EM74	;RTZ NOT SET

C05

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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ERROR POINTER TABLE

SEQ 0053

2819	007712	052374	DH41	;DURING RECD CMD
2820	007714	053764	DT1	
2821	007716	054512	DF10	
2822			;ERR 215	
2823	007720	045330	EM17	;MSG AD ERROR
2824	007722	052341	DH39	;AFTER WRITE HEADER CMD.
2825	007724	054142	DT13	
2826	007726	054546	DF21	
2827			;ERR 216	
2828	007730	045351	EM18	;B0 ERROR
2829	007732	052341	DH39	
2830	007734	054142	DT13	
2831	007736	054646	DF21	
2832			;ERR 217	
2833	007740	045372	EM19	;A1 ERROR
2834	007742	052341	DH39	
2835	007744	054142	DT13	
2836	007746	054646	DF21	
2837			;ERR 220	
2838	007750	045413	EM20	;B1 ERROR
2839	007752	052341	DH39	
2840	007754	054142	DT13	
2841	007756	054646	DF21	
2842			;ERROR 221	
2843	007760	000000	0	
2844	007762	000000	0	
2845	007764	000000	0	
2846	007766	000000	0	
2847			;ERROR 222	
2848	007770	000000	0	
2849	007772	000000	0	
2850	007774	000000	0	
2851	007776	000000	0	
2852			;ERROR 223	
2853	010000	000000	0	
2854	010002	000000	0	
2855	010004	000000	0	
2856	010006	000000	0	
2857			;ERROR 224	
2858	010010	000000	0	
2859	010012	000000	0	
2860	010014	000000	0	
2861	010016	000000	0	
2862			;ERROR 225	
2863	010020	000000	0	
2864	010022	000000	0	
2865	010024	000000	0	
2866	010026	000000	0	
2867			;ERROR 226	
2868	010030	045144	EM12	;NO RDY
2869	010032	051703	DH26	;AFTER READ DATA CMD
2870	010034	053764	DT1	
2871	010036	054512	DF10	
2872			;ERROR 227	
2873	010040	045434	EM21	;CERR SET
2874	010042	051703	DH26	

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ERROR POINTER TABLE

SEQ 0054

2875 010044 053764
2876 010046 054556

DT1
DF15

E05

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ERROR POINTER TABLE

SEQ 0055

```

2877
2878
2879
2880 010050 012737 000001 001356 PARSRT: MOV #1,PARAM ;SET FLAG FOR 220 START
2881 010056 000402 BR PRGSRT ;START PROGRAM
2882
2883 010060 005037 001356 START: CLR PARAM ;CLEAR FOR 200 START
2884 010064 000005 PRGSRT: RESET ;CLEAR ALL INT ENABLE & INIT
2885 010066 012706 001100 MOV #STACK,SP ;SETUP STACK POINTER
2886 010072 012746 000000 MOV #PRO,-(SP) ;PSW LOADED TO BE
2887 010076 012746 010104 MOV #IS,-(SP) ;LSI-11 COMPATABLE
2888 010102 000002 RTI ;ENABLE ALL INTERRUPTS
2889
2890 010104 004737 033262 IS: JSR PC,STKINT ;SETUP KB VECTOR ADDR, PRIORITY 4
2891 ; & TURN ON KB INTERRUPT
2892
2893
2894 ;*** CPU PRIORITY LEVEL NOW AT 0 ***
2895 ;*** ANY DEVICE WHICH SETS ITS ***
2896 ;*** INTERRUPT ENABLE BIT WILL ***
2897 ;*** SERVICED. ***
2898
2899 ;CLOCK INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 6 (IN 'STS')
2900 ;RK06 CONTROLLER INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 5 IN 'SETINT')
2901 ;KEYBOARD INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 4 (SEE ABOVE)
2902
2903
2904
2905
2906
2907
2908 010110 012706 001100
2909 010114 005026
2910 010116 022706 001140
2911 010122 001374
2912 010124 012706 001100
2913
2914 010130 012737 031370 000020
2915 010136 012737 000340 000022
2916 010144 012737 031650 000030
2917 010152 012737 000340 000032
2918 010160 012737 035500 000034
2919 010166 012737 000340 000036
2920 010174 012737 031124 000024
2921 010202 012737 000340 000026
2922 010210 013737 023776 023770
2923 010216 005037 001174
2924 010222 005037 001176
2925 010226 012737 000001 001115
2926 010234 012737 010234 001106
2927 010242 012737 010242 001110
2928
2929
2930 010250 013746 000004
2931 010254 012737 010310 000004
2932 010262 012737 177570 001140

```

.SBTTL PROGRAM SETUP

*** CPU PRIORITY LEVEL NOW AT 0 ***
 *** ANY DEVICE WHICH SETS ITS ***
 *** INTERRUPT ENABLE BIT WILL ***
 *** SERVICED. ***

CLOCK INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 6 (IN 'STS')
 RK06 CONTROLLER INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 5 IN 'SETINT')
 KEYBOARD INTERRUPTS WILL CHANGE CPU PRIORITY TO LEVEL 4 (SEE ABOVE)

ALL 'SYSMAC' TRAPS WILL CHANGE CPU PRIORITY TO LEVEL 7 (SEE BELOW)

.SBTTL INITIALIZE THE COMMON TAGS (SCMTAG) AREA
 ;;CLEAR THE COMMON TAGS (SCMTAG) AREA
 MOV #SCMTAG,R6 ;FIRST LOCATION TO BE CLEARED
 CLR (R6)+ ;CLEAR MEMORY LOCATION
 CMP #SWR,R6 ;;DONE?
 BNE -6 ;;LOOP BACK IF NO
 MOV #STACK,SP ;;SETUP THE STACK POINTER

;;INITIALIZE A FEW VECTORS
 MOV #SCOPE,#IOTVEC ;;IOT VECTOR FOR SCOPE ROUTINE
 MOV #340,#IOTVEC+2 ;;LEVEL 7
 MOV #ERROR,#EMTVEC ;;EMT VECTOR FOR ERROR ROUTINE
 MOV #340,#EMTVEC+2 ;;LEVEL 7
 MOV #TRAP,#TRAPVEC ;;TRAP VECTOR FOR TRAP CALLS
 MOV #340,#TRAPVEC+2 ;;LEVEL 7
 MOV #SPWRON,#PWAVEC ;;POWER FAILURE VECTOR
 MOV #340,#PWAVEC+2 ;;LEVEL 7
 MOV #ENDCT,#EOPCT ;;SETUP END-OF-PROGRAM COUNTER
 CLR #TIMES ;;INITIALIZE NUMBER OF ITERATIONS
 CLR #ESCAPE ;;CLEAR THE ESCAPE ON ERROR ADDRESS
 MOV #1,#SERMAX ;;ALLOW ONE ERROR PER TEST
 MOV #.,#SLPADR ;;INITIALIZE THE LOOP ADDRESS FOR SCOPE
 MOV #.,#SLPERR ;;SETUP THE ERROR LOOP ADDRESS

;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
 ;;EQUAL TO A "-1" SETUP FOR A SOFTWARE SWITCH REGISTER.
 MOV #ERRVEC,-(SP) ;;SAVE ERROR VECTOR
 MOV #645,#ERRVEC ;;SET UP ERROR VECTOR
 MOV #DSWR,SWR ;;SETUP FOR A HARDWARE SWICH REGISTER

F05

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INITIALIZE THE COMMON TAGS

SEQ 0056

```

2933 010270 012737 177570 001142      MOV    #DDISP,DISPLAY    ;AND A HARDWARE DISPLAY REGISTER
2934 010276 022777 177777 170634      CMP    #-1,2SWR        ;TRY TO REFERENCE HARDWARE SWR
2935 010304 001012                BNE    66$              ;BRANCH IF NO TIMEOUT TRAP OCCURRED
2936                                ;AND THE HARDWARE SWR IS NOT = -1
2937 010306 000403                BR     65$              ;BRANCH IF NO TIMEOUT
2938 010310 012716 010316      64$:    MOV    #65$, (SP)      ;SET UP FOR TRAP RETURN
2939 010314 000002                RTI
2940 010316 012737 000176 001140      65$:    MOV    #SWREG,SWR        ;POINT TO SOFTWARE SWR
2941 010324 012737 000174 001142      MOV    #DISPREG,DISPLAY
2942 010332 012637 000004      66$:    MOV    (SP)+,2#ERRVEC    ;RESTORE ERROR VECTOR
2943
2944 010336 005037 001216                CLR    $PASS          ;CLEAR PASS COUNT
2945 010342 132737 000200 001231      BITB   #APTSIZE,$ENVM    ;TEST USER SIZE UNDER APT
2946 010350 001403                BEQ    67$              ;YES,USE NON-APT SWITCH
2947 010352 012737 001232 001140      MOV    #SSWREG,SWR    ;NO,USE APT SWITCH REGISTER
2948 010360
2949
2950 010360 012737 010424 000004      MEMPARG: MOV    #1$,ERRVEC    ;TIMEOUT VECTOR
2951 010366 012737 000340 000006      MOV    #PR7,ERRVEC+2
2952
2953 010374 012701 172100                MOV    #MEMBAS,R1      ;ADDR OF MEM CSR
2954 010400 005011      3$:    CLR    (R1)          ;SEE IF CAN REFERENCE
2955 010402 012711 000001                MOV    #1,(R1)        ;SET ENABLE BIT IF YES
2956 010406 012737 031026 000114      MOV    #MEMERR,MEMVEC    ;LD MEMORY CHK VECTOR IF DONT TIMEOUT
2957 010414 012737 000340 000116      MOV    #PR7,MEMVEC+2
2958 010422 000401                BR     2$
2959
2960 010424 022626      1$:    CMP    (SP)+,(SP)+    ;ADJ STACK
2961 010426 062701 000002      2$:    ADD    #2,R1        ;TRY NEXT CSR
2962 010432 020127 172140                CMP    R1,#MEMBAS+40    ;ALL TRIED?
2963 010436 001360                BNE    3$          ;BR IN NO
2964 010440 012737 000006 000004      MOV    #ERRVEC+2,ERRVEC    ;RESTORE TRAP CATCHER
2965 010446 005037 000006
2966                                CLR    ERRVEC+2
2967 010452 004737 024064                JSR    PC,CLRFLG      ;CLEAR DDUMP THRU SIZEFLG
2968 010456 005037 001220                CLR    $DEVCT
2969 010462 005037 001222                CLR    $UNIT
2970
2971                                ;FIND OUT IF XXDP, ACT, APT; CHAIN OR DUMP MODE
2972                                ;
2973                                ;
2974
2975 010466 005737 000042      START1: TST    42
2976 010472 001014                BNE    1$
2977 010474 004737 024104                JSR    PC,TITLE      ;BR IF AUTO
2978 010500 123727 000041 000013      CMPB   41,#13      ;MANUAL, TYPE PROG ID
2979 010506 001010                BNE    2$          ;13=LOADED BY XXDP
2980 010510 005237 005516                INC    DDUMP        ;SET RK06 DUMP MODE FLAG
2981 010514 104401 036462                TYPE   ,MSG2      ;REPLACE DRO PACK W/SCRATCH & DO<CR>
2982 010520 000137 010534                JMP    ST2
2983 010524 000137 010600      1$:    JMP    ST3
2984 010530 005237 005524      2$:    INC    PPTP        ;SET ACT/APT/PTP DUMP MODE FLAG
2985
2986                                ;
2987                                ;CHECK IF ALL PARAMETERS DEFAULTED. IF NOT, BEGIN INPUT DIALOGUE
2988                                ;WITH OPERATOR. THE REPLY TO 'DRIVES TO BE TESTED' SHOULD BE

```

G05

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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INITIALIZE THE COMMON TAGS

SEQ 0057

```

2989
2990
2991
2992
2993 010534 005737 001356
2994 010540 001002
2995 010542 000137 010632
2996 010546 104401 036533
2997 010552 004737 024164
2998 010556 104401 036565
2999 010562 004737 024324
3000 010566 104401 036632
3001 010572 004737 024352
3002 010576 000427
3003
3004
3005
3006
3007
3008
3009
3010
3011 010600 123727 000041 000013
3012 010606 001007
3013 010610 005237 005520
3014 010614 004737 024104
3015 010620 104401 036747
3016 010624 000402
3017 010626 005237 005522
3018
3019 010632 012737 177440 001264
3020 010640 012737 000210 001334
3021 010646 004737 024404
3022 010652 005237 005556
3023
3024 010656 005037 005370
3025 010662 005037 005372
3026 010666 005037 005374
3027 010672 005037 001176
3028 010676 012737 005530 001362
3029 010704 005037 001220
3030 010710 005037 001222
3031 010714 012737 010762 000004
3032 010722 005777 170420
3033 010726 005237 005550
3034 010732 013700 001350
3035 010736 012737 011024 000004
3036 010744 005777 170370
3037 010750 005237 005552
3038 010754 013700 001352
3039 010760 000412
3040
3041 010762 022626
3042 010764 012737 011030 000004
3043 010772 005777 170342
3044 010776 005237 005552

;DRIVE NOS. SEPERATED BY COMMAS & TERMINATED BY <CR>
;EX: DRIVES TO BE TESTED: 1,2,4<CR>
;
ST2: TST PARAM
      BNE 1$ ;BR IF 220 START
      JMP ST4 ;200 START, DEFAULT & SIZE THE BUSS
1$: TYPE MSG3 ;DRIVES TO BE TESTED
      JSR PC,GDRVS ;GET DR NOS.
      TYPE MSG4 ;BUSS ADDR
      JSR PC,GBA ;GET BA
      TYPE MSG5 ;CONT INT VECTOR
      JSR PC,GINT ;GET INT VECTOR
      BR ST5

;
;AUTO MODE
;CHECK IF LOADED BY XXDP OR OTHER. SET FLAGS & NO INPUT DIALOGUE.
;DEFAULT ALL PARAMETERS. TEST ONLY THOSE DRIVES THAT ARE READY
;ON THE BUSS
;
ST3: CMPB 41,#13 ;13=LOADED BY XXDP
      BNE 1$
      INC DDPCH ;SET RK06 CHAIN MODE FLAG
      JSR PC,TITLE
      TYPE MSG7 ;DRO NOT TSTD
      BR ST4
1$: INC ACT11 ;SET ACT AUTO FLAG.

ST4: MOV #177440,$BASE ;DEFAULT VALUE
      MOV #210,RKVEC ;DEFAULT VALUE
      JSR PC,SETINT
      INC SIZEFLG ;DO "SIZE THE BUSS" TEST

ST5: CLR UNLD ;INITIALIZE FLAGS
      CLR BADHDR ;USED IN 'STOP' ROUTINE
      CLR HPEND ;FOR VALID PROGRAM HALTS
      CLR $ESCAPE
      MOV #DRIVO,DRVPTA ;SETUP
      CLR $DEVCT ;NO. OF DRVS DONE
      CLR $UNIT ;CURRENT DRV UNDER TEST
      MOV #1$,$ERRVEC ;SETUP TIMEOUT ERROR VECTOR
      TST $LK$ ;SEE IF L-CLOCK THERE
      INC LCLKF ;PRESENT, SET FLAG.
      MOV LCVEC,RO ;VECTOR ADDR
      MOV #2$,$ERRVEC ;SEE IF P-CLOCK THERE
      TST $PK$ ;PRESENT, SET FLAG
      INC PCLKF ;VECTOR ADDR
      MOV PCVEC,RO
      BR 3$

1$: CMP (SP)+,(SP)+ ;L-CLOCK NOT THERE, CLEAR STACK
      MOV #4$,$ERRVEC
      TST $PK$ ;SEE IF P-CLOCK THERE
      INC PCLKF ;PRESENT, SET FLAG

```

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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INITIALIZE THE COMMON TAGS

SEQ 0058

3045 011002 013700 001352
3046 011006 005237 005554
3047 011012 012720 030124
3048 011016 012710 000300
3049 011022 000407
3050
3051 011024 022626
3052 011026 000767
3053
3054 011030 022626
3055 011032 005037 005554
3056 011036 104401 037156
3057
3058

35: MOV PCVEC,RO ;VECTOR ADDR
INC DOTIM ;INDICATES TIMING TESTS CAN BE DONE
MOV #CLOCK,(RO)+ ;SERVICE ROUTINE FOR CLOCKS
MOV #PR6,(RO)
BR TST1 ;;GO TO NEXT TEST
25: CMP (SP)+,(SP)+ ;P-CLOCK NOT THERE, CLEAR STACK
BR 35
45: CMP (SP)+,(SP)+ ;NEITHER CLOCK THERE, CLEAR STACK
CLR DOTIM ;TIMING TESTS CANNOT BE DONE.
TYPE ,MSG13 ;ALL TIMING TESTS BYPASSED

.SBTTL BASIC CONTROLLER TESTS, SIZING & SETUP

```

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

```

```

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

```

```

*****

```

```

TST1:  SCOPE
        MOV     #1,STIMES      ;DO 1 ITERATION
        MOV     #STACK,SP      ;RESTORE STK PTR
        MOV     #PRD,-(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     $EOP

```

```

*****
;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
;

```

```

3059
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3069
3070
3071 011042 000004
3072 011044 012737 000001 001174
3073 011052 012706 001100
3074
3075 011056 012746 000000
3076 011062 012746 011070
3077 011066 000002
3078 011070
3079
3080 011070 012737 011206 000004
3081 011076 013705 001264
3082 011102 005765 000000
3083 011106 005765 000010
3084 011112 005765 000002
3085 011116 005765 000004
3086 011122 005765 000006
3087 011126 005765 000012
3088 011132 005765 000014
3089 011136 005765 000016
3090 011142 005765 000020
3091 011146 005765 000024
3092 011152 005765 000026
3093 011156 005765 000034
3094 011162 005765 000036
3095 011166 005765 000030
3096 011172 005765 000032
3097
3098 011176 012737 030740 000004
3099 011204 000404
3100
3101 011206 022626
3102 011210 104007
3103 011212 000137 023742
3104
3105
3106
3107
3108
3109
3110
3111
3112
3113
3114

```

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T2 SIZE THE BUSS

SEQ 0060

```

3115      *      TESTING THAT DRIVE ONLY IF THE ERROR WAS A RESULT OF
3116      *      MDS, UFE OR NED BEING SET; OR BOTH NED & DRA RESET IN-
3117      *      DICATING THE OTHER PORT IS ACCESSED.
3118      *
3119      * *****
3120 011216 000004      TST2: SCOPE
3121 011220 012737 000001 001174      MOV      #1,$TIMES      ;DO 1 ITERATION
3122 011226 012706 001100      MOV      #STACK,SP      ;RESTORE STK PTR
3123
3124 011232 005237 001550      INC      BYPCERR      ;DO NOT TEST CERR IN FRDY
3125
3126 011236 132737 000200 001231      BITB      #BIT7,$ENVM      ;SEE IF USE APT SELECTED DRIVES
3127 011244 001002      BNE      14$      ;BR IF YES
3128 011246 000137 011362      JMP      12$      ;ELSE DO NORM SIZING OR VERIFY
3129
3130 011252 104401 037062      14$: TYPE      MSG10      ;WILL TEST DRIVES
3131 011256 000037 005526      CLR      DRVS      ;# OF DRIVES PRESENT
3132 011262 005000      CLR      RD      ;DRV ADDR
3133 011264 012701 005530      MOV      #DRIV0,R1      ;DRV FLAG
3134 011270 013702 001266      MOV      $DEV0,R2      ;APT DEVICE MAP
3135
3136 011274 032702 000001      15$: BIT      #BIT0,R2      ;SEE IF DRV IN DEVICE MAP
3137 011300 001410      BEQ      16$      ;BR IF NO
3138 011302 005237 005526      INC      DRVS      ;ELSE INCR DRIVE COUNT
3139 011306 005211      INC      (R1)      ;& SET DRIVE PRESENT FLAG
3140 011310 104401 001205      TYPE      $CRLF
3141 011314 010046      MOV      RD,-(SP)      ;SAVE RD FOR TYPEOUT
3142
3143 011316 104403      TYPOS      ;TYPE DRIVE #
3144 011320 001      .BYTE      1      ;GO TYPE--OCTAL ASCII
3145 011321 000      .BYTE      0      ;TYPE 1 DIGIT(S)
3146
3147 011322 005721      16$: TST      (R1)+      ;ADV POINTER TO NEXT FLAG
3148 011324 005200      INC      RD      ;INC DRIVE #
3149 011326 022700 000010      CMP      #8,RD      ;ALL 8 TESTED?
3150 011332 001402      BEQ      17$      ;BR IF YES
3151
3152 011334 006002      ROR      R2      ;ELSE GET NEXT BIT OFF DEVICE MAP
3153 011336 000756      BR      15$      ;& TRY AGAIN
3154
3155 011340 005737 005526      17$: TST      DRVS      ;SEE IF MORE DRIVES PRESENT
3156 011344 001402      BEQ      18$      ;BR IF NO
3157 011346 000137 012302      JMP      NUORV      ;ELSE EXIT TEST
3158
3159 011352 104034      18$: ERROR      34      ;NO DRIVES FOUND IN $DEV0
3160 011354 000000      HALT      ;SETUP CORRECTLY & PRESS 'CONTINUE'
3161 011356 000137 010656      JMP      ST5      ;TO TRY AGAIN
3162
3163 011362 012765 000040 000010 12$: MOV      #SCLR,RKCS2(R5) ;SUBSYSTEM CLEAR
3164
3165
3166
3167
3168
3169 011370 013737 001426 005444      MOV      T10,TEMP1      ;SET TIMEOUT
3170 011376 004737 024422      JSR      PC,FRDY      ;FIND RDY

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T2 SIZE THE BUSS

SEQ 0061

```

3171 011402 104120          ERROR 120          ;RDY NOT SET BY END OF SCLR
3172
3173
3174 011404 005737 005556    TST      SIZELG
3175 011410 001562          BEQ      TST3          ;DO NOT SIZE, GOTO NEXT TEST
3176 011412 104401 037062    TYPE     MSG10        ;WILL TEST DRIVES
3177 011416 005037 005526    CLR      DRVS        ;# OF DRIVES PRESENT
3178 011422 005000          CLR      RD            ;DRV ADDR
3179 011424 012701 005530    MOV      @DRVD,R1      ;DRV FLAG
3180 011430
3181 011430 104415          1$: SCOP1
3182 011432 012706 001100    MOV      @STACK,SP      ;RESTORE STK PTR
3183
3184 011436 012765 000040 000010 MOV      @SCLR,RKCS2(R5) ;SUBSYSTEM CLEAR
3185 011444 013737 001426 005444 MOV      T10,TEMP1      ;SET TIMEOUT
3186 011452 004737 024422    JSR      PC,FRDY      ;FIND RDY
3187 011456 104120          ERROR 120          ;RDY NOT SET BY END OF SCLR
3188 011460 010065 000010    MOV      RD,RKCS2(R5) ;SELECT THE DRIVE ADDR
3189 011464 012765 000001 000000 MOV      @SELDRV,RKCS1(R5) ;SELECT DRIVE CMD
3190 011472 013737 001426 005444 MOV      T10,TEMP1
3191 011500 004737 024422    JSR      PC,FRDY      ;FIND RDY
3192 011504 104117          ERROR 117          ;NO RDY AFTER SELECT DRIVE CMD.
3193 011506 032737 100000 005406 BIT      @CERR,HCS1
3194 011514 001046          BNE      2$
3195 011516 013737 005434 005444 MOV      HMR2,TEMP1
3196 011524 042737 177770 005444 BIC      @C<DRVMSK>,TEMP1
3197 011532 020037 005444    CMP      RD,TEMP1      ;S/B SAME
3198 011536 001016          BNE      3$
3199 011540 005700          TST      RD
3200 011542 001003          BNE      4$
3201 011544 005737 005520    TST      DDPCH          ;SEE IF XXDP CHAIN MODE
3202 011550 001014          BNE      5$
3203 011552 005237 005526          INC      DRVS        ;INC DRIVE COUNT
3204 011556 005211          INC      (R1)          ;SET DRIVE PRESENT FLAG
3205 011560 104401 001205    TYPE     SCRLF
3206 011564 010046          MOV      RD,-(SP)      ;SAVE RD FOR TYPEOUT
3207
3208 011566 104403          TYP0S          ;TYPE DR #
3209 011570 001          .BYTE 1          ;GO TYPE--OCTAL ASCII
3210 011571 000          .BYTE 0          ;TYPE 1 DIGIT(S)
3211 011572 000403          BR      5$          ;SUPPRESS LEADING ZEROS
3212
3213 011574 004737 025130          3$: JSR      PC,BYP
3214 011600 104001          ERROR 1          ;TYPE BYPASS DR #
3215
3216 011602 005721          5$: TST      (R1)+      ;SHIFT PTR TO NEXT DR. FLAG
3217 011604 005200          INC      RD            ;INC DR #
3218 011606 022700 000010    CMP      @8.,RD
3219 011612 001306          BNE      1$          ;MORE LEFT.
3220 011614 005737 005526    TST      DRVS
3221 011620 001054          BNE      10$
3222 011622 104061          ERROR 61          ;NO DRIVES SEEN
3223 011624 000000          HALT
3224 011626 000137 010656    JMP      ST5          ;SETUP & PRESS 'CONTINUE'
3225
3226 011632 032737 001000 005410 2$: BIT      @MDS,HCS2

```

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T2 SIZE THE BUSS

SEQ 0062

```

3227 011640 001015      BNE      6$
3228 011642 032737 000400 005410  BIT      #UFE,HCS2
3229 011650 001015      BNE      7$
3230 011652 032737 000001 005420  BIT      #DRA,HDS
3231 011660 001015      BNE      8$
3232 011662 032737 010000 005410  BIT      #NED,HCS2
3233 011670 001424      BEQ      9$
3234 011672 000743      BR       5$
3235
3236 011674 004737 025130      6$:   JSR      PC,BYP      ;TYPE BYP DR #
3237 011700 104002      ERROR    2      ;MDS DETECTED
3238 011702 000737      BR       5$
3239
3240 011704 004737 025130      7$:   JSR      PC,BYP
3241 011710 104003      ERROR    3      ;UFE DETECTED
3242 011712 000733      BR       5$
3243
3244 011714 032737 010000 005410  8$:   BIT      #NED,HCS2
3245 011722 001713      BEQ      4$
3246 011724 104401 037267      TYPE    MSG15      ;DRV#
3247 011730 010046      MOV      RD,-(SP)      ;SAVE RD FOR TYPEOUT
3248
3249 011732 104403      TYPOS
3250 011734      .BYTE    1      ;TYPE DR#
3251 011735      .BYTE    0      ;GO TYPE--OCTAL ASCII
3252 011736 104010      ERROR    10     ;TYPE 1 DIGIT(S)
3253 011740 000720      BR       5$      ;SUPPRESS LEADING ZEROS
3254
3255 011742 004737 025130      9$:   JSR      PC,BYP
3256 011746 104004      ERROR    4      ;NO DRA & NO NED = OTHER PORT SELECTED
3257 011750 000714      BR       5$
3258 011752 000137 012302     10$:  JMP      NUDRV
3259
3260 *****
3261 *TEST 3      VERIFY OPERATOR DRIVE SELECTIONS
3262 *
3263 *      THIS TEST IS ENTERED ONLY IF DRIVE SELECTION IS NOT
3264 *      DEFAULTED. EVERY DRIVE FROM 0 TO 7 IS ADDRESSED &
3265 *      CONTROLLER ERROR (CERR) IS EXAMINED. IF NOT SET, THE
3266 *      PROGRAM WILL ASSUME THE DRIVE IS PRESENT. IT WILL THEN CHECK
3267 *      TO SEE THAT THE DRIVE WAS INPUTTED FOR TESTING. IF NOT, IT WILL
3268 *      BE AN ERROR. IF CERR WAS SET, THAT DRIVE WILL BE BYPASSED
3269 *      ONLY IF THE ERROR WAS A RESULT OF MDS OR UFE SET OR BOTH
3270 *      NED & DRA RESET (WRONG PORT). IF CERR IS A RESULT OF
3271 *      NED ONLY, IT IS CHECKED AGAINST THE INPUTTED INFOR TO
3272 *      VERIFY IT WAS NOT SPECIFIED.
3273 *
3274 *****
3275 011756 000004      11$:  SCOPE
3276 011760 012737 000001 001174  MOV      #1,STIMES      ;DO 1 ITERATION
3277 011766 012706 001100      MOV      #STACK,SP      ;RESTORE STK PTR
3278 011772 005000      CLR      RD      ;DRIVE ADDR
3279 011774 012701 005530      MOV      #DRIVO,R1      ;DRIVE FLAG
3280 012000
3281 012000 104415      12$:  SCOP1
3282 012002 012706 001100      MOV      #STACK,SP      ;RESTORE STK PTR

```

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T3 VERIFY OPERATOR DRIVE SELECTIONS

SEQ 0063

3283											
3284	012006	012765	000040	000010		MOV	#SCLR,RKCS2(R5)	;SUBSYSTEM CLEAR			
3285	012014	013737	001426	005444		MOV	T10,TEMP1	;SET TIME OUT			
3286	012022	004737	024422			JSR	PC,FRDY	;FIND RDY			
3287	012026	104120				ERROR	120	;NO RDY AFTER SCLR			
3288	012030	010065	000010			MOV	R0,RKCS2(R5)	;DRV ADDR			
3289	012034	012765	000001	000000		MOV	#SELD,DRV,RKCS1(R5)	;SELECT DRIVE CMD			
3290	012042	013737	001426	005444		MOV	T10,TEMP1				
3291	012050	004737	024422			JSR	PC,FRDY	;FIND RDY			
3292	012054	104117				ERROR	117	;NO RDY AFTER SELECT DRIVE CMD.			
3293	012056	032737	100000	005406		BIT	#CERR,HCS1				
3294	012064	001036				BNE	2\$				
3295	012066	013737	005434	005444		MOV	HMR2,TEMP1				
3296	012074	042737	177770	005444		BIC	#1C<DRVMSK>,TEMP1				
3297	012102	020037	005444			CMP	R0,TEMP1	;S/B SAME			
3298	012106	001010				BNE	3\$				
3299	012110	005711			11\$:	TST	(R1)				
3300	012112	001417				BEQ	5\$				
3301	012114	005721			4\$:	TST	(R1)+	;SHIFT PTR TO NEXT DR FLAG			
3302	012116	005200				INC	R0	;INC DR#			
3303	012120	022700	000010			CMP	#8.,R0				
3304	012124	001325				BNE	1\$	;MORE LEFT			
3305	012126	000467				BR	TST4	;GO TO NEXT TEST			
3306											
3307	012130	004737	025130		3\$:	JSR	PC,BYP	;TRY BYPASS DRIVE#			
3308	012134	104001				ERROR	1	;WRITTEN DR# DOES NOT MATCH RKMR2 DR#			
3309	012136	005711				TST	(R1)				
3310	012140	001765				BEQ	4\$	;BRANCH IF NOT SPEC BY INPUT			
3311	012142	005337	005526		12\$:	DEC	DRVS	;DECREMENT TOTAL DRVS			
3312	012146	005011				CLR	(R1)	;CLEAR DRIVE FLAG			
3313	012150	000761				BR	4\$				
3314											
3315	012152	004737	025130		5\$:	JSR	PC,BYP				
3316	012156	104005				ERROR	5	;DR PRESENT BUT NOT SPECIFIED BY OPERATOR			
3317	012160	000755				BR	4\$				
3318											
3319	012162	032737	001000	005410	2\$:	BIT	#MDS,HCS2				
3320	012170	001027				BNE	6\$				
3321	012172	032737	000400	005410		BIT	#UFE,HCS2				
3322	012200	001027				BNE	7\$				
3323	012202	032737	000001	005420		BIT	#DRA,HDS				
3324	012210	001005				BNE	8\$				
3325	012212	032737	010000	005410		BIT	#NED,HCS2				
3326	012220	001423				BEQ	9\$				
3327	012222	000404				BR	10\$				
3328	012224	032737	010000	005410	8\$:	BIT	#NED,HCS2				
3329	012232	001726				BEQ	11\$				
3330	012234	005711			10\$:	TST	(R1)				
3331	012236	001726				BEQ	4\$				
3332											
3333	012240	004737	025130			JSR	PC,BYP	;TYPE BYPASS DRIVE#			
3334	012244	104006				ERROR	6				
3335	012246	000735				BR	12\$				
3336											
3337	012250	004737	025130		6\$:	JSR	PC,BYP	;TYPE BYPASS DRIVE#			
3338	012254	104002				ERROR	2	;MDS DETECTED			

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T3 VERIFY OPERATOR DRIVE SELECTIONS

SEQ 0064

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3339 012256 000762          BR      8$
3340
3341 012260 004737 025130    7$:   JSR      PC,BYP
3342 012264 104003          ERROR   3          ;UFE DETECTED
3343 012266 000756          BR      8$
3344
3345 012270 004737 025130    9$:   JSR      PC,BYP
3346 012274 104004          ERROR   4          ;DRA & NED RESET - OTHER PORT SELECTED
3347 012276 000752          BR      8$
3348
3349 012300 001237          BNE      1$          ;BRANCH IF MORE LEFT.
3350
3351
3352
3353          ;THIS PART OF THE PROGRAM WILL BE REPEATED FOR EACH
3354          ;DRIVE PRESENT
3355
3356          ;'SUNIT' CONTAINS THE ADDRESS OF THE DRIVE CURRENTLY
3357          ;UNDER TEST
3358
3359 012302 005037 001550    NUDRV: CLR      BYPCERR          ;ENTER HERE FROM LAST TEST
3360                                     ;TEST CERR IN 'FRDY'
3361
3362          ;*****
3363          ;TEST 4          FIND NEXT DRIVE TO BE TESTED
3364          ;
3365          ;THIS TEST FINDS THE NEXT DRIVE PRESENT & PUTS THAT
3366          ;ADDRESS IN 'SUNIT'.
3367          ;THROUGHOUT THE FOLLOWING TESTS, THE DRIVE TESTED IS
3368          ;THE DRIVE WHOSE ADDRESS IS IN 'SUNIT'.
3369          ;*****
3370          ;*****
3371 012306 000004          ST4:   SCOPE
3372 012310 012737 000001 001174    MOV      #1,STIMES          ;DO 1 ITERATION
3373 012316 012706 001100          MOV      #STACK,SP          ;RESTORE STK PTR
3374 012322 012737 000004 001214    MOV      #STN-1,STSTN
3375 012330 012737 000004 001102    MOV      #STN-1,STSTNM
3376
3377 012336 005737 005526          TST      DRVS          ;ANY DRIVES PRESENT?
3378 012342 001004          BNE      4$          ;YES BRANCH
3379 012344 104401 037647          TYPE     MSG27          ;ALL DRIVES TESTED
3380 012350 000137 023742          JMP      $EOP          ;NO, GO TO END
3381
3382 012354 013701 001362          4$:   MOV      DRVPTR,R1          ;ADDR OF NEXT DRIVE FLAG
3383 012360 005737 001220          TST      $DEVCT          ;IS FIRST DRIVE BEING CHECKED
3384 012364 001402          BEQ      2$          ;YES, BRANCH
3385 012366 005237 001222          1$:   INC      SUNIT          ;INCR DRIVE ADDR TO NEXT DRIVE
3386 012372 005721          2$:   TST      (R1)+          ;IS DRIVE PRESENT?
3387 012374 001774          BEQ      1$          ;NO, FIND NEXT DRIVE PRESENT
3388 012376 005737 005520          TST      DDPCH          ;DDP CHAIN MODE?
3389 012402 001403          BEQ      3$          ;NO, BRANCH
3390 012404 005737 001222          TST      SUNIT          ;YES, IS IT DRIVE 0?
3391 012410 001766          BEQ      1$          ;IF YES, DON'T TEST DR 0
3392 012412 010137 001362          3$:   MOV      R1,DRVPTN          ;STORE POINTER TO THE NEXT DR. FLAG
3393 012416 104401 037267          TYPE     MSG15          ;DRIVE
3394 012422 013700 001222          MOV      SUNIT,R0

```

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T4 FIND NEXT DRIVE TO BE TESTED

SEQ 0065

```

3395 012426 010046      MOV      RD,-(SP)      ;;SAVE RD FOR TYPEOUT
3396                                     ;;DRIVE #
3397 012430 104403      TYPOS      ;;GO TYPE--OCTAL ASCII
3398 012432 001        .BYTE      1      ;;TYPE 1 DIGIT(S)
3399 012433 000        .BYTE      0      ;;SUPPRESS LEADING ZEROS
3400
3401 012434 104401 001205  TYPE      ,SCLF
3402
3403 012440
3404
3405
3406
3407
3408
3409
3410
3411 012440 000004
3412 012442 012737 000001 001174
3413 012450 012706 001100
3414
3415 012454 005737 001216
3416 012460 001046
3417 012462 004737 026332
3418 012466 104024
3419
3420 012470 104401 037301
3421 012474 012765 000003 000026
3422 012502 004737 025760
3423 012506 013701 005434
3424 012512 012704 034764
3425 012516 010446
3426 012520 012703 000003
3427 012524 006101
3428 012526 006101
3429 012530 006101
3430 012532 006101
3431 012534 006101
3432 012536 006101
3433 012540 010100
3434 012542 042700 177760
3435 012546 052700 000060
3436 012552 110024
3437 012554 005303
3438 012556 001364
3439 012560 105014
3440
3441 012562 004737 035232
3442 012566 104401 001205
3443 012572 104401 001205
3444
3445
3446
3447
3448
3449
3450

PFSRT:                                ;ENTER HERE FOR POWER FAIL RESTART
;*****
;TEST 5      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
;*****
TSTS:  SCOPE
      MOV      #1,STIMES      ;;DO 1 ITERATION
      MOV      #STACK,SP      ;RESTORE STK PTR
      TST      $PASS
      BNE      TST6           ;;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,RKMR:(R5)  ;SELECT BYTE 3
      JSR      PC,GSTAT      ;GET STATUS
      MOV      #R2,R1        ;GET SERIAL #
      MOV      #SOCTVL,R4    ;GET ADDR CHAR BUFF
      MOV      R4,-(SP)      ;STORE ON STACK FOR $SUPRS
      MOV      #3,R3         ;SETUP CHAR COUNT
      ROL      R1            ;INITIALIZE BIT POSITIONS
      ROL      R1
      ROL      R1            ;GET NEXT 4 BITS
      ROL      R1
      ROL      R1
      ROL      R1
      MOV      R1,R0         ;GET WORKING COPY
      BIC      #177760,R0    ;CLEAR ALL BUT LOW 4 BITS
      BIS      #60,R0        ;CONVERT TO ASCII DIGIT
      MOV      R0,(R4)+      ;PUT ASCII DIGIT INTO CHAR BUFF
      DEC      R3
      BNE      IS           ;BR IF ALL 3 CHARS NOT DONE
      CLRB     (R4)          ;ELSE INSERT NULL TERMINATOR
      JSR      PC,$SUPRS     ;TYPE
      TYPE     ,SCLF
      TYPE     ,SCLF

;*****
;TEST 6      SET VV WITH PACK COMMAND
;
;      IF VV IS RESET, THE PACK COMMAND IS USED TO SET IT.
;*****

```

C06

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T6 SET VV WITH PACK COMMAND

SEQ 0066

3451	012576	000004			TST6:	SCOPE		
3452	012600	012737	000001	001174		MOV	#1,STIMES	::DO 1 ITERATION
3453	012606	012706	001100			MOV	#STACK,SP	;RESTORE STK PTR
3454								
3455	012612	004737	026332			JSR	PC,SUBCLR	
3456	012616	104024				ERROR	24	;CERR AFTER SCLR
3457								
3458	012620	032737	000100	005434		BIT	#D.VV,HMR2	
3459	012626	001024				BNE	TST7	::GO TO NEXT TEST IF VV SET
3460								
3461	012630	104415				SCOPI		
3462	012632	012706	001100			MOV	#STACK,SP	;RESTORE STK PTR
3463								
3464	012636	004737	026332			JSR	PC,SUBCLR	
3465	012642	104024				ERROR	24	;CERR AFTER SCLR
3466								
3467	012644	012765	000003	000000		MOV	#PACK,RKCS1(R5)	;CMD TO SET VV
3468	012652	012737	000010	005444		MOV	#10,TEMP1	
3469	012660	004737	024422			JSR	PC,FRDY	;FIND RDY
3470	012664	104116				ERROR	116	;RDY NOT SET AFTER PACK CMD
3471								
3472	012666	032737	000100	005434		BIT	#D.VV,HMR2	
3473	012674	001001				BNE	TST7	::GO TO NEXT TEST IF VV NOW SET
3474	012676	104027				ERROR	27	;PACK DID NOT SET VV
3475								
3476								
3477								
3478								
3479								
3480								
3481								
3482								
3483	012700	000004						
3484	012702	012737	000001	001174		TST7:	SCOPE	
3485	012710	012706	001100				MOV	#1,STIMES
3486							MOV	#STACK,SP
3487	012714	005237	005370				INC	UNLD
3488								;USED TO CHECK FOR VALID HALT
3489	012720	004737	026332				JSR	PC,SUBCLR
3490	012724	104024					ERROR	24
3491								;CERR AFTER SCLR
3492	012726	012765	000007	000000			MOV	#UNLOAD,RKCS1(R5)
3493	012734	013737	001426	005444			MOV	T10,TEMP1
3494	012742	004737	024422				JSR	PC,FRDY
3495	012746	104017					ERROR	17
3496	012750	004737	024704				JSR	PC,TSTATN
3497	012754	104020					ERROR	20
3498								;NO ATTN AFTER UNLOAD CMD
3499								
3500								

.SBTTL OPERATOR INTERVENTION TESTS

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*****
;TEST 10      INTERLOCKS TESTS
;
; THIS TEST VERIFIES THAT THE DOOR & CARTRIDGE STATUS BITS
; ARE OPERATING PROPERLY IN MESSAGE AD & THAT THE REMOVAL

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3507      * OF THE CARTRIDGE CLEARS VOLUME VALID.
3508      * IT FURTHER VERIFIES ALL REMAINING STATUS BITS OF
3509      * MESSAGE A & B, WORDS 0 & 1.
3510      * THIS TEST ALSO CHECKS THAT THE SPINDLE CANNOT BE STARTED
3511      * WHEN THE DOOR IS OPEN OR THE CARTRIDGE IS REMOVED.
3512      * IT ALSO VERIFIES THAT LOSS OF VOLUME VALID RESETS SACK WHICH
3513      * ASSERTS NON EXISTENT DRIVE IN RKCS2
3514      *
3515      * *****
3516 012756 000004      * ST10: SCOPE
3517 012760 012737 000001 001174      * MOV #1,STIMES ;DO 1 ITERATION
3518 012766 012706 001100      * MOV #STACK,SP ;RESET STACK PTR
3519
3520 012772 004737 026332      * JSR PC,SUBCLR
3521 012776 104024      * ERROR 24 ;CERR AFTER SCLR
3522
3523 013000 005237 001550      * INC BYPCERR ;DONT DO CKCERR ROUTINE
3524
3525 013004 104401 037004      * TYPE ,MSG8 ;INTERLOCKS TEST
3526 013010 104401 041656      * TYPE ,MSG52 ;CONT-E TO EXIT OR SPACE TO CONTINUE
3527 013014 004737 030306      * JSR PC,CCSP ;INPUT CONT-E OR SPACE
3528 013020 000137 013634      * JMP BS ;RET HERE FOR CONT-E
3529
3530 013024 104401 041350      * TYPE ,MSG47 ;VERIFY DOOR CANNOT BE OPENED
3531 013030 104401 040502      * TYPE ,MSG37 ;DEPRESS SPACE WHEN DONE
3532 013034 004737 030346      * JSR PC,GETSP ;GET SPACE
3533
3534 013040 104401 043323      * TYPE ,MSG65 ;DEPRESS RUN/STOP SW TO 'STOP'
3535 013044 104401 040005      * TYPE ,MSG30 ;OPEN DOOR & LEAVE IT OPEN
3536 013050 104401 040502      * TYPE ,MSG37 ;DEPRESS SPACE BAR WHEN DONE
3537 013054 004737 030346      * JSR PC,GETSP ;INPUT SPACE
3538 013060 012765 000001 000026      * MOV #1,RKMR1(R5) ;SELECT WORD 1
3539 013066 004737 025760      * JSR PC,GSTAT
3540 013072 032737 000200 005434      * BIT #0.DOOR,HMR2
3541 013100 001401      * BEQ BS
3542 013102 104044      * ERROR 44 ;DOOR STATUS BIT NOT CLEARED
3543
3544 013104 012737 000140 005476 1S:      * MOV #<D.DRA!D.VV>,E.A0 ;EXPECTED A0
3545 013112 005037 005500      * CLR E.B0
3546 013116 012737 000540 005502      * MOV #<D.HDMM!D.BRHM!D.CART>,E.A1
3547 013124 012737 000001 005504      * MOV #1,E.B1
3548
3549 013132 004737 025144      * JSR PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
3550 013136 000000      * .WORD 0!0!0 ;& MSGS SPECIFIED HERE
3551 013140 104045      * ERROR 45 ;MSG A0 ERROR AFTER DRIVE UNLOADED & DOOR OPENED
3552 013142 104046      * ERROR 46 ;MSG B0 ERROR
3553 013144 104063      * ERROR 63 ;MSG A1 ERROR
3554 013146 104064      * ERROR 64 ;MSG B1 ERROR
3555
3556 013150 004737 026332      * JSR PC,SUBCLR
3557 013154 104024      * ERROR 24 ;CERR AFTER SCLR
3558
3559 013156 104401 040135      * TYPE ,MSG33 ;PRESS 'RUN-STOP' TO 'RUN'
3560 013162 104401 040222      * TYPE ,MSG34 ;VERIFY DOES NOT START
3561 013166 104401 040502      * TYPE ,MSG37
3562 013172 004737 030346      * JSR PC,GETSP ;GET SPACE FROM TTY

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T10 INTERLOCKS TESTS

SEQ 0068

3563								
3564	013176	004737	025760		JSR	PC,GSTAT		
3565	013202	032737	010000	005434	BIT	#D.SPIN,HMR2		
3566	013210	001401			BEQ	5\$		
3567	013212	104065			ERROR	65		;SPIN SET IN MSGAO
3568								
3569	013214	012737	000140	005476	2\$: MOV	#(D.DRA!D.VV),E.A0		;EXPECTED MSG AO
3570	013222	005037	005500		CLR	E.B0		
3571	013226	012737	000540	005502	MOV	#(D.HOHM!D.BRHM!D.CART),E.A1		
3572	013234	012737	000001	005504	MOV	#1,E.B1		
3573								
3574	013242	004737	025144		JSR	PC,CHKMSG		;CHECK MSGS AO, BO, A1, B1
3575	013246	000000			.WORD	0!0!0		; & MSGS SPECIFIED HERE
3576	013250	104066			ERROR	66		;MSG AO ERROR AFTER ATTEMPT TO START SPIN & DOOR OPEN
3577	013252	104067			ERROR	67		;MSG BO ERROR
3578	013254	104070			ERROR	70		;MSG A1 ERROR
3579	013256	104071			ERROR	71		;MSG B1 ERROR
3580								
3581	013260	004737	026332		JSR	PC,SUBCLR		
3582	013264	104024			ERROR	24		;CERR AFTER SCLR
3583								
3584	013266	104401	043323		TYPE	,MSG65		;DEPRESS 'RUN-STOP' SW TO STOP
3585	013272	104401	040075		TYPE	,MSG32		;REMOVE PACK & CLOSE DOOR
3586	013276	104401	040502		TYPE	,MSG37		
3587	013302	004737	030346		JSR	PC,GETSP		;GET SPACE FROM TTY
3588								
3589	013306	012765	000001	000026	MOV	#1,RKMR1(R5)		;SELECT WORD 1
3590	013314	004737	025760		JSR	PC,GSTAT		
3591	013320	032737	000400	005434	BIT	#D.CART,HMR2		
3592	013326	001401			BEQ	3\$		
3593	013330	104072			ERROR	72		;CARTRIDGE STATUS BIT NOT RESET
3594								
3595								
3596	013332	004737	026332		3\$: JSR	PC,SUBCLR		
3597	013336	104024			ERROR	24		;CERR AFTER SCLR
3598								
3599	013340	104401	040310		TYPE	,MSG35		;PRESS 'RUN-STOP' TO 'RUN'
3600	013344	104401	040222		TYPE	,MSG34		;VERIFY DOES NOT START
3601	013350	104401	040502		TYPE	,MSG37		
3602	013354	004737	030346		JSR	PC,GETSP		;GET SPACE FROM TTY
3603								
3604	013360	004737	025760		JSR	PC,GSTAT		
3605	013364	032737	010000	005434	BIT	#D.SPIN,HMR2		
3606	013372	001401			BEQ	5\$		
3607	013374	104100			ERROR	100		;SPIN SET IN MSG AO
3608								
3609	013376	104401	043323		5\$: TYPE	,MSG65		;PRESS 'RUN-STOP' TO 'STOP'
3610	013402	104401	040405		TYPE	,MSG36		;INSERT CARTRIDGE, SET 'RUN' SW. & CLOSE DOOR
3611	013406	104401	043563		TYPE	,MSG70		;VERIFY HEADS LOAD
3612	013412	104401	043506		TYPE	,MSG69		;DEPRESS SPACE WHEN READY GOES ON
3613	013416	004737	030346		JSR	PC,GETSP		;GET SPACE FROM TTY
3614	013422	005037	005370		CLR	UNLD		;FOR VALID HALT
3615								
3616	013426	012765	100000	000000	MOV	#CCLR,RKCS1(R5)		
3617	013434	005065	000026		CLR	RKMR1(R5)		;SELECT WORD 0
3618	013440	004737	025760		JSR	PC,GSTAT		

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T10 INTERLOCKS TESTS

SEQ 0069

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3619 013444 032737 000100 005434      BIT      #D.VV,HMR2
3620 013452 001401      BEQ      75
3621 013454 104033      ERROR    33          ;VV NOT CLEARED AFTER PACK RE-INSERTED
3622
3623 013456 012737 050240 005476 75:    MOV      #<D.DSC!D.SPIN!D.DRDY!D.DRA>,E.A0      ;EXPECTED A0
3624 013464 005037 005500      CLR      E.B0
3625 013470 012737 001720 005502      MOV      #<D.SPOK!D.CART!D.SSP!D.BRHM!D.DOOR>,E.A1
3626 013476 012737 000001 005504      MOV      #1,E.B1
3627
3628 013504 004737 025144      JSR      PC,CHKMSG          ;CHECK MSGS A0, B0, A1, B1
3629 013510 000000      .WORD    0!0!0          ;& MSGS SPECIFIED HERE
3630 013512 104074      ERROR    74          ;MSG A0 ERROR AFTER PACK REINSERTED & HEADS LOADED
3631 013514 104075      ERROR    75          ;MSG B0 ERROR
3632 013516 104076      ERROR    76          ;MSG A1 ERROR
3633 013520 104077      ERROR    77          ;MSG B1 ERROR
3634
3635 013522 012765 100000 000000      MOV      #CCLR,RKCS1(R5)
3636 013530 013765 001222 000010      MOV      $UNIT,RKCS2(R5)      ;DRIVE #
3637 013536 012765 000003 000000      MOV      #PACK,RKCS1(R5)      ;PACK CMD
3638 013544 013737 001426 005444      MOV      T10,TEMP1
3639 013552 004737 024422      JSR      PC,FRDY          ;FIND CONTR RDY
3640 013556 104116      ERROR    116         ;CONTR NOT RDY
3641
3642 013560 032737 000100 005434      BIT      #D.VV,HMR2
3643 013566 001001      BNE      64$
3644 013570 104027      ERROR    27          ;VOLUME VALID NOT SET AFTER PACK CMD
3645 013572      64$:
3646 013572 005237 005370      INC      UNLD          ;FOR VALID HALT
3647
3648 013576 004737 026332      JSR      PC,SUBCLR
3649 013602 104024      ERROR    24          ;CERR AFTER SCLR
3650
3651 013604 012765 000007 000000      MOV      #UNLOAD,RKCS1(R5)      ;UNLOAD CMD
3652 013612 013737 001426 005444      MOV      T10,TEMP1
3653 013620 004737 024422      JSR      PC,FRDY          ;FIND CONTR RDY
3654 013624 104017      ERROR    17          ;NO RDY AFTER UNLD CMD
3655 013626 004737 024704      JSR      PC,TSTATN
3656 013632 104020      ERROR    20          ;NO ATTN AFTER UNLOAD CMD
3657 013634      8$:
3658
3659      ;*****
3660      ;TEST 11      UNIT SELECT PLUG TEST
3661      ;
3662      ;      THIS TEST VERIFIES THAT WHEN THE UNIT SELECT PLUG IS PULLED
3663      ;      OUT, THE QUAL LOGIC RESETS ATTN & VOLUME VALID, THAT
3664      ;      THE DRIVE DE-SELECTS & NON EXISTENT DRIVE ASSERTS.
3665      ;      FURTHER, THE OPERATOR IS ASKED TO INSERT ANY NUMBER OF
3666      ;      UNIT SELECT PLUGS. THE PROGRAM WILL RESPOND BY TYPING
3667      ;      THE PLUG CODE NUMBER AS SOON AS IT IS INSERTED.
3668      ;      THIS PORTION OF THE TEST IS TERMINATED AT ANY TIME BY A CONT-E
3669      ;
3670      ;*****
3671 013634 000004      TEST11: SCOPE
3672 013636 012737 000001 001174      MOV      #1,STIMES          ;;DO 1 ITERATION
3673 013644 012706 001100      MOV      #STACK,SP          ;RESTORE STACK PTR
3674

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T11 UNIT SELECT PLUG TEST

SEQ 0070

3675	013650	004737	026332		JSR	PC, SUBCLR	
3676	013654	104024			ERROR	24	; CERR AFTER SCLR
3677							
3678	013656	104401	037355		TYPE	, MSG18	; UNIT SELECT PLUG TEST
3679	013662	104401	041656		TYPE	, MSG52	; CONT-E TO EXIT OR SPACE TO CONTINUE
3680	013666	004737	030306		JSR	PC, CCSP	; INPUT CONT-E OR SPACE
3681	013672	000137	014504		JMP	12\$	; RETURN HERE FOR CONT-E
3682							
3683	013676	012765	000020	000026	MOV	#PAT, RKMR1(R5)	; EVEN PARITY TO GET DSC & ATTN
3684	013704	004737	025760		JSR	PC, GSTAT	
3685	013710	032737	001000	005436	BIT	#D, PAR, HMR3	; SEE IF PARITY SET
3686	013716	001001			BNE	2\$	; BR IF YES
3687	013720	104114			ERROR	114	; PARITY BIT NOT SET AFTER SEL DRIVE CMD
3688							; WITH EVEN PARITY ISSUED.
3689	013722	032737	040000	005434	2\$: BIT	#D, DSC, HMR2	; SEE IF DSC SET
3690	013730	001001			BNE	1\$	
3691	013732	104107			ERROR	107	; DSC NOT SET AFTER SEL DRV WITH EVEN PARITY
3692							
3693	013734	012765	100000	000000	1\$: MOV	#CCLR, RKCS1(R5)	
3694	013742	004737	025760		JSR	PC, GSTAT	
3695	013746	004737	024704		JSR	PC, TSTATN	
3696	013752	104113			ERROR	113	; NO ATTN AFTER SEL DRV WITH EVEN PARITY
3697							
3698	013754	104401	037030		TYPE	, MSG9	; REMOVE UNIT SELECT PLUG
3699	013760	104401	040502		TYPE	, MSG37	; DEPRESS SPACE WHEN DONE
3700	013764	004737	030346		JSR	PC, GETSP	; GET SPACE
3701							
3702	013770	012765	100000	000000	MOV	#CCLR, RKCS1(R5)	
3703	013776	004737	025760		JSR	PC, GSTAT	
3704	014002	004737	024704		JSR	PC, TSTATN	; RETURN HERE FOR SPACE
3705	014006	000401			BR	3\$	; NO ATTN
3706	014010	104111			ERROR	111	; REMOVING UNIT SEL PLUG, DID NOT
3707							; DISABLE ATTN.
3708	014012	012765	100000	000000	3\$: MOV	#CCLR, RKCS1(R5)	
3709	014020	004737	025760		JSR	PC, GSTAT	
3710	014024	032765	010000	000010	BIT	#NED, RKCS2(R5)	
3711	014032	001001			BNE	4\$	
3712	014034	104112			ERROR	112	; REMOVING UNIT SEL PLUG DID NOT
3713							; ASSERT NON-EXISTENT DRIVE
3714							
3715	014036	104401	043371		4\$: TYPE	, MSG67	; DESELECT ALL OTHER PORTS
3716	014042	104401	040502		TYPE	, MSG37	; TYPE SPACE WHEN DONE
3717	014046	004737	030346		JSR	PC, GETSP	; GET SPACE
3718							
3719	014052	104401	040546		TYPE	, MSG38	; INSERT UNIT SELECT PLUGS
3720	014056	104401	040704		TYPE	, MSG39	; DEPRESS CONTROL-E WHEN FINISHED
3721	014062	104401	042137		TYPE	, MSG55	; EXIT WITH CORRECT UNIT SELECT PLUG
3722	014066	013746	001222		MOV	\$UNIT, -(SP)	; SAVE \$UNIT FOR TYPEOUT
3723							; TYPE CORRECT
3724	014072	104403			TYPOS		; GO TYPE--OCTAL ASCII
3725	014074	001			.BYTE	1	; TYPE 1 DIGIT(S)
3726	014075	000			.BYTE	0	; SUPPRESS LEADING ZEROS
3727	014076	104401	001205		TYPE	, \$CRLF	
3728							
3729	014102	105037	033260		CLPB	\$TKQSRT	; CLEAR PREVIOUS INFO
3730	014106	005037	001160		CLR	\$TMP0	

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T11 UNIT SELECT PLUG TEST

SEQ 0071

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3731
3732 014112 113737 033260 001160 5$: MOV B $TKQSRT,$TMP0 ;GET CHAR IF THERE
3733 014120 042737 177600 001160 BIC #C(177),$TMP0 ;GET RID OF JUNK, IF ANY
3734 014126 005737 001160 TST $TMP0
3735 014132 001422 BEQ 6$ ;BR IF NOTHING TYPED YET
3736 014134 023727 001160 000005 CMP $TMP0,#5 ;SEE IF CONT-E
3737 014142 001476 BEQ 9$ ;BR IF YES
3738 014144 023727 001160 000003 CMP $TMP0,#3 ;SEE IF CONT-C
3739 014152 001004 BNE 13$ ;BR IF NO
3740 014154 004737 033262 JSR PC,$TKINT ;ENABLE KB INT
3741 014160 000137 030376 JMP STOP1 ;ELSE DO VALID HALT
3742 014164 104401 040067 13$: TYPE MSG31 ;?
3743 014170 105037 033260 CLRB $TKQSRT
3744 014174 004737 033262 JSR PC,$TKINT
3745
3746 014200 005000 6$: CLR R0
3747 014202 012765 100000 000000 7$: MOV #CCLR,RKCS1(R5)
3748 014210 010065 000010 MOV R0,RKCS2(R5) ;DRIVE NO.
3749 014214 012765 000001 000000 #SELDV,RKCS1(R5) ;SELECT DRIVE CMD
3750 014222 013737 001426 005444 MOV T10,TEMP1
3751 014230 004737 024422 JSR PC,FRDY ;FIND CONTR RDY
3752 014234 104117 ERROR 117 ;CONTR RDY NOT SET
3753
3754 014236 032765 010000 000010 BIT #NED,RKCS2(R5) ;SEE IF UNIT SELECT PLUG INSERTED
3755 014244 001405 BEQ 8$ ;& IF MATCH DRIVE NO IN CS2. BR IF YES
3756 014246 005200 INC R0
3757 014250 020027 000010 CMP R0,#8. ;ALL 8 DRIVE NOS TRIED?
3758 014254 001352 BNE 7$ ;BR IF NO
3759 014256 000715 BR 5$ ;ELSE RETURN
3760
3761 014260 032737 000100 005434 8$: BIT #D.VV,HMR2
3762 014266 001311 BNE 5$ ;TYPE SAME UNIT SELECT PLUG RDY ONCE
3763 014270 012765 100000 000000 MOV #CCLR,RKCS1(R5)
3764 014276 010065 000010 MOV R0,RKCS2(R5) ;DRIVE ADDR
3765 014302 012765 000003 000000 MOV #PACK,RKCS1(R5) ;PACK CMD
3766 014310 013737 001426 005444 MOV T10,TEMP1
3767 014316 004737 024422 JSR PC,FRDY ;FIND CONTR RDY
3768 014322 104116 ERROR 116 ;CONTR NOT RDY
3769 014324 010046 MOV R0,-(SP) ;SAVE R0 FOR TYPEOUT
3770
3771 014326 104403 TYPEOS ;TYPE UNIT SEL PLUG NO.
3772 014330 001 .BYTE 1 ;GO TYPE--OCTAL ASCII
3773 014331 000 .BYTE 0 ;TYPE 1 DIGIT(S)
3774 014332 104401 001205 TYPE $CRLF ;SUPPRESS LEADING ZEROS
3775 014336 000665 BR 5$
3776
3777 014340 004737 033262 9$: JSR PC,$TKINT ;ENABLE KB INT
3778 014344 012765 100000 000000 MOV #CCLR,RKCS1(R5)
3779 014352 013765 001222 000010 MOV $UNIT,RKCS2(R5)
3780 014360 012765 000001 000000 MOV #SELDV,RKCS1(R5)
3781 014366 013737 001426 005444 MOV T10,TEMP1
3782 014374 004737 024422 JSR PC,FRDY
3783 014400 104117 ERROR 117 ;CONT NOT RDY AFTER SEL DRV CMD
3784
3785 014402 032765 010000 000010 BIT #NED,RKCS2(R5) ;SEE IF CORRECT PLUG FOR EXIT
3786 014410 001411 BEQ 10$ ;BR IF YES

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T11 UNIT SELECT PLUG TEST

SEQ 0C72

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3787 014412 104401 042137      TYPE      MSG55      ;EXIT WITH CORRECT UNIT SELECT PLUG NO.
3788 014416 013746 001222      MOV      $UNIT,-(SP)  ;SAVE $UNIT FOR TYPEOUT
3789                                ;TYPE CORRECT UNIT SEL PLUG #
3790 014422 104403                TYP0S      ;GO TYPE--OCTAL ASCII
3791 014424      001              .BYTE      1      ;TYPE 1 DIGIT(S)
3792 014425      000              .BYTE      0      ;SUPPRESS LEADING ZEROS
3793 014426 104401 040704      TYPE      MSG39      ;DEPRESS CONT-E WHEN DONE
3794 014432 000627                BR          $$
3795
3796 014434 004737 026332      10$: JSR      PC,SUBCLR
3797 014440 104024                ERROR      24      ;CERR AFTER SCLR
3798
3799 014442 004737 025760      JSR      PC,GSTAT
3800 014446 032737 000100 005434 BIT      #D,VV,HMR2
3801 014454 001005                BNE      11$
3802 014456 104401 040747      TYPE      ,MSG40      ;VV NOT SET, INSERT UNIT SELECT PLUG
3803 014462 104401 040704      TYPE      ,MSG39      ;DEPRESS CONT-E TO EXIT TEST
3804 014466 000611                BR          $$
3805
3806 014470 104401 043611      11$: TYPE      ,MSG71      ;SELECT CORRECT PORT ON OTHER DRIVES
3807 014474 104401 040502      TYPE      ,MSG37      ;TYPE SPACE WHEN DONE
3808 014500 004737 030346      JSR      PC,GETSP      ;GET SPACE
3809 014504
3810
3811
3812
3813
3814
3815
3816
3817
3818
3819
3820 014504 000004                ;*****
3821 014506 012737 000001 001174 ;*TEST 12      PORT SELECTION TESTS
3822 014514 012706 001100                ;*
3823                                ;*      THE OPERATOR IS ASKED TO SWITCH TO THE WRONG PORT
3824 014520 004737 026332                ;*      & THEN DESELECT BOTH PORTS.
3825 014524 104024                ;*      IN BOTH CASES, NON EXISTENT DRIVE SHOULD ASSERT IN RKCS2
3826                                ;*
3827                                ;*****
3828 014526 104401 037407      TST12: SCOPE
3829 014532 104401 041656      MOV      #1,$TIMES      ;DO 1 ITERATION
3830 014536 004737 030306      MOV      $STACK,SP      ;RESTORE STACK PTR
3831 014542 000137 014722                ;
3832                                JSR      PC,SUBCLR
3833 014546 104401 041061      ERROR      24      ;CERR AFTER SCLR
3834 014552 104401 040502      TYPE      ,MSG19      ;PORT SELECTION TESTS
3835 014556 004737 030346      TYPE      ,MSG52      ;DEPRESS CONT-E TO EXIT OR SPACE BAR TO CONTINUE
3836 014562 004737 025760      JSR      PC,CCSP      ;INPUT CONT-E OR SPACE
3837 014566 032765 010000 000010 JMP      4$      ;RETURN HERE FOR CONT-E
3838 014574 001001                ;
3839 014576 104122                TYPE      ,MSG41      ;SWITCH TO OTHER PORT
3840                                TYPE      ,MSG37      ;DEPRESS SPACE WHEN DONE
3841                                JSR      PC,GETSP      ;GET SPACE
3842 014600 104401 041141      JSR      PC,GSTAT
3843                                BIT      #NED,RKCS2(R5)
3844                                BNE      1$
3845                                ERROR      122      ;NED NOT SET AFTER WRONG PORT SELECTED
3846                                1$: TYPE      ,MSG42      ;SELECT CORRECT PORT

```

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T12 PORT SELECTION TESTS

SEQ 0073

3843	014604	104401	040502		TYPE	MSG37		;DEPRESS SPACE BAR WHEN DONE
3844	014610	004737	030346		JSR	PC,GETSP		;GET SPACE
3845								
3846	014614	004737	026332		JSR	PC,SUBCLR		
3847	014620	104024			ERROR	24		;CERR AFTER SCLR
3848								
3849	014622	032765	010000	000010	BIT	#NED,RKCS2(R5)		
3850	014630	001401			BEQ	25		
3851	014632	104130			ERROR	130		;NED NOT CLEARED AFTER CORRECT PORT SELECTED
3852								
3853	014634	104401	041217		25: TYPE	MSG43		;DESELECT BOTH PORTS
3854	014640	104401	040502		TYPE	MSG37		;DEPRESS SPACE BAR WHEN DONE
3855	014644	004737	030346		JSR	PC,GETSP		
3856	014650	004737	025760		JSR	PC,GSTAT		
3857	014654	032765	010000	000010	BIT	#NED,RKCS2(R5)		
3858	014662	001001			BNE	35		
3859	014664	104133			ERROR	133		;NED NOT SET AFTER BOTH PORTS DESELECTED
3860								
3861								
3862	014666	104401	041247		35: TYPE	MSG44		;SELECT CORRECT PORT
3863	014672	104401	040502		TYPE	MSG37		;DEPRESS SPACE BAR WHEN DONE
3864	014676	004737	030346		JSR	PC,GETSP		
3865								
3866	014702	004737	026332		JSR	PC,SUBCLR		
3867	014706	104024			ERROR	24		;CERR AFTER SCLR
3868								
3869	014710	032765	010000	000010	BIT	#NED,RKCS2(R5)		
3870	014716	001421			BEQ	TST13		;GOTO NEXT TEST
3871	014720	104130			ERROR	130		;NED NOT CLEARED AFTER CORRECT PORT SELECTED
3872								
3873	014722	012765	100000	000000	45: MOV	#CCLR,RKCS1(R5)		
3874	014730	004737	025760		JSR	PC,GSTAT		
3875	014734	032765	010000	000010	BIT	#NED,RKCS2(R5)		
3876	014742	001407			BEQ	TST13		;GOTO NEXT TEST
3877	014744	104401	041277		TYPE	MSG45		;CORRECT PORT NOT SELECTED, TRY AGAIN
3878	014750	104401	040502		TYPE	MSG37		;DEPRESS SPACE BAR WHEN DONE
3879	014754	004737	030346		JSR	PC,GETSP		
3880	014760	000760			BR	45		

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3894
3895 014762 000004
3896 014764 012737 000001 001174
3897 014772 012706 001100
3898

```

*****
*TEST 13      AC LOW DETECTION PART 1
*
*  A PRELIMINARY AC LOW TEST IS PERFORMED HERE WHILE HEADS ARE UNLOADED.
*  BATTERY RETRACT WILL BE TESTED LATER.
*  ACLO CANNOT BE TESTED DIRECTLY SINCE IT REQUIRES SECTOR PULSES
*  I.E. HEADS LOADED.
*  THEREFORE THE INDICATOR CHECKED IS NON-EXISTENT DRIVE (NED)
*  ASSERTING IN RKCS2 AS A RESULT OF DCLO.
*  AFTER POWER UP, VOLUME VALID IS CHECKED TO BE CLEARED.
*****
TST13: SCOPE
      MOV      #1,STIMES      ;DO 1 ITERATION
      MOV      #STACK,SP      ;RESTORE STK PTR

```

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T13 AC LOW DETECTION PART 1

SEQ 0074

3899	014776	004737	026332			JSR	PC, SUBCLR	
3900	015002	104024				ERROR	24	; CERR AFTER SCLR
3901								
3902	015004	104401	037440			TYPE	, MSG21	; AC LOW TEST
3903	015010	104401	041656			TYPE	, MSG52	; CONT-E TO BYPASS TEST
3904								; OR SPACE TO CONTINUE
3905	015014	004737	030306			JSR	PC, CCSP	; INPUT CONT-E OR SPACE
3906	015020	000137	015302			JMP	10\$	; RETURN HERE IF CONT-E
3907	015024	104401	041430			TYPE	, MSG49	; TURN OFF AC (RET HERE IF SPACE)
3908								
3909	015030	005037	005446			CLR	TEMP2	
3910	015034	012737	177777	005444	12\$:	MOV	#-1, TEMP1	; SETUP TIMEOUT
3911	015042	004737	025760		1\$:	JSR	PC, GSTAT	
3912	015046	032737	100000	005406		BIT	#CERR, HCS1	
3913	015054	001012				BNE	3\$	
3914	015056	005337	005444			DEC	TEMP1	
3915	015062	001367				BNE	1\$	
3916	015064	005237	005446			INC	TEMP2	
3917	015070	023727	005446	000002		CMP	TEMP2, #2	; SEE IF GONE THRU 2 TIMES
3918	015076	001356				BNE	12\$	; BR IF NO
3919	015100	104146				ERROR	146	; CERR NOT DETECTED BEFORE TIMEOUT
3920	015102	013737	001440	005444	3\$:	MOV	T50000, TEMP1	
3921	015110	012765	100000	000000	4\$:	MOV	#CCLR, RKCS1(R5)	
3922	015116	004737	025760			JSR	PC, GSTAT	
3923	015122	032765	010000	000010		BIT	#NED, RKCS2(R5)	
3924	015130	001004				BNE	5\$	
3925	015132	005337	005444			DEC	TEMP1	
3926	015136	001364				BNE	4\$	
3927	015140	104150				ERROR	150	; NED NOT SET BEFORE TIMEOUT
3928								
3929	015142	104401	041503		5\$:	TYPE	, MSG50	; SWITCH AC BACK ON
3930	015146	104401	043563			TYPE	, MSG70	; VERIFY HEADS LOAD
3931	015152	104401	043506			TYPE	, MSG69	; PRESS SPACE AFTER READY ON
3932	015156	004737	030346			JSR	PC, GETSP	; GET SPACE
3933								
3934	015162	004737	026332			JSR	PC, SUBCLR	
3935	015166	104024				ERROR	24	; CERR AFTER SCLR
3936								
3937	015170	032737	000200	005434		BIT	#D.DRDY, HMR2	; SEE IF LOADED
3938	015176	001001				BNE	6\$	; BR IN YES
3939	015200	104141				ERROR	141	; DRV NOT RDY AFTER AC UP
3940								
3941	015202	005037	005370		6\$:	CLR	UNLD	; FOR VALID HALT
3942	015206	032737	000170	005436		BIT	#D.ACLO, HMR3	
3943	015214	001401				BEQ	7\$	
3944	015216	104152				ERROR	152	; ACLO NOT RESET AFTER POWER UP
3945								
3946	015220	032737	000100	005434	7\$:	BIT	#D.VV, HMR2	
3947	015226	001401				BEQ	8\$	
3948	015230	104153				ERROR	153	; VV NOT RESET AFTER POWER UP
3949								
3950	015232				8\$:			
3951	015232	012765	100000	000000		MOV	#CCLR, RKCS1(R5)	
3952	015240	013765	001222	000010		MOV	#UNIT, RKCS2(R5)	; DRIVE #
3953	015246	012765	000003	000000		MOV	#PACK, RKCS1(R5)	; PACK CMD
3954	015254	013737	001426	005444		MOV	T10, TEMP1	

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T13 AC LOW DETECTION PART 1

SEQ 0075

3955	015262	004737	024422		JSR	PC,FRDY	;FIND CONTR RDY
3956	015266	104116			ERROR	116	;CONTR NOT RDY
3957							
3958	015270	032737	000100	005434	BIT	#D.VV,HMR2	
3959	015276	001001			BNE	64\$	
3960	015300	104027			ERROR	27	;VOLUME VALID NOT SET AFTER PACK CMD
3961	015302						
3962	015302						
3963							
3964							
3965							
3966							
3967							
3968							
3969							
3970							
3971	015302	000004			ST14:	SCOPE	
3972	015304	012737	000001	001174	MOV	#1,STIMES	;DO 1 ITERATION
3973	015312	012706	001100		MOV	#STACK,SP	;RESTORE STACK PTR
3974							
3975	015316	004737	026332		JSR	PC,SUBCLR	
3976	015322	104024			ERROR	24	;CERR AFTER SCLR
3977							
3978	015324	032737	010000	005434	BIT	#D.SPIN,HMR2	;SEE IF SPINDLE ALREADY ON
3979	015332	001023			BNE	64\$	;BR IF YES
3980	015334	104401	037741		TYPE	,MSG29	;PLEASE WAIT, HEADS BEING LOADED
3981							
3982	015340	012765	000011	000000	MOV	#SRTSPL,RKCS1(R5)	;START SPINDLE CMD
3983	015346	013737	001426	005444	MOV	T10,TEMP1	
3984	015354	004737	024422		JSR	PC,FRDY	;FIND CONTR RDY
3985	015360	104143			ERROR	143	;CONTR RDY NOT SET AFTER CMD
3986							
3987	015362	013737	001434	005446	MOV	T100,TEMP2	
3988	015370	004737	024736		JSR	PC,FATT1	;FIND ATTN
3989	015374	104144			ERROR	144	;NO ATTN AFTER CMD
3990							
3991	015376	005037	005370		CLR	UNLD	
3992	015402						
3993	015402	005037	005370		CLR	UNLD	;FOR VALID HALT
3994							
3995	015406	004737	026332		JSR	PC,SUBCLR	
3996	015412	104024			ERROR	24	;CERR AFTER SCLR
3997							
3998	015414	104401	037501		TYPE	,MSG22	;NXF TEST
3999	015420	104401	041656		TYPE	,MSG52	;PRESS CONT-E TO EXIT OR SPACE TO CONTINUE
4000	015424	004737	030306		JSR	PC,CCSP	;INPUT CONT-E OR SPACE
4001	015430	000137	015752		JMP	7\$	;RETURN HERE FOR CONT-E
4002							
4003	015434	104401	041535		TYPE	,MSG51	;REMOVE UNIT SELECT PLUG TO CLEAR VV
4004	015440	104401	040502		TYPE	,MSG37	;PRESS SPACE WHEN DONE
4005	015444	004737	030346		JSR	PC,GETSP	;GET SPACE
4006							
4007	015450	004737	025760		JSR	PC,GSTAT	
4008	015454	032737	000100	005434	BIT	#D.VV,HMR2	
4009	015462	001403			BEG	1\$	
4010	015464	104177			ERROR	177	;VV NOT CLEARED AFTER UNIT SEL PLUG

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T14 CHECK NXF LOGIC

SEQ 0076

```

4011 015466 000137 015752      JMP      7$      ;EXIT TEST
4012
4013 015472 032737 000100 005434 1$:  BIT      #D.VV,HMR2
4014 015500 001406      BEQ      2$
4015 015502 104155      ERROR    155      ;VV SET AFTER HEADS LOADED
4016 015504 000137 015752      JMP      7$      ;EXIT TEST
4017
4018 015510 004737 026332      JSR      PC,SUBCLR
4019 015514 104024      ERROR    24      ;CERR AFTER SCLR
4020
4021 015516 012765 000001 000020 2$:  MOV      #1,RKDC(R5)
4022 015524 012765 000017 000000      MOV      #SEEK,RKCS1(R5) ;SEEK CMD
4023 015532 013737 001426 005444      MOV      T10,TEMP1
4024 015540 004737 024422      JSR      PC,FRDY      ;FIND RDY
4025 015544 104131      ERROR    131      ;NO RDY AFTER SEEK CMD
4026
4027 015546 013737 001440 005444      MOV      T50000,TEMP1
4028 015554 004737 025032      JSR      PC,FAT12      ;FIND ATTN
4029 015560 104132      ERROR    132      ;NO ATTN AFTER SEEK CMD
4030
4031 015562 032737 000400 005436      BIT      #D.NXF,HMR3
4032 015570 001003      BNE      3$
4033 015572 104156      ERROR    156      ;NXF NOT SET AFTER SEEK WITH .V=L
4034 015574 000137 015752      JMP      7$      ;EXIT TEST
4035
4036 015600 032737 000200 005436 3$:  BIT      #D.FLT,HMR3
4037 015606 001003      BNE      4$
4038 015610 104172      ERROR    172      ;NXF DID NOT SET FAULT
4039 015612 000137 015752      JMP      7$      ;EXIT TEST
4040
4041 015616 012737 050240 005476 4$:  MOV      #<D.DSC!D.SPIN!D.DRDY!D.DRA>,E.A0 ;EXPECTED A0
4042 015624 012737 000600 005500      MOV      #<D.NXF!D.FLT>,E.B0
4043 015632 012737 001720 005502      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
4044 015640 012737 000001 005504      MOV      #1,E.B1
4045
4046 015646 004737 025144      JSR      PC,CHKMSG      ;CHECK MSGS A0, B0, A1, B1
4047 015652 000003      .WORD    T.A2!T.B2!0      ;& MSGS SPECIFIED HERE
4048 015654 104160      ERROR    160      ;MSG A0 ERROR AFTER SEEK WITH VV=0
4049 015656 104161      ERROR    161      ;MSG B0 ERROR
4050 015660 104162      ERROR    162      ;MSG A1 ERROR
4051 015662 104163      ERROR    163      ;MSG B1 ERROR
4052 015664 005737 001400      TST      CYLADD
4053 015670 001401      BEQ      5$
4054 015672 104157      ERROR    157      ;HEADS MOVED WITH SEEK & DXF
4055
4056 015674 004737 026332      JSR      PC,SUBCLR
4057 015700 104024      ERROR    24      ;CERR AFTER SCLR
4058
4059 015702 012765 100000 000000      MOV      #CCLR,RKCS1(R5)
4060 015710 013765 001222 000010      MOV      #UNIT,RKCS2(R5) ;DRIVE #
4061 015716 012765 000003 000000      MOV      #PACK,RKCS1(R5) ;PACK CMD
4062 015724 013737 001426 005444      MOV      T10,TEMP1
4063 015732 004737 024422      JSR      PC,FRDY      ;FIND CONTR RDY
4064 015736 104116      ERROR    116      ;CONTR NOT RDY
4065
4066 015740 032737 000100 005434      BIT      #D.VV,HMR2

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T14 CHECK NXF LOGIC

SEQ 0077

4067 015746 001001
4068 015750 104027
4069 015752
4070 015752

BNE 655
ERROR 27

;VOLUME VALID NOT SET AFTER PACK CMD

655:
75:

TEST 15 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #

THIS TEST VERIFIES THAT CYL 410, TRACK 2 CAN BE READ.
THIS AREA CONTAINS BAD SECTOR INFOR WHICH IS WRITTEN BY THE
FACTORY DURING MANF. ALL BAD SECTOR INFOR (BSE) WILL BE STORED
AT THIS TIME TO MASK FUTURE READ HEADER OR DATA ERROR PRINTOUTS.

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

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

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

TEST 15: SCOPE

4092 015752 000004
4093 015754 012737 000001 001174
4094 015762 012706 001100

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

4096 015766 004737 026332
4097 015772 104024
4098 015774 005037 005446
4099 016000 005037 005450

JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR
CLR TEMP2 ;SECTOR CTR
CLR TEMP3 ;0=22 SECTOR HARDWARE DETECTED TABLE
;1=22 SECTOR SOFTWARE DETECTED TABLE
;2=DONE

4102 016004 012737 002370 005452
4103 016012 013765 005452 000004
4104 016020 012737 001000 005454
4105 016026 013765 005454 000006

MOV #BSE22H,TEMP4 ;STORE 22 SECTOR HARDWARE BSE ADDR.
MOV TEMP4,RKBA(R5)
MOV #1000,TEMP5 ;TRACK 2, SECTOR 0
MOV TEMP5,RKDA(R5)

4107 016034 012765 000632 000020
4108 016042 012765 177400 000002
4109 016050 012765 000021 000000
4110 016056 013737 001440 005444

15: MOV #410,RKDC(R5) ;CYL 410
MOV #-256,RKWC(R5) ;LOAD WORD CT
MOV #RODATA,RKCSI(R5) ;READ DATA COMMAND
MOV 150000,TEMP1 ;SETUP TIMEOUT
JSR PC,FRDY ;FIND RDY
ERROR 226 ;NO RDY AFTER READ DATA CMD
JSR PC,GSTAT ;GET FRESH DATA
BIT #CEP?,HCS1
BEQ B5

4111 016064 004737 024422
4112 016070 104226
4113 016072 004737 025760
4114 016076 032737 100000 005406
4115 016104 001470
4116 016106 104227

ERROR 227 ;CERR AFTER READ DATA CMD

4118 016110 012737 010340 005476
4119 016116 005037 005500
4120 016122 012737 001720 005502
4121 016130 012737 000001 005504
4122 016136 005037 005506

MOV #<0!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.BRAH!D.SSP>,E.A1 ;EXPECTED A1
MOV #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
CLR E.A2 ;EXPECTED MSG A2

B07

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T15 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #

SEQ 0078

4123	016142	012737	000002	005510		MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4124	016150	012737	000003	005514		MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4125								
4126	016156	004737	025144			JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
4127	016162	000000				.WORD	0!0!0	; & MSGS SPECIFIED HERE
4128	016164	104054				ERROR	54	;MSG A0 ERROR AFTER READ DATA CMD
4129	016166	104026				ERROR	26	;MSG B0 ERROR
4130	016170	104056				ERROR	56	;MSG A1 ERROR
4131	016172	104030				ERROR	30	;MSG B1 ERROR
4132	016174	004737	026332			JSR	PC,SUBCLR	
4133	016200	104024				ERROR	24	;CERR AFTER SUBCLR
4134	016202	005237	005446			INC	TEMP2	
4135	016206	023727	005446	000005		CMP	TEMP2,#5	;READ ALL 5 SECTORS?
4136	016214	001007				BNE	5\$	
4137	016216	005737	005450			TST	TEMP3	
4138	016222	001002				BNE	2\$	
4139	016224	104165				ERROR	165	;CANT READ SECTORS 0,2,4,6,8
4140	016226	000414				BR	3\$	
4141	016230	104167			2\$:	ERROR	167	;CANT READ SECTORS 10,12,14,16,18,20
4142	016232	000412				BR	3\$	
4143								
4144	016234	013765	005452	000004	5\$:	MOV	TEMP4,RKBA(R5)	;RESTORE TABLE ADDR
4145	016242	062737	000002	005454		ADD	#2,TEMP5	;SETUP TO READ 2 SECTORS FROM LAST
4146	016250	013765	005454	000006		MOV	TEMP5,RKDA(R5)	
4147	016256	000666				BR	1\$	
4148								
4149	016260	005237	001542		3\$:	INC	BSEERR	;SET BSE FLAG
4150	016264	000504				BR	TST16	;GO TO NEXT TEST
4151	016266	005737	002376		8\$:	TST	BSE22H+6	;TEST CARTRIDGE TYPE
4152	016272	001405				BEQ	9\$	;BRANCH IF DATA CARTRIDGE
4153	016274	104401	042217			TYPE	MSG56	;ALIGNMENT CARTRIDGE USED
4154	016300	005237	001542			INC	BSEERR	;SET BSE ERROR FLAG
4155	016304	000426				BR	10\$	
4156								
4157	016306	005237	005450		9\$:	INC	TEMP3	
4158	016312	023727	005450	000001		CMP	TEMP3,#1	
4159	016320	001020				BNE	10\$	
4160	016322	005037	005446			CLR	TEMP2	
4161	016326	012737	003370	005452		MOV	#BSE22S,TEMP4	;STORE 22 SECTOR SOFTWARE BSE ADDR
4162	016334	013765	005452	000004		MOV	TEMP4,RKBA(R5)	
4163	016342	012737	001012	005454		MOV	#1012,TEMP5	;TRACK 2, SECTOR 12
4164	016350	013765	005454	000006		MOV	TEMP5,RKDA(R5)	
4165	016356	000137	016034			JMP	1\$	;REPEAT
4166								
4167	016362	005737	001216		10\$:	TST	\$PASS	
4168								
4169								
4170	016366	001014				BNE	13\$	;TYPE CART # ONLY ON 1'ST PASS
4171	016370	104401	037325			TYPE	MSG17	;CART SERIAL #
4172	016374	012746	002370			MOV	#BSE22H, -(SP)	
4173	016400	004737	034662			JSR	PC,\$DB20	;CONVERT DBL BINARY WORD TO OCTAL
4174	016404	004737	035232			JSR	PC,\$SUPRS	;TYPE SERIAL #
4175	016410	104401	001205			TYPE	,\$CRLF	
4176	016414	104401	001205			TYPE	,\$CRLF	
4177								
4178	016420	004737	026332		13\$:	JSR	PC,SUBCLR	

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T15 READ & SAVE BAD SECTOR INFO & TYPE PACK SERIAL #

SEQ 0079

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4179 016424 104024          ERROR 24          ;CERR AFTER SCLR
4180                                     ;RETURN TO CYL 0
4181
4182 016426 012765 000017 000000          MOV  #SEEK,RKCS1(R5) ;SEEK CMD
4183 016434 013737 001430 005444          MOV  T50,TEMP1      ;SETUP TIMEOUT
4184 016442 004737 024422          JSR   PC,FRDY        ;FIND ROY
4185 016446 104131          ERROR 131         ;NO ROY AFTER SEEK CMD
4186
4187 016450 013737 001440 005444          MOV  T50000,TEMP1    ;SETUP TIMEOUT
4188 016456 004737 025032          JSR   PC,FATT2       ;FIND ATTN
4189 016462 104132          ERROR 132         ;NO ATTN AFTER SEEK CMD
4190
4191 016464 032737 100000 005406          BIT   #CERR,HCS1
4192 016472 001401          BEQ   64$
4193 016474 104210          ERROR 210         ;CERR AFTER SEEK CMD
4194
4195 016476          64$:
4196
4197
4198
4199
4200
4201
4202
4203
4204
4205
4206
4207 016476 000004          *****
4208 016500 012737 000001 001174          *TEST 16      WRITE LOCK TEST
4209 016506 012706 001100
4210 016512 005737 001542
4211 016516 001402
4212 016520 000137 021426          *
4213                                     *
4214                                     * THIS TEST VERIFIES THAT DATA WRITTEN ON A SECTOR CANNOT BE
4215                                     * ALTERED ONCE THE WRITE LOCK SWITCH HAS BEEN ENABLED.
4216                                     * IT ALSO CHECKS THAT WRITE PROTECT TAKES EFFECT ONLY AT
4217                                     * SECTOR BOUNDRIES WHEN DOING CONTINUOUS WRITING ON CYL 0, HEAD 0
4218                                     *
4219                                     *****
4220
4221
4222
4223
4224
4225
4226
4227
4228
4229
4230
4231
4232
4233
4234

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T16 WRITE LOCK TEST

SEQ 0080

4235	016622	005037	001366		25:	CLR	TOCYL	; SETUP
4236	016626	005037	001402			CLR	CALADD	; FOR
4237	016632	005037	001510			CLR	HEAD	; FILL HEADER TABLE
4238	016636	005037	001516			CLR	FORMAT	; ROUTINE
4239								
4240	016642	004737	027314		165:	JSR	PC, FHD TAB	; BUILD STD 22 SECTOR HEADER TABLE
4241								
4242	016646	012765	001554	000004		MOV	#HDTAB, RKBA(R5)	
4243	016654	012765	177676	000002		MOV	#-66., RKWC(R5)	
4244	016662	000337	001510			SWAB	HEAD	
4245	016666	013765	001510	000006		MOV	HEAD, RKDA(R5)	; HEAD ADDR
4246	016674	000337	001510			SWAB	HEAD	
4247								
4248								
4249	016700	012765	000027	000000		MOV	#<WRHEAD>, RKCS1(R5)	; WRITE HEADER CMD
4250	016706	013737	001440	005444		MOV	T50000, TEMP1	; SETUP TIMEOUT
4251	016714	004737	024422			JSR	PC, FRDY	; FIND RDY
4252	016720	104200				ERROR	200	; NO RDY AFTER WRITE HEADER CMD
4253	016722	004737	025760			JSR	PC, GSTAT	; GET FRESH STATUS
4254	016726	032737	100000	005406		BIT	#CERR, HCS1	
4255	016734	001401				BEQ	645	
4256	016736	104201				ERROR	201	; CERR AFTER WRITE HEADER CMD
4257	016740				645:			
4258								
4259								
4260	016740	005237	001510			INC	HEAD	
4261	016744	023727	001510	000003		CMP	HEAD, #3	; SEE IF ALL HEADS DONE
4262	016752	001333				BNE	165	; BR IF NO
4263								
4264	016754	004737	026332			JSR	PC, SUBCLR	
4265	016760	104024				ERROR	24	; CERR AFTER SCLR
4266								
4267	016762	005037	001422			CLR	SECTOR	
4268	016766	013765	001422	000006	145:	MOV	SECTOR, RKDA(R5)	
4269								
4270	016774	012765	001524	000004		MOV	#DATA0, RKBA(R5)	; WRITE ALL 0'S
4271	017002	052765	000020	000010		BIS	#BA1, RKCS2(R5)	
4272	017010	012765	177400	000002		MOV	#-256., RKWC(R5)	; CYL 0, TRK 0, SECTOR 0
4273								
4274	017016	012765	000023	000000		MOV	#<WRDATA>, RKCS1(R5)	; WRITE DATA CMD
4275	017024	013737	001440	005444		MOV	T50000, TEMP1	; SETUP TIMEOUT
4276	017032	004737	024422			JSR	PC, FRDY	; FIND RDY
4277	017036	104011				ERROR	11	; NO RDY AFTER WRITE DATA CMD
4278	017040	004737	025760			JSR	PC, GSTAT	; GET FRESH STATUS
4279	017044	032737	100000	005406		BIT	#CERR, HCS1	
4280	017052	001465				BEQ	685	; BR IF NO ERRORS
4281								
4282	017054	032737	000200	005422		BIT	#BSE, HER	; SEE IF BAD SECTOR FLAG
4283	017062	001421				BEQ	665	; BR IF NO
4284	017064	004737	027752			JSR	PC, TRUEERR	; ELSE SEE IF SECTOR LISTED IN BSE TABLE
4285	017070	000455				BR	675	; RETURN HERE IF NO
4286								
4287	017072	005237	001422			INC	SECTOR	; RETURN HERE IF YES
4288	017076	023727	001422	000012		CMP	SECTOR, #10.	; ARE 10 CONSEC. SECTORS BAD
4289	017104	001003				BNE	655	; BR IF NO
4290	017106	104040				ERROR	40	; ABORTING TEST DETECTED 10 BAD SECTORS

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T16 WRITE LOCK TEST

SEQ 0081

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4291 017110 000137 021426      JMP      12$      ;BYPASS TEST
4292
4293 017114 012765 100000 000000 65$:  MOV      #CCLR,RKCS1(R5) ;TRY ANOTHER SECTOR
4294 017122 000137 016766      JMP      14$
4295
4296 017126 104012      66$:  ERROR    12      ;CERR WITH WRITE DATA CMD
4297
4298 017130 012737 010340 005476      MOV      #<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
4299 017136 005037 005500      CLR      E.B0      ;EXPECTED MSG B0
4300 017142 012737 001720 005502      MOV      #<0.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4301 017150 012737 000001 005504      MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
4302 017156 005037 005506      CLR      E.A2      ;EXPECTED MSG A2
4303 017162 012737 000002 005510      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2
4304 017170 012737 000003 005514      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
4305
4306 017176 004737 025144      JSR      PC,CHKMSG      ;CHECK MSGS A0 B0 A1 B1
4307 017202 000003      .WORD    T.A2!T.B2!0      ;8 MSGS SPECIFIED HERE
4308 017204 104052      ERROR    52      ;MSG A0 ERROR AFTER WRITE DATA CMD
4309 017206 104023      ERROR    23      ;MSG B0 ERROR
4310 017210 104053      ERROR    53      ;MSG A1 ERROR
4311 017212 104025      ERROR    25      ;MSG B1 ERROR
4312 017214 104401 043674      TYPE     MSG72      ;ABORTING BALANCE OF TESTS
4313 017220 000137 023742      JMP      $EOP
4314 017224 104047      67$:  ERROR    47      ;BAD SECTOR NOT LISTED IN TABLE
4315 017226      68$:
4316
4317 017226 004737 026332      JSR      PC,SUBCLR
4318 017232 104024      ERROR    24      ;CERR AFTER SCLR
4319
4320 017234 012765 001524 000004      MOV      #DATA0,RKBA(R5)
4321 017242 052765 000020 000010      BIS      #BA1,RKCS2(R5)
4322 017250 012765 177400 000002      MOV      #-256.,RKWC(R5)
4323 017256 013737 001524 001504      MOV      DATA0,WD2      ;EXPECTED WORD FOR TRUERR TYPEOUT
4324 017264 013765 001422 000006      MOV      SECTOR,RKDA(R5)
4325
4326 017272 012765 000031 000000      MOV      #<WRTCHK>,RKCS1(R5) ;WRITE CHECK CMD
4327 017300 013737 001440 005444      MOV      T50000,TEMP1 ;SETUP TIMEOUT
4328 017306 004737 024422      JSR      PC,FRDY      ;FIND RDY
4329 017312 104015      ERROR    15      ;NO RDY AFTER WRITE CHECK CMD
4330 017314 004737 025760      JSR      PC,GSTAT      ;GET FRESH STATUS
4331 017320 032737 100000 005406      BIT      #CERR,HCS1
4332 017326 001450      BEQ      70$
4333 017330 032737 040000 005410      BIT      #WCE,HCS2      ;SEE IF WRITE CHECK ERROR
4334 017336 001405      BEQ      69$
4335 017340 016537 000024 001502      MOV      RKDB(R5),WD1 ;ACTUAL WORD FOR PRINTOUT
4336 017346 104016      ERROR    16      ;WCE AFTER WRITE CMD
4337 017350 000437      BR      70$
4338
4339 017352 104022      69$:  ERROR    22      ;CERR AFTER WRITE CHECK CMD
4340
4341 017354 012737 010340 005476      MOV      #<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
4342 017362 005037 005500      CLR      E.B0      ;EXPECTED MSG B0
4343 017366 012737 001720 005502      MOV      #<0.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1 ;EXPECTED A1
4344 017374 012737 000001 005504      MOV      #1,E.B1      ;MSG ID FOR EXPECTED MSG B1
4345 017402 005037 005506      CLR      E.A2      ;EXPECTED MSG A2
4346 017406 012737 000002 005510      MOV      #2,E.B2      ;MSG ID FOR EXPECTED MSG B2

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T16 WRITE LOCK TEST

SEQ 0082

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4347 017414 012737 000003 005514      MOV      #3,E.B3      ;MSG ID FOR EXPECTED MSG B3
4348
4349 017422 004737 025144      JSR      PC,CHKMSG    ;CHECK MSGS A0, B0, A1, B1
4350 017426 000003              .WORD      T.A2!T.B2!0    ;& MSGS SPECIFIED HERE
4351 017430 104057              ERROR      57      ;MSG A0 ERROR AFTER WRITE CHECK CMD
4352 017432 104031              ERROR      31      ;MSG B0 ERROR
4353 017434 104060              ERROR      60      ;MSG A1 ERROR
4354 017436 104032              ERROR      32      ;MSG B1 ERROR
4355 017440 104401 043674      TYPE      MSG72    ;ABORTING BALANCE OF TESTS
4356 017444 000137 023416      JMP      ENDRV
4357
4358 017450                      70$:
4359
4360 017450 004737 026332      3$:      JSR      PC,SUBCLR
4361 017454 104024              ERROR      24      ;CERR AFTER SCLR
4362
4363 017456 104401 042050      TYPE      ,MSG54    ;ENABLE WRITE LOCK
4364 017462 104401 040502      TYPE      ,MSG37    ;PRESS SPACE WHEN DONE
4365 017466 004737 030346      JSR      PC,GETSP    ;GET SPACE
4366
4367 017472 012765 100000 000000      MOV      #CCLR,RKCS1(R5)
4368 017500 004737 025760      JSR      PC,GSTAT
4369 017504 032737 004000 005434      BIT      #D.WRL,HMR2 ;SEE IF WRITE LOCK IS ON
4370 017512 001002              BNE      4$
4371 017514 104115              ERROR      115    ;WRITE LOCK NOT ENABLED
4372 017516 000754              BR      3$
4373
4374 017520 012765 001530 000004      4$:      MOV      #DATA1,RKBA(R5) ;ATTEMPT TO WRITE ALL 1'S WITH WRITE LOCK SET
4375 017526 052765 000020 000010      BIS      #BA1,RKCS2(R5)
4376 017534 012765 177400 000002      MOV      #-256.,RKWC(R5) ;CYLINDER 0, HEAD 0
4377 017542 013765 001422 000006      MOV      SECTOR,RKDA(R5)
4378 017550 012765 000023 000000      MOV      #WRDATA,RKCS1(R5)
4379 017556 013737 001440 005444      MOV      T50000,TEMP1 ;SETUP TIMEOUT
4380 017564 004737 024422      JSR      PC,FRDY      ;FIND RDY
4381 017570 104116              ERROR      116    ;CONTR NOT RDY
4382
4383 017572 004737 025760      JSR      PC,GSTAT      ;GET FRESH STATUS
4384 017576 032737 100000 005406      BIT      #CERR,HCS1
4385 017604 001001              BNE      17$
4386 017606 104207              ERROR      207    ;CERR NOT SET AFTER WRITE WITH WRL SET
4387 017610 032737 004000 005436      17$:      BIT      #D.WLE,HMR3 ;CHECK WRITE LOCK ERROR SET
4388 017616 001001              BNE      5$      ;BR IF SET
4389 017620 104121              ERROR      121    ;WRITE LOCK ERROR NOT SET
4390                                ;AFTER WRITE DATA WITH WRITE LOCK SET
4391 017622 012737 054340 005476      5$:      MOV      #<D.DSC!D.SPIN!D.WRL!D.DRDY!D.VV!D.DRA>,E.A0 ;EXP A0
4392 017630 012737 004200 005500      MOV      #<D.WLE!D.FLT>,E.B0
4393 017636 012737 001720 005502      MOV      #<D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
4394 017644 012737 000001 005504      MOV      #1,E.B1
4395
4396 017652 004737 025144      JSR      PC,CHKMSG    ;CHECK MSGS A0, B0, A1, B1
4397 017656 000000              .WORD      0!0!0    ;& MSGS SPECIFIED HERE
4398 017660 104123              ERROR      123    ;MSG A0 ERROR AFTER WRITE WITH WRITE LOCK SET
4399 017662 104125              ERROR      125    ;MSG B0 ERROR
4400 017664 104126              ERROR      126    ;MSG A1 ERROR
4401 017666 104127              ERROR      127    ;MSG B1 ERROR
4402

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T16 WRITE LOCK TEST

SEQ 0083

4403	017670	004737	026332		JSR	PC,SUBCLR	
4404	017674	104024			ERROR	24	;CERR AFTER SCLR
4405							
4406	017676	012765	001524	000004	MOV	#DATA0,RKBA(R5)	;CHECK THAT NONE OF ORIG DATA
4407	017704	052765	000020	000010	BIS	#BA1,RKCS2(R5)	;HAS CHANGED
4408	017712	012765	177400	000002	MOV	#-256,RKWC(R5)	;AS RESULT OF WRITE WITH WRITE LOCK SET
4409	017720	013737	001524	001504	MOV	DATA0,W02	;EXPECTED WORD FOR TRUEERR TYPEOUT
4410	017726	013765	001422	000006	MOV	SECTOR,RKDA(R5)	
4411							
4412	017734	012765	000031	000000	MOV	#(WRTCHK),RKCS1(R5)	;WRITE CHECK CMD
4413	017742	013737	001440	005444	MOV	T50000,TEMP1	;SETUP TIMEOUT
4414	017750	004737	024422		JSR	PC,FRDY	;FIND RDY
4415	017754	104015			ERROR	15	;NO RDY AFTER WRITE CHECK CMD
4416	017756	004737	025760		JSR	PC,GSTAT	;GET FRESH STATUS
4417	017762	032737	100000	005406	BIT	#CERR,HCS1	
4418	017770	001450			BEQ	72\$	
4419	017772	032737	040000	005410	BIT	#WCE,HCS2	;SEE IF WRITE CHECK ERROR
4420	020000	001405			BEQ	71\$	
4421	020002	016537	000024	001502	MOV	RKDB(R5),WD1	;ACTUAL WORD FOR PRINTOUT
4422	020010	104016			ERROR	16	;WCE AFTER WRITE CMD
4423	020012	000437			BR	72\$	
4424							
4425	020014	104022			71\$: ERROR	22	;CERR AFTER WRITE CHECK CMD
4426							
4427	020016	012737	010340	005476	MOV	#(0!D.SPIN!D.DRDY!D.VV!D.DRA),E.A0	;EXPECTED MSG A0
4428	020024	005037	005500		CLR	E.B0	;EXPECTED MSG B0
4429	020030	012737	001720	005502	MOV	#(D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP),E.A1	;EXPECTED A1
4430	020036	012737	000001	005504	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4431	020044	005037	005506		CLR	E.A2	;EXPECTED MSG A2
4432	020050	012737	000002	005510	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4433	020056	012737	000003	005514	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4434							
4435	020064	004737	025144		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
4436	020070	000003			.WORD	T.A2!T.B2!0	; & MSGS SPECIFIED HERE
4437	020072	104057			ERROR	57	;MSG A0 ERROR AFTER WRITE CHECK CMD
4438	020074	104031			ERROR	31	;MSG B0 ERROR
4439	020076	104060			ERROR	60	;MSG A1 ERROR
4440	020100	104032			ERROR	32	;MSG B1 ERROR
4441	020102	104401	043674		TYPE	MSG72	;ABORTING BALANCE OF TESTS
4442	020106	000137	023416		JMP	ENDRV	
4443							
4444	020112				72\$:		
4445							
4446	020112	004737	026332		6\$: JSR	PC,SUBCLR	
4447	020116	104024			ERROR	24	;CERR AFTER SCLR
4448							
4449	020120	104401	041757		TYPE	MSG53	;DISABLE WRITE LOCK
4450	020124	104401	040502		TYPE	MSG37	;SPACE BAR WHEN DONE
4451	020130	004737	030346		JSR	PC,GETSP	;GET SPACE
4452	020134	004737	025760		JSR	PC,GSTAT	
4453	020140	032737	004000	005434	BIT	#D.WRL,HMR2	;SEE IF WRITE LOCK OFF
4454	020146	001361			BNE	6\$	
4455							
4456							;TEST FOR WRITE LOCK AT SECTOR BOUNDRIES
4457	020150	104401	042050		TYPE	MSG54	;FOR CONTINUOUS WRITING ON CYL 0, TRACK 0,1,2
4458	020154	013737	001436	001160	MOV	T5000,\$TMP0	;SET WRITE LOCK

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T16 WRITE LOCK TEST

SEQ 0084

4459	020162	005037	001162		CLR	\$TMP1	;BIT0=0:WRITE 0'S; BIT0=1;WRITE 1'S
4460	020166	005037	001366		CLR	TOCYL	
4461							
4462	020172	004737	026332	7\$:	JSR	PC,SUBCLR	
4463	020176	104024			ERROR	24	;CERR AFTER SCLR
4464							
4465	020200	032737	000001	001162	BIT	#BIT0,\$TMP1	
4466	020206	001004			BNE	8\$	;BR IF WRITING 1'S
4467	020210	012765	001524	000004	MOV	#DATA0,RKBA(R5)	;SETUP ALL 0'S
4468	020216	000403			BR	9\$	
4469							
4470	020220	012765	001530	000004	8\$:	MOV	#DATA1,RKBA(R5) ;SETUP ALL 1'S
4471	020226	052765	000020	000010	9\$:	BIS	#BA1,RKCS2(R5)
4472	020234	012765	140400	000002	MOV	#-63.*256.,RKWC(R5)	;WRITE TRACK 0,1,2 63 SECTORS
4473	020242	005065	000006		CLR	RKDA(R5)	;BEGIN AT TRACK AND SEC 0
4474	020246	013765	001366	000020	MOV	TOCYL,RKDC(R5)	
4475	020254	012765	000023	000000	MOV	#WRDATA,RKCS1(R5)	
4476	020262	013737	001440	005444	MOV	T50000,\$TMP1	
4477	020270	004737	024422		JSR	PC,FRDY	;FIND CONTR RDY
4478	020274	104011			ERROR	11	;CONTR NOT RDY
4479							
4480	020276	032737	100000	005406	BIT	#CERR,HCS1	
4481	020304	001017			BNE	13\$	
4482	020306	005337	001160		DEC	\$TMP0	
4483	020312	001011			BNE	10\$	
4484	020314	104204			ERROR	204	;CERR NOT SET BY TIMEOUT
4485	020316	104401	041757		TYPE	,MSG53	;DISABLE WRITE LOCK
4486	020322	104401	040502		TYPE	,MSG37	;PRESS SPACE WHEN DONE
4487	020326	004737	030346		JSR	PC,GETSP	;INPUT SPACE
4488	020332	000137	021426		JMP	12\$	;EXIT TEST
4489							
4490	020336	005237	001162	10\$:	INC	\$TMP1	
4491	020342	000713			BR	7\$	;GO WRITE OPPOSITE DATA
4492	020344	032737	000200	005422	13\$:	BIT	#BSE,HER
4493	020352	001411			BEQ	21\$	;SEE IF BAD SECTOR
4494	020354	005237	001366		INC	TOCYL	;BR IF NO
4495	020360	023727	001366	000012	CMP	TOCYL,#10.	;ELSE TRY ANOTHER CYL
4496	020366	001301			BNE	7\$	;SEE IF 10 CONSEC CYL BAD
4497	020370	104062			ERROR	62	;BR IF NO & DO AGAIN
4498	020372	000137	021426		JMP	12\$	;10 BAD CONSEC CYLINDERS
4499							;EXIT TEST
4500	020376	032737	004000	005436	21\$:	BIT	#D.WLE,HMR3
4501	020404	001001			BNE	11\$	
4502	020406	104205			ERROR	205	;NO WRL BY TIMEOUT
4503							
4504	020410	104401	041757		11\$:	TYPE	,MSG53
4505	020414	104401	040502		TYPE	,MSG37	;DISABLE WRITE LOCK
4506	020420	004737	030346		JSR	PC,GETSP	;TYPE SPACE WHEN DONE
4507							
4508	020424	013737	005416	001164	MOV	HDA,\$TMP2	;STORE RKDA OF ERROR
4509	020432	013737	005416	001166	MOV	HDA,\$TMP3	;STORE FOR ERROR TYPEOUT
4510							
4511	020440	023727	001164	000001	CMP	\$TMP2,#1	;SEE IF WRL ON TRK 0, SEC 1
4512	020446	001003			BNE	22\$	;BR IF NO
4513	020450	104401	044072		TYPE	,MSG100	;ELSE WRL OCCURRED ON TRK 2, SEC 21
4514	020454	000616			BR	6\$	;& NO NEW DATA XFER TOOK PLACE

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T16 WRITE LOCK TEST

SEQ 0085

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4515
4516 020456 005737 001164      22$: TST      $TMP2      ;SEE IF WRL ON TRK 0, SEC 0
4517 020462 001004              BNE      23$      ;BR IF NO
4518 020464 104401 044072      TYPE     MSG100     ;ELSE WRL ON TRK 2, SEC 20
4519 020470 000137 020112      JMP      6$      ;& NO NEW DATA XFER TOOK PLACE
4520
4521 020474 023727 001164 001025 23$: CMP      $TMP2,#1025 ;SEE IF WRL ON TRK 2, SEC 21
4522 020502 001004              BNE      24$      ;BR IF NO
4523 020504 104401 044072      TYPE     MSG100     ;ELSE WRL ON TRK 2, SEC 19
4524 020510 000137 020112      JMP      6$      ;& NO NEW DATA XFER TOOK PLACE
4525
4526 020514 023727 001164 001024 24$: CMP      $TMP2,#1024 ;SEE IF WRL ON TRK 2, SEC 20
4527 020522 001004              BNE      25$      ;BR IF NO
4528 020524 104401 044072      TYPE     MSG100     ;ELSE WRL ON TRK 2, SEC 18
4529 020530 000137 020112      JMP      6$      ;& NO OLD DATA TO CHECK AGAINST
4530
4531 020534 023727 001164 000400 25$: CMP      $TMP2,#400   ;SEE IF WRL AT TRK 1, SEC 0
4532 020542 001004              BNE      18$      ;BR IF NO
4533 020544 012765 000025 000006  MOV      #21.,RKDA(R5) ;ELSE SECTOR AT WRL IS TRK 0, SEC 21
4534 020552 000415              BR       20$
4535
4536 020554 023727 001164 001000 18$: CMP      $TMP2,#1000 ;SEE IF WRL AT TRK 2, SEC 0
4537 020562 001004              BNE      19$      ;BR IF NO
4538 020564 012765 000425 000006  MOV      #425,RKDA(R5) ;ELSE SECTOR AT WRL IS TRK 1, SEC 21
4539 020572 000405              BR       20$
4540
4541 020574 005337 001164          19$: DEC      $TMP2      ;GET SECTOR AT WRL
4542 020600 013765 001164 000006  MOV      $TMP2,RKDA(R5)
4543
4544 020606 016537 000006 001166 20$: MOV      RKDA(R5),$TMP3 ;FOR ERROR PRINTOUT
4545
4546
4547
4548 020614 004737 026332          JSR      PC,SUBCLR   ;CERR AFTER SCLR
4549 020620 104024              ERROR     24
4550
4551 020622 005737 001164          TST      $TMP2      ;SEE IF TRK/SECTOR 0
4552 020626 001414              BEQ      80$      ;REPEAT,NO NEW DATA XFER TOOK PLACE
4553 020630 023727 001164 001023  CMP      $TMP2,#1023 ;SEE IF TRK 2,SECTOR 19
4554 020636 001410              BEQ      80$      ;REPEAT,NO OLD DATA TO CHECK AGAINST
4555 020640 032737 000001 001162  BIT      #BIT0,$TMP1
4556 020646 001006              BNE      73$      ;BR IF WRITING 1'S WHEN WLE OCCURRED
4557 020650 012765 001530 000004  MOV      #DATA1,RKBA(R5) ;WRITING 0'S:WLE SECTOR SHOULD HAVE ALL 1'S
4558 020656 000405              BR       74$
4559
4560 020660 000137 020112          80$: JMP      6$
4561
4562 020664 012765 001524 000004 73$: MOV      #DATA0,RKBA(R5) ;WRITING 1'S:WLE SECTOR SHOULD HAVE ALL 0'S
4563 020672 052765 000020 000010 74$: BIS      #BA1,RKCS2(R5)
4564 020700 012765 177400 000002  MOV      #-256.,RKWC(R5)
4565 020706 013765 001166 000006  MOV      $TMP3,RKDA(R5) ;REFRESH RKDA
4566 020714 017537 000004 001504  MOV      RKBA(R5),WD2 ;EXPECTED WORD FOR TRUERR TYPEOUT
4567 020722 013765 001366 000020  MOV      TOCYL,RKDC(R5)
4568
4569 020730 012765 000031 000000  MOV      #<WRTCHK>,RKCS1(R5) ;WRITE CHECK CMD
4570 020736 013737 001440 005444  MOV      T50000,TEMP1 ;SETUP TIMEOUT

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T16 WRITE LOCK TEST

SEQ 0086

4571	020744	004737	024422		JSR	PC,FRDY	;FIND RDY
4572	020750	104015			ERROR	15	;NO RDY AFTER WRITE CHECK CMD
4573	020752	004737	025760		JSR	PC,GSTAT	;GET FRESH STATUS
4574	020756	032737	100000	005406	BIT	#CERR,HCS1	
4575	020764	001450			BEQ	82\$	
4576	020766	032737	040000	005410	BIT	#WCE,HCS2	;SEE IF WRITE CHECK ERROR
4577	020774	001405			BEQ	81\$	
4578	020776	016537	000024	001502	MOV	RKDB(R5),WD1	;ACTUAL WORD FOR PRINTOUT
4579	021004	104134			ERROR	134	;WCE AFTER WRITE CMD
4580	021006	000437			BR	82\$	
4581							
4582	021010	104022			81\$: ERROR	22	;CERR AFTER WRITE CHECK CMD
4583							
4584	021012	012737	010340	005476	MOV	#<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
4585	021020	005037	005500		CLR	E.B0	;EXPECTED MSG B0
4586	021024	012737	001720	005502	MOV	#<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
4587	021032	012737	000001	005504	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4588	021040	005037	005506		CLR	E.A2	;EXPECTED MSG A2
4589	021044	012737	000002	005510	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4590	021052	012737	000003	005514	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4591							
4592	021060	004737	025144		JSR	PC,CHKMSG	;CHECK MSGS A0 B0 A1 B1
4593	021064	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
4594	021066	104057			ERROR	57	;MSG A0 ERROR AFTER WRITE CHECK CMD
4595	021070	104031			ERROR	31	;MSG B0 ERROR
4596	021072	104060			ERROR	60	;MSG A1 ERROR
4597	021074	104032			ERROR	32	;MSG B1 ERROR
4598	021076	104401	043674		TYPE	MSG72	;ABORTING BALANCE OF TESTS
4599	021102	000137	023416		JMP	ENDRV	
4600							
4601	021106				82\$:		
4602	021106	000240			NOP		
4603	021110	000240			NOP		
4604							
4605	021112	023727	001164	000400	CMP	\$TMP2,#400	;SEE IF WRL AT TRK 1, SECTOR 0
4606	021120	001004			BNE	75\$	;BR IF NO
4607	021122	012765	000025	000006	MOV	#21,RKDA(R5)	;ELSE SECTOR BEFORE WRL IS TRK 0, SEC 21
4608	021130	000415			BR	77\$	
4609	021132	023727	001164	001000	75\$: CMP	\$TMP2,#1000	;SEE IF WRL AT TRK 2,SECTOR 0
4610	021140	001004			BNE	76\$	;BR IF NO
4611	021142	012765	000425	000006	MOV	#425,RKDA(R5)	;ELSE SECTOR BEFORE WRL IS TRK 1, SEC 21
4612	021150	000405			BR	77\$	
4613							
4614	021152	005337	001164		76\$: DEC	\$TMP2	;GET SECTOR BEFORE WRL
4615	021156	013765	001164	000006	MOV	\$TMP2,RKDA(R5)	
4616	021164	016537	000006	001166	77\$: MOV	RKDA(R5),\$TMP3	;FOR ERROR PRINTOUT
4617	021172	032737	000001	001162	BIT	#BIT0,\$TMP1	
4618	021200	001004			BNE	78\$	;BR IF WRITING 1'S WHEN WLE OCCURRED
4619	021202	012765	001524	000004	MOV	#DATA0,RKBA(R5)	;WRITING 0'S:WLE SECTOR -1 SHOULD HAVE ALL 0'S
4620	021210	000403			BR	79\$	
4621							
4622	021212	012765	001530	000004	78\$: MOV	#DATA1,RKBA(R5)	;WRITING 1'S:WLE SECTOR -1 SHOULD HAVE ALL 1'S
4623	021220	052765	000020	000010	79\$: BIS	#BA1,RKCS2(R5)	
4624	021226	012765	177400	000002	MOV	#-256,RKWC(R5)	
4625	021234	017537	000004	001504	MOV	#RKBA(R5),WD2	;EXPECTED WORD FOR TRUERR TYPEOUT
4626	021242	013765	001366	000020	MOV	TOCYL,RKDC(R5)	

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T16 WRITE LOCK TEST

SEQ 0087

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4627
4628 021250 012765 000031 000000      MOV      #(<WRCHK>,RKCS1(R5)      ;WRITE CHECK CMD
4629 021256 013737 001440 005444      MOV      T50000,TEMP1          ;SETUP TIMEOUT
4630 021264 004737 024422              JSR      PC,FRDY              ;FIND RDY
4631 021270 104015                      ERROR    15                  ;NO RDY AFTER WRITE CHECK CMD
4632 021272 004737 025760              JSR      PC,GSTAT            ;GET FRESH STATUS
4633 021276 032737 100000 005406      BIT      #CERR,HCS1
4634 021304 001450                      BEQ      84$
4635 021306 032737 040000 005410      BIT      #WCE,HCS2          ;SEE IF WRITE CHECK ERROR
4636 021314 001405                      BEQ      83$
4637 021316 016537 000024 001502      MOV      RKDB(R5),WD1        ;ACTUAL WORD FOR PRINTOUT
4638 021324 104135                      ERROR    13$                  ;WCE AFTER WRITE CMD
4639 021326 000437                      BR       84$
4640
4641 021330 104022                      83$:  ERROR    22          ;CERR AFTER WRITE CHECK CMD
4642
4643 021332 012737 010340 005476      MOV      #(<D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG AC
4644 021340 005037 005500              CLR      E.B0              ;EXPECTED MSG B0
4645 021344 012737 001720 005502      MOV      #(<D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1 ;EXPECTED A1
4646 021352 012737 000001 005504      MOV      #1,E.B1          ;MSG ID FOR EXPECTED MSG B1
4647 021360 005037 005506              CLR      E.A2              ;EXPECTED MSG A2
4648 021364 012737 000002 005510      MOV      #2,E.B2          ;MSG ID FOR EXPECTED MSG B2
4649 021372 012737 000003 005514      MOV      #3,E.B3          ;MSG ID FOR EXPECTED MSG B3
4650
4651 021400 004737 025144              JSR      PC,CHKMSG          ;CHECK MSGS A0, B0, A1, B1
4652 021404 000003                      .WORD    T.A2!T.B2!0        ;& MSGS SPECIFIED HERE
4653 021406 104057                      ERROR    57              ;MSG A0 ERROR AFTER WRITE CHECK CMD
4654 021410 104031                      ERROR    31              ;MSG B0 ERROR
4655 021412 104060                      ERROR    60              ;MSG A1 ERROR
4656 021414 104032                      ERROR    32              ;MSG B1 ERROR
4657 021416 104401 043674              TYPE     MSG72            ;ABORTING BALANCE OF TESTS
4658 021422 000137 023416              JMP      ENDRV
4659
4660 021426                      84$:
4661
4662 021426                      12$:
4663
4664 ;*****
4665 ;TEST 17      AC LOW DETECTION PART 2
4666 ;
4667 ;      THIS TEST VERIFIES THAT WHEN AC POWER IS LOST, THAT WRITING CEASES
4668 ;      AT SECTOR BOUNDARIES & THAT THE BATTERY RETRACT IS FUNCTIONAL.
4669 ;      THERE IS APPROX 4 MS BETWEEN AC LOW ASSERTING AND NED ASSERTING
4670 ;      WHEN THE INTERFACE SHUTS DOWN.
4671 ;
4672 ;*****
4673 021426 000004      ST17: SCOPE
4674 021430 012737 000001 001174      MOV      #1,STIMES          ;DO 1 ITERATION
4675 021436 012706 001100              MOV      #STACK,SP        ;RESTORE STK PTR
4676
4677 021442 004737 026332              JSR      PC,SUBCLR
4678 021446 104024                      ERROR    24              ;CERR AFTER SCLR
4679
4680 021450 104401 037606              TYPE     ,MSG26          ;AC LOW-PART 2
4681 021454 104401 041656              TYPE     ,MSG52          ;CONT-E TO BYPASS TEST
4682                                ;OR SPACE TO CONINUE

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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T17 AC LOW DETECTION PART 2

SEQ 0088

4683	021460	004737	030306		JSR	PC,CCSP	;INPUT CONT-E OR SPACE
4684	021464	000137	023416		JMP	12\$	;RETURN HERE FOR CONT-E
4685							;RETURN HERE FOR SPACE
4686	021470	005737	001542		TST	BSERR	;TEST FOR ALIGN CARTRIDGE
4687	021474	001402			BEQ	1\$	;BR IF NOT ALIGN CART.
4688	021476	000137	022134		JMP	2\$	
4689							
4690	021502	004737	025760		JSR	PC,GSTAT	
4691	021506	032737	004000	005434	BIT	#D.WRL,HMR2	;SEE IF WRITE LOCK
4692	021514	001417			BEQ	11\$	;BR IF NO
4693							
4694	021516	104401	041757		TYPE	,MSG53	;DISABLE WRITE LOCK
4695	021522	104401	040502		TYPE	,MSG37	;PRESS SPACE WHEN DONE
4696	021526	004737	030346		JSR	PC,GETSP	;GET SPACE
4697							
4698	021532	004737	025760		JSR	PC,GSTAT	
4699	021536	032737	004000	005434	BIT	#D.WRL,HMR2	;SEE IF STILL WRITE LOCK
4700	021544	001403			BEQ	11\$	;BR IF NO
4701	021546	104110			ERROR	110	;WRITE LOCK NOT DISABLED
4702	021550	000137	023416		JMP	12\$	;EXIT TEST
4703							
4704	021554	005037	001366		CLR	TOCYL	;SETUP
4705	021560	005037	001402		CLR	CALADD	;FOR
4706	021564	005037	001510		CLR	HEAD	;FILL HEADER TABLE
4707	021570	005037	001516		CLR	FORMAT	;ROUTINE
4708							
4709	021574	004737	027314		JSR	PC,FHDTAB	;BUILD STD 22 SECTOR HEADER TABLE
4710							
4711	021600	012765	001554	000004	MOV	#HDTAB,RKBA(R5)	
4712	021606	012765	177676	000002	MOV	#-66.,RKWC(R5)	
4713	021614	000337	001510		SWAB	HEAD	
4714	021620	013765	001510	000006	MOV	HEAD,RKDA(R5)	;HEAD ADDR
4715	021626	000337	001510		SWAB	HEAD	
4716							
4717	021632	012765	000027	000000	MOV	#<WRHEAD>,RKCS1(R5)	;WRITE HEADER CMD
4718	021640	013737	001440	005444	MOV	T50000,TEMP1	;SETUP TIMEOUT
4719	021646	004737	024422		JSR	PC,FROY	;FIND RDY
4720	021652	104200			ERROR	200	;NO RDY AFTER WRITE HEADER CMD
4721	021654	004737	025760		JSR	PC,GSTAT	;GET FRESH STATUS
4722	021660	032737	100000	005406	BIT	#CERR,HCS1	
4723	021666	001401			BEQ	64\$	
4724	021670	104201			ERROR	201	;CERR AFTER WRITE HEADER CMD
4725	021672						
4726							
4727	021672	005237	001510		INC	HEAD	
4728	021676	023727	001510	000003	CMP	HEAD,#3	;SEE IF ALL HEADS DONE
4729	021704	001333			BNE	13\$	;BR IF NO
4730	021706	005037	001366		CLR	TOCYL	
4731							
4732	021712	004737	026332		JSR	PC,SUBCLR	
4733	021716	104024			ERROR	24	;CERR AFTER SCLR
4734							
4735	021720	012765	001530	000004	MOV	#DATA1,RKBA(R5)	;RETURN HERE FOR SPACE
4736	021726	052765	000020	000010	BIS	#BA1,RKCS2(R5)	;WRITE INITIAL BACKGROUND OF 1'S
4737	021734	012765	137000	000002	MOV	#-66.*256.,RKWC(R5)	;TRACK 0,1,2 ALL SECTORS
4738	021742	013765	001366	000020	MOV	TOCYL,RKDC(R5)	

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T17 AC LOW DETECTION PART 2

SEQ 0089

4739	021750	012765	000023	000000	MOV	#WRDATA,RKCS1(R5)	;WRITE DATA CMD
4740	021756	013737	001440	005444	MOV	T50000,TMP1	;SETUP TIMEOUT
4741	021764	004737	024422		JSR	PC,FROD	;FIND RDY
4742	021770	104011			ERROR	11	;NO RDY AFTER WRITE DATA CMD
4743	021772	004737	025760		JSR	PC,GSTAT	;GET FRESH STATUS
4744	021776	032737	100000	005406	BIT	#CERR,HCS1	
4745	022004	001453			BEQ	25	
4746	022006	032737	000200	005422	BIT	#BSE,HER	;SEE IF BAD SECTOR
4747	022014	001034			BNE	175	
4748							
4749	022016	012737	010340	005476	MOV	#<0!D.SPIN!D.DRDY!D.VV!D.DRA>,E.A0	;EXPECTED MSG A0
4750	022024	005037	005500		CLR	E.B0	;EXPECTED MSG B0
4751	022030	012737	001720	005502	MOV	#<0!D.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1	;EXPECTED A1
4752	022036	012737	000001	005504	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4753	022044	005037	005506		CLR	E.A2	;EXPECTED MSG A2
4754	022050	012737	000002	005510	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4755	022056	012737	000003	005514	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4756							
4757	022064	004737	025144		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
4758	022070	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
4759	022072	104052			ERROR	52	;MSG A0 ERROR AFTER WRITE DATA CMD
4760	022074	104023			ERROR	23	;MSG B0 ERROR
4761	022076	104053			ERROR	53	;MSG A1 ERROR
4762	022100	104025			ERROR	25	;MSG B1 ERROR
4763	022102	000137	023416		JMP	125	
4764							
4765	022106	005237	001366		INC	TOCYL	
4766	022112	023727	001366	000012	CMP	TOCYL,#10.	;TRIED 10 CYLINDERS?
4767	022120	001003			BNE	185	;BR IF NO
4768	022122	104062			ERROR	62	;CANNOT WRITE ON 10 CONSEC CYL
4769	022124	000137	023416		JMP	125	
4770							
4771	022130	000137	021712		JMP	165	
4772							
4773	022134	004737	026332		JSR	PC,SUBCLR	
4774	022140	104024			ERROR	24	;CERR AFTER SCLR
4775							
4776	022142	104401	041430		TYPE	,MSG49	;TURN OFF AC
4777	022146	104401	042423		TYPE	,MSG57	;VERIFY BATTERY RETRACT FUNCTIONAL
4778							
4779	022152	005737	001542		TST	BSERR	;SEE IF ALIGN CART USED
4780	022156	001405			BEQ	155	;BR IF NO
4781	022160	104401	040502		TYPE	,MSG37	;PRESS SPACE WHEN DONE
4782	022164	004737	030346		JSR	PC,GETSP	;GET SPACE
4783	022170	000526			BR	85	;SKIP ALL WRITING
4784							
4785	022172	013737	001440	001160	MOV	T50000,STMP0	
4786	022200	005037	001162		CLR	STMP1	;BIT0=0;WRITE 0'S; BIT0=1:WRITE 1'S
4787							
4788	022204	004737	026332		JSR	PC,SUBCLR	
4789	022210	104024			ERROR	24	;CERR AFTER SCLR
4790							
4791	022212	032737	000001	001162	BIT	#BIT0,STMP1	
4792	022220	001004			BNE	55	;BR IF WRITING 1'S
4793	022222	012765	001524	000004	MOV	#DATA0,RKBA(R5)	;SETUP ALL 0'S
4794	022230	000403			BR	65	

Address	Offset	Hex	Hex	Hex	Label	Instruction	Comment
4795	022232	012765	001530	000004	5\$:	MOV	#DATA1,RKBA(R5) ; SETUP ALL 1'S
4796	022240	052765	000020	000010	6\$:	BIS	#BAI,RKCS2(R5)
4797	022246	012765	140400	000002		MOV	#-63, #256.,RKWC(R5) ; TRACK 0,1,2 63 SECTORS
4798	022254	005065	000006			CLR	RKDA(R5) ; BEGIN AT TRK AND SECTOR 0
4799	022260	013765	001366	000020		MOV	TOCYL,RKDC(R5)
4800	022266	012765	000023	000000		MOV	#WRDATA,RKCS1(R5)
4801	022274	013737	001440	005444		MOV	T50000,TEMP1
4802	022302	004737	024422			JSR	PC,FRDY ; FIND CONTR RDY
4803	022306	104011				ERROR	11 ; CONTR NOT RDY
4804							
4805							
4806	022310	004737	025760			JSR	PC,GSTAT
4807	022314	032737	100000	005406		BIT	#CERR,HCS1
4808	022322	001017				BNE	3\$
4809	022324	005337	001160			DEC	\$TMP0
4810	022330	001011				BNE	7\$
4811	022332	104146				ERROR	146 ; CERR NOT SET BY TIMEOUT
4812	022334	104401	041503			TYPE	,MSG50 ; TURN AC BACK ON
4813	022340	104401	043506			TYPE	,MSG69 ; DEPRESS SPACE AFTER 'READY' LIGHT ON
4814	022344	004737	030346			JSR	PC,GETSP ; GET SPACE
4815	022350	000137	023416			JMP	12\$; EXIT TEST
4816							
4817	022354	005237	001162		7\$:	INC	\$TMP1
4818	022360	000711				BR	4\$; GO WRITE OPPOSITE DATA
4819							
4820	022362	032737	000100	005436	3\$:	BIT	#D.ACLO,HMR3
4821	022370	001001				BNE	10\$
4822	022372	104147				ERROR	147 ; AC LOW NOT SET
4823							
4824	022374	005237	005370		10\$:	INC	UNLD ; FOR VALID HALT
4825	022400	012737	070140	005476		MOV	#<D.DSC!D.PIP!D.SPIN!D.VV!D.DRA>,E.A0 ; EXPECTED MSG A0
4826	022406	012737	010300	005500		MOV	#<D.SPLS!D.ACLO!D.FLT>,E.B0
4827	022414	012737	044720	005502		MOV	#<D.UNLD!D.REV!D.CART!D.DOOR!D.BRHM!D.SSP>,E.A1
4828	022422	012737	000001	005504		MOV	#1,E.B1
4829							
4830	022430	004737	025144			JSR	PC,CHKMSG ; CHECK MSGS A0, B0, A1, B1
4831	022434	000000				.WORD	0!0!0 ; 8 MSGS SPECIFIED HERE
4832	022436	104035				ERROR	35 ; MSG A0 ERROR AFTER AC SWITCH OFF FROM HEADS LOADED
4833	022440	104203				ERROR	203 ; MSG B0 ERROR
4834	022442	104036				ERROR	36 ; MSG A1 ERROR
4835	022444	104037				ERROR	37 ; MSG B1 ERROR
4836							
4837	022446	013737	005416	001164	8\$:	MOV	HDA,\$TMP2 ; SAVE RKDA
4838	022454	013737	005416	001166		MOV	HDA,\$TMP3 ; SAVE FOR TYPEOUT
4839							
4840	022462	104401	041503			TYPE	,MSG50 ; TURN AC BACK ON
4841	022466	104401	043506			TYPE	,MSG69 ; DEPRESS SPACE AFTER 'READY' LIGHT ON
4842	022472	004737	030346			JSR	PC,GETSP ; GET SPACE
4843							
4844	022476	004737	026332			JSR	PC

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T17 AC LOW DETECTION PART 2

SEQ 0091

4851	022516	005037	005370		95:	CLR	UNLD		;FOR VALID HALT
4852	022522	012765	100000	000000		MOV	#CCLR,RKCS1(R5)		
4853	022530	013765	001222	000010		MOV	SUNIT,RKCS2(R5)		;DRIVE #
4854	022536	012765	000003	000000		MOV	#PACK,RKCS1(R5)		;PACK CMD
4855	022544	013737	001426	005444		MOV	T10,TEMP1		
4856	022552	004737	024422			JSR	PC,FRDY		;FIND CONTR RDY
4857	022556	104116				ERROR	116		;CONTR NOT RDY
4858									
4859	022560	032737	000100	005434		BIT	#D.VV,HMR2		
4860	022566	001001				BNE	655		
4861	022570	104027				ERROR	27		;VOLUME VALID NOT SET AFTER PACK CMD
4862	022572				655:				
4863	022572	005737	001542			TST	BSERR		;SEE IF ALIGN CART USED
4864	022576	001402				BEQ	145		;BR IF NO
4865	022600	000137	023416			JMP	125		;ELSE EXIT TEST
4866									
4867	022604				145:				
4868									
4869	022604	004737	026332			JSR	PC,SUBCLR		
4870	022610	104024				ERROR	24		;CERR AFTER SCLR
4871									
4872	022612	005737	001164			TST	\$TMP2		;SEE IF TRK/SECTOR 0
4873	022616	001414				BEQ	735		;REPEAT,NO NEW DATA XFER TOOK PLACE
4874	022620	023727	001164	001023		CMP	\$TMP2,#1023		;SEE IF TRK 2,SECTOR 19
4875	022626	001410				BEQ	735		;REPEAT,NO OLD DATA TO CHECK AGAINST
4876	022630	032737	000001	001162		BIT	#BIT0,\$TMP1		
4877	022636	001006				BNE	665		;BR IF WRITING 1'S WHEN WLE OCCURRED
4878	022640	012765	001530	000004		MOV	#DATA1,RKBA(R5)		;WRITING 0'S:WLE SECTOR SHOULD HAVE ALL 1'S
4879	022646	000405				BR	675		
4880									
4881	022650	000137	022134		735:	JMP	25		
4882									
4883	022654	012765	001524	000004	665:	MOV	#DATA0,RKBA(R5)		;WRITING 1'S:WLE SECTOR SHOULD HAVE ALL 0'S
4884	022662	052765	000020	000010	675:	BIS	#BA1,RKCS2(R5)		
4885	022670	012765	177400	000002		MOV	#-256,RKWC(R5)		
4886	022676	013765	001166	000006		MOV	\$TMP3,RKDA(R5)		;REFRESH RKDA
4887	022704	017537	000004	001504		MOV	2RKBA(R5),WD2		;EXPECTED WORD FOR TRUERR TYPEOUT
4888	022712	013765	001366	000020		MOV	TOCYL,RKDC(R5)		
4889									
4890	022720	012765	000031	000000		MOV	#(WRTCHK),RKCS1(R5)		;WRITE CHECK CMD
4891	022726	013737	001440	005444		MOV	T50000,TEMP1		;SETUP TIMEOUT
4892	022734	004737	024422			JSR	PC,FRDY		;FIND RDY
4893	022740	104015				ERROR	15		;NO RDY AFTER WRITE CHECK CMD
4894	022742	004737	025760			JSR	PC,GSTAT		;GET FRESH STATUS
4895	022746	032737	100000	005406		BIT	#CERR,HCS1		
4896	022754	001450				BEQ	755		
4897	022756	032737	040000	005410		BIT	#WCE,HCS2		;SEE IF WRITE CHECK ERROR
4898	022764	001405				BEQ	745		
4899	022766	016537	000024	001502		MOV	RKDB(R5),WD1		;ACTUAL WORD FOR PRINTOUT
4900	022774	104136				ERROR	136		;WCE AFTER WRITE CMD
4901	022776	000437				BR	755		
4902									
4903	023000	104022			745:	ERROR	22		;CERR AFTER WRITE CHECK CMD
4904									
4905	023002	012737	010340	005476		MOV	#(0!D.SPIN!D.DRDY!D.VV!D.DRA),E.A0		;EXPECTED MSG A0
4906	023010	005037	005500			CLR	E.B0		;EXPECTED MSG B0

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SEQ 0092

4907	023014	012737	001720	005502	MOV	#(D.SPOK!D.CART!D.DOOR!D.BRHM!D.SSP),E.A1	;EXPECTED A1
4908	023022	012737	000001	005504	MOV	#1,E.B1	;MSG ID FOR EXPECTED MSG B1
4909	023030	005037	005506		CLR	E.A2	;EXPECTED MSG A2
4910	023034	012737	000002	005510	MOV	#2,E.B2	;MSG ID FOR EXPECTED MSG B2
4911	023042	012737	000003	005514	MOV	#3,E.B3	;MSG ID FOR EXPECTED MSG B3
4912							
4913	023050	004737	025144		JSR	PC,CHKMSG	;CHECK MSGS A0, B0, A1, B1
4914	023054	000003			.WORD	T.A2!T.B2!0	;8 MSGS SPECIFIED HERE
4915	023056	104057			ERROR	57	;MSG A0 ERROR AFTER WRITE CHECK CMD
4916	023060	104031			ERROR	31	;MSG B0 ERROR
4917	023062	104060			ERROR	60	;MSG A1 ERROR
4918	023064	104032			ERROR	32	;MSG B1 ERROR
4919	023066	104401	043674		TYPE	MSG72	;ABORTING BALANCE OF TESTS
4920	023072	000137	023416		JMP	ENDRV	
4921							
4922	023076						75\$:
4923	023076	000240			NOP		
4924	023100	000240			NOP		
4925							
4926	023102	023727	001164	000400	CMP	\$TMP2,#400	;SEE IF WRL AT TRK 1, SECTOR 0
4927	023110	001004			BNE	68\$	;BR IF NO
4928	023112	012765	000025	000006	MOV	#21,RKDA(R5)	;ELSE SECTOR BEFORE WRL IS TRK 0, SEC 21
4929	023120	000415			BR	70\$	
4930	023122	023727	001164	001000	CMP	\$TMP2,#1000	;SEE IF WRL AT TRK 2,SECTOR 0
4931	023130	001004			BNE	69\$	;BR IF NO
4932	023132	012765	000425	000006	MOV	#425,RKDA(R5)	;ELSE SECTOR BEFORE WRL IS TRK 1, SEC 21
4933	023140	000405			BR	70\$	
4934							
4935	023142	005337	001164		DEC	\$TMP2	;GET SECTOR BEFORE WRL
4936	023146	013765	001164	000006	MOV	\$TMP2,RKDA(R5)	
4937	023154	016537	000006	001166	MOV	RKDA(R5), \$TMP3	;FOR ERROR PRINTOUT
4938	023162	032737	000001	001162	BIT	#BIT0,\$TMP1	
4939	023170	001004			BNE	71\$	;BR IF WRITING 1'S WHEN WLE OCCURRED
4940	023172	012765	001524	000004	MOV	#DATA0,RKBA(R5)	;WRITING 0'S:WLE SECTOR -1 SHOULD HAVE ALL 0'S
4941	023200	000403			BR	72\$	
4942							
4943	023202	012765	001530	000004	MOV	#DATA1,RKBA(R5)	;WRITING 1'S:WLE SECTOR -1 SHOULD HAVE ALL 1'S
4944	023210	052765	000020	000010	BIS	#BA1,RKCS2(R5)	
4945	023216	012765	177400	000002	MOV	#-256,RKWC(R5)	
4946	023224	017537	000004	001504	MOV	2RKBA(R5),WD2	;EXPECTED WORD FOR TRUERR TYPEOUT
4947	023232	013765	001366	000020	MOV	TOCYL,RKDC(R5)	
4948							
4949	023240	012765	000031	000000	MOV	#(WRCHK),RKCS1(R5)	;WRITE CHECK CMD
4950	023246	013737	001440	005444	MOV	T50000,TEMP1	;SETUP TIMEOUT
4951	023254	004737	024422		JSR	PC,FRDY	;FIND ROY
4952	023260	104015			ERROR	15	;NO ROY AFTER WRITE CHECK CMD
4953	023262	004737	025760		JSR	PC,GSTAT	;GET FRESH STATUS
4954	023266	032737	100000	005406	BIT	#CERR,HCS1	
4955	023274	001450			BEQ	77\$	
4956	023276	032737	040000	005410	BIT	#WCE,HCS2	;SEE IF WRITE CHECK ERROR
4957	023304	001405			BEQ	76\$	
4958	023306	016537	000024	001502	MOV	RKDB(R5),WD1	;ACTUAL WORD FOR PRINTOUT
4959	023314	104137			ERROR	137	;WCE AFTER WRITE CMD
4960	023316	000437			BR	77\$	
4961							
4962	023320	104022			ERROR	22	;CERR AFTER WRITE CHECK CMD

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T17 AC LOW DETECTION PART 2

SEQ 0093

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4963
4964 023322 012737 010340 005476      MOV      #<0!D.SPIN!D.DROY!D.VV!D.DRA>,E.A0 ;EXPECTED MSG A0
4965 023330 005037 005500              CLR      E.B0 ;EXPECTED MSG B0
4966 023334 012737 001720 005502      MOV      #<0.SPOK!D.CART!D.DOOR!D.BRM!D.SSP>,E.A1 ;EXPECTED A1
4967 023342 012737 000001 005504      MOV      #1,E.B1 ;MSG ID FOR EXPECTED MSG B1
4968 023350 005037 005506              CLR      E.A2 ;EXPECTED MSG A2
4969 023354 012737 000002 005510      MOV      #2,E.B2 ;MSG ID FOR EXPECTED MSG B2
4970 023362 012737 000003 005514      MOV      #3,E.B3 ;MSG ID FOR EXPECTED MSG B3
4971
4972 023370 004737 025144              JSR      PC,CHKMSG ;CHECK MSGS A0, B0, A1, B1
4973 023374 000003              .WORD      T.A2!T.B2!0 ;& MSGS SPECIFIED HERE
4974 023376 104057              ERROR      57 ;MSG A0 ERROR AFTER WRITE CHECK CMD
4975 023400 104031              ERROR      31 ;MSG B0 ERROR
4976 023402 104060              ERROR      60 ;MSG A1 ERROR
4977 023404 104032              ERROR      32 ;MSG B1 ERROR
4978 023406 104401 043674              TYPE      MSG72 ;ABORTING BALANCE OF TESTS
4979 023412 000137 023416              JMP      ENDRV
4980
4981 023416              77$:
4982
4983 023416              12$:
4984
4985 023416              ENDRV:
4986
4987 *****
4988 :TEST 20      END OF PROGRAM
4989 :
4990 :      THIS IS NOT A TEST BUT A LINKAGE TO PERFORM ALL THE
4991 :      ABOVE TESTS FOR THE NEXT DRIVE PRESENT.
4992 :      THE NEXT TEST IS ENTERED ONLY AFTER ALL DRIVES PRESENT
4993 :      HAVE BEEN TESTED.
4994 :      DO NOT LOOP ON THIS 'TEST'.
4995 :
4996 *****
4997 :TEST20: SCOPE
4998 023416 000004
4999 023420 012737 000001 001174      MOV      #1,STIMES ;DO 1 ITERATION
5000 023426 012706 001100              MOV      #STACK,SP ;RESTORE STK PTR
5001
5002 023432 005237 001220 001220      INC      $DEVCT ;INCR COUNT FOR # OF DRIVES THAT ARE CHECKED
5003 023436 023737 005526              CMP      DRIVS,$DEVCT ;ARE ALL DRIVES PRESENT TESTED?
5004 023444 001402              BEQ      TST21 ;GO TO NEXT TEST IF YES
5005 023446 000137 012302              JMP      NUDRV ;IF NOT, GO BACK & TEST NEXT DRIVE PRESENT.
5006
5007 *****
5008 :TEST 21      MULTIPLE DRIVE DETECTION TEST
5009 :
5010 :      THIS TEST IS PERFORMED ONLY ONCE AT THE END OF PASS 1
5011 :      AND IS BYPASSED IF ONLY ONE DRIVE IS PRESENT.
5012 :
5013 :      THE MULTIPLE DRIVE DETECTION LOGIC IS TESTED BY THE FOLLOWING METHOD:
5014 :
5015 :      A. HEADS MUST BE LOADED (SECTOR PULSES REQ'D)
5016 :      B. THE OPERATOR IS INSTRUCTED TO INSERT THE SAME UNIT SELECT
5017 :      PLUG NUMBER (1 PAIR AT A TIME) ON ANY 2 DRIVES
5018 :      TO BE TESTED
5019 :
5020 :      C. THE OPERATOR THEN DEPRESSES THE SPACE BAR TO CONTINUE THE TEST

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T21 MULTIPLE DRIVE DETECTION TEST

SEQ 0094

OR A CONT-E TO EXIT THE TEST

THE PROGRAM VERIFIES THAT MULTIPLE DRIVE SELECT & DRIVE UNSAFE
BOTH SET & THAT THE DRIVE UNLOADS

THE OPERATOR IS ASKED TO VERIFY THAT HEADS UNLOAD FROM BOTH DRIVES

```

T21: SCOPE
MOV #1,STIMES ;DO 1 ITERATION
MOV #STACK,SP ;RESTORE STACK PTR

TST SPASS
BEQ 1$ ;DO TEST ONLY IN 1ST PASS
JMP 11$ ;ELSE EXIT TEST

1$: CMP DRVS,#1
BNE 2$ ;BR IF MORE THAN 1 DRIVE PRESENT
TYPE MSG62 ;BYPASS TEST, ONLY 1 DRIVE PRESENT
JMP 11$ ;ELSE EXIT TEST

2$: TYPE MSG28 ;MULT DRV DETECTION TEST
TYPE MSG52 ;PRESS CONT-E TO EXIT OR SPACE TO CONTINUE
JSR PC,CCSP ;INPUT CONT-E OR SPACE
JMP 11$ ;RETURN HERE FOR CONT-E

TYPE MSG58 ;LOAD HEADS ON ALL DRIVES
TYPE MSG37 ;PRESS SPACE WHEN DONE
JSR PC,GETSP ;GET SPACE

3$: JSR PC,SUBCLR
ERROR 24 ;CERR AFTER SCLR

TYPE MSG59 ;INSERT SAME UNIT SEL PLUG # IN 2 DRIVES
TYPE MSG37 ;DEPRESS SPACE BAR WHEN DONE
JSR PC,GETSP ;GET SPACE

CLR RO ;DRIVE # COUNTER

6$: MOV #CCLR,RKCS1(R5)
MOV RO,RKCS2(R5) ;DRIVE #
MOV #SELDIV,RKCS1(R5) ;SELECT DRIVE CMD TO GET STATUS
MOV #50000.,TEMP1
JSR PC,DLY ;REQ 2 MS DELAY BEFORE MDS DETECTED

BIT #MDS,RKCS2(R5) ;SEE IF THAT DRIVE HAS MDS
BNE 7$ ;BR IF YES
RO ;ELSE TRY ANOTHER DRIVE
INC RO
CMP RO,#8. ;SEE IF ALL DRIVES TESTED
BNE 6$ ;BR IF NO
ERROR 176 ;CANNOT FIND MDS
BR 10$ ;TRY AGAIN

7$: TYPE MSG61 ;MULT DRIVES FOUND ON DRIVE #
MOV RO,-(SP) ;SAVE RO FOR TYPEOUT
;TYPE UNIT NO

```

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5019
5020
5021
5022
5023
5024
5025
5026
5027 023452 000004
5028 023454 012737 000001 001174
5029 023462 012706 001100
5030
5031 023466 005737 001216
5032 023472 001402
5033 023474 000137 023730
5034
5035 023500 023727 005526 000001 1$:
5036 023506 001004
5037 023510 104401 043034
5038 023514 000137 023730
5039
5040 023520 104401 037677 2$:
5041 023524 104401 041656
5042 023530 004737 030306
5043 023534 000137 023730
5044
5045 023540 104401 042471
5046 023544 104401 040502
5047 023550 004737 030346
5048
5049 023554 004737 026332 3$:
5050 023560 104024
5051
5052 023562 104401 042553
5053 023566 104401 040502
5054 023572 004737 030346
5055
5056 023576 005000
5057
5058 023600 012765 100000 000000 6$:
5059 023606 010065 000010
5060 023612 012765 000001 000000
5061 023620 012737 141520 005444
5062 023626 004737 025112
5063
5064 023632 032765 001000 000010
5065 023640 001006
5066 023642 005200
5067 023644 020027 000010
5068 023650 001353
5069 023652 104176
5070 023654 000411
5071
5072 023656 104401 042766 7$:
5073 023662 010046
5074

```

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21 MULTIPLE DRIVE DETECTION TEST

SEQ 0095

5075 023664 104403
5076 023666 001
5077 023667 000
5078 023670 104401 043446
5079 023674 005237 005370
5080 023700 104401 042656
5081 023704 104401 043130
5082 023710 004737 030306
5083 023714 000137 023730
5084 023720 005037 005370
5085 023724 000137 023554
5086 023730 005037 005370
5087
5088 023734 004737 026332
5089 023740 104024

TYP05
BYTE 1
BYTE 0
TYPE ,MSG68
INC UNLD
10\$: TYPE ,MSG60
TYPE ,MSG63
JSR ^C CCSP
JMP 11\$
CLR UNLD
JMP 3\$
11\$: CLR UNLD
JSR PC,SUBCLR
ERROR 24

;;GO TYPE--OCTAL ASCII
;;TYPE 1 DIGIT(S)
;;SUPPRESS LEADING ZEROS
;;VERIFY BOTH DRIVES UNLOADED
;;FOR VALID HALT
;;INSERT CORRECT UNIT SEL PLUG & LOAD HEADS
;;DEPRESS CONT-E OR SPACE BAR WHEN DONE
;;INPUT CONT-E OR SPACE
;;RETURN HERE FOR CONTROL-E (EXIT)
;;RETURN HERE FOR SPACE (DO AGAIN)

;CERR AFTER SCLR

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END OF PASS ROUTINE

SEQ 0096

```
5090
5091
5092
5093
5094
5095
5096
5097
5098 023742
5099 023742 000004
5100 023744 005037 001102
5101 023750 005037 001174
5102 023754 005237 001216
5103 023760 042737 100000 001216
5104 023766 005327
5105 023770 000001
5106 023772 003022
5107 023774 012737
5108 023776 000001
5109 024000 023770
5110 024002 104401 024047
5111 024006 013746 001216
5112 024012 104405
5113 024014 104401 024044
5114 024020 013700 000042
5115 024024 001405
5116 024026 000005
5117 024030 004710
5118 024032 000240
5119 024034 000240
5120 024036 000240
5121 024040
5122 024040 000137
5123 024042 010656
5124 024044 377 377 000
5125 024047 015 042412 042116
5126 024054 050040 051501 020123
5127 024062 000043

.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 ST5

SEOP:
    SCOPE
    CLR $TSTNM ;;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?
SEOPCT: .WORD 1
    BGT $DOAGN ;;YES
    MOV (PC)+,$(PC)+ ;;RESTORE COUNTER
SENDCT: .WORD 1
    SEOPCT
    TYPE $SENDMG ;;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
SENDAD: JSR PC,(R0) ;;GO TO MONITOR
    NOP ;;SAVE ROOM
    NOP ;;FOR
    NOP ;;ACT11
$DOAGN: JMP $(PC)+ ;;RETURN
$RTNAD: .WORD ST5
$ENULL: .BYTE -1,-1,0 ;;NULL CHARACTER STRING
$SENDMG: .ASCIIZ <15><12>/END PASS #/
```

```

5128      .SBTTL  SUBROUTINES
5129
5130      ;SUBROUTINE TO CLEAR ALL FLAGS FROM DDUMP THRU DOTIM
5131      ;
5132
5133      024064 012700 005516      CLRFLG: MOV      #DDUMP, R0
5134      024070 012701 177757      MOV      #-17., R1
5135      024074 005020      1$:      CLR      (R0)+
5136      024076 005201      INC      R1
5137      024100 001375      BNE      1$
5138      024102 000207      RTS      PC
5139
5140
5141      ;TYPE PROGRAM ID IF FTITLE=0
5142      ;
5143
5144      024104 005737 001360      TITLE: TST      FTITLE
5145      024110 001024      BNE      1$
5146      024112 005237 001360      INC      FTITLE
5147      024116 104401 035570      TYPE      MSG1      ;PROGRAM ID
5148      .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
5149      024122 005737 000042      TST      2#42      ;;ARE WE RUNNING UNDER XXDP/ACT?
5150      024126 001012      BNE      64$      ;;BRANCH IF YES
5151      024130 123727 001230 000001      CMPB     $ENV, #1      ;;ARE WE RUNNING UNDER APT?
5152      024136 001406      BEQ      64$      ;;BRANCH IF YES
5153      024140 023727 001140 000176      CMP      SWR, #SWREG      ;;SOFTWARE SWITCH REG SELECTED?
5154      024146 001005      BNE      65$      ;;BRANCH IF NO
5155      024150 104406      GTSWR      ;;GET SOFT-SWR SETTINGS
5156      024152 000403      BR      65$
5157      024154 112737 000001 001134      64$:      MOVB     #1, $AUTOB      ;;SET AUTO-MODE INDICATOR
5158      024162      65$:
5159      024162 000207      1$:      RTS      PC
5160
5161
5162      ;ROUTINE TO INPUT DRIVE NOS. TYPED IN & SET
5163      ;DRIVS, DRIVO-DRIV7 REGISTERS APPROPRIATELY
5164      ;
5165
5166      024164 104411      GDRVS:  RDLIN
5167      024166 012600      MOV      (SP)+, R0      ;GET STARTING ADDR OF ASCII STRING
5168      024170 012701 177770      MOV      #-8., R1      ;SET UP COUNT
5169      024174 112002      1$:      MOVB     (R0)+, R2      ;GET ASCII CHAR
5170      024176 042702 177400      BIC      #177400, R2      ;MASK HI BYTE
5171      024202 012703 005530      MOV      #DRIVO, R3      ;DRIVE FLAG ADDR
5172      024206 012704 000060      MOV      #60, R4
5173
5174      024212 020402      2$:      CMP      R4, R2      ;WAS TYPED CHAR 0 THRU 7?
5175      024214 001415      BEQ      3$      ;BRANCH IF YES
5176      024216 005723      TST      (R3)+      ;NO, INCREMENT DR FLAG ADDR
5177      024220 005204      INC      R4
5178      024222 020427 000070      CMP      R4, #70
5179      024226 001371      BNE      2$      ;S/B 0-7 OR TERMINATOR
5180      024230 005702      TST      R2
5181      024232 001022      BNE      4$
5182      024234 020127 177770      CMP      R1, #-8.
5183      024240 001426      BEQ      5$      ;DEFAULT ALL DRIVES

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SEQ 0098

5184	024242	005037	005556	7\$:	CLR	SIZFLG		;BYPASS TEST 1 (SIZING)
5185	024246	000207			RTS	PC		;FOUND TERMINATOR, EXIT
5186								
5187	024250	005213		3\$:	INC	DR3		;SET UP FLAG FOR THE DRIVE
5188	024252	005237	005526		INC	DRVS		;INCREMENT TOTAL # DRIVES TO BE TESTED
5189	024256	112002			MOVB	(R0)+,R2		;GET NEXT ASCII CHAR.
5190	024260	042702	177400		BIC	#177400,R2		;MASK
5191	024264	022702	000054		CMP	#54,R2		;IS IT A COMMA?
5192	024270	001407			BEQ	5\$		;YES, GO TO NEXT WORD.
5193	024272	005702			TST	R2		;NO, IS IT A TERMINATOR?
5194	024274	001001			BNE	4\$		;IF NOT, SOMETHING WRONG.
5195	024276	000761			BR	7\$		;FOUND TERMINATOR, EXIT
5196								
5197	024300	104401	044241	4\$:	TYPE	EM1		;ONLY 0-7 ALLOWED.
5198	024304	000137	010064		JMP	PRGSRT		;START ALL OVER
5199								
5200	024310	005201		5\$:	INC	R1		;S/B NO MORE THAN 8 DIFF
5201	024312	001330			BNE	1\$		;DRIVES TYPED IN.
5202	024314	000771			BR	4\$		;IF MORE, HAVE ERROR.
5203								
5204	024316	005237	005556	6\$:	INC	SIZFLG		;DO TEST 1 (SIZING)
5205	024322	000207			RTS	PC		;EXIT.
5206								
5207								
5208								
5209								
5210								
5211	024324	104412		GBA:	RDOCT			
5212	024326	012600			MOV	(SP)+,R0		;GET LOW ORDER FROM STACK
5213	024330	005700			TST	R0		
5214	024332	001403			BEQ	1\$		;BRANCH IF DEFAULT.
5215	024334	010037	001264		MOV	R0,\$BASE		
5216	024340	000207			RTS	PC		
5217	024342	012737	177440 001264	1\$:	MOV	#177440,\$BASE		;DEFAULT VALUE
5218	024350	000207			RTS	PC		
5219								
5220								
5221								
5222								
5223								
5224	024352	104412		GINT:	RDOCT			
5225	024354	012600			MOV	(SP)+,R0		;GET LOW ORDER FROM STACK
5226	024356	005700			TST	R0		
5227	024360	001405			BEQ	1\$		;BRANCH IF DEFAULT
5228	024362	010037	001334		MOV	R0,RKVEC		
5229	024366	004737	024404	2\$:	JSR	PC,SETINT		
5230	024372	000207			RTS	PC		
5231	024374	012737	000210 001334	1\$:	MOV	#210,RKVEC		;DEFAULT VALUE
5232	024402	000771			BR	2\$		
5233								
5234								
5235								
5236								
5237								
5238	024404	013700	001334	SETINT:	MOV	RKVEC,R0		
5239	024410	012720	031070		MOV	#INTER,(R0)+		;INTER ADDR TO RKVEC

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SEQ 0099

5240	024414	013710	001336		MOV	RKPRI,(R0)	;PRS TO RKVEC+2
5241	024420	000207			RTS	PC	
5242							
5243							
5244							
5245							
5246							
5247							
5248							
5249							
5250							
5251							
5252	024422	032765	000200	000000	FRDY:	BIT	#RDY,RKCS1(R5)
5253	024430	001010				BNE	IS
5254	024432	005337	005444			DEC	TEMP1
5255	024436	001371				BNE	FRDY
5256	024440	004737	024556			JSR	PC,HOLD ;STORE ALL RK611 REGS IN HOLDING REGS.
5257	024444	004737	025676			JSR	PC,CKCERR ;CHECK FOR SPECIAL CERR
5258	024450	000207				RTS	PC ;NO RDY, EXIT
5259	024452	062716	000002		IS:	ADD	#2,(SP) ;SKIP OVER ERROR
5260	024456	004737	024556			JSR	PC,HOLD
5261	024462	004737	025676			JSR	PC,CKCERR ;CHECK FOR SPECIAL CERR
5262	024466	000207				RTS	PC
5263							
5264							
5265							
5266	024470	032765	000200	000000	FRDY1:	BIT	#RDY,RKCS1(R5)
5267	024476	001014				BNE	IS
5268	024500	005337	005444			DEC	TEMP1
5269	024504	001371				BNE	FRDY1
5270	024506	016537	000034	005434		MOV	RKMR2(R5),HMR2
5271	024514	016537	000036	005436		MOV	RKMR3(R5),HMR3
5272	024522	004737	025676			JSR	PC,CKCERR ;CHECK FOR SPECIAL CERR CONDITIONS
5273	024526	000207				RTS	PC ;NO RDY, EXIT
5274	024530	062716	000002		IS:	ADD	#2,(SP) ;SKIP OVER ERROR
5275	024534	016537	000034	005434		MOV	RKMR2(R5),HMR2
5276	024542	016537	000036	005436		MOV	RKMR3(R5),HMR3
5277	024550	004737	025676			JSR	PC,CKCERR ;CHECK FOR SPECIAL CERR CONDITIONS
5278	024554	000207				RTS	PC
5279							
5280							
5281							
5282							
5283							
5284	024556	016537	000000	005406	HOLD:	MOV	RKCS1(R5),HCS1
5285	024564	016537	000010	005410		MOV	RKCS2(R5),HCS2
5286	024572	016537	000002	005412		MOV	RKWC(R5),HWC
5287	024600	016537	000004	005414		MOV	RKBA(R5),HBA
5288	024606	016537	000006	005416		MOV	RKDA(R5),HDA
5289	024614	016537	000012	005420		MOV	RKDS(R5),HDS
5290	024622	016537	000014	005422		MOV	RKER(R5),HER
5291	024630	016537	000016	005424		MOV	RKASOF(R5),HASOF
5292	024636	016537	000020	005426		MOV	RKDC(R5),HDC
5293	024644	016537	000026	005432		MOV	RKMR1(R5),HMR1
5294	024652	016537	000034	005434		MOV	RKMR2(R5),HMR2
5295	024660	016537	000036	005436		MOV	RKMR3(R5),HMR3

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SEQ 010C

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5296 024666 016537 000030 005440      MOV      RKECPS(R5),HPOS
5297 024674 016537 000032 005442      MOV      RKECPT(R5),HPAT
5298 024702 000207                      RTS      PC
5299
5300
5301      ; ROUTINE TO CHECK FOR CORRECT ATTN
5302      ; RETURN IF ATTN NOT PRESENT (ERROR CONDITION)
5303      ; RETURN +2 IF ATTN PRESENT (SKIP OVER ERROR)
5304
5305 024704 010446      ;STATN: MOV      R4, -(SP)          ; SAV R4
5306 024706 013704 001222      MOV      $UNIT, R4
5307 024712 136437 005376 005425      BITB     ATTN(R4), HASOF+1
5308 024720 001404      BEQ      1$          ; BRANCH IF ATTN NOT PRESENT
5309 024722 012604      MOV      (SP)+, R4      ; RESTOR R4
5310 024724 062716 000002      ADD      #2, (SP)      ; INCR RET ADDR TO JUMP OVER ERROR.
5311 024730 000207      RTS      PC
5312 024732 012604      1$:      MOV      (SP)+, R4      ; RESTOR R4
5313 024734 000207      RTS      PC
5314
5315
5316      ; ROUTINE TO FIND ATTN WITHIN TIMES GREATER THAN 1 SEC
5317      ; ENTER WITH TIME IN SECONDS IN TEMP2
5318      ; RETURN IF NO ATTN (ERROR CONDITION)
5319      ; RETURN +2 IF ATTN FOUND
5320      ; STATUS IS OBTAINED BEFORE THE RETURN FOR EITHER CASE
5321
5322
5323
5324 024736 010446      FATT1:  MOV      R4, -(SP)          ; SAV R4
5325 024740 012737 177777 005444      3$:      MOV      #-1, TEMP1
5326 024746 013704 001222      MOV      $UNIT, R4
5327 024752 136465 005376 000017      1$:      BITB     ATTN(R4), RKASOF+1(R5) ; FIND CORRECT ATTN
5328 024760 001014      BNE      2$
5329 024762 005337 005444      DEC      TEMP1
5330 024766 001371      BNE      1$
5331 024770 005337 005446      DEC      TEMP2
5332 024774 001361      BNE      3$
5333 024776 005065 000026      CLR      RKMR1(R5)      ; SELECT WORD 0
5334 025002 004737 025760      JSR      PC, GSTAT      ; GET LATEST STATUS
5335 025006 012604      MOV      (SP)+, R4      ; RESTOR R4
5336 025010 000207      RTS      PC
5337
5338 025012 005065 000026      2$:      CLR      RKMR1(R5)
5339 025016 004737 025760      JSR      PC, GSTAT      ; GET STATUS AFTER ATTN SEEN
5340 025022 012604      MOV      (SP)+, R4      ; RESTOR R4
5341 025024 062716 000002      ADD      #2, (SP)      ; SKIP OVER ERROR
5342 025030 000207      RTS      PC
5343
5344
5345      ; ROUTINE TO FIND ATTN WITHIN 1 SEC
5346      ; ENTER WITH COUNT IN TEMP1
5347      ; RETURN IF NO ATTN (ERROR)
5348      ; RETURN +2 IF ATTN FOUND
5349      ; STATUS IS OBTAINED BEFORE THE RETURN FOR EITHER CASE
5350
5351

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SEQ 0101

5352	025032	010446		FATT2:	MOV	R4,-(SP)	;SAV R4
5353	025034	013704	001222	2\$:	MOV	\$UNIT,R4	
5354	025040	136465	005376 000017		BITB	ATTN(R4),RKASOF+1(R5)	;FIND CORRECT ATTN
5355	025046	001011			BNE	1\$	
5356	025050	005337	005444		DEC	TEMP1	
5357	025054	001367			BNE	2\$	
5358	025056	005065	000026		CLR	RKMR1(R5)	;SELECT WORD 0
5359	025062	004737	025760		JSR	PC,GSTAT	;GET LATEST STATUS.
5360	025066	012604			MOV	(SP)+,R4	;RESTOR R4
5361	025070	000207			RTS	PC	
5362	025072	005065	000026	1\$:	CLR	RKMR1(R5)	
5363	025076	004737	025760		JSR	PC,GSTAT	
5364	025102	012604			MOV	(SP)+,R4	;RESTOR R4
5365	025104	062716	000002		ADD	#2,(SP)	;SKIP OVER ERROR
5366	025110	000207			RTS	PC	
5367							
5368							
5369							
5370							
5371							
5372	025112	005737	005444	DLY:	TST	TEMP1	;5.6 US
5373	025116	001403			BEQ	1\$	;2.5 US
5374	025120	005337	005444		DEC	TEMP1	;6.8 US
5375	025124	000772			BR	DLY	;2.5 US
5376	025126	000207		1\$:	RTS	PC	;3.8 US
5377							
5378							
5379							
5380							
5381	025130	104401	037244	BYP:	TYPE	MSG14	;BYPASS DRIVE
5382	025134	010046			MOV	AO,-(SP)	;SAVE AO FOR TYPEOUT
5383							;TYPE DR#
5384	025136	104403			TYPOS		;GO TYPE--OCTAL ASCII
5385	025140	001			.BYTE	1	;TYPE 1 DIGIT(S)
5386	025141	000			.BYTE	0	;SUPPRESS LEADING ZEROS
5387	025142	000207			RTS	PC	
5388							
5389							
5390							
5391	025144	017637	000000 001552	CHKMSG:	MOV	2(SP),CHKFLG	;PASS MSGS TO BE TESTED
5392	025152	062716	000002		ADD	#2,(SP)	;BUMP RETURN ADDR TO 1ST ERROR
5393	025156	004737	026022		JSR	PC,GSTAT1	;GET ALL ACTUAL DRIVE & CONTR STATUS
5394							
5395	025162	053737	001222 005476		BIS	\$UNIT,E.A0	;SET UNIT #
5396	025170	053737	001222 005502		BIS	\$UNIT,E.A1	
5397	025176	053737	001222 005506		BIS	\$UNIT,E.A2	
5398	025204	053737	001222 005512		BIS	\$UNIT,E.A3	
5399							
5400	025212	013746	005444		MOV	TEMP1,-(SP)	;SAVE TEMP1
5401							
5402	025216	013737	005476 005444		MOV	E.A0,TEMP1	
5403	025224	004737	030202		JSR	PC,SBPAR	;GET PARITY FOR MSG A0
5404	025230	013737	005444 005476		MOV	TEMP1,E.A0	
5405							
5406	025236	013737	005502 005444		MOV	E.A1,TEMP1	
5407	025244	004737	030202		JSR	PC,SBPAR	;GET PARITY FOR MSG A1

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SEQ 0102

5408	025250	013737	005444	005502		MOV	TEMP1,E.A1	
5409								
5410	025256	013737	005506	005444		MOV	E.A2,TEMP1	
5411	025264	004737	030202			JSR	PC,SBPAR	;GET PARITY FOR MSG A2
5412	025270	013737	005444	005506		MOV	TEMP1,E.A2	
5413								
5414	025276	013737	005500	005444		MOV	E.B0,TEMP1	
5415	025304	004737	030202			JSR	PC,SBPAR	;GET PARITY FOR MSG B0
5416	025310	013737	005444	005500		MOV	TEMP1,E.B0	
5417								
5418	025316	013737	005504	005444		MOV	E.B1,TEMP1	
5419	025324	004737	030202			JSR	PC,SBPAR	;GET PARITY FOR MSG B1
5420	025330	013737	005444	005504		MOV	TEMP1,E.B1	
5421								
5422	025336	013737	005510	005444		MOV	E.B2,TEMP1	
5423	025344	004737	030202			JSR	PC,SBPAR	;GET PARITY FOR MSG B2
5424	025350	013737	005444	005510		MOV	TEMP1,E.B2	
5425								
5426	025356	013737	005514	005444		MOV	E.B3,TEMP1	
5427	025364	004737	030202			JSR	PC,SBPAR	;GET PARITY FOR MSG B3
5428	025370	013737	005444	005514		MOV	TEMP1,E.B3	
5429								
5430	025376	012637	005444			MOV	(SP)+,TEMP1	;RESTORE TEMP1
5431	025402	013737	001176	001172		MOV	\$ESCAPE,\$TMP5	;SAVE ESCAPE
5432								
5433	025410	023737	005456	005476		CMP	H.A0,E.A0	;TEST MSG A0
5434	025416	001411				BEQ	2\$	;BR IF OK
5435	025420	012737	025432	001176		MOV	#1\$,\$ESCAPE	;ELSE SETUP ESCAPE
5436	025426	011646				MOV	(SP),-(SP)	;COPY RET ADDR.
5437	025430	000207				RTS	PC	;RETURN TO MAINLINE ERROR
5438								
5439	025432	032777	001000	153500	1\$:	BIT	#SW9,\$SWR	;RET HERE FROM MAINLINE ERROR
5440	025440	001107				BNE	20\$	;BR IF LOOP ON ERROR
5441	025442	062716	000002		2\$:	ADD	#2,(SP)	;BUMP RET ADDR TO NEXT ERROR
5442								
5443	025446	023737	005460	005500		CMP	H.B0,E.B0	;TEST MSG B0
5444	025454	001411				BEQ	5\$	;BR IF OK
5445	025456	012737	025470	001176		MOV	#4\$,\$ESCAPE	;ELSE SETUP ESCAPE
5446	025464	011646				MOV	(SP),-(SP)	;COPY RET ADDR
5447	025466	000207				RTS	PC	;RETURN TO MAINLINE ERROR
5448								
5449	025470	032777	001000	153442	4\$:	BIT	#SW9,\$SWR	;RETURN HERE FROM MAINLINE ERROR
5450	025476	001070				BNE	20\$	;BR IF LOOP ON ERROR
5451	025500	062716	000002		5\$:	ADD	#2,(SP)	;BUMP RET ADDR TO NEXT ERROR
5452								
5453	025504	023737	005462	005502		CMP	H.A1,E.A1	;TEST MSG A1
5454	025512	001411				BEQ	8\$	;BR IF OK
5455	025514	012737	025526	001176		MOV	#7\$,\$ESCAPE	
5456	025522	011646				MOV	(SP),-(SP)	
5457	025524	000207				RTS	PC	
5458								
5459	025526	032777	001000	153404	7\$:	BIT	#SW9,\$SWR	
5460	025534	001051				BNE	20\$	
5461	025536	062716	000002		8\$:	ADD	#2,(SP)	
5462								
5463	025542	023737	005464	005504		CMP	H.B1,E.B1	;TEST MSG B1

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SEQ 0103

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5464 025550 001411          BEQ      11$          ;BR IF OK
5465 025552 012737 025564 001176  MOV     #10$, $ESCAPE
5466 025560 011646          MOV     (SP), -(SP)
5467 025562 000207          RTS      PC
5468
5469 025564 032777 001000 153346 10$:  BIT     #SW9, $SWR
5470 025572 001032          BNE     20$
5471 025574 062716 000002          AND     #2, (SP)
5472
5473 025600 032737 000001 001552 12$:  BIT     #T.A2, CHKFLG ;TEST MSG A2?
5474 025606 001402          BEQ     13$          ;BR IF NO
5475 025610 004737 026616          JSR     PC, RCYLD ;PUT INFO CYLDIF, DO NOT CHECK
5476 025614 032737 000002 001552 13$:  BIT     #T.B2, CHKFLG ;TEST MSG B2?
5477 025622 001402          BEQ     14$          ;BR IF NO
5478 025624 004737 026670          JSR     PC, RCYLA ;PUT INFO IN CYLADD, DO NOT CHECK
5479
5480 025630 032737 000004 001552 14$:  BIT     #T.B3, CHKFLG ;TEST MSG B3?
5481 025636 001404          BEQ     15$
5482 025640 004737 026726          JSR     PC, RSEC ;PUT INFO IN SECTOR, DO NOT CHECK
5483 025644 004737 026764          JSR     PC, RHEAD ;PUT INFO IN HEAD, DO NOT CHECK
5484
5485 025650 013737 001172 001176 15$:  MOV     $TMP5, $ESCAPE ;RESTORE ESCAPE
5486 025656 000207          RTS      PC
5487
5488 025660 012706 001100          MOV     #STACK, SP ;RESET STACK PTR
5489 025664 013737 001172 001176 20$:  MOV     $TMP5, $ESCAPE ;RESTORE ESCAPE
5490 025672 000177 153212          JMP     $SLPERR
5491
5492 ;THIS ROUTINE CHECKS FOR CERTAIN ERROR CONDITIONS ONLY
5493 ;I.E.: IF NED, CTO OR MDS SET MESSAGE A & B ARE INVALID
5494
5495 025676 005737 001550          CKCERR: TST     BYPCERR
5496 025702 001025          BNE     4$
5497 025704 032737 100000 005406          BIT     #CERR, HCS1
5498 025712 001001          BNE     1$
5499 025714 000207          RTS      PC ;BR IF CERR
5500
5501 025716 032737 004000 005406 1$:  BIT     #CTO, HCS1
5502 025724 001402          BEQ     2$
5503 025726 104211          ERROR    211 ;BR IF NOT CTO
5504 025730 000207          RTS      PC ;CTO ERROR, MSG A & B INVALID
5505
5506 025732 032737 010000 005410 2$:  BIT     #NED, HCS2
5507 025740 001401          BEQ     3$
5508 025742 104212          ERROR    212 ;BR IF NOT NED
5509 ;NED ERROR, MSG A & B INVALID
5510 025744 032737 001000 005410 3$:  BIT     #MDS, HCS2
5511 025752 001401          BEQ     4$
5512 025754 104213          ERROR    213 ;MDS ERROR, MSG A & B INVALID
5513
5514 025756 000207          4$:  RTS      PC
5515
5516 ;THIS ROUTINE DOES THE SELECT DRIVE COMMAND TO GET STATUS
5517 ;IT THEN WAITS FOR CONTROLLER READY
5518
5519

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5520 ;IF RDY NOT RECEIVED BY THE TIMEOUT, AN ERROR IS FLAGGED
5521 ;
5522
5523 025760 013746 005444 GSTAT: MOV TEMP1,-(SP) ;SAVE TEMP1
5524 025764 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;CURRENT DRIVE #
5525 025772 012765 000001 000000 MOV #SELD, RKCS1(R5) ;GET STATUS WITH SELECT DRIVE CMD
5526 026000 013737 001426 005444 MOV T10,TEMP1
5527 026006 004737 024422 JSR PC,FRDY ;FIND RDY
5528 026012 104117 ERROR 117 ;RDY NOT SET BY END OF SELECT DRIVE CMD
5529 026014 012637 005444 MOV (SP)+,TEMP1 ;RESTOR TEMP1.
5530 026020 000207 RTS PC
5531
5532 ;THIS ROUTINE GETS STATUS OF ALL DRIVE REGISTERS (MSG A0-A3, B0-B3)
5533 ;& ALL CONTROLLER REGISTERS.
5534
5535 026022 013746 005444 GSTAT1: MOV TEMP1,-(SP) ;SAVE TEMP1
5536 026026 004737 024556 JSR PC,HOLD ;GET ALL CONTR REG
5537 026032 012765 100000 000000 MOV #CCLR,RKCS1(R5) ;CLEAR CONTR
5538 026040 013765 001222 000010 MOV $UNIT,RKCS2(R5) ;CURRENT DRIVE #
5539 026046 012765 000003 000026 MOV #3,RKMR1(R5) ;SELECT WORD 3
5540 026054 012765 000001 000000 MOV #SELD, RKCS1(R5) ;GET STATUS
5541 026062 013737 001426 005444 MOV T10,TEMP1
5542 026070 004737 024470 JSR PC,FRDY1 ;FIND RDY & STORE DRIVE REGS ONLY
5543 026074 104117 ERROR 117 ;RDY NOT SET BY END OF SELECT DRV CMD
5544 026076 013737 005434 005472 MOV HMR2,H.A3 ;STORE MSG A3
5545 026104 013737 005436 005474 MOV HMR3,H.B3 ;STORE MSG B3
5546
5547 026112 012765 100000 000000 MOV #CCLR,RKCS1(R5)
5548 026120 013765 001222 000010 MOV $UNIT,RKCS2(R5)
5549 026126 012765 000002 000026 MOV #2,RKMR1(R5) ;SELECT WORD 2
5550 026134 012765 000001 000000 MOV #SELD, RKCS1(R5)
5551 026142 013737 001426 005444 MOV T10,TEMP1
5552 026150 004737 024470 JSR PC,FRDY1 ;FIND RDY & STORE DRIVE REGS ONLY
5553 026154 104117 ERROR 117 ;RDY NOT SET BY END OF SELECT DRV CMD
5554 026156 013737 005434 005466 MOV HMR2,H.A2 ;STORE MSG A2
5555 026164 013737 005436 005470 MOV HMR3,H.B2 ;STORE MSG B2
5556
5557 026172 012765 100000 000000 MOV #CCLR,RKCS1(R5)
5558 026200 013765 001222 000010 MOV $UNIT,RKCS2(R5)
5559 026206 012765 000001 000026 MOV #1,RKMR1(R5) ;SELECT WORD 1
5560 026214 012765 000001 000000 MOV #SELD, RKCS1(R5)
5561 026222 013737 001426 005444 MOV T10,TEMP1
5562 026230 004737 024470 JSR PC,FRDY1 ;FIND RDY & STORE DRIVE REGS ONLY
5563 026234 104117 ERROR 117 ;RDY NOT SET BY END OF SELECT DRV CMD
5564 026236 013737 005434 005462 MOV HMR2,H.A1 ;STORE MSG A1
5565 026244 013737 005436 005464 MOV HMR3,H.B1 ;STORE MSG B1
5566
5567 026252 012765 100000 000000 MOV #CCLR,RKCS1(R5)
5568 026260 013765 001222 000010 MOV $UNIT,RKCS2(R5)
5569 026266 012765 000001 000000 MOV #SELD, RKCS1(R5) ;SELECT WORD 0
5570 026274 013737 001426 005444 MOV T10,TEMP1
5571 026302 004737 024470 JSR PC,FRDY1 ;FIND RDY & STORE DRIVE REGS ONLY
5572 026306 104117 ERROR 117 ;RDY NOT SET BY END OF SEL DRV CMD
5573 026310 013737 005434 005456 MOV HMR2,H.A0 ;STORE MSG A0
5574 026316 013737 005436 005460 MOV HMR3,H.B0 ;STORE MSG B0
5575

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5576 026324 012637 005444
5577 026330 000207

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

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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

5586 026332 012765 000040 000010
5587 026340 013737 001426 005444
5588 026346 004737 024422
5589 026352 104120
5590 026354 013765 001222 000010
5591 026362 005065 000026
5592 026366 004737 025760
5593 026372 032737 100000 005406
5594 026400 001401
5595 026402 000207
5596 026404 062716 000002
5597 026410 000207

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

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5611

READ THE SECTOR COUNT IN RKMR3, RIGHT JUSTIFY IT & STORE IT IN 'SECTOR'

5602 026412 012765 000003 000026
5603 026420 004737 025760
5604 026424 013737 005436 001422
5605 026432 042737 177017 001422
5606 026440 006237 001422
5607 026444 006237 001422
5608 026450 006237 001422
5609 026454 006237 001422
5610 026460 000207

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
RTS PC

5612
5613

READ THE CYL DIFF/OFFSET IN RKMR2, RIGHT JUSTIFY IT & STORE IT IN 'CYLDIF'

5614 026462 012765 000002 000026
5615 026470 004737 025760
5616 026474 013737 005434 001376
5617
5618 026502 042737 160017 001376
5619 026510 006237 001376
5620 026514 006237 001376
5621 026520 006237 001376
5622 026524 006237 001376
5623 026530 023727 001376 000777
5624 026536 001002
5625 026540 005037 001376
5626 026544 000207

RDCYLD: MOV #2,RKMR1(R5) ;WORD 2
JSR PC,GSTAT
MOV HMR2,CYLDIF
BIC #1<M.CDIF>,CYLDIF
ASR CYLDIF ;RIGHT JUSTIFY
ASR CYLDIF ;CYL DIFF/OFFSET
ASR CYLDIF ;INFO
ASR CYLDIF
CMP CYLDIF,#777 ;CHK TO SEE IF RET IN COMPL. FORM
BNE 1\$;BR IF NOT
CLR CYLDIF ;CLR IF YES
1\$: RTS PC

5627
5628
5629

READ THE CYL ADDR IN RKMR3, RIGHT JUSTIFY IT & STORE IT IN 'CYLADD'

5630 026546 012765 000002 000026
5631 026554 004737 025760

RDCYLA: MOV #2,RKMR1(R5) ;WORD 2
JSR PC,GSTAT

5632	026560	013737	005436	001400	MOV	HMR3,CYLADD	
5633	026566	042737	160017	001400	BIC	#1C<M.CADD>,CYLADD	
5634	026574	006237	001400		ASR	CYLADD	;RIGHT JUSTIFY
5635	026600	006237	001400		ASR	CYLADD	;CYL ADDR
5636	026604	006237	001400		ASR	CYLADD	;INFO
5637	026610	006237	001400		ASR	CYLADD	
5638	026614	000207			RTS	PC	
5639							
5640							;READ THE CYL DIFF/OFFSET IN H.A2, RIGHT JUSTIFY IT & STORE IT IN 'CYLDIF'
5641							
5642	026616	013737	005466	001376	RCYLD:	MOV	H.A2,CYLDIF
5643	026624	042737	160017	001376	BIC	#1C<M.CDIF>,CYLDIF	;CLEAR UNWANTED INFO
5644	026632	006237	001376		ASR	CYLDIF	;RIGHT JUSTIFY
5645	026636	006237	001376		ASR	CYLDIF	
5646	026642	006237	001376		ASR	CYLDIF	
5647	026646	006237	001376		ASR	CYLDIF	
5648	026652	023727	001376	000777	CMP	CYLDIF,#777	;CHK TO SEE IF RET IN COMPL. FORM
5649	026660	001002			BNE	IS	;BR IF NO
5650	026662	005037	001376		CLR	CYLDIF	;ELSE CLEAR
5651	026666	000207			IS:	RTS	PC
5652							
5653							;READ THE CYL ADDR IN H.B2, RIGHT JUSTIFY IT & STORE IT IN 'CYLADD'
5654							
5655	026670	013737	005470	001400	RCYLA:	MOV	H.B2,CYLADD
5656	026676	042737	160017	001400	BIC	#1C<M.CADD>,CYLADD	;CLEAR UNWANTED INFO
5657	026704	006237	001400		ASR	CYLADD	;RIGHT JUSTIFY
5658	026710	006237	001400		ASR	CYLADD	
5659	026714	006237	001400		ASR	CYLADD	
5660	026720	006237	001400		ASR	CYLADD	
5661	026724	000207			RTS	PC	
5662							
5663							;READ THE SECTOR COUNT IN H.B3, RIGHT JUSTIFY IT & STORE IT IN 'SECTOR'
5664							
5665	026726	013737	005474	001422	RSEC:	MOV	H.B3,SECTOR
5666	026734	042737	177017	001422	BIC	#1C<M.SECT>,SECTOR	;CLEAR UNWANTED INFO
5667	026742	006237	001422		ASR	SECTOR	;RIGHT JUSTIFY
5668	026746	006237	001422		ASR	SECTOR	
5669	026752	006237	001422		ASR	SECTOR	
5670	026756	006237	001422		ASR	SECTOR	
5671	026762	000207			RTS	PC	
5672							
5673							;READ THE HEAD ADDR IN H.B3, RIGHT IT & STORE IT IN 'HEADA'
5674							
5675	026764	013737	005474	001512	RHEAD:	MOV	H.B3,HEADA
5676	026772	042737	170777	001512	BIC	#1C<M.HEAD>,HEADA	;CLEAR UNWANTED INFO
5677	027000	006237	001512		ASR	HEADA	;RIGHT JUSTIFY IT
5678	027004	000337	001512		SWAB	HEADA	
5679	027010	000207			RTS	PC	
5680							
5681							;FIND SECTOR 17
5682							;RETURN IF NOT FOUND
5683							;RETURN +4 IF FOUND
5684							
5685	027012	013737	001436	005444	FSEC17:	MOV	T5000,TEMP1
5686	027020	004737	026412		IS:	JSR	PC,RDSEC
5687	027024	023727	001422	000021	CMP	SECTOR,#17.	;SETUP TIMEOUT ;READ SECTOR ;TEST FOR SECTOR 17

E09

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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GET VALUE FOR SOFTWARE SWITCH REGISTER

SEQ 0107

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5688 027032 001014          BNE      2$          ;BR IF NOT 17
5689
5690 027034 004737 026412    JSR      PC,RDSEC
5691 027040 023727 001422 000021  CMP      SECTOR,#17.
5692 027046 001412          BEQ      3$          ;BR IF READ SAME TWICE
5693 027050 004737 026412    JSR      PC,RDSEC
5694 027054 023727 001422 000021  CMP      SECTOR,#17.
5695 027062 001404          BEQ      3$          ;ELSE TRY 1 MORE TIME
5696                                     ;BR IF 17
5697 027064 005337 005444    2$:    DEC      TEMP1
5698 027070 001353          BNE      1$          ;TRY AGAIN
5699 027072 000207          RTS      PC
5700
5701 027074 062716 000004    3$:    ADD      #4,(SP)
5702 027100 000207          RTS      PC          ;SKIP OVER ERROR
5703
5704                                     ;FIND DESIRED CYL DIFF
5705                                     ;RETURN IF NOT FOUND
5706                                     ;RETURN+6 IF FOUND
5707                                     ;
5708
5709 027102 013737 001436 005444  FCYL:   MOV      T5000,TEMP1
5710 027110 004737 026462    1$:    JSR      PC,RDCYLD
5711 027114 023737 001376 005446    CMP      CYLDIF,TEMP2
5712 027122 001014          BNE      2$          ;TEST FOR CYL DIFF
5713                                     ;BR IF NOT FOUND
5714 027124 004737 026462    JSR      PC,RDCYLD
5715 027130 023737 001376 005446    CMP      CYLDIF,TEMP2
5716 027136 001412          BEQ      3$          ;BR IF READ SAME TWICE
5717 027140 004737 026462    JSR      PC,RDCYLD
5718 027144 023737 001376 005446    CMP      CYLDIF,TEMP2
5719 027152 001404          BEQ      3$          ;ELSE TRY 1 MORE TIME
5720
5721 027154 005337 005444    2$:    DEC      TEMP1
5722 027160 001353          BNE      1$          ;TRY AGAIN
5723 027162 000207          RTS      PC
5724
5725 027164 062716 000006    3$:    ADD      #6,(SP)
5726 027170 000207          RTS      PC          ;SKIP OVER ERROR
5727
5728
5729                                     ;ROUTINE TO FIND HEADS HOME IN RKMR2 WORD 1 BEFORE SPECIFIED DELAY
5730                                     ;ENTER WITH TIME IN SECONDS IN TEMP2
5731                                     ;RETURN IF NOT FOUND
5732                                     ;RETURN+2 IF FOUND - SKIP OVER ERROR
5733                                     ;
5734 027172 012737 177777 005444  FHDHM:  MOV      #-1,TEMP1
5735 027200 012765 000001 000026    MOV      #1,RKMR1(R5)
5736 027206 004737 025760    1$:    JSR      PC,GSTAT
5737 027212 032737 000040 005434    BIT      #0,FHDHM,HMR2
5738 027220 001007          BNE      2$          ;ALL 1'S
5739 027222 005337 005444    DEC      TEMP1
5740 027226 001367          BNE      1$          ;WORD 1
5741
5742 027230 005337 005446    DEC      TEMP2
5743 027234 001356          BNE      FHDHM

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5744	027236	000207			RTS	PC		
5745	027240	062716	000002		2\$: ADD	#2, (SP)		; SKIP OVER ERROR
5746	027244	000207			RTS	PC		
5747								
5748								; ROUTINE TO FIND LOAD HEADS IN RKMR2 WORD 1 BEFORE SMS
5749								; RETURN IF NOT FOUND
5750								; RETURN+2 IF FOUND: SKIP OVER ERROR
5751								
5752	027246	012737	000372	005444	FLOAD:	MOV	#250, TEMP1	
5753	027254	012765	000001	000026		MOV	#1, RKMR1(R5)	; WORD 1
5754	027262	004737	025760		1\$: JSR	PC, GSTAT		
5755	027266	032737	010000	005434		BIT	#0, LOAD, HMR2	
5756	027274	001004				BNE	2\$	
5757	027276	005337	005444			DEC	TEMP1	
5758	027302	001367				BNE	1\$	
5759	027304	000207				RTS	PC	
5760	027306	062716	000002		2\$: ADD	#2, (SP)		; SKIP OVER ERROR
5761	027312	000207			RTS	PC		
5762								
5763								; FILL HEADER TABLE WITH 66 WORDS OF VALID HEADERS
5764								; ENTER WITH CYL # IN 'CALADD'
5765								; ENTER WITH HEAD # IN 'HEAD'
5766								; ENTER WITH FORMAT IN 'FORMAT'
5767								
5768	027314	010046			FHDTAB:	MOV	RO, -(SP)	; SAV RO
5769	027316	010146				MOV	R1, -(SP)	; SAV R1
5770	027320	012700	001554			MOV	#HDTAB, RO	; HEADER WORD TABLE ADDR
5771	027324	005001				CLR	R1	; SECTOR COUNTER
5772	027326	013737	001510	001514		MOV	HEAD, HD1	
5773	027334	006337	001514			ASL	HD1	
5774	027340	006337	001514			ASL	HD1	
5775	027344	006337	001514			ASL	HD1	
5776	027350	006337	001514			ASL	HD1	
5777	027354	006337	001514			ASL	HD1	; SETUP HEAD # FOR WORD 2 OF HEADER
5778	027360	013737	001516	001520		MOV	FORMAT, FMT1	
5779	027366	000337	001520			SWAB	FMT1	
5780	027372	006337	001520			ASL	FMT1	; SETUP FORMAT FOR WORD 2 OF HEADER
5781								
5782	027376	013720	001402		1\$: MOV	CALADD, (RO)+		; HEADER WORD 1-CYL ADDR
5783	027402	010110				MOV	R1, (RO)	; HEADER WORD 2-SECTOR NO
5784	027404	053710	001514			BIS	HD1, (RO)	; -HEAD NO
5785	027410	053710	001520			BIS	FMT1, (RO)	; -FORMAT
5786	027414	004737	027474			JSR	PC, SECFLG	; GET SECTOR FLAGS
5787								
5788	027420	013737	001402	005444		MOV	CALADD, TEMP1	
5789	027426	011037	005446			MOV	(RO), TEMP2	
5790	027432	043737	001402	005446		BIC	CALADD, TEMP2	
5791	027440	042037	005444			BIC	(RO)+, TEMP1	
5792	027444	053737	005444	005446		BIS	TEMP1, TEMP2	
5793	027452	013720	005446			MOV	TEMP2, (RO)+	; HEADER WORD 3-HEADER CHECK
5794								
5795	027456	005201				INC	R1	; SECTOR CTR
5796	027460	020127	000026			CMP	R1, #22.	; ALL 22 SECTORS DONE? (66 WORDS)
5797	027464	001344				BNE	1\$	; BR IF NO
5798								
5799	027466	012601				MOV	(SP)+, R1	; RESTOR R1

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5800 027470 012600      MOV      (SP)+,R0      ;RESTOR R0
5801 027472 000207      RTS      PC
5802
5803      ; THIS ROUTINE GETS INFORMATION FROM THE BAD SECTOR TABLE FILLED BY A PREVIOUS
5804      ; TEST & SETS BITS 14 & 15 APPROPRIATLY.
5805
5806 027474 010246      SECFLG: MOV      R2,-(SP)      ;SAVE R2
5807 027476 005737 001516      TST      FORMAT
5808 027502 001016      BNE      1$      ;BR IF 20 SECTOR FORMAT
5809 027504 012702 002400      MOV      #BSE22H+8.,R2
5810 027510 004737 027544      JSR      PC,FLGTST      ;GET HARDWARE DETECTED FLAG
5811 027514 052710 100000      BIS      #BIT15,(R0)      ;RETURN HERE IF GOOD SECTOR
5812
5813 027520 012702 003400      MOV      #BSE22S+8.,R2      ;ELSE RETURN HERE
5814 027524 004737 027544      JSR      PC,FLGTST      ;GET SOFTWARE DETECTED FLAG
5815 027530 052710 040000      BIS      #BIT14,(R0)      ;RETURN HERE IF GOOD SECTOR
5816
5817 027534 012602      MOV      (SP)+,R2      ;ELSE RETURN HERE
5818 027536 000207      RTS      PC
5819
5820 027540 012602      1$: MOV      (SP)+,R2      ;RESTORE R2
5821 027542 000207      RTS      PC
5822
5823      ;
5824      ; THIS ROUTINE DOES THE ACTUAL SCANNING OF THE BAD SECTOR TABLES.
5825      ; ENTER WITH THE ADDRESS OF TABLE (BSE22H, BSE22S, ETC.) IN TEMP1
5826      ; RETURN IF NO COMPARE
5827      ; RETURN+4 IF COMPARE
5828
5829 027544 010346      FLGTST: MOV      R3,-(SP)      ;SAVE R3
5830
5831 027546 021227 177777      1$: CMP      (R2),#-1      ;SEE IF ALL 1'S
5832 027552 001002      BNE      2$      ;BR IF NO
5833 027554 012603      MOV      (SP)+,R3      ;RESTORE R3
5834 027556 000207      RTS      PC
5835
5836 027560 022237 001402      2$: CMP      (R2)+,CALADD      ;SEE IF=CYL # & ADR PTR TO TRK/SECTOR WORD
5837 027564 001403      BEQ      3$
5838 027566 062702 000002      ADD      #2,R2      ;GO TO NEXT CYL WORD IN TABLE
5839 027572 000765      BR      1$
5840
5841 027574 013703 001510      3$: MOV      HEAD,R3      ;GET HEAD # FROM FHDTAB ROUTINE
5842 027600 000303      SWAB      R3
5843 027602 050103      BIS      R1,R3      ;ADD SECTOR # FROM FHDTAB ROUTINE
5844 027604 022203      CMP      (R2)+,R3      ;SEE IF SECTOR/HEAD COMPARE
5845      ; & INCR PTR TO NEXT CYL WORD
5846 027606 001401      BEQ      4$      ;BR IF COMPARE
5847 027610 000756      BR      1$      ;ELSE TRY NEXT CYL
5848
5849 027612 012603      4$: MOV      (SP)+,R3      ;RESTORE R3
5850 027614 062716 000004      ADD      #4,(SP)      ;INCREMENT RET ADDR
5851 027620 000207      RTS      PC
5852
5853      ;
5854      ; THIS ROUTINE SORTS THE RHTAB TABLE FROM WHATEVER SECTOR IT BEGINS
5855      ; WITH AND RE-WITES THE INFO IN SRTTAB TABLE TO BEGIN WITH SECTOR 0

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5856
5857 027622 010046
5858 027624 010146
5859 027626 004737 026412
5860 027632 062737 000001 001422
5861 027640 004737 027730
5862
5863 027644 012700 000204
5864 027650 163700 001422
5865 027654 010037 001422
5866 027660 062737 001760 001422
5867
5868 027666 062700 001760
5869 027672 012701 002164
5870
5871
5872 027676 012021
5873 027700 020027 002164
5874 027704 001374
5875
5876 027706 012700 001760
5877 027712 012021
5878 027714 020037 001422
5879 027720 001374
5880
5881 027722 012601
5882 027724 012600
5883 027726 000207
5884
5885
5886
5887
5888 027730 006337 001422
5889 027734 013746 001422
5890 027740 006337 001422
5891 027744 062637 001422
5892 027750 000207
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5902 027752 010446
5903
5904 027754 032737 010000 005406
5905 027762 001014
5906
5907
5908
5909 027764 012704 002400
5910 027770 004737 030024
5911 027774 000407

;
; SORT:
; MOV R0, -(SP) ;SAVE R0
; MOV R1, -(SP) ;SAVE R1
; JSR PC, R0SEC
; ADD #1, SECTOR
; JSR PC, MULT6 ;MULT SECTOR BY 6
;
; MOV #132, R0
; SUB SECTOR, R0 ;R0-SECTOR TO R0 = INDEX
; MOV R0, SECTOR
; ADD #RHTAB, SECTOR ;SAVE INDEX
;
; ADD #RHTAB, R0 ;INDEX TO BOT HALF OF RHTAB
; MOV #SRTTAB, R1 ;INDEX TO TOP HALF OF SRTTAB
;
; 1$: MOV (R0)+, (R1)+ ;PUT BOTTOM OF RHTAB TO TOP OF SRTTAB
; CMP R0, #RHTAB+132.
; BNE 1$
;
; 2$: MOV #RHTAB, R0 ;PUT TOP OF RHTAB TO BOT OF SRTTAB
; MOV (R0)+, (R1)+
; CMP R0, SECTOR
; BNE 2$
;
; MOV (SP)+, R1 ;RESTOR R1
; MOV (SP)+, R0 ;RESTOR R0
; RTS PC
;
; 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 S)+(2 X S) = 6 X SECTOR
; RTS PC
;
; THIS ROUTINE IS ENTERED ONLY IF THERE IS A BSE ERROR AFTER A WRITE DATA
; CMD. IT VERIFIES THAT THE BAD SECTOR IS LISTED IN THE BSE INFORMATION
; CYLINDER AT CYL 410, TRACK 2.
;
; RETURN IF SECTOR NOT LISTED IN BSE TABLE, ERROR CONDITION.
; RETURN+2 IF LISTED, SKIP OVER ERROR
;
; TRUERR: MOV R4, -(SP) ;SAVE R4
;
; BIT #CFMT, HCS1 ;CHECK FORMAT
; BNE 3$ ;BR FOR 20 SECTOR FORMAT
; ;NOTE, 20 SECTOR FORMAT NOT
; ;DONE IN THIS PROGRAM
;
; MOV #BSE22H+8., R4
; JSR PC, TERR1 ;SEE IF ON HARDWARE DETECTED TABLE
; BR 3$ ;RETURN HERE IF YES

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SEQ 0111

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5912
5913 027776 012704 003400      MOV      #BSE225+8.,R4      ;ELSE RETURN HERE
5914 030002 004737 030024      JSR      PC,TERR1      ;& SEE IF ON SOFTWARE DETECTED TABLE
5915 030006 000402              BR      3$      ;RETURN HERE IF YES
5916
5917 030010 012604              1$:      MOV      (SP)+,R4      ;RESTORE R4
5918 030012 000207              RTS      PC      ;RETURN WITHOUT JUMPING OVER ERROR
5919
5920
5921 030014 012604              3$:      MOV      (SP)+,R4      ;RESTORE R4
5922 030016 062716 000002      ADD      #2,(SP)      ;SKIP OVER ERROR ON RETURN
5923 030022 000207              RTS      PC
5924
5925
5926
5927
5928
5929
5930
5931 030024 021427 177777      TERR1:  CMP      (R4),#-1      ;SEE IF ALL 1'S
5932 030030 001405              BEQ      1$      ;BR IF YES, NOT ON TABLE
5933 030032 022437 005426      CMP      (R4)+,HDC      ;SEE IF CYL MATCH
5934 030036 001405              BEQ      2$      ;BR IF YES
5935 030040 005724              TST      (R4)+      ;ELSE ADV TO NEXT CYL WORD
5936 030042 000770              BR      TERR1      ;& TRY AGAIN.
5937
5938 030044 062716 000002      1$:      ADD      #2,(SP)
5939 030050 000207              RTS      PC
5940
5941 030052 022437 005416      2$:      CMP      (R4)+,HDA      ;SEE IF SECTOR & TRACK MATCH
5942 030056 001401              BEQ      3$      ;BR IF YES
5943 030060 000761              BR      TERR1      ;OR TRY AGAIN
5944
5945 030062 000207              3$:      RTS      PC
5946
5947
5948
5949
5950
5951
5952
5953
5954 030064 005037 001412      ;ROUTINE TO TURN L OR P CLOCK INTERRUPT ON
5955 030070 005737 005552      CLKON:  CLR      TIMUP
5956 030074 001004              TST      PCLKF
5957 030076 012777 000100 151242      BNE      1$      ;BRANCH IF P-CLOCK PRESENT
5958 030104 000207              MOV      #100,2LKS      ;L-CLOCK, ENABLE INT
5959 030106 012777 177777 151226      1$:      MOV      #-1,2PKSB      ;P-CLOCK, ALL 1'S
5960 030114 012777 000135 151216      MOV      #135,2PKS      ;ENABLE INT, CT UP, REP INT
5961 030122 000207              RTS      PC      ;LINE FREQ & RUN
5962
5963
5964
5965 030124 005037 001412      ;KW11-L & KW11-P INTERRUPT HANDLER
5966 030130 005337 001406      CLOCK:  CLR      TIMUP
5967 030134 001010              DEC      COUNT

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SEQ 0112

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5968 030136 013737 001404 001406      MOV      HZ COUNT
5969 030144 005337 001410      DEC      SEC
5970 030150 001002      BNE      1$
5971 030152 005237 001412      INC      TIMUP      ; SORRY, TIME IS UP
5972 030156 000002      1$:      RTI
5973
5974      ; ROUTINE TO TURN L OR P CLOCK INTERRUPT OFF
5975
5976 030160 005737 005552      CLKOF:  TST      PCLKF
5977 030164 001003      BNE      1$      ; BRACH IF P-CLOCK PRESENT
5978 030166 005077 151154      CLR      ALKS      ; L-CLOCK, CLEAR INTERRUPT
5979 030172 000207      RTS      PC
5980 030174 005077 151140      1$:      CLR      APKS      ; P-CLOCK, CLEAR INTERRUPT
5981 030200 000207      RTS      PC
5982
5983      ; THIS ROUTINE GENERATES PARITY FOR THE EXPECTED MESSAGES
5984      ; ENTER WITH THE EXPECTED WORD IN TEMP1
5985      ; TEMP1 IS ROTATED LEFT 17 TIMES. EACH TIME THE CARRY BIT IS SET
5986      ; R1 IS INCREMENTED. AT THE END OF 17 ROTATES ( TEMP1 BACK TO ORIG),
5987      ; R1 BIT 0 IS EXAMINED. IF IT IS SET, INDICATING AN ODD # OF 1'S,
5988      ; THE PARITY BIT IS NOT SET IN B
5989      ; IF IT IS NOT SET, INDICATING AN EVEN # OF 1'S ,THE PARITY BIT IS
5990      ; SET IN TEMP1
5991
5992      SBPAR:  MOV      R0, -(SP)      ; SAVE R0
5993 030202 010046      MOV      R1, -(SP)      ; SAVE R1
5994 030204 010146      MOV      #17, R0      ; SHIFT COUNTER
5995 030206 012700 000021      CLR      R1      ; COUNT # OF 1'S IN TEMP1
5996 030212 005001      CLC      ; CLEAR CARRY
5997 030214 000241
5998
5999 030216 006137 005444      1$:      ROL      TEMP1
6000 030222 103001      BCC      2$      ; BR IF CARRY CLEAR
6001 030224 005201      INC      R1      ; COUNT # OF 1'S
6002 030226 005300      2$:      DEC      R0      ; SHIFT COUNTER
6003 030230 001372      BNE      1$
6004
6005 030232 032701 000001      BIT      #BIT0, R1
6006 030236 001003      BNE      3$      ; BR IF ODD # IN R0
6007 030240 052737 100000 005444      BIS      #M.PAR, TEMP1      ; SET PARITY BIT
6008 030246 012601      3$:      MOV      (SP)+, R1      ; RESTORE R1
6009 030250 012600      MOV      (SP)+, R0      ; RESTORE R0
6010 030252 000207      RTS      PC
6011
6012      ; ROUTINE TO ENABLE LOOPING ON INTERMITTANT ERRORS
6013      ; WHEN SLPERR SET BY OTHER THAN SCOPE ROUTINE
6014      ; IE: MY LOOP MACRO
6015
6016
6017 030254 032777 001000 150656      SCOP1$: BIT      #SW9, 2SWR      ; LOOP ON ERROR?
6018 030262 001406      BEQ      1$      ; BR IF NO
6019 030264 105737 001103      TSTB     $ERFLG      ; HAD ERROR?
6020 030270 001403      BEQ      1$      ; BR IF NO
6021 030272 013716 001110      MOV      SLPERR, (SP)
6022 030276 000002      RTI
6023

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SEQ 0113

6024 030300 011637 001110
6025 030304 00000215: MOV (SP), \$LPERR ; SET LOOP ADDR FOR TIGHT SCOPE LOOP
RTI6026
6027
6028
6029
6030
6031
6032
6033; ROUTINE TO INPUT A 'SPACE' OR 'CONTROL-E' FROM TTY
; RETURN IF CONTROL-E
; RETURN +4 IF SPACE
;6034 030306 005777 150634
6035 030312 104410
6036 030314 012600
6037 030316 020027 000040
6038 030322 001406CCSP: TST 2\$TKB ; CLEAR DONE FLAG
RDCHR ; READ CHAR FROM TTY
MOV (SP)+, R0 ; GET CHAR OFF STACK
CMP R0, #SPBAR ; SEE IF SPACE
BEQ 1\$; BR IF YES.6039
6040 030324 020027 000005
6041 030330 001405
6042 030332 104401 040067
6043 030336 000763CMP R0, #5 ; SEE IF CONTROL-E
BEQ 2\$; BR IF YES
TYPE MSG31 ; "?"
BR CCSP ; TRY AGAIN6044
6045 030340 062716 000004
6046 030344 00020715: ADD #4, (SP)
25: RTS PC6047
6048
6049
6050

; ROUTINE TO INPUT A 'SPACE' FROM TTY

6051 030346 005777 150574
6052 030352 104410
6053 030354 012600
6054 030356 020027 000040
6055 030362 001403
6056 030364 104401 040067
6057 030370 000766
6058 030372 000207GETSP: TST 2\$TKB ; CLEAR DONE FLAG
RDCHR ; READ CHAR OFF TTY
MOV (SP)+, R0 ; GET CHAR OFF STACK
CMP R0, #SPBAR ; SEE IF SPACE
BEQ 1\$; EXIT IF YES
TYPE MSG31 ; ?
BR GETSP ; TRY AGAIN
15: RTS PC6059
6060
6061
6062
6063
6064
6065; THIS ROUTINE IS ENTERED BY TYPING A CONTROL-C.
; IT IS USED TO ALLOW THE OPERATOR TO HALT THE CPU WHILE INSURING
; THAT HEADS ARE LOADED & FORMATTING IS VALID BEFORE ACTUALLY HALTING
; THE CPU.

6066 030374 022626

STOP: CMP (SP)+, (SP)+ ; RESTORE STACK FROM INTERRUPT

6067
6068 030376 004737 026332
6069 030402 104024STOP1: JSR PC, SUBCLR
ERROR 24 ; CERR AFTER6070
6071 030404 005737 005370
6072 030410 001442
6073 030412 005737 000042
6074 030416 001403
6075 030420 104401 043730
6076 030424 000402
6077 030426 104401 043776
6078 030432TST UNLD ; SEE IF HEADS UNLOADED
BEQ 3\$; BR IF NO
TST 42 ; SEE IF MANUAL OR AUTO MODE
BEQ 1\$; BR IF MANUAL MODE
TYPE MSG74 ; PGM ABORT PENDING
BR 2\$
15: TYPE ,MSG75 ; HALT PENDING
25:

6079

6080	030432	004737	026332		JSR	PC,SUBCLR	
6081	030436	104024			ERROR	24	;CERR AFTER SCLR
6082							
6083	030440	032737	010000	005434	BIT	#D.SPIN,HMR2	;SEE IF SPINDLE ALREADY ON
6084	030446	001023			BNE	64\$	;BR IF YES
6085	030450	104401	037741		TYPE	,MSG29	;PLEASE WAIT, HEADS BEING LOADED
6086							
6087	030454	012765	000011	000000	MOV	#SRTSPL,RKCS1(R5)	;START SPINDLE CMD
6088	030462	013737	001426	005444	MOV	T10,TEMP1	
6089	030470	004737	024422		JSR	PC,FRDY	;FIND CONTR RDY
6090	030474	104143			ERROR	143	;CONTR RDY NOT SET AFTER CMD
6091							
6092	030476	013737	001434	005446	MOV	T100,TEMP2	
6093	030504	004737	024736		JSR	PC,FATT1	;FIND ATTN
6094	030510	104144			ERROR	144	;NO ATTN AFTER CMD
6095							
6096	030512	005037	005370		CLR	UNLD	
6097	030516						
6098							
6099	030516	005737	005372				
6100	030522	001466			TST	BADHDR	;SEE IF HEADERS VALID
6101	030524	005237	005374		BEQ	4\$	;BR IF YES
6102	030530	012765	100000	000000	INC	HPEND	
6103	030536	013765	001222	000010	MOV	#CCLR,RKCS1(R5)	
6104	030544	012765	000013	000000	MOV	\$UNIT,RKCS2(R5)	
6105					MOV	#RECAL,RKCS1(R5)	;RECAL CMD
6106							;RESET CYL DIFF/OFFSET & CYL ADDR REG
6107	030552	013737	001426	005444	MOV	T10,TEMP1	;IN RKMR2 & RKMR3 RESP.
6108	030560	004737	024422		JSR	PC,FRDY	;SETUP TIMEOUT
6109	030564	104124			ERROR	124	;FIND RDY
6110							;RDY NOT SET AFTER RECAL CMD
6111	030566	012765	000001	000026	MOV	#1,RKMR1(R5)	;SELECT WORD 1
6112	030574	004737	025710		JSR	PC,GSTAT	
6113	030600	032737	020000	005434	BIT	#D.RTZ,HMR2	
6114	030606	001001			BNE	65\$	
6115	030610	104214			ERROR	214	;RTZ NOT SET DURING RECAL CMD
6116	030612	013737	001426	005446	MOV	T10,TEMP2	;SETUP TIMEOUT
6117	030620	004737	024736		JSR	PC,FATT1	;FIND ATTN
6118	030624	104055			ERROR	55	;NO ATTN AFTER RECAL CMD
6119							
6120	030626	012765	100000	000000	MOV	#CCLR,RKCS1(R5)	
6121	030634	013765	001222	000010	MOV	\$UNIT,RKCS2(R5)	;DRIVE#
6122	030642	012765	000005	000000	MOV	#CLEAR,RKCS1(R5)	;DRIVE CLEAR CMD
6123	030650	013737	001426	005444	MOV	T10,TEMP1	;SETUP TIMEOUT
6124	030656	004737	024422		JSR	PC,FRDY	;FIND RDY
6125	030662	104151			ERROR	151	;NO RDY AFTER DRIVE CLEAR CMD
6126	030664	004737	024704		JSR	PC,TSTATN	;TEST FOR ATTN
6127	030670	000401			BR	66\$	
6128	030672	104154			ERROR	154	;ATTN NOT CLEARED AFTER DRIVE CLEAR CMD
6129	030674						
6130							
6131							
6132	030674	000137	030740		JMP	FORM	;WRITE VALID FORMATS
6133							
6134	030700	005737	000042		TST	42	;SEE IF MANUAL OR AUTO MODE
6135	030704	001410			BEQ	5\$	;BR IF MANUAL MODE

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6136	030706	104401	044033		TYPE	MSG76		;PGM ABORTED
6137	030712	005037	023770		CLR	\$EOPCT		;SET UP EOP TO EXIT TO MONITOR
6138	030716	005037	001176		CLR	\$ESCAPE		
6139	030722	000137	023742		JMP	\$EOP		;ABORT PROGRAM
6140								
6141	030726	104401	044055	5\$:	TYPE	,MSG77		;CPU HALTED
6142	030732	000000			HALT			
6143	030734	000137	010656		JMP	ST5		;START OVER IF CONTINUE PRESSED
6144								
6145	030740							
6146					FORM:			
6147					.SBTTL	UNEXPECTED TIMEOUT HANDLER		
6148								
6149								
6150								
6151								
6152								
6153								
6154								
6155	030740	011600			BADTMO:	MOV	(SP),RO	;SAVE PC WHERE TIMEOUT OCCURRED.
6156	030742	005740				TST	-(RO)	;GET PC BEFORE UPDATE
6157	030744	032777	020000	150166		BIT	#SW13,2SWR	;INHIBIT ERR TYP0UT?
6158	030752	001005				BNE	1\$	;YES, DON'T TYPE
6159	030754	104401	044405			TYPE	EM3	;ABORT TESTS,UNEXP T.O. 2 PC=
6160	030760	010046				MOV	RO,-(SP)	;SAVE RO FOR TYPEOUT
6161								;TYPE PC
6162	030762	104403				TYPOS		;GO TYPE--OCTAL ASCII
6163	030764	006				.BYTE	6	;TYPE 6 DIGIT(S)
6164	030765	000				.BYTE	0	;SUPPRESS LEADING ZEROS
6165	030766	032777	001000	150144	1\$:	BIT	#SW9,2SWR	;LOOP ON ERROR?
6166	030774	001403				BEQ	2\$	;NO BRANCH
6167	030776	022626				CMP	(SP)+,(SP)+	;YES, RESTORE STACK
6168	031000	000177	150102			JMP	2\$LPADR	;GO TO STARTING ADDR OF TEST
6169								;THAT GAVE BAD TIMEOUT
6170	031004	032777	040000	150126	2\$:	BIT	#SW14,2SWR	;LOOP ON TEST?
6171	031012	001401				BEQ	3\$	;NO BRANCH
6172	031014	000002				RTI		;YES
6173								
6174	031016	000000			3\$:	HALT		;UNEXPECTED TIME OUT OCCURRED
6175								;AS INDICATED. YOU CAN LOOP ON
6176								;ERROR, LOOP ON TEST OR INHIBIT
6177								;ERROR TYPEOUT BY SETTING THOSE
6178								;SWITCHES.
6179								
6180	031020	022626				CMP	(SP)+,(SP)+	;RESTORE STACK
6181	031022	000137	023742			JMP	\$EOP	;ABORT TESTS
6182								
6183					.SBTTL	MEMORY CHECK ENABLE TRAP		
6184								
6185	031026	012737	031042	001176	MEMERR:	MOV	#1\$, \$ESCAPE	
6186	031034	011637	001354			MOV	(SP),TRAPPC	;STORE PC
6187	031040	104202				ERROR	202	;UNEXP MEM PARITY ERROR
6188								
6189	031042	005037	001176		1\$:	CLR	\$ESCAPE	
6190	031046	032777	001000	150064		BIT	#SW9,2SWR	;CHECK IF LOOP ON ERROR
6191	031054	001001				BNE	2\$	;YES, FORCE STACK AND TRY AGAIN

6192	031056	000002		RTI		;ELSE RETURN
6193						
6194	031060	012706	001100	25: MOV	#STACK, SP	;INIT STACK
6195	031064	000177	150020	JMP	2SLPERA	
6196						
6197				.SBTTL	RK06 INTERRUPT HANDLER	
6198				INTER:	NOP	
6199	031070	000240		NOP		
6200	031072	000240		NOP		
6201	031074	000240		NOP		
6202	031076	011600		MOV	(SP), RO	;SAVE PC WHERE INT OCCURRED.
6203	031100	005740		TST	-(RO)	;GET PC BEFORE UPDATE.
6204	031102	104401	036713	TYPE	MSG6	;INT AT PC=
6205	031106	010046		MOV	RO, -(SP)	;SAVE RO FOR TYPEOUT
6206						;TYPE PC
6207	031110	104403		TYPOS		;GO TYPE--OCTAL ASCII
6208	031112	006		.BYTE	6	;TYPE 6 DIGIT(S)
6209	031113	000		.BYTE	0	;SUPPRESS LEADING ZEROS
6210	031114	000000		HALT		
6211	031116	000240		NOP		
6212	031120	000240		NOP		
6213	031122	000002		RTI		
6214						
6215				.SBTTL	POWER DOWN AND UP ROUTINES	
6216						
6217				;POWER DOWN ROUTINE		
6218						
6219	031124	012737	031136 000024	\$PWRDN: MOV	#SPWRUP, PWRVEC	;SET UP VECTOR
6220	031132	000000		HALT		
6221	031134	000776		BR	.-2	;HANG UP.
6222						
6223				;POWER UP ROUTINE		
6224						
6225	031136	005037	031210	\$PWRUP: CLR	\$PWRCT	;WAIT LOOP FOR TTY
6226	031142	005237	031210	15: INC	\$PWRCT	;WAIT FOR THE INCR
6227	031146	001375		BNE	15	;OF WORD
6228	031150	012737	031124 000024	MOV	#SPWRDN, PWRVEC	;SET POWER DOWN VECTOR
6229	031156	012737	000340 000026	MOV	#PR7, PWRVEC+2	;PRIORITY 7
6230	031164	012737	000340 000036	MOV	#PR7, TRAPVEC+2	;LOCKOUT ALL INTERRUPTS FOR TRAPS
6231	031172	012706	001100	MOV	#STACK, SP	;INITIALIZE STACK
6232	031176	104401	037107	TYPE	,MSG11	;REPORT POWER FAIL
6233	031202	000005		RESET		
6234	031204	000137	012440	JMP	PFSRT	
6235						
6236	031210	000000		\$PWRCT: 0		;WAIT COUNT FOR TTY
6237						
6238						
6239				;DIVISION UTILITY ROUTINE		
6240						
6241				;R0-R1-R2-R3=DIVIDEND		
6242				;R4-R5=DIVISOR		
6243				;R0-R1=REMAINDER AFTER DIVISION		
6244				;R2-R3=QUOTIENT AFTER DIVISION		
6245				;ENTER WITH JSR PC, M.DPID		
6246						
6247	031212	012746	000040	M.DPID: MOV	#40, -(SP)	;COUNTER FOR DIVISION CYCLES

6248	031216	010446		MOV	R4, -(SP)	;HI ORDER
6249	031220	010546		MOV	R5, -(SP)	;LO ORDER TO THE STACK
6250	031222	005466	000002	NEG	2(SP)	;FORM NEGATIVE
6251	031226	005416		NEG	2SP	;VERSION OF DIVISOR
6252	031230	005666	000002	SBC	2(SP)	
6253	031234	061601		ADD	2SP, R1	
6254	031236	005500		ADC	R0	;PERFORM INIT SUBT.
6255	031240	066600	000002	ADD	2(SP), R0	
6256	031244	103445		BCS	M.DP50	;IF CARRY THEN OVERFLOW HAS OCCURRED
6257	031246	005046		CLR	-(SP)	;THIS IS A LONGER LASTING CARRY BIT
6258	031250	006103		M.DP40: ROL	R3	
6259	031252	006102		ROL	R2	
6260	031254	006101		ROL	R1	
6261	031256	006100		ROL	R0	
6262	031260	005716		TST	2SP	;TEST CARRY INDICATOR
6263	031262	001410		BEQ	M.DP41	;IF TO CARRY THEN ADD, ELSE SUBT.
6264	031264	005016		CLR	2SP	;CLEAR UP FOR NEXT TIME
6265	031266	066601	000002	ADD	2(SP), R1	
6266	031272	005500		ADC	R0	;ADD -(DIVISOR)
6267	031274	005516		ADC	2SP	;SET CARRY
6268	031276	066600	000004	ADD	4(SP), R0	
6269	031302	000404		BR	M.DP42	
6270						
6271	031304	060501		M.DP41: ADD	R5, R1	
6272	031306	005500		ADC	R0	;ADD +(DIVISOR)
6273	031310	005516		ADC	2SP	;SET CARRY
6274	031312	060400		ADD	R4, R0	
6275	031314	005516		M.DP42: ADC	2SP	;SET CARRY
6276	031316	005716		TST	2SP	;TEST THE UPDATE INDICATOR
6277	031320	001401		BEQ	.+4	;IF 0 FORGET IT
6278	031322	005203		INC	R3	;NO CARRY POSSIBLE HERE
6279	031324	005366	000006	DEC	6(SP)	;DECREMENT CTR
6280	031330	003347		BGT	M.DP40	;BR IF MORE TO DO
6281	031332	006003		ROR	R3	
6282	031334	103404		BCS	M.DP44	
6283	031336	060501		ADD	R5, R1	
6284	031340	005500		ADC	R0	
6285	031342	060400		ADD	R4, R0	
6286	031344	000241		CLC		
6287						
6288	031346	006103		M.DP44: ROL	R3	
6289	031350	062706	000010	ADD	#10, SP	;ADJUST STACK BY 4 WORDS
6290	031354	000242		CLV		
6291	031356	000207		RTS	PC	
6292						
6293	031360	062706	000006	M.DP50: ADD	#6, SP	
6294	031364	000262		SEV		
6295	031366	000207		RTS	PC	
6296						

.SBTTL SCOPE HANDLER ROUTINE

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6311 031370
6312 031370 104407
6313 031372 032777 040000 147540
6314 031400 001114
6315
6316 031402 000416
6317
6318 031404 013746 000004
6319 031410 012737 031430 000004
6320 031416 005737 177060
6321 031422 012637 000004
6322 031426 000463
6323 031430 022626
6324 031432 012637 000004
6325 031436 000423
6326 031440
6327 031440 032777 000400 147472
6328 031446 001404
6329 031450 127737 147464 001102
6330 031456 001465
6331 031460 105737 001103
6332 031464 001421
6333 031466 123737 001115 001103
6334 031474 101015
6335 031476 032777 001000 147434
6336 031504 001404
6337 031506 013737 001110 001106
6338 031514 000446
6339 031516 105037 001103
6340 031522 005037 001174
6341 031526 000415
6342 031530 032777 004000 147402
6343 031536 001011
6344 031540 005737 001216
6345 031544 001406
6346 031546 005237 001104
6347 031552 023737 001174 001104
6348 031560 002024
6349 031562 012737 000001 001104
6350 031570 013737 031646 001174
6351 031576 105237 001102
6352 031602 113737 001102 001214

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SCOPE HANDLER ROUTINE
*****
*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
*SW14=1      LOOP ON TEST
*SW11=1      INHIBIT ITERATIONS
*SW09=1      LOOP ON ERROR
*SW08=1      LOOP ON TEST IN SWR<7:0>
*CALL
*          SCOPE          ;;SCOPE=IOT

$SCOPE:
        CKSWR
1$:      BIT      $BIT14,$SWR
        BNE      $OVER
        *****START OF CODE FOR THE XOR TESTER*****
$XTSTR:  BR      6$
        MOV      $ERRVEC,-($SP)
        MOV      $S,$ERRVEC
        TST      $177060
        MOV      ($SP)+,$ERRVEC
        BR      $SVLAD
        5$:      CMP      ($SP)+,($SP)+
        MOV      ($SP)+,$ERRVEC
        BR      7$
        6$;;*****END OF CODE FOR THE XOR TESTER*****
        BIT      $BIT08,$SWR
        BEQ      2$
        CMPB     $SWR,$TSTNM
        BEQ      $OVER
        2$:      TSTB     $ERFLG
        BEQ      3$
        CMPB     $ERMAX,$ERFLG
        BHI      3$
        BIT      $BIT09,$SWR
        BEQ      4$
        7$:      MOV      $LPERR,$LPAOR
        BR      $OVER
        4$:      CLRB     $ERFLG
        CLR      $TIMES
        BR      1$
        3$:      BIT      $BIT11,$SWR
        BNE      1$
        TST      $PASS
        BEQ      1$
        INC      $ICNT
        CMP      $TIMES,$ICNT
        BGE      $OVER
        1$:      MOV      $1,$ICNT
        MOV      $MXCNT,$TIMES
        $SVLAD:  INCB     $TSTNM
        MOVB     $TSTNM,$TESTN

```

```

;;TEST FOR CHANGE IN SOFT-SWR
;;LOOP ON PRESENT TEST?
;;YES IF SW14=1
;;TESTER*****
;;IF RUNNING ON THE "XOR" TESTER CHANGE
;;THIS INSTRUCTION TO A "NOP" (NOP=240)
;;SAVE THE CONTENTS OF THE ERROR VECTOR
;;SET FOR TIMEOUT
;;TIME OUT ON XOR?
;;RESTORE THE ERROR VECTOR
;;GO TO THE NEXT TEST
;;CLEAR THE STACK AFTER A TIME OUT
;;RESTORE THE ERROR VECTOR
;;LOOP ON THE PRESENT TEST
;;TESTER*****
;;LOOP ON SPEC. TEST?
;;BR IF NO
;;ON THE RIGHT TEST?      SWR<7:0>
;;BR IF YES
;;HAS AN ERROR OCCURRED?
;;BR IF NO
;;MAX. ERRORS FOR THIS TEST OCCURRED?
;;BR IF NO
;;LOOP ON ERROR?
;;BR IF NO
;;SET LOOP ADDRESS TO LAST SCOPE

;;ZERO THE ERROR FLAG
;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
;;ESCAPE TO THE NEXT TEST
;;INHIBIT ITERATIONS?
;;BR IF YES
;;IF FIRST PASS OF PROGRAM
;;INHIBIT ITERATIONS
;;INCREMENT ITERATION COUNT
;;CHECK THE NUMBER OF ITERATIONS MADE
;;BR IF MORE ITERATION REQUIRED
;;REINITIALIZE THE ITERATION COUNTER
;;SET NUMBER OF ITERATIONS TO DO
;;COUNT TEST NUMBERS
;;SET TEST NUMBER IN APT MAILBOX

```

```

6353 031610 011637 001106      MOV      (SP), $LPADR      ;; SAVE SCOPE LOOP ADDRESS
6354 031614 011637 001110      MOV      (SP), $LPERR      ;; SAVE ERROR LOOP ADDRESS
6355 031620 005037 001176      CLR      $ESCAPE      ;; CLEAR THE ESCAPE FROM ERROR ADDRESS
6356 031624 112737 000001 001115  $OVER  MOV      #1, $ERMAX      ;; ONLY ALLOW ONE(1) ERROR ON NEXT TEST
6357 031632 013777 001102 147302  MOV      $STNM, $DISPLAY  ;; DISPLAY TEST NUMBER
6358 031640 013716 001106      MOV      $LPADR, (SP)      ;; FUDGE RETURN ADDRESS
6359 031644 000002      RTI      ;; FIXES PS
6360 031646 003720      $MXCNT: 2000.      ;; MAX. NUMBER OF ITERATIONS
6361      .SBTTL  ERROR HANDLER ROUTINE
6362
6363      ;*****
6364      ;THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
6365      ;SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
6366      ;AND GO TO TYPERR ON ERROR
6367      ;THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
6368      ;$SW15=1      HALT ON ERROR
6369      ;$SW13=1      INHIBIT ERROR TYPEOUTS
6370      ;$SW10=1      BELL ON ERROR
6371      ;$SW09=1      LOOP ON ERROR
6372      ;$CALL
6373      ;*      ERROR      N      ;; ERROR=EMT AND N=ERROR ITEM NUMBER
6374
6375      $ERROR:
6376 031650 104407      CKSWR      ;; TEST FOR CHANGE IN SOFT-SWR
6377 031652 105237 001103 7$:      INCB      $ERFLG      ;; SET THE ERROR FLAG
6378 031656 001775      BEQ      7$      ;; DON'T LET THE FLAG GO TO ZERO
6379 031660 013777 001102 147254  MOV      $STNM, $DISPLAY  ;; DISPLAY TEST NUMBER AND ERROR FLAG
6380 031666 032777 002000 147244  BIT      #BIT10, $SWR      ;; BELL ON ERROR?
6381 031674 001402      BEQ      1$      ;; NO - SKIP
6382 031676 104401 001200      TYPE      $BELL      ;; RING BELL
6383 031702 005237 001112 1$:      INC      $ERTTL      ;; COUNT THE NUMBER OF ERRORS
6384 031706 011637 001116      MOV      (SP), $ERRPC      ;; GET ADDRESS OF ERROR INSTRUCTION
6385 031712 162737 000002 001116  SUB      #2, $ERRPC
6386 031720 117737 147172 001114  MOV      $ERRPC, $ITEMB      ;; STRIP AND SAVE THE ERROR ITEM CODE
6387 031726 032777 020000 147204  BIT      #BIT13, $SWR      ;; SKIP TYPEOUT IF SET
6388 031734 001004      BNE      20$      ;; SKIP TYPEOUTS
6389 031736 004737 054772      JSR      PC, TYPERR      ;; GO TO USER ERROR ROUTINE
6390 031742 104401 001205      TYPE      , $CRLF
6391 031746
6392 031746 122737 000001 001230 20$:  CMPB      #APTENV, $ENV      ;; RUNNING IN APT MODE
6393 031754 001007      BNE      2$      ;; NO SKIP APT ERROR REPORT
6394 031756 113737 001114 031770  MOV      $ITEMB, 21$      ;; SET ITEM NUMBER AS ERROR NUMBER
6395 031764 004737 032574      JSR      PC, $ATY4      ;; REPORT FATAL ERROR TO APT
6396 031770      000      21$:      .BYTE      0
6397 031771      000      .BYTE      0
6398 031772 000777      22$:      BR      22$      ;; APT ERROR LOOP
6399 031774 005777 147140 2$:      TST      $SWR      ;; HALT ON ERROR
6400 032000 100002      BPL      3$      ;; SKIP IF CONTINUE
6401 032002 000000      HALT      ;; HALT ON ERROR!
6402 032004 104407      CKSWR      ;; TEST FOR CHANGE IN SOFT-SWR
6403 032006 032777 001000 147124 3$:  BIT      #BIT09, $SWR      ;; LOOP ON ERROR SWITCH SET?
6404 032014 001402      BEQ      4$      ;; BR IF NO
6405 032016 013716 001110      MOV      $LPERR, (SP)      ;; FUDGE RETURN FOR LOOPING
6406 032022 005737 001176 4$:      TST      $ESCAPE      ;; CHECK FOR AN ESCAPE ADDRESS
6407 032026 001402      BEQ      5$      ;; BR IF NONE
6408 032030 013716 001176      MOV      $ESCAPE, (SP)      ;; FUDGE RETURN ADDRESS FOR ESCAPE

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6409 032034
6410 032034 022737 024030 000042
6411 032042 001001
6412 032044 000000
6413 032046
6414 032046 000002
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6432 032050 105737 001157
6433 032054 100002
6434 032056 000000
6435 032060 000430
6436 032062 010046
6437 032064 017600 000002
6438 032070 122737 000001 001230
6439 032076 001011
6440 032100 132737 000100 001231
6441 032106 001405
6442 032110 010037 032120
6443 032114 004737 032564
6444 032120 000000
6445 032122 132737 000040 001231
6446 032130 001003
6447 032132 112046
6448 032134 001005
6449 032136 005726
6450 032140 012600
6451 032142 062716 000002
6452 032146 000002
6453 032150 122716 000011
6454 032154 001430
6455 032156 122716 000200
6456 032162 001006
6457 032164 005726
6458 032166 104401
6459 032170 001205
6460 032172 105037 032326
6461 032176 000755
6462 032200 004737 032262
6463 032204 123726 001156
6464 032210 001350

5$:      CMP      #SENDAD,2#42      ;;ACT-11 AUTO-ACCEPT?
        BNE      6$                  ;;BRANCH IF NO
        HALT                      ;;YES

6$:      RTI                          ;;RETURN
        .SBTTL   TYPE ROUTINE

*****
*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
*NOTE1:      $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
*NOTE2:      $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
*NOTE3:      $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
*
*CALL:
*1) USING A TRAP INSTRUCTION
*      TYPE      ,MESADR      ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
*OR
*      TYPE
*      MESADR
*
$TYPE:   TSTB      $TPFLG      ;;IS THERE A TERMINAL?
        BPL      1$            ;;BR IF YES
        HALT      HERE IF NO TERMINAL
        BR      3$            ;;LEAVE
1$:      MOV      RO,-(SP)      ;;SAVE RO
        MOV      22(SP),RO      ;;GET ADDRESS OF ASCIZ STRING
        CMPB     #APTENV,$ENV      ;;RUNNING IN APT MODE
        BNE      62$           ;;NO GO CHECK FOR APT CONSOLE
        BITB     #APTSPool,$ENV      ;;SPOOL MESSAGE TO APT
        BEQ      62$           ;;NO GO CHECK FOR CONSOLE
        MOV      RO,61$        ;;SETUP MESSAGE ADDRESS FOR APT
        JSR      PC,$ATY3      ;;SPOOL MESSAGE TO APT
        .WORD    0              ;;MESSAGE ADDRESS
        BITB     #APTCsup,$ENV      ;;APT CONSOLE SUPPRESSED
        BNE      60$           ;;YES, SKIP TYPE OUT
        MOVB     (RO)+,-(SP)      ;;PUSH CHARACTER TO BE TYPED ONTO STACK
        BNE      4$            ;;BR IF IT ISN'T THE TERMINATOR
        TST      (SP)+          ;;IF TERMINATOR POP IT OFF THE STACK
        MOV      (SP)+,RO      ;;RESTORE RO
        ADD      #2,(SP)        ;;ADJUST RETURN PC
        RTI                      ;;RETURN
        CMPB     #HT,(SP)      ;;BRANCH IF <HT>
        BEQ      8$            ;;
        CMPB     #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
        BNE      5$            ;;
        TST      (SP)+          ;;POP <CR><LF> EQUIV
        TYPE     A CR AND LF
        CLR      $CHARCNT      ;;CLEAR CHARACTER COUNT
        BR      2$            ;;GET NEXT CHARACTER
        JSR      PC,$TYPEC      ;;GO TYPE THIS CHARACTER
        CMPB     $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
        BNE      2$            ;;IF NO GO GET NEXT CHAR.

```

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6465 032212 013746 001154          MOV      $NULL,-(SP)      ;; GET # OF FILLER CHARS. NEEDED
6466                                     ;; AND THE NULL CHAR.
6467 032216 105366 000001      7$:  DECB      1(SP)          ;; DOES A NULL NEED TO BE TYPED?
6468 032222 002770                BLT      6$              ;; BR IF NO--GO POP THE NULL OFF OF STACK
6469 032224 004737 032262          JSR      PC,$TYPEC        ;; GO TYPE A NULL
6470 032230 105337 032326          DECB      $CHARCNT        ;; DO NOT COUNT AS A COUNT
6471 032234 000770                BR       7$              ;; LOOP
6472
6473                                     ;HORIZONTAL TAB PROCESSOR
6474
6475 032236 112716 000040      8$:  MOV      #' (SP)          ;; REPLACE TAB WITH SPACE
6476 032242 004737 032262      9$:  JSR      PC,$TYPEC        ;; TYPE A SPACE
6477 032246 132737 000007 032326  BITB      #',$CHARCNT      ;; BRANCH IF NOT AT
6478 032254 001372                BNE      9$              ;; TAB STOP
6479 032256 005726                TST      (SP)+            ;; POP SPACE OFF STACK
6480 032260 000724                BR       2$              ;; GET NEXT CHARACTER
6481 032262 105777 146662      $TYPEC: TSTB      2$TPS        ;; WAIT UNTIL PRINTER IS READY
6482 032266 100375                BPL      $TYPEC
6483 032270 116677 000002 146654  MOV      2(SP),2$TPB        ;; LOAD CHAR TO BE TYPED INTO DATA REG.
6484 032276 122766 000015 000002  CMPB      #'CR,2(SP)      ;; IS CHARACTER A CARRIAGE RETURN?
6485 032304 001003                BNE      1$              ;; BRANCH IF NO
6486 032306 105037 032326          CLRB      $CHARCNT        ;; YES--CLEAR CHARACTER COUNT
6487 032312 000406                BR       $TYPEX          ;; EXIT
6488 032314 122766 000012 000002  1$:  CMPB      #'LF,2(SP)      ;; IS CHARACTER A LINE FEED?
6489 032322 001402                BEQ      $TYPEX          ;; BRANCH IF YES
6490 032324 105227                INCB      (PC)+            ;; COUNT THE CHARACTER
6491 032326 000000      $CHARCNT: .WORD 0                ;; CHARACTER COUNT STORAGE
6492 032330 000207      $TYPEX: RTS      PC
6493
6494                                     .SBTTL CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
6495
6496                                     ;*****
6497                                     ;THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
6498                                     ;SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
6499                                     ;NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
6500                                     ;BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
6501                                     ;REPLACED WITH SPACES.
6502                                     ;CALL:
6503                                     ;*      MOV      NUM,-(SP)          ;; PUT THE BINARY NUMBER ON THE STACK
6504                                     ;*      TYPDS                    ;; GO TO THE ROUTINE
6505
6506      032332      $TYPDS:
6507 032332 010046                MOV      R0,-(SP)          ;; PUSH R0 ON STACK
6508 032334 010146                MOV      R1,-(SP)          ;; PUSH R1 ON STACK
6509 032336 010246                MOV      R2,-(SP)          ;; PUSH R2 ON STACK
6510 032340 010346                MOV      R3,-(SP)          ;; PUSH R3 ON STACK
6511 032342 010546                MOV      R5,-(SP)          ;; PUSH R5 ON STACK
6512 032344 012746 020200      MOV      #'20200,-(SP)        ;; SET BLANK SWITCH AND SIGN
6513 032350 016605 000020      MOV      20(SP),R5          ;; GET THE INPUT NUMBER
6514 032354 100004                BPL      1$              ;; BR IF INPUT IS POS.
6515 032356 005405                NEG      R5              ;; MAKE THE BINARY NUMBER POS.
6516 032360 112766 000055 000001  MOV      #'-,1(SP)        ;; MAKE THE ASCII NUMBER NEG.
6517 032366 005000      1$:  CLR      R0              ;; ZERO THE CONSTANTS INDEX
6518 032370 012703 032546      MOV      #'$DBLK,R3          ;; SETUP THE OUTPUT POINTER
6519 032374 112723 000040      MOV      #' ,(R3)+          ;; SET THE FIRST CHARACTER TO A BLANK
6520 032400 005002      2$:  CLR      R2              ;; CLEAR THE BCD NUMBER

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G10

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CONVERT BINARY TO DECIMAL AND TYPE ROUTINE

SEQ 0122

6521	032402	016001	032536		MOV	\$DTBL(R0),R1	;; GET THE CONSTANT
6522	032406	160105		3\$:	SUB	R1,R5	;; FORM THIS BCD DIGIT
6523	032410	002402			BLT	4\$	;; BR IF DONE
6524	032412	005202			INC	R2	;; INCREASE THE BCD DIGIT BY 1
6525	032414	000774			BR	3\$	
6526	032416	060105		4\$:	ADD	R1,R5	;; ADD BACK THE CONSTANT
6527	032420	005702			TST	R2	;; CHECK IF BCD DIGIT=0
6528	032422	001002			BNE	5\$	;; FALL THROUGH IF 0
6529	032424	105716			TSTB	(SP)	;; STILL DOING LEADING 0'S?
6530	032426	100407			BMI	7\$	;; BR IF YES
6531	032430	106316		5\$:	ASLB	(SP)	;; MSD?
6532	032432	103003			BCC	6\$	;; BR IF NO
6533	032434	116663	000001 177777		MOVB	1(SP),-1(R3)	;; YES--SET THE SIGN
6534	032442	052702	000060	6\$:	BIS	#'0,R2	;; MAKE THE BCD DIGIT ASCII
6535	032446	052702	000040	7\$:	BIS	#'1,R2	;; MAKE IT A SPACE IF NOT ALREADY A DIGIT
6536	032452	110223			MOVB	R2,(R3)+	;; PUT THIS CHARACTER IN THE OUTPUT BUFFER
6537	032454	005720			TST	(R0)+	;; JUST INCREMENTING
6538	032456	020027	000010		CMP	R0,#10	;; CHECK THE TABLE INDEX
6539	032462	002746			BLT	2\$	;; GO DO THE NEXT DIGIT
6540	032464	003002			BGT	8\$	;; GO TO EXIT
6541	032466	010502			MOV	R5,R2	;; GET THE LSD
6542	032470	000764			BR	6\$	;; GO CHANGE TO ASCII
6543	032472	105726		8\$:	TSTB	(SP)+	;; WAS THE LSD THE FIRST NON-ZERO?
6544	032474	100003			BPL	9\$	;; BR IF NO
6545	032476	116663	177777 177776		MOVB	-1(SP),-2(R3)	;; YES--SET THE SIGN FOR TYPING
6546	032504	105013		9\$:	CLRB	(R3)	;; SET THE TERMINATOR
6547	032506	012605			MOV	(SP)+,R5	;; POP STACK INTO R5
6548	032510	012603			MOV	(SP)+,R3	;; POP STACK INTO R3
6549	032512	012602			MOV	(SP)+,R2	;; POP STACK INTO R2
6550	032514	012601			MOV	(SP)+,R1	;; POP STACK INTO R1
6551	032516	012600			MOV	(SP)+,R0	;; POP STACK INTO R0
6552	032520	104401	032546		TYPE	\$DBLK	;; NOW TYPE THE NUMBER
6553	032524	016666	000002 000004		MOV	2(SP),4(SP)	;; ADJUST THE STACK
6554	032532	012616			MOV	(SP)+,(SP)	
6555	032534	000002			RTI		;; RETURN TO USER
6556	032536	023420		\$DTBL:	10000.		
6557	032540	001750			1000.		
6558	032542	000144			100.		
6559	032544	000012			10.		
6560	032546	000004		\$DBLK:	.BLKW 4		
6561				.SBTTL	APT COMMUNICATIONS ROUTINE		
6562							
6563							
6564	032556	112737	000001 033022	\$ATY1:	MOVB	#1,\$FFLG	;; TO REPORT FATAL ERROR
6565	032564	112737	000001 033020	\$ATY3:	MOVB	#1,\$MFLG	;; TO TYPE A MESSAGE
6566	032572	000403			BR	\$ATYC	
6567	032574	112737	000001 033022	\$ATY4:	MOVB	#1,\$FFLG	;; TO ONLY REPORT FATAL ERROR
6568	032602			\$ATYC:			
6569	032602	010046			MOV	R0,-(SP)	;; PUSH R0 ON STACK
6570	032604	010146			MOV	R1,-(SP)	;; PUSH R1 ON STACK
6571	032606	105737	033020		TSTB	\$MFLG	;; SHOULD TYPE A MESSAGE?
6572	032612	001450			BEQ	5\$	;; IF NOT: BR
6573	032614	122737	000001 001230		CMPB	\$APTENV,\$ENV	;; OPERATING UNDER APT?
6574	032622	001031			BNE	3\$	;; IF NOT: BR
6575	032624	132737	000100 001231		BITB	\$APTPOOL,\$ENV	;; SHOULD SPOOL MESSAGES?
6576	032632	001425			BEQ	3\$	;; IF NOT: BR

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APT COMMUNICATIONS ROUTINE

SEQ 0123

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6577 032634 017600 000004      MOV      24(SP),RO      ;; GET MESSAGE ADDR.
6578 032640 062766 000002 000004  ADD      #2,4(SP)      ;; BUMP RETURN ADDR.
6579 032646 005737 001210 1$:   TST      $MSGTYPE      ;; SEE IF DONE W/ LAST XMISSION?
6580 032652 001375      BNE      1$      ;; IF NOT: WAIT
6581 032654 010037 001224      MOV      RO,$MSGAD      ;; PUT ADDR IN MAILBOX
6582 032660 105720 2$:   TSTB     (RO)+      ;; FIND END OF MESSAGE
6583 032662 001376      BNE      2$
6584 032664 163700 001224      SUB      $MSGAD,RO      ;; SUB START OF MESSAGE
6585 032670 006200      ASR      RO      ;; GET MESSAGE LGTH IN WORDS
6586 032672 010037 001226      MOV      RO,$MSGLG      ;; PUT LENGTH IN MAILBOX
6587 032676 012737 000004 001210  MOV      #4,$MSGTYPE      ;; TELL APT TO TAKE MSG.
6588 032704 000413      BR       5$
6589 C32706 017637 000004 032732 3$:   MOV      24(SP),4$      ;; PUT MSG ADDR IN JSR LINKAGE
6590 C32714 062766 000002 000004  ADD      #2,4(SP)      ;; BUMP RETURN ADDRESS
6591 032722 013746 177776      MOV      177776,-(SP)      ;; PUSH 177776 ON STACK
6592 032726 004737 032050      JSR      PC,$TYPE      ;; CALL TYPE MACRO
6593 032732 000000 4$:   .WORD     0
6594 032734 5$:
6595 032734 105737 033022 10$:  TSTB     $FFLG      ;; SHOULD REPORT FATAL ERROR?
6596 032740 001416      BEQ      12$      ;; IF NOT: BR
6597 032742 005737 001230      TST      $ENV      ;; RUNNING UNDER APT?
6598 032746 001413      BEQ      12$      ;; IF NOT: BR
6599 032750 005737 001210 11$:  TST      $MSGTYPE      ;; FINISHED LAST MESSAGE?
6600 032754 001375      BNE      11$      ;; IF NOT: WAIT
6601 032756 017637 000004 001212  MOV      24(SP),$FATAL      ;; GET ERROR #
6602 032764 062766 000002 000004  ADD      #2,4(SP)      ;; BUMP RETURN ADDR.
6603 032772 005237 001210      INC      $MSGTYPE      ;; TELL APT TO TAKE ERROR
6604 032776 105037 033022 12$:  CLRB     $FFLG      ;; CLEAR FATAL FLAG
6605 033002 105037 033021      CLRB     $LFLG      ;; CLEAR LOG FLAG
6606 033006 105037 033020      CLRB     $MFLG      ;; CLEAR MESSAGE FLAG
6607 033012 012601      MOV      (SP)+,R1      ;; POP STACK INTO R1
6608 033014 012600      MOV      (SP)+,RO      ;; POP STACK INTO RO
6609 033016 000207      RTS      PC      ;; RETURN
6610 033020      000      $MFLG: .BYTE 0      ;; MESSG. FLAG
6611 033021      000      $LFLG: .BYTE 0      ;; LOG FLAG
6612 033022      000      $FFLG: .BYTE 0      ;; FATAL FLAG
6613      033024      .EVEN
6614      000200      APTSIZE=200
6615      000001      APTENV=001
6616      000100      APTSPool=100
6617      000040      APTCSUP=040
6618      .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
6619
6620 *****
6621 *THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
6622 *OCTAL (ASCII) NUMBER AND TYPE IT.
6623 *$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
6624 *CALL:
6625 *      MOV      NUM,-(SP)      ;; NUMBER TO BE TYPED
6626 *      TYPOS      ;; CALL FOR TYPEOUT
6627 *      .BYTE     N      ;; N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
6628 *      .BYTE     M      ;; M=1 OR 0
6629 *      ;; 1=TYPE LEADING ZEROS
6630 *      ;; 0=SUPPRESS LEADING ZEROS
6631 *
6632 *$STYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST

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6633      ;*STYPOS OR STYPOC
6634      ;*CALL:
6635      ;*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED
6636      ;*      TYPON      ;;CALL FOR TYPEOUT
6637      ;*
6638      ;*STYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
6639      ;*CALL:
6640      ;*      MOV      NUM,-(SP)      ;;NUMBER TO BE TYPED
6641      ;*      TYPON      ;;CALL FOR TYPEOUT
6642
6643      033024 017646 000000      STYPOS: MOV      2(SP),-(SP)      ;;PICKUP THE MODE
6644      033030 116637 000001 033247      MOV      1(SP),SOFILL      ;;LOAD ZERO FILL SWITCH
6645      033036 112637 033251      MOV      (SP)+,SOMODE+1      ;;NUMBER OF DIGITS TO TYPE
6646      033042 062716 000002      ADD      #2,(SP)      ;;ADJUST RETURN ADDRESS
6647      033046 000406      BR      STYPON
6648      033050 112737 000001 033247      STYPOC: MOV      #1,SOFILL      ;;SET THE ZERO FILL SWITCH
6649      033056 112737 000006 033251      MOV      #6,SOMODE+1      ;;SET FOR SIX(6) DIGITS
6650      033064 112737 000005 033246      STYPON: MOV      #5,SOCNT      ;;SET THE ITERATION COUNT
6651      033072 010346      MOV      R3,-(SP)      ;;SAVE R3
6652      033074 010446      MOV      R4,-(SP)      ;;SAVE R4
6653      033076 010546      MOV      R5,-(SP)      ;;SAVE R5
6654      033100 113704 033251      MOV      SOMODE+1,R4      ;;GET THE NUMBER OF DIGITS TO TYPE
6655      033104 005404      NEG      R4
6656      033106 062704 000006      ADD      #6,R4      ;;SUBTRACT IT FOR MAX. ALLOWED
6657      033112 110437 033250      MOV      R4,SOMODE      ;;SAVE IT FOR USE
6658      033116 113704 033247      MOV      SOFILL,R4      ;;GET THE ZERO FILL SWITCH
6659      033122 016605 000012      MOV      12(SP),R5      ;;PICKUP THE INPUT NUMBER
6660      033126 005003      CLR      R3      ;;CLEAR THE OUTPUT WORD
6661      033130 006105      1$: ROL      R5      ;;ROTATE MSB INTO "C"
6662      033132 000404      BR      3$      ;;GO DO MSB
6663      033134 006105      2$: ROL      R5      ;;FORM THIS DIGIT
6664      033136 006105      ROL      R5
6665      033140 006105      ROL      R5
6666      033142 010503      MOV      R5,R3
6667      033144 006103      3$: ROL      R3      ;;GET LSB OF THIS DIGIT
6668      033146 105337 033250      DECB      SOMODE      ;;TYPE THIS DIGIT?
6669      033152 100016      BPL      7$      ;;BR IF NO
6670      033154 042703 177770      BIC      #177770,R3      ;;GET RID OF JUNK
6671      033160 001002      BNE      4$      ;;TEST FOR 0
6672      033162 005704      TST      R4      ;;SUPPRESS THIS 0?
6673      033164 001403      BEQ      5$      ;;BR IF YES
6674      033166 005204      4$: INC      R4      ;;DON'T SUPPRESS ANYMORE 0'S
6675      033170 052703 000060      BIS      #'0,R3      ;;MAKE THIS DIGIT ASCII
6676      033174 052703 000040      5$: BIS      #' ,R3      ;;MAKE ASCII IF NOT ALREADY
6677      033200 110337 033244      MOV      R3,#$      ;;SAVE FOR TYPING
6678      033204 104401 033244      TYPE      ,R3      ;;GO TYPE THIS DIGIT
6679      033210 105337 033246      7$: DECB      SOCNT      ;;COUNT BY 1
6680      033214 003347      BGT      2$      ;;BR IF MORE TO DO
6681      033216 002402      BLT      6$      ;;BR IF DONE
6682      033220 005204      INC      R4      ;;INSURE LAST DIGIT ISN'T A BLANK
6683      033222 000744      BR      2$      ;;GO DO THE LAST DIGIT
6684      033224 012605      6$: MOV      (SP)+,R5      ;;RESTORE R5
6685      033226 012604      MOV      (SP)+,R4      ;;RESTORE R4
6686      033230 012603      MOV      (SP)+,R3      ;;RESTORE R3
6687      033232 016666 000002 000004      MOV      2(SP),4(SP)      ;;SET THE STACK FOR RETURNING
6688      033240 012616      MOV      (SP)+,(SP)

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6689 033242 000002
6690 033244 000
6691 033245 000
6692 033246 000
6693 033247 000
6694 033250 000000
6695
6696
6697
6698
6699 033252 000000
6700 033254 000000
6701 033256 000000
6702 033260 000001
6703 033261
6704 033262
6705
6706
6707
6708
6709
6710
6711
6712
6713
6714 033262 005037 033252
6715 033266 012737 033260 033254
6716 033274 013737 033254 033256
6717 033302 012737 033332 000060
6718 033310 012737 000200 000062
6719 033316 005777 145624
6720 033322 012777 000100 145614
6721 033330 000207
6722
6723
6724
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6726
6727
6728
6729
6730 033332 117746 145610
6731 033336 042716 177600
6732 033342 021627 000003
6733 033346 001007
6734 033350 104401 034460
6735 033354 004737 033262
6736 033360 005726
6737 033362 000137 030374
6738 033366 021627 000007
6739 033372 001004
6740 033374 022737 000176 001140
6741 033402 001500
6742
6743 033404
6744 033404 022737 000001 033252

RTI
BS: .BYTE 0
S0CNT: .BYTE 0
S0FILL: .BYTE 0
S0MODE: .WORD 0
.S8TTL 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
STKCNT: .WORD 0
STKQIN: .WORD 0
STKQOUT: .WORD 0
STKQSR: .BLKB 1
STKQEND=.
.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,STKINT
;; * RETURN

STKINT: CLR STKCNT
MOV STKQSR STKQIN
MOV STKQIN,STKQOUT
MOV STKSRV,STKVEC
MOV #200,STKVEC+2
TST STKB
MOV #100,STKS
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" (↑C) STKINT IS CALLED AND
;; *UPON RETURN EXIT IS MADE TO THE "CONTROL-C" RESTART ADDRESS (STOP)

STKSRV: MOVB STKB, -(SP)
BIC #↑C177, (SP)
CMP (SP), #3
BNE 1\$
TYPE SCNTLC
JSR PC,STKINT
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 (↑C)
;; 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, STKCNT
;; IS THE QUEUE FULL?

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SEQ 0126

6745	033412	001004			BNE	3\$	;; BRANCH IF NO
6746	033414	104401	001200		TYPE	, \$BELL	;; RING THE TTY BELL
6747	033420	005726			TST	(SP)+	;; CLEAN CHARACTER OFF OF STACK
6748	033422	000451			BR	5\$	;; EXIT
6749	033424	021627	000023	3\$:	CMP	(SP), #23	;; IS IT A CONTROL-S?
6750	033430	001021			BNE	32\$	;; BRANCH IF NO
6751	033432	005077	145506		CLR	\$TKS	;; DISABLE TTY KEYBOARD INTERRUPTS
6752	033436	005726			TST	(SP)+	;; CLEAN CHAR OFF STACK
6753	033440	105777	145500	31\$:	TSTB	\$TKS	;; WAIT FOR A CHAR
6754	033444	100375			BPL	31\$	;; LOOP UNTIL ITS THERE
6755	033446	117746	145474		MOVB	\$TKB, -(SP)	;; GET THE CHARACTER
6756	033452	042716	177600		BIC	#1C177, (SP)	;; MAKE IT 7-BIT ASCII
6757	033456	022627	000021		CMP	(SP)+, #21	;; IS IT A CONTROL-Q?
6758	033462	001366			BNE	31\$	;; BRANCH IF NO
6759	033464	012777	000100	145452	MOV	#100, \$TKS	;; REENABLE TTY KEYBOARD INTERRUPTS
6760	033472	001002			RTI		;; RETURN
6761	033474	005237	033252	32\$:	INC	\$TKCNT	;; COUNT THIS CHARACTER
6762	033500	021627	000140		CMP	(SP), #140	;; IS IT UPPER CASE?
6763	033504	002405			BLT	4\$	;; BRANCH IF YES
6764	033506	021627	000175		CMP	(SP), #175	;; IS IT A SPECIAL CHAR?
6765	033512	003002			BGT	4\$	;; BRANCH IF YES
6766	033514	042716	000040		BIC	#40, (SP)	;; MAKE IT UPPER CASE
6767	033520	112677	177530	4\$:	MOVB	(SP)+, \$TKQIN	;; AND PUT IT IN QUEUE
6768	033524	005237	033254		INC	\$TKQIN	;; UPDATE THE POINTER
6769	033530	023727	033254	033261	CMP	\$TKQIN, \$TKQEND	;; GO OFF THE END?
6770	033536	001003			BNE	5\$	;; BRANCH IF NO
6771	033540	012737	033260	033254	MOV	\$TKQSRT, \$TKQIN	;; RESET THE POINTER
6772	033546	000002		5\$:	RTI		;; RETURN
6773							
6774							
6775							
6776							
6777							
6778							
6779	033550	022737	000176	001140	\$CKSWR: CMP	\$SWREG, SWR	;; IS THE SOFT-SWR SELECTED
6780	033556	001124			BNE	15\$	;; EXIT IF NOT
6781	033560	105777	145360		TSTB	\$TKS	;; IS A CHAR WAITING?
6782	033564	100121			BPL	15\$	;; IF NOT, EXIT
6783	033566	117746	145354		MOVB	\$TKB, -(SP)	;; YES
6784	033572	042716	177600		BIC	#1C177, (SP)	;; MAKE IT 7-BIT ASCII
6785	033576	021627	000007		CMP	(SP), #7	;; IS IT A CONTROL-G?
6786	033602	001300			BNE	2\$	;; IF NOT, PUT IT IN THE TTY QUEUE
6787							;; AND EXIT
6788							
6789							
6790							
6791							
6792							
6793	033604	123727	001134	000001	6\$:	CMPB	\$AUTOB, #1
6794	033612	001674			BEQ	2\$	;; ARE WE RUNNING IN AUTO-MODE?
6795	033614	005726			TST	(SP)+	;; BRANCH IF YES
6796	033616	004737	033262		JSR	PC, \$TKINT	;; CLEAR CONTROL-G OFF STACK
6797	033622	005077	145316		CLR	\$TKS	;; FLUSH THE TTY INPUT QUEUE
6798	033626	112737	000001	001135	MOVB	#1, \$INTAG	;; DISABLE TTY KEYBOARD INTERRUPTS
6799							;; SET INTERRUPT MODE INDICATOR
6800	033634	104401	034472		TYPE	, \$CNTLG	;; ECHO THE CONTROL-G (+G)

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SEQ 0127

6801	033640	104401	034477		SGTSWR: TYPE	\$MSWR	:: TYPE CURRENT CONTENTS
6802	033644	013746	000176		MOV	\$WREG, -(SP)	:: SAVE SWREG FOR TYPEOUT
6803	033650	104402			TYPEOC		:: GO TYPE--OCTAL ASCII(ALL DIGITS)
6804	033652	104401	034510		TYPE	\$MNEW	:: PROMPT FOR NEW SWR
6805	033656	005046		19\$:	CLR	-(SP)	:: CLEAR COUNTER
6806	033660	005046			CLR	-(SP)	:: THE NEW SWR
6807	033662	105777	145256	7\$:	TSTB	\$STKS	:: CHAR THERE?
6808	033666	100375			BPL	7\$	:: IF NOT TRY AGAIN
6809							
6810	033670	117746	145252		MOVB	\$STKB, -(SP)	:: PICK UP CHAR
6811	033674	042716	177600		BIC	\$1C177, (SP)	:: MAKE IT 7-BIT ASCII
6812							
6813	033700	021627	000003		CMP	(SP), #3	:: IS IT A CONTROL-C?
6814	033704	001015			BNE	9\$	:: BRANCH IF NOT
6815	033706	104401	034460		TYPE	\$CNTLC	:: YES, ECHO CONTROL-C (1C)
6816	033712	062706	000006		ADD	\$6, SP	:: CLEAN UP STACK
6817	033716	123727	001135	000001	CMPB	\$INTAG, #1	:: REENABLE TTY KEYBOARD INTERRUPTS?
6818	033724	001003			BNE	8\$	:: BRANCH IF NO
6819	033726	012777	000100	145210	MOV	\$100, \$STKS	:: ALLOW TTY KEYBOARD INTERRUPTS
6820	033734	000137	030374		JMP	STOP	:: CONTROL-C RESTART
6821							
6822							
6823	033740	021627	000025		9\$:	CMP	(SP), #25
6824	033744	001005			BNE	10\$	:: IS IT A CONTROL-U?
6825	033746	104401	034465		TYPE	\$CNTLU	:: BRANCH IF NOT
6826	033752	062706	000006		20\$:	ADD	\$6, SP
6827	033756	000737			BR	19\$	:: YES, ECHO CONTROL-U (1U)
6828							:: IGNORE PREVIOUS INPUT
6829							:: LET'S TRY IT AGAIN
6830	033760	021627	000015		10\$:	CMP	(SP), #15
6831	033764	001022			BNE	16\$	:: IS IT A <CR>?
6832	033766	005766	000004		TST	4(SP)	:: BRANCH IF NO
6833	033772	001403			BEQ	11\$	:: YES, IS IT THE FIRST CHAR?
6834	033774	016677	000002	145136	MOV	2(SP), \$SWR	:: BRANCH IF YES
6835	034002	062706	000006		11\$:	ADD	\$6, SP
6836	034006	104401	001205		14\$:	TYPE	\$CRLF
6837	034012	123727	001135	000001	CMPB	\$INTAG, #1	:: SAVE NEW SWR
6838	034020	001003			BNE	15\$	:: CLEAR UP STACK
6839	034022	012777	000100	145114	MOV	\$100, \$STKS	:: ECHO <CR> AND <LF>
6840	034030	000002			15\$:	RTI	:: RE-ENABLE TTY KBD INTERRUPTS?
6841	034032	004737	032262		16\$:	JSR	PC, \$TYPEC
6842	034036	021627	000060		CMP	(SP), #60	:: BRANCH IF NOT
6843	034042	002420			BLT	18\$	:: CHAR < 0?
6844	034044	021627	000067		CMP	(SP), #67	:: BRANCH IF YES
6845	034050	003015			BGT	18\$	:: CHAR > 7?
6846	034052	042726	000060		BIC	\$60, (SP)+	:: BRANCH IF YES
6847	034056	005766	000002		TST	2(SP)	:: STRIP-OFF ASCII
6848	034062	001403			BEQ	17\$	:: IS THIS THE FIRST CHAR
6849	034064	006316			ASL	(SP)	:: BRANCH IF YES
6850	034066	006316			ASL	(SP)	:: NO, SHIFT PRESENT
6851	034070	006316			ASL	(SP)	:: CHAR OVER TO MAKE
6852	034072	005266	000002		17\$:	INC	2(SP)
6853	034076	056616	177776		BIS	-2(SP), (SP)	:: KEEP COUNT OF CHAR
6854	034102	000667			BR	7\$	:: SET IN NEW CHAR
6855	034104	104401	001204		18\$:	TYPE	\$QUES
6856	034110	000720			BR	20\$	:: GET THE NEXT ONE
							:: TYPE ?<CR><LF>
							:: SIMULATE CONTROL-U

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SEQ 0128

.DSABL LSB

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6857
6858
6859
6860
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6863
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6865
6866
6867
6868 034112 011646 000004 000002 $RDCHR: MOV (SP),-(SP) ;; PUSH DOWN THE PC AND
6869 034114 016666 000004 000002 MOV 4(SP),2(SP) ;; THE PS
6870 034122 005066 000004 CLR 4(SP) ;; GET READY FOR A CHARACTER
6871 034126 005046 CLR -(SP) ;; PUT NEW PS ON STACK
6872 034130 012746 034136 MOV #64$,-(SP) ;; PUT NEW PC ON STACK
6873 034134 000002 RTI ;; POP NEW PC AND PS
6874 034136
6875 034136 005737 033252 64$: TST $TKCNT ;; WAIT ON A CHARACTER
6876 034142 001775 1$: BEQ 1$
6877 034144 005337 033252 DEC $TKCNT ;; DECREMENT THE COUNTER
6878 034150 117766 177102 000004 MOVB $TKQOUT,4(SP) ;; GET ONE CHARACTER
6879 034156 005237 033256 INC $TKQOUT ;; UPDATE THE POINTER
6880 034162 023727 033256 033261 CMP $TKQOUT,$$TKQEND ;; DID IT GO OFF OF THE END?
6881 034170 001003 BNE 2$ ;; BRANCH IF NO
6882 034172 012737 033260 033256 MOV $$TKQSR, $TKQOUT ;; RESET THE POINTER
6883 034200 000002 2$: RTI ;; RETURN
6884
6885
6886
6887
6888
6889
6890
6891 034202 010346 $RDLIN: MOV R3, -(SP) ;; SAVE R3
6892 034204 005046 CLR -(SP) ;; CLEAR THE RUBOUT KEY
6893 034206 012703 034436 1$: MOV $$TTYIN, R3 ;; GET ADDRESS
6894 034212 022703 034460 2$: CMP $$TTYIN+22, R3 ;; BUFFER FULL?
6895 034216 101456 BLOS 4$ ;; BR IF YES
6896 034220 104410 RDCHR ;; GO READ ONE CHARACTER FROM THE TTY
6897 034222 112613 MOVB (SP)+, (R3) ;; GET CHARACTER
6898 034224 122713 000177 10$: CMPB #177, (R3) ;; IS IT A RUBOUT
6899 034230 001022 BNE 5$ ;; BR IF NO
6900 034232 005716 TST (SP) ;; IS THIS THE FIRST RUBOUT?
6901 034234 001007 BNE 6$ ;; BR IF NO
6902 034236 112737 000134 034434 MOVB #'\\, 9$ ;; TYPE A BACK SLASH
6903 034244 104401 034434 TYPE 9$
6904 034250 012716 177777 MOV #-1, (SP) ;; SET THE RUBOUT KEY
6905 034254 005303 6$: DEC R3 ;; BACKUP BY ONE
6906 034256 020327 034436 CMP R3, $$TTYIN ;; STACK EMPTY?
6907 034262 103434 BLO 4$ ;; BR IF YES
6908 034264 111337 034434 MOVB (R3), 9$ ;; SETUP TO TYPEOUT THE DELETED CHAR.
6909 034270 104401 034434 TYPE 9$ ;; GO TYPE
6910 034274 000746 BR 2$ ;; GO READ ANOTHER CHAR.
6911 034276 005716 5$: TST (SP) ;; RUBOUT KEY SET?
6912 034300 001406 BEQ 7$ ;; BR IF NO

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6913	034302	112737	000134	034434	MOVB	#'\,95	;;TYPE A BACK SLASH
6914	034310	104401	034434		TYPE	95	
6915	034314	005016			CLR	(SP)	;;CLEAR THE RUBOUT KEY
6916	034316	122713	000025	75:	CMPB	#25,(R3)	;;IS CHARACTER A CTRL U?
6917	034322	001003			BNE	85	;;IF NO
6918	034324	104401	034465		TYPE	\$CNTLU	;;TYPE A CONTROL "U"
6919	034330	000726			BR	15	;;GO START OVER
6920	034332	122713	000022	85:	CMPB	#22,(R3)	;;IS CHARACTER A "R"?
6921	034336	001011			BNE	35	;;BRANCH IF NO
6922	034340	105013			CLRB	(R3)	;;CLEAR THE CHARACTER
6923	034342	104401	001205		TYPE	\$CRLF	;;TYPE A "CR" & "LF"
6924	034346	104401	034436		TYPE	\$TTYIN	;;TYPE THE INPUT STRING
6925	034352	000717			BR	25	;;GO PICKUP ANOTHER CHARACTER
6926	034354	104401	001204	45:	TYPE	\$QUES	;;TYPE A "?"
6927	034360	000712			BR	15	;;CLEAR THE BUFFER AND LOOP
6928	034362	111337	034434	35:	MOVB	(R3),95	;;ECHO THE CHARACTER
6929	034366	104401	034434		TYPE	95	
6930	034372	122723	000015		CMPB	#15,(R3)+	;;CHECK FOR RETURN
6931	034376	001305			BNE	25	;;LOOP IF NOT RETURN
6932	034400	105063	177777		CLRB	-1(R3)	;;CLEAR RETURN (THE 15)
6933	034404	104401	001206		TYPE	\$LF	;;TYPE A LINE FEED
6934	034410	005726			TST	(SP)+	;;CLEAN RUBOUT KEY FROM THE STACK
6935	034412	012603			MOV	(SP)+,R3	;;RESTORE R3
6936	034414	011646			MOV	(SP)-,(SP)	;;ADJUST THE STACK AND PUT ADDRESS OF THE
6937	034416	016666	000004	000002	MOV	4(SP),2(SP)	;;FIRST ASCII CHARACTER ON IT
6938	034424	012766	034436	000004	MOV	#TTYIN,4(SP)	
6939	034432	000002			RTI		;;RETURN
6940	034434	000			95:	.BYTE 0	;;STORAGE FOR ASCII CHAR. TO TYPE
6941	034435	000			.BYTE 0		;;TERMINATOR
6942	034436	000022			\$TTYIN:	.BLKB 22	;;RESERVE 22 BYTES FOR TTY INPUT
6943	034460	041536	005015	000	\$CNTLC:	.ASCIZ /TC<15><12>	;;CONTROL "C"
6944	034465	136	006525	000012	\$CNTLU:	.ASCIZ /TU<15><12>	;;CONTROL "U"
6945	034472	043536	005015	000	\$CNTLG:	.ASCIZ /TG<15><12>	;;CONTROL "G"
6946	034477	015	051412	051127	\$MSWR:	.ASCIZ <15><12>/SWR = /	
6947	034504	036440	000040				
6948	034510	020040	042516	020127	\$MNEW:	.ASCIZ / NEW = /	
6949	034516	020075	000				
6950		034522			.EVEN		
6951					.SBTTL	READ AN OCTAL NUMBER FROM THE TTY	
6952							
6953					*****		
6954					;;THIS ROUTINE WILL READ AN OCTAL (ASCII) NUMBER FROM THE TTY AND		
6955					;;CHANGE IT TO BINARY.		
6956					;;THE INPUT CHARACTERS WILL BE CHECKED TO INSURED THEY ARE LEGAL		
6957					;;OCTAL DIGITS. IF AN ILLEGAL CHARACTER IS READ A "?" WILL BE TYPED		
6958					;;FOLLOWED BY A CARRIAGE RETURN-LINE FEED. THE COMPLETE NUMBER MUST		
6959					;;THEN BE RETYPED. THE INPUT IS TERMINATED BY TYPING A CARRIAGE RETURN.		
6960					;;CALL:		
6961					;;		
6962					;;RDOCT	;;READ AN OCTAL NUMBER	
6963					;;RETURN HERE	;;LOW ORDER BITS ARE ON TOP OF THE STACK	
6964					;;	;;HIGH ORDER BITS ARE IN \$HI OCT	
6965	034522	011646			\$RDOCT: MOV	(SP)-,(SP)	;;PROVIDE SPACE FOR THE
6966	034524	016666	000004	000002	MOV	4(SP),2(SP)	;;INPUT NUMBER
6967	034532	010046			MOV	R0,-(SP)	;;PUSH R0 ON STACK
6968	034534	010146			MOV	R1,-(SP)	;;PUSH R1 ON STACK

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6969 034536 010246
6970 034540 104411
6971 034542 012600
6972 034544 010037 034650
6973 034550 005001
6974 034552 005002
6975 034554 112046
6976 034556 001420
6977 034560 122716 000060
6978 034564 003026
6979 034566 122716 000067
6980 034572 002423
6981 034574 006301
6982 034576 006102
6983 034600 006301
6984 034602 006102
6985 034604 006301
6986 034606 006102
6987 034610 042716 177770
6988 034614 062601
6989 034616 000756
6990 034620 005726
6991 034622 010166 000012
6992 034626 010237 034660
6993 034632 012602
6994 034634 012601
6995 034636 012600
6996 034640 000002
6997 034642 005726
6998 034644 105010
6999 034646 104401
7000 034650 000000
7001 034652 104401 001204
7002 034656 000730
7003 034660 000000
7004
7005
7006
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7008
7009
7010
7011
7012
7013
7014
7015 034662 104413
7016 034664 016601 000002
7017 034670 012705 035001
7018 034674 012704 000014
7019 034700 012703 177770
7020 034704 012100
7021 034706 012101
7022 034710 005002
7023 034712 110245
7024 034714 010002

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```

1$: MOV R2,-(SP) ;; PUSH R2 ON STACK
RDLIN ;; READ AN ASCII LINE
MOV (SP)+,R0 ;; GET ADDRESS OF 1ST CHARACTER
MOV R0,5$ ;; 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
BGT 4$ ;; 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$: TST (SP)+ ;; CLEAN TERMINATOR FROM STACK
MOV R1,12(SP) ;; SAVE THE RESULT
MOV R2,$HI OCT
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
$HI OCT: .WORD 0 ;; HIGH ORDER BITS GO HERE
.SBTL 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,$$SDB20 ;; CALL THE ROUTINE
; RETURN ;; THE ADDRESS OF THE FIRST ASCII CHAR. IS ON THE STACK

SDB20: SAVREG
MOV 2(SP),R1 ;; SAVE ALL REGISTERS
MOV $OCTVL+13.,R5 ;; PICKUP THE POINTER TO LOW WORD
MOV #12.,R4 ;; POINTER TO DATA TABLE
MOV #C7,R3 ;; DO ELEVEN CHARACTERS
MOV (R1)+,R0 ;; MASK
MOV (R1)+,R1 ;; LOWER WORD
CLR R2 ;; HIGH WORD
MOV R2,5$ ;; TERMINATOR
1$: MOVB R2,-(R5) ;; PUT CHARACTER IN DATA TABLE
MOV R0,R2 ;; GET THIS DIGIT

```

```

7025 034716 005304      DEC      R4      ;; COUNT THIS CHARACTER
7026 034720 003007      BGT      3$      ;; BR IF NOT THE LAST DIGIT
7027 034722 001405      BEQ      2$      ;; BR IF IT IS THE LAST DIGIT
7028 034724 005205      INC      R5      ;; ALL DIGITS DONE-ADJUST POINTER FOR FIRST
7029 034726 010566 000002 MOV      R5,2(SP) ;; ASCII CHAR. & PUT IT ON THE STACK
7030 034732 104414      RESREG      ;; RESTORE ALL REGISTERS
7031 034734 000207      RTS      PC      ;; RETURN TO USER
7032 034736 006203 2$: ASR      R3      ;; POSITION THE MASK FOR THE LAST DIGIT
7033 034740 006001 3$: ROR      R1      ;; POSITION THE BINARY NUMBER FOR
7034 034742 006000      ROR      R0      ;; THE NEXT OCTAL DIGIT
7035 034744 006001      ROR      R1
7036 034746 006000      ROR      R0
7037 034750 006001      ROR      R1
7038 034752 006000      ROR      R0
7039 034754 040302 000060 BIC      R3,R2      ;; MASK OUT ALL JUNK
7040 034756 062702      ADD      #0,R2      ;; MAKE THIS CHAR. ASCII
7041 034762 000753      BR      1$      ;; GO PUT IT IN THE DATA TABLE
7042 034764 000016      $OCTVL: .BLKB 14.      ;; RESERVE DATA TABLE
7043
7044      .SBTTL DOUBLE LENGTH BINARY TO DECIMAL ASCII CONVERT ROUTINE
7045
7046      ;; *****
7047      ;; THIS ROUTINE WILL CONVERT A 32-BIT BINARY NUMBER TO AN UNSIGNED
7048      ;; DECIMAL (ASCII) NUMBER. THE SIGN OF THE BINARY NUMBER MUST BE
7049      ;; POSITIVE.
7050      ;; CALL
7051      ;;      MOV      #PNTR, -(SP)      ;; POINTER TO LOW WORD OF BINARY NUMBER
7052      ;;      JSR      PC, @#$DB2D      ;; THE FIRST ADDRESS OF ASCII
7053      ;;      RETURN      ;; IS ON THE STACK
7054
7055      $DB2D: SAVREG      ;; SAVE REGISTERS
7056 035002 104413      MOV      2(SP), R2      ;; PICKUP THE DATA POINTER
7057 035004 016602 000002 MOV      #SDECVL, R0      ;; GET ADDRESS OF "SDECVL" STRING
7058 035010 012700 035162 MOV      R0, 2(SP)      ;; PUT ADDRESS OF ASCII STRING ON STACK
7059 035014 010066 000002 MOV      (R2)+, R1      ;; PICKUP THE BINARY NUMBER
7060 035020 012201      MOV      (R2)+, R2
7061 035022 012202      MOV      #10, 4$      ;; SET UP TO DO 10 CONVERSIONS
7062 035024 012737 000012 035100 MOV      #STNPNR, R4      ;; ADDRESS OF TEN POWER
7063 035032 012704 035112      MOV      #STNPNR+2, R5
7064 035036 012705 035114      1$: CLR      R3      ;; CLEAR PARTIAL
7065 035042 005003      2$: SUB      (R4), R1      ;; SUBTRACT TEN POWER
7066 035044 161401      SBC      R2
7067 035046 005602      SUB      (R5), R2
7068 035050 161502      BLT      3$      ;; BR IF TEN POWER TOO LARGE
7069 035052 002402      INC      R3      ;; ADD 1 TO PARTIAL
7070 035054 005203      BR      2$      ;; LOOP
7071 035056 000772      3$: ADD      (R4)+, R1      ;; RESTORE SUBTRACTED VALUE
7072 035060 062401      ADC      R2
7073 035062 005502      ADD      (R4)+, R2
7074 035064 062402      CMP      (R5)+, (R5)+      ;; MOVE TO NEXT TEN POWER
7075 035066 022525      BIS      #0, R3      ;; CHANGE PARTIAL TO ASCII
7076 035070 052703 000060 MOV      R3, (R0)+      ;; SAVE IT
7077 035074 110320      DEC      (PC)+      ;; DONE?
7078 035076 005327      4$: .WORD 0
7079 035100 000000      BNE      1$      ;; BR IF NO
7080 035102 001357

```

D11

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DOUBLE LENGTH BINARY TO DECIMAL ASCII CONVERT ROUTINE

SEQ 0132

7081	035104	105020		CLAB	(RO)+	:: TERMINATOR
7082	035106	104414		RESREG		:: RESTORE REGISTERS
7083	035110	000207		RTS	PC	:: RETURN
7084	035112	145000	\$TNPWR:	145000		:: 1.0E09
7085	035114	035632		35632		
7086	035116	160400		160400		:: 1.0E08
7087	035120	002765		2765		
7088	035122	113200		113200		:: 1.0E07
7089	035124	000230		230		
7090	035126	041100		041100		:: 1.0E06
7091	035130	000017		17		
7092	035132	103240		103240		:: 1.0E05
7093	035134	000001		1		
7094	035136	023420		23420		:: 1.0E04
7095	035140	000000		0		
7096	035142	001750		1750		:: 1.0E03
7097	035144	000000		0		
7098	035146	000144		144		:: 1.0E02
7099	035150	000000		0		
7100	035152	000012		12		:: 1.0E01
7101	035154	000000		0		
7102	035156	000001		1		:: 1.0E00
7103	035160	000000		0		
7104	035162	000014	\$DECVL:	.BLKB 12.		:: RESERVE STORAGE FOR ASCII STRING
7105			.SBTTL	SINGLE LENGTH BINARY TO DECIMAL ASCII ROUTINE		
7106						
7107						
7108						
7109						
7110						
7111						
7112						
7113						
7114						
7115						
7116	035176	016637	000002	035226	\$SB2D: MOV 2(SP), 1\$	:: SAVE BINARY NUMBER
7117	035204	012746	035226		MOV 1\$, -(SP)	:: SET POINTER
7118	035210	004737	035002		JSR PC, 2*\$SB2D	:: CALL DOUBLE LENGTH CONVERT
7119	035214	062716	000005		ADD 5, (SP)	:: ONLY ALLOW FIVE CHARACTERS
7120	035220	012666	000002		MOV (SP)+, 2(SP)	:: PICKUP POINTER
7121	035224	000207			RTS PC	:: RETURN
7122	035226	000000	000000		1\$: .WORD 0,0	
7123					.SBTTL TYPE NUMERICAL ASCII STRING SUPPRESS LEADING ZEROS	
7124						
7125						
7126						
7127						
7128						
7129						
7130						
7131						
7132						
7133	035232	010046			\$SUPRS: MOV RO, -(SP)	:: SAVE RO
7134	035234	016600	000004		MOV 4(SP), RO	:: PICKUP THE POINTER
7135	035240	105710			1\$: TSTB (RO)	:: TERMINATEOR?
7136	035242	001403			BEQ 2\$	:: BR IF YES

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TYPE NUMERICAL ASCIZ STRING SUPPRESS LEADING ZEROS

SEQ 0133

7137 035244 122720 000060
7138 035250 001773
7139 035252 005300
7140 035254 010037 035262
7141 035260 104401
7142 035262 000000
7143 035264 012600
7144 035266 012616
7145 035270 000207
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7160 035272
7161 035272 010046
7162 035274 010146
7163 035276 010246
7164 035300 005046
7165 035302 016601 000012
7166 035306 100002
7167 035310 005216
7168 035312 005401
7169 035314 016602 000014
7170 035320 100002
7171 035322 005316
7172 035324 005402
7173 035326 012746 000021
7174 035332 005000
7175 035334 103001
7176 035336 060200
7177 035340 006000
7178 035342 006001
7179 035344 005316
7180 035346 001372
7181 035350 022616
7182 035352 001403
7183 035354 005400
7184 035356 005401
7185 035360 005600
7186 035362 005726
7187 035364 010066 000012
7188 035370 010166 000010
7189 035374 012602
7190 035376 012601
7191 035400 012600
7192 035402 000207

```

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

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

```

.SBTTL SAVE AND RESTORE RO-R5 ROUTINES

```

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

```

```

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

```

.SBTTL TRAP DECODER

```

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

```

```

$TRAP:  MOV      R0,-(SP)      ;; SAVE R0
        MOV      2(SP),R0     ;; GET TRAP ADDRESS
        TST      -(R0)        ;; BACKUP BY 2

```

```

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7210 035404
7211 035404 010046
7212 035406 010146
7213 035410 010246
7214 035412 010346
7215 035414 010446
7216 035416 010546
7217 035420 016646 000022
7218 035424 016646 000022
7219 035430 016646 000022
7220 035434 016646 000022
7221 035440 000002
7222
7223
7224
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7226 035442
7227 035442 012666 000022
7228 035446 012666 000022
7229 035452 012666 000022
7230 035456 012666 000022
7231 035462 012605
7232 035464 012604
7233 035466 012603
7234 035470 012602
7235 035472 012601
7236 035474 012600
7237 035476 000002
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7246 035500 010046
7247 035502 016600 000002
7248 035506 005740

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```

7249 035510 111000          MOVB    (RO),RO          ;;GET RIGHT BYTE OF TRAP
7250 035512 006300          ASL      RO              ;;POSITION FOR INDEXING
7251 035514 016000 035534    MOV      STRPAD(RO),RO    ;;INDEX TO TABLE
7252 035520 000200          RTS      RO              ;;GO TO ROUTINE
7253
7254
7255                      ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
7256
7257 035522 011646 000004 000002 STRAP2: MOV    (SP),-(SP)      ;;MOVE THE PC DOWN
7258 035524 016666          MOV      4(SP),2(SP)      ;;MOVE THE PSW DOWN
7259 035532 000002          RTI                      ;;RESTORE THE PSW
7260
7261                      .SBTTL  TRAP TABLE
7262
7263                      ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
7264                      ;*BY THE "TRAP" INSTRUCTION.
7265
7266                      ;
7267                      ROUTINE
7268                      -----
7268 035534 035522 STRPAD: .WORD  STRAP2
7269 035536 032050          $TYPE   ;;CALL=TYPE      TRAP+1(104401) TTY TYPEOUT ROUTINE
7270 035540 033050          $TYPOC  ;;CALL=TYPOC     TRAP+2(104402) TYPE OCTAL NUMBER (WITH LEADING ZEROS)
7271 035542 033024          $TYPOS  ;;CALL=TYPOS     TRAP+3(104403) TYPE OCTAL NUMBER (NO LEADING ZEROS)
7272 035544 033064          $TYPON  ;;CALL=TYPON     TRAP+4(104404) TYPE OCTAL NUMBER (AS PER LAST CALL)
7273 035546 032332          $TYPDS  ;;CALL=TYPDS     TRAP+5(104405) TYPE DECIMAL NUMBER (WITH SIGN)
7274
7275 035550 033640          $GTSWR   ;;CALL=GTSWR     TRAP+6(104406) GET SOFT-SWR SETTING
7276
7277 035552 033550          $CKSWR   ;;CALL=CKSWR     TRAP+7(104407) TEST FOR CHANGE IN SOFT-SWR
7278 035554 034112          $RDCHR   ;;CALL=RDCHR     TRAP+10(104410) TTY TYPEIN CHARACTER ROUTINE
7279 035556 034202          $RDLIN   ;;CALL=RDLIN     TRAP+11(104411) TTY TYPEIN STRING ROUTINE
7280 035560 034522          $RDOCT   ;;CALL=RDOCT     TRAP+12(104412) READ AN OCTAL NUMBER FROM TTY
7281 035562 035404          $SAVREG  ;;CALL=SAVREG     TRAP+13(104413) SAVE RO-R5 ROUTINE
7282 035564 035442          $RESREG  ;;CALL=RESREG     TRAP+14(104414) RESTORE RO-R5 ROUTINE
7283 035566 030254          $COPI$   ;;CALL=SCOP1     TRAP+15(104415) INTERNAL LOOP ON ERROR
7284

```

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TRAP TABLE

SEQ 0136

.SBTTL SERVICE MESSAGES

MSG1: .ASCII <CR><LF>/UNIBUS RK06 DRIVE DIAGNOSTIC/

.ASCII <CR><LF>/MAINDEC-11-DZR6J-D-PB/<CR><LF>

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

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

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

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

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

.ASCII <CR><LF>/A. HEADS MANUALLY LOADED/

7285				
7286				
7287				
7288				
7289	035570	005015	047125	041111
7290	035576	051525	051040	030113
7291	035604	020066	051104	053111
7292	035612	020105	044504	043501
7293	035620	047516	052123	041511
7294	035626	005015	040515	047111
7295	035634	042504	026503	030461
7296	035642	042055	051132	045066
7297	035650	042055	050055	006502
7298	035656	012		
7299	035657	015	004412	025052
7300	035664	025052	020052	040503
7301	035672	052125	047511	020116
7302	035700	025052	025052	006452
7303	035706	012		
7304	035707	015	052012	044510
7305	035714	020123	051120	043517
7306	035722	040522	020115	044123
7307	035730	052517	042114	020040
7308	035736	042502	044040	046101
7309	035744	042524	020104	047117
7310	035752	054514	041040	020131
7311	035760	054524	044520	043516
7312	035766	041440	047117	051124
7313	035774	046117	041455	
7314	036000	005015	052117	042510
7315	036006	053522	051511	020105
7316	036014	040503	052122	044522
7317	036022	043504	020105	047506
7318	036030	046522	052101	044524
7319	036036	043516	040440	042116
7320	036044	020054	051117	052040
7321	036052	042510	042040	053105
7322	036060	041511	105	
7323	036063	015	046412	054501
7324	036070	041040	020105	042514
7325	036076	052106	044440	020116
7326	036104	047101	052440	042116
7327	036112	052105	051105	044515
7328	036120	042516	020104	052123
7329	036126	052101	006505	012
7330	036133	015	044412	044516
7331	036140	044524	046101	054514
7332	036146	020054	051104	053111
7333	036154	051505	052040	020117
7334	036162	042502	052040	051505
7335	036170	042524	020104	044123
7336	036176	052517	042114	044040
7337	036204	053101	035105	005015
7338	036212	005015	027101	044040
7339	036220	040505	051504	046440
7340	036226	047101	040525	046114

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SEQ 0137

7341	036234	020131	047514	042101	
7342	036242	042105			
7343	036244	005015	027102	041440	.ASCII <CR><LF>/B. CORRECT PORT SELECTED/
7344	036252	051117	042522	052103	
7345	036260	050040	051117	020124	
7346	036266	042523	042514	052103	
7347	036274	042105			
7348	036276	005015	027103	053440	.ASCII <CR><LF>/C. WRITE LOCK DISABLED/
7349	036304	044522	042524	046040	
7350	036312	041517	020113	044504	
7351	036320	040523	046102	042105	
7352	036326	005015	027104	042040	.ASCII <CR><LF>/D. DRIVE READY INDICATOR ON/<CR><LF>
7353	036334	044522	042526	051040	
7354	036342	040505	054504	044440	
7355	036350	042116	041511	052101	
7356	036356	051117	047440	006516	
7357	036364	012			
7358	036365	015	042012	044522	.ASCII <CR><LF>/DRIVES NOT TO BE TESTED MUST HAVE/
7359	036372	042526	020123	047516	
7360	036400	020124	047524	041040	
7361	036406	020105	042524	052123	
7362	036414	042105	046440	051525	
7363	036422	020124	040510	042526	
7364	036430	005015	047502	044124	.ASCIIZ <CR><LF>/BOTH PORTS DESELECTED/<CR><LF>
7365	036436	050040	051117	051524	
7366	036444	042040	051505	046105	
7367	036452	041505	042524	006504	
7368	036460	000012			
7369					
7370	036462	005015	042502	051440	MSG2: .ASCIIZ <CR><LF>/BE SURE TO PUT SCRATCH PACK IN DRIVE D/
7371	036470	051125	020105	047524	
7372	036476	050040	052125	051440	
7373	036504	051103	052101	044103	
7374	036512	050040	041501	020113	
7375	036520	047111	042040	044522	
7376	036526	042526	030040	000	
7377	036533	015	042012	044522	MSG3: .ASCIIZ <CR><LF>/DRIVE(S) TO BE TESTED: /
7378	036540	042526	051450	020051	
7379	036546	047524	041040	020105	
7380	036554	042524	052123	042105	
7381	036562	020072	000		
7382	036565	015	052012	050131	MSG4: .ASCIIZ <CR><LF>/TYPE BUSS ADDRESS IF NOT 177440: /
7383	036572	020105	052502	051523	
7384	036600	040440	042104	042522	
7385	036606	051523	044440	020106	
7386	036614	047516	020124	033461	
7387	036622	032067	030064	020072	
7388	036630	000040			
7389	036632	005015	054524	042520	MSG5: .ASCIIZ <CR><LF>/TYPE CONTROLLER INTERRUPT VECTOR IF NOT 210: /
7390	036640	041440	047117	051124	
7391	036646	046117	042514	020122	
7392	036654	047111	042524	051122	
7393	036662	050125	020124	042525	
7394	036670	052103	051117	044440	
7395	036676	020106	047516	020124	
7396	036704	030462	035060	020040	

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SEQ 0138

7397	036712	000			
7398	036713	015	044412	052116	MSG6: .ASCIZ <CR><LF>/INTERRUPT OCCURRED AT PC=
7399	036720	051105	052522	052120	
7400	036726	047440	041503	051125	
7401	036734	042522	020104	052101	
7402	036742	050040	036503	000	
7403	036747	015	042012	044522	MSG7: .ASCIZ <CR><LF>/DRIVE 0 WILL NOT BE TESTED/
7404	036754	042526	030040	053440	
7405	036762	046111	020114	047516	
7406	036770	020124	042502	052040	
7407	036776	051505	042524	000104	
7408	037004	005015	047111	042524	MSG8: .ASCIZ <CR><LF>/INTERLOCKS TEST/<CR><LF>
7409	037012	046122	041517	051513	
7410	037020	052040	051505	006524	
7411	037026	000012			
7412	037030	005015	042522	047515	MSG9: .ASCIZ <CR><LF>/REMOVE UNIT SELECT PLUG/
7413	037036	042526	052440	044516	
7414	037044	020124	042523	042514	
7415	037052	052103	050040	052514	
7416	037060	000107			
7417	037062	005015	053412	046111	MSG10: .ASCIZ <CR><LF><LF>/WILL TEST DRIVES:/
7418	037070	020114	042524	052123	
7419	037076	042040	044522	042526	
7420	037104	035123	000		
7421	037107	015	005012	047520	MSG11: .ASCIZ <CR><LF><LF>/POWER UP RESTART TO TEST 1/<CR><LF>
7422	037114	042527	020122	050125	
7423	037122	051040	051505	040524	
7424	037130	052122	052040	020117	
7425	037136	042524	052123	030440	
7426	037144	005015	000		
7427	037147	116	047117	006505	MSG12: .ASCIZ /NONE/<CR><LF>
7428	037154	000012			
7429	037156	005015	047516	046040	MSG13: .ASCII <CR><LF>/NO L OR P CLOCKS PRESENT/
7430	037164	047440	020122	020120	
7431	037172	046103	041517	051513	
7432	037200	050040	042522	042523	
7433	037206	052116			
7434	037210	005015	046101	020114	.ASCIZ <CR><LF>/ALL TIMING TESTS BYPASSED/
7435	037216	044524	044515	043516	
7436	037224	052040	051505	051524	
7437	037232	041040	050131	051501	
7438	037240	042523	000104		
7439	037244	005015	054502	040520	MSG14: .ASCIZ <CR><LF>/BYPASSING DRIVE /
7440	037252	051523	047111	020107	
7441	037260	051104	053111	020105	
7442	037266	000			
7443	037267	015	005012	051104	MSG15: .ASCIZ <CR><LF><LF>/DRIVE /
7444	037274	053111	020105	000	
7445	037301	015	042012	044522	MSG16: .ASCIZ <CR><LF>/DRIVE SERIAL NO. /
7446	037306	042526	051440	051105	
7447	037314	040511	020114	047516	
7448	037322	020056	000		
7449	037325	015	041412	051101	MSG17: .ASCIZ <CR><LF>/CARTRIDGE SERIAL NO. /
7450	037332	051124	042111	042507	
7451	037340	051440	051105	040511	
7452	037346	020114	047516	020056	

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SEQ 0139

7453	037354	000			
7454	037355	015	052412	044516	MSG18: .ASCIZ <CR><LF>/UNIT SELECT PLUG TEST/<CR><LF>
7455	037362	020124	042523	042514	
7456	037370	052103	050040	052514	
7457	037376	020107	042524	052123	
7458	037404	005015	000		
7459	037407	015	050012	051117	MSG19: .ASCIZ <CR><LF>/PORT SELECTION TESTS/<CR><LF>
7460	037414	020124	042523	042514	
7461	037422	052103	047511	020116	
7462	037430	042524	052123	006523	
7463	037436	000012			
7464	037440	005015	041501	046040	MSG21: .ASCIZ <CR><LF>/AC LOW DETECTION TEST-PART 1/<CR><LF>
7465	037446	053517	042040	052105	
7466	037454	041505	044524	047117	
7467	037462	052040	051505	026524	
7468	037470	040520	052122	030440	
7469	037476	005015	000		
7470	037501	015	047012	047117	MSG22: .ASCIZ <CR><LF>/NON-EXECUTABLE FUNCTION (NXF) DETECTION TEST/<CR><LF>
7471	037506	042455	042530	052503	
7472	037514	040524	046102	020105	
7473	037522	052506	041516	044524	
7474	037530	047117	024040	054116	
7475	037536	024506	042040	052105	
7476	037544	041505	044524	047117	
7477	037552	052040	051505	006524	
7478	037560	000012			
7479	037562	005015	051127	052111	MSG24: .ASCIZ <CR><LF>/WRITE LOCK TEST/<CR><LF>
7480	037570	020105	047514	045503	
7481	037576	052040	051505	006524	
7482	037604	000012			
7483	037606	005015	041501	046040	MSG26: .ASCIZ <CR><LF>/AC LOW DETECTION TEST-PART 2/<CR><LF>
7484	037614	053517	042040	052105	
7485	037622	041505	044524	047117	
7486	037630	052040	051505	026524	
7487	037636	040520	052122	031040	
7488	037644	005015	000		
7489	037647	015	005012	046101	MSG27: .ASCIZ <CR><LF><LF>/ALL DRIVES TESTED/<CR><LF><LF>
7490	037654	020114	051104	053111	
7491	037662	051505	052040	051505	
7492	037670	042524	006504	005012	
7493	037676	000			
7494	037677	015	046412	046125	MSG28: .ASCIZ <CR><LF>/MULTIPLE DRIVE DETECTION TEST/<CR><LF>
7495	037704	044524	046120	020105	
7496	037712	051104	053111	020105	
7497	037720	042504	042524	052103	
7498	037726	047511	020116	042524	
7499	037734	052123	005015	000	
7500	037741	015	050012	042514	MSG29: .ASCIZ <CR><LF>/PLEASE WAIT, HEADS BEING LOADED/<CR><LF>
7501	037746	051501	020105	040527	
7502	037754	052111	020054	042510	
7503	037762	042101	020123	042502	
7504	037770	047111	020107	047514	
7505	037776	042101	042105	005015	
7506	040004	000			
7507	040005	015	053012	051105	MSG30: .ASCIZ <CR><LF>/VERIFY DOOR CAN NOW BE OPENED & LEAVE IT OPEN/<CR><LF>
7508	040012	043111	020131	047504	

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SEQ 0140

7509	040020	051117	041440	047101	
7510	040026	047040	053517	041040	
7511	040034	020105	050117	047105	
7512	040042	042105	023040	046040	
7513	040050	040505	042526	044440	
7514	040056	020124	050117	047105	
7515	040064	005015	000		
7516	040067	015	037412	005015	MSG31: .ASCIZ <CR><LF>/?<CR><LF>
7517	040074	000			
7518	040075	015	051012	046505	MSG32: .ASCIZ <CR><LF>/REMOVE DISK PACK & CLOSE DOOR/
7519	040102	053117	020105	044504	
7520	040110	045523	050040	041501	
7521	040116	020113	020046	046103	
7522	040124	051517	020105	047504	
7523	040132	051117	000		
7524	040135	015	042012	050105	MSG33: .ASCIZ <CR><LF>/DEPRESS 'RUN-STOP' SWITCH TO 'RUN' WHILE DOOR OPEN/
7525	040142	042522	051523	023440	
7526	040150	052522	026516	052123	
7527	040156	050117	020047	053523	
7528	040164	052111	044103	052040	
7529	040172	020117	051047	047125	
7530	040200	020047	044127	046111	
7531	040206	020105	047504	051117	
7532	040214	047440	042520	000116	
7533	040222	005015	042526	044522	MSG34: .ASCIZ <CR><LF>/VERIFY SPINDLE DOES NOT START & HEADS DO NOT LOAD/<CR><LF>
7534	040230	054506	051440	044520	
7535	040236	042116	042514	042040	
7536	040244	042517	020123	047516	
7537	040252	020124	052123	051101	
7538	040260	020124	020046	042510	
7539	040266	042101	020123	047504	
7540	040274	047040	052117	046040	
7541	040302	040517	006504	000012	
7542	040310	005015	042504	051120	MSG35: .ASCIZ <CR><LF>/DEPRESS 'RUN-STOP' SWITCH TO 'RUN' WHILE CARTRIDGE REMOVED/
7543	040316	051505	020123	051047	
7544	040324	047125	051455	047524	
7545	040332	023520	051440	044527	
7546	040340	041524	020110	047524	
7547	040346	023440	052522	023516	
7548	040354	053440	044510	042514	
7549	040362	041440	051101	051124	
7550	040370	042111	042507	051040	
7551	040376	046505	053117	042105	
7552	040404	000			
7553	040405	015	044412	051516	MSG36: .ASCIZ <CR><LF>/INSERT DISK PACK, DEPRESS 'RUN-STOP' TO 'RUN' & CLOSE DOOR/
7554	040412	051105	020124	044504	
7555	040420	045523	050040	041501	
7556	040426	026113	042040	050105	
7557	040434	042522	051523	023440	
7558	040442	052522	026516	052123	
7559	040450	050117	020047	047524	
7560	040456	023440	052522	023516	
7561	040464	023040	041440	047514	
7562	040472	042523	042040	047517	
7563	040500	000122			
7564	040502	005015	042504	051120	MSG37: .ASCIZ <CR><LF>/DEPRESS SPACE BAR WHEN FINISHED/<CR><LF>

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SEQ 0141

7565	040510	051505	020123	050123
7566	040516	041501	020105	040502
7567	040524	020122	044127	047105
7568	040532	043040	047111	051511
7569	040540	042510	006504	000012
7570	040546	005015	047111	042523
7571	040554	052122	052440	044516
7572	040562	020124	042523	042514
7573	040570	052103	050040	052514
7574	040576	051507	020054	047111
7575	040604	040440	054516	047440
7576	040612	042122	051105	
7577	040616	005015	044124	020105
7578	040624	051120	043517	040522
7579	040632	020115	044527	046114
7580	040640	042440	044103	020117
7581	040646	044124	020105	047125
7582	040654	052111	051440	046105
7583	040662	041505	020124	046120
7584	040670	043525	047040	046525
7585	040676	042502	006522	000012
7586	040704	005015	042504	051120
7587	040712	051505	020123	047503
7588	040720	052116	047522	026514
7589	040726	020105	047524	042440
7590	040734	044530	020124	042524
7591	040742	052123	005015	000
7592	040747	015	053012	046117
7593	040754	046525	020105	040526
7594	040762	044514	020104	047516
7595	040770	020124	042523	124
7596	040775	015	046412	045501
7597	041002	020105	052523	042522
7598	041010	047440	044522	044507
7599	041016	040516	020114	047125
7600	041024	052111	051440	046105
7601	041032	041505	020124	046120
7602	041040	043525	044440	020123
7603	041046	047111	042523	052122
7604	041054	042105	005015	000
7605	041061	015	042012	051505
7606	041066	046105	041505	020124
7607	041074	047520	052122	044440
7608	041102	020116	051525	020105
7609	041110	020046	042523	042514
7610	041116	052103	047440	050120
7611	041124	051517	052111	020105
7612	041132	047520	052122	005015
7613	041140	000		
7614	041141	015	042012	051505
7615	041146	046105	041505	020124
7616	041154	051127	047117	020107
7617	041162	047520	052122	023040
7618	041170	051440	046105	041505
7619	041176	020124	047503	051122
7620	041204	041505	020124	047520

MSG38: .ASCII <CR><LF>/INSERT UNIT SELECT PLUGS, IN ANY ORDER/

.ASCIZ <CR><LF>/THE PROGRAM WILL ECHO THE UNIT SELECT PLUG NUMBER/<CR><LF>

MSG39: .ASCIZ <CR><LF>/DEPRESS CONTROL-E TO EXIT TEST/<CR><LF>

MSG40: .ASCII <CR><LF>/VOLUME VALID NOT SET/

.ASCIZ <CR><LF>/MAKE SURE ORIGINAL UNIT SELECT PLUG IS INSERTED/<CR><LF>

MSG41: .ASCIZ <CR><LF>/DESELECT PORT IN USE & SELECT OPPOSITE PORT/<CR><LF>

MSG42: .ASCIZ <CR><LF>/DESELECT WRONG PORT & SELECT CORRECT PORT/<CR><LF>

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SEQ 0142

7621	041212	052122	005015	000
7622	041217	015	042012	051505
7623	041224	046105	041505	020124
7624	041232	047502	044124	050040
7625	041240	051117	051524	005015
7626	041246	000		
7627	041247	015	051412	046105
7628	041254	041505	020124	047503
7629	041262	051122	041505	020124
7630	041270	047520	052122	005015
7631	041276	000		
7632	041277	015	041412	051117
7633	041304	042522	052103	050040
7634	041312	051117	020124	047516
7635	041320	020124	042523	042514
7636	041326	052103	042105	020054
7637	041334	051124	020131	043501
7638	041342	044501	006516	000012
7639	041350	005015	042526	044522
7640	041356	054506	042040	047517
7641	041364	020122	040503	047116
7642	041372	052117	041040	020105
7643	041400	050117	047105	042105
7644	041406	024040	047504	047040
7645	041414	052117	043040	051117
7646	041422	042503	006451	000012
7647	041430	005015	052524	047122
7648	041436	047440	043106	040440
7649	041444	020103	047520	042527
7650	041452	020122	051106	046517
7651	041460	041040	044105	047111
7652	041466	020104	044124	020105
7653	041474	045522	033060	005015
7654	041502	000		
7655	041503	015	051412	044527
7656	041510	041524	020110	041501
7657	041516	050040	053517	051105
7658	041524	041040	041501	020113
7659	041532	047117	000	
7660	041535	015	046412	046517
7661	041542	047105	040524	044522
7662	041550	054514	051040	046505
7663	041556	053117	020105	020046
7664	041564	047111	042523	052122
7665	041572	052040	042510	051440
7666	041600	046501	020105	047125
7667	041606	052111	051440	046105
7668	041614	041505	020124	046120
7669	041622	043525		
7670	041624	005015	047524	051040
7671	041632	051505	052105	053040
7672	041640	046117	046525	020105
7673	041646	040526	044514	006504
7674	041654	000012		
7675	041656	005015	042504	051120
7676	041664	051505	020123	050123

MSG43: .ASCIZ <CR><LF>/DESELECT BOTH PORTS/<CR><LF>

MSG44: .ASCIZ <CR><LF>/SELECT CORRECT PORT/<CR><LF>

MSG45: .ASCIZ <CR><LF>/CORRECT PORT NOT SELECTED, TRY AGAIN/<CR><LF>

MSG47: .ASCIZ <CR><LF>/VERIFY DOOR CANNOT BE OPENED (DO NOT FORCE)/<CR><LF>

MSG49: .ASCIZ <CR><LF>/TURN OFF AC POWER FROM BEHIND THE RK06/<CR><LF>

MSG50: .ASCIZ <CR><LF>/SWITCH AC POWER BACK ON/

MSG51: .ASCII <CR><LF>/MOMENTARILY REMOVE & INSERT THE SAME UNIT SELECT PLUG/

.ASCIZ <CR><LF>/TO RESET VOLUME VALID/<CR><LF>

MSG52: .ASCII <CR><LF>/DEPRESS SPACE TO DO TEST/

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SEQ 0143

7677	041672	041501	020105	047524
7678	041700	042040	020117	042524
7679	041706	052123		
7680	041710	005015	051117	041440
7681	041716	047117	051124	046117
7682	041724	042455	052040	020117
7683	041732	054502	040520	051523
7684	041740	042440	052116	051111
7685	041746	020105	042524	052123
7686	041754	005015	000	
7687	041757	015	042012	051511
7688	041764	041101	042514	052040
7689	041772	042510	053440	044522
7690	042000	042524	046040	041517
7691	042006	020113	053523	052111
7692	042014	044103	020054	042526
7693	042022	044522	054506	046040
7694	042030	043511	052110	043440
7695	042036	042517	020123	043117
7696	042044	006506	000012	
7697	042050	005015	047105	041101
7698	042056	042514	052040	042510
7699	042064	053440	044522	042524
7700	042072	046040	041517	020113
7701	042100	053523	052111	044103
7702	042106	020054	042526	044522
7703	042114	054506	046040	043511
7704	042122	052110	043440	042517
7705	042130	020123	047117	005015
7706	042136	000		
7707	042137	015	042412	044530
7708	042144	020124	042524	052123
7709	042152	053440	052111	020110
7710	042160	051117	043511	047111
7711	042166	046101	052440	044516
7712	042174	020124	042523	042514
7713	042202	052103	050040	052514
7714	042210	020107	047516	020056
7715	042216	000		
7716	042217	015	040412	044514
7717	042224	047107	042515	052116
7718	042232	041440	051101	051124
7719	042240	042111	042507	052440
7720	042246	042523	104	
7721	042251	015	050012	047522
7722	042256	051107	046501	053440
7723	042264	046111	020114	054502
7724	042272	040520	051523	052040
7725	042300	042510	053440	044522
7726	042306	042524	046040	041517
7727	042314	020113	042524	052123
7728	042322	005015	047101	020104
7729	042330	042522	042101	053455
7730	042336	044522	042524	042040
7731	042344	052101	020101	047520
7732	042352	052122	047511	020116

.ASCIZ <CR><LF>/OR CONTROL-E TO BYPASS ENTIRE TEST/<CR><LF>

MSG53: .ASCIZ <CR><LF>/DISABLE THE WRITE LOCK SWITCH, VERIFY LIGHT GOES OFF/<CR><LF>

MSG54: .ASCIZ <CR><LF>/ENABLE THE WRITE LOCK SWITCH, VERIFY LIGHT GOES ON/<CR><LF>

MSG55: .ASCIZ <CR><LF>/EXIT TEST WITH ORIGINAL UNIT SELECT PLUG NO. /

MSG56: .ASCII <CR><LF>/ALIGNMENT CARTRIDGE USED/

.ASCII <CR><LF>/PROGRAM WILL BYPASS THE WRITE LOCK TEST/

.ASCIZ <CR><LF>/AND READ-WRITE DATA PORTION OF AC LOW DETECTION TEST-PART 2/<CR>

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SEQ 0144

7733	042360	043117	040440	020103
7734	042366	047514	020127	042504
7735	042374	042524	052103	047511
7736	042402	020116	042524	052123
7737	042410	050055	051101	020124
7738	042416	006462	005012	000
7739	042423	015	053012	051105
7740	042430	043111	020131	040502
7741	042436	052124	051105	020131
7742	042444	042522	051124	041501
7743	042452	020124	052506	041516
7744	042460	044524	047117	046101
7745	042466	005015	000	
7746	042471	015	046012	040517
7747	042476	020104	042510	042101
7748	042504	020123	047117	040440
7749	042512	046114	042040	044522
7750	042520	042526	020123	047524
7751	042526	041040	020105	042524
7752	042534	052123	042105	043040
7753	042542	051117	046440	051504
7754	042550	005015	000	
7755	042553	015	044412	051516
7756	042560	051105	020124	040523
7757	042566	042515	052440	044516
7758	042574	020124	042523	042514
7759	042602	052103	050040	052514
7760	042610	020107	052516	041115
7761	042616	051105	044440	020116
7762	042624	047101	020131	020062
7763	042632	051104	053111	051505
7764	042640	052040	020117	042502
7765	042646	052040	051505	042524
7766	042654	000104		
7767	042656	005015	047111	042523
7768	042664	052122	041440	051117
7769	042672	042522	052103	052440
7770	042700	044516	020124	042523
7771	042706	042514	052103	050040
7772	042714	052514	051507	023040
7773	042722	046040	040517	020104
7774	042730	042510	042101	123
7775	042735	015	047412	020116
7776	042742	051120	053105	047511
7777	042750	051525	031040	042040
7778	042756	044522	042526	006523
7779	042764	000012		
7780	042766	005015	052515	052114
7781	042774	050111	042514	042040
7782	043002	044522	042526	020123
7783	043010	047506	047125	020104
7784	043016	047117	042040	044522
7785	043024	042526	047040	027117
7786	043032	000040		
7787	043034	005015	054502	040520
7788	043042	051523	047111	020107

MSG57: .ASCIZ <CR><LF>/VERIFY BATTERY RETRACT FUNCTIONAL/<CR><LF>

MSG58: .ASCIZ <CR><LF>/LOAD HEADS ON ALL DRIVES TO BE TESTED FOR MDS/<CR><LF>

MSG59: .ASCIZ <CR><LF>/INSERT SAME UNIT SELECT PLUG NUMBER IN ANY 2 DRIVES TO BE TESTE

MSG60: .ASCII <CR><LF>/INSERT CORRECT UNIT SELECT PLUGS & LOAD HEADS/

.ASCIZ <CR><LF>/ON PREVIOUS 2 DRIVES/<CR><LF>

MSG61: .ASCIZ <CR><LF>/MULTIPLE DRIVES FOUND ON DRIVE NO. /

MSG62: .ASCII <CR><LF>/BYPASSING MULT. DRIVE SELECT TEST/

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SEQ 0145

7789 043050 052515 052114 020056
7790 043056 051104 053111 020105
7791 043064 042523 042514 052103
7792 043072 052040 051505 124
7793 043077 015 047412 046116
7794 043104 020131 020061 051104
7795 043112 053111 020105 051120
7796 043120 051505 047105 006524
7797 043126 000012
7798 043130 005015 042504 051120
7799 043136 051505 020123 050123
7800 043144 041501 020105 040502
7801 043152 020122 047524 042040
7802 043160 020117 047101 052117
7803 043166 042510 020122 020062
7804 043174 051104 053111 051505
7805 043202 005015 051117 041440
7806 043210 047117 051124 046117
7807 043216 042455 052040 020117
7808 043224 054105 052111 052040
7809 043232 051505 124
7810 043235 015 024012 047111
7811 043242 042523 052122 041440
7812 043250 051117 042522 052103
7813 043256 052440 044516 020124
7814 043264 042523 042514 052103
7815 043272 050040 052514 051507
7816 043300 041040 043105 051117
7817 043306 020105 054105 052111
7818 043314 047111 024507 005015
7819 043322 000
7820 043323 015 042012 050105
7821 043330 042522 051523 023440
7822 043336 052522 026516 052123
7823 043344 050117 020047 053523
7824 043352 052111 044103 052040
7825 043360 020117 051447 047524
7826 043366 023520 000
7827 043371 015 042012 051505
7828 043376 046105 041505 020124
7829 043404 047520 052122 051440
7830 043412 044527 041524 020110
7831 043420 047117 040440 046114
7832 043426 047440 044124 051105
7833 043434 042040 044522 042526
7834 043442 006523 000012
7835 043446 005015 042526 044522
7836 043454 054506 041040 052117
7837 043462 020110 051104 053111
7838 043470 051505 052440 046116
7839 043476 040517 042504 006504
7840 043504 000012
7841 043506 005015 042504 051120
7842 043514 051505 020123 050123
7843 043522 041501 020105 044127
7844 043530 047105 023440 042522

.ASCIZ <CR><LF>/ONLY 1 DRIVE PRESENT/<CR><LF>

MSG63: .ASCII <CR><LF>/DEPRESS SPACE BAR TO DO ANOTHER 2 DRIVES/

.ASCII <CR><LF>/OR CONTROL-E TO EXIT TEST/

.ASCIZ <CR><LF>/((INSERT CORRECT UNIT SELECT PLUGS BEFORE EXITING))/<CR><LF>

MSG65: .ASCIZ <CR><LF>/DEPRESS 'RUN-STOP' SWITCH TO 'STOP'/'

MSG67: .ASCIZ <CR><LF>/DESELECT PORT SWITCH ON ALL OTHER DRIVES/<CR><LF>

MSG68: .ASCIZ <CR><LF>/VERIFY BOTH DRIVES UNLOADED/<CR><LF>

MSG69: .ASCIZ <CR><LF>/DEPRESS SPACE WHEN 'READY' LIGHT GOES ON/<CR><LF>

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SEQ 0146

7845	043536	042101	023531	046040
7846	043544	043511	052110	043440
7847	043552	042517	020123	047117
7848	043560	005015	000	
7849	043563	015	053012	051105
7850	043570	043111	020131	042510
7851	043576	042101	020123	047514
7852	043604	042101	005015	000
7853	043611	015	051412	046105
7854	043616	041505	020124	047503
7855	043624	051122	041505	020124
7856	043632	047520	052122	051440
7857	043640	044527	041524	020110
7858	043646	047117	040440	046114
7859	043654	047440	044124	051105
7860	043662	042040	044522	042526
7861	043670	006523	000012	
7862	043674	005015	041101	051117
7863	043702	044524	043516	041040
7864	043710	046101	047101	042503
7865	043716	047440	020106	042524
7866	043724	052123	000123	
7867				
7868	043730	005015	051120	043517
7869	043736	040522	020115	041101
7870	043744	051117	020124	042520
7871	043752	042116	047111	027107
7872	043760	027056	046120	040505
7873	043766	042523	053440	044501
7874	043774	000124		
7875	043776	005015	040510	052114
7876	044004	050040	047105	044504
7877	044012	043516	027056	050056
7878	044020	042514	051501	020105
7879	044026	040527	052111	000
7880	044033	015	050012	047522
7881	044040	051107	046501	040440
7882	044046	047502	052122	042105
7883	044054	000		
7884	044055	015	041412	052520
7885	044062	044040	046101	042524
7886	044070	000104		
7887	044072	005015	047523	051122
7888	044100	026131	053440	044522
7889	044106	042524	046040	041517
7890	044114	020113	044123	052517
7891	044122	042114	047040	052117
7892	044130	041040	020105	042504
7893	044136	051120	051505	042523
7894	044144	104		
7895	044145	015	053412	044510
7896	044152	042514	047440	020116
7897	044160	051124	041501	020113
7898	044166	020062	042523	052103
7899	044174	051117	020123	034461
7900	044202	020054	030062	047440

MSG70: .ASCIZ <CR><LF>/VERIFY HEADS LOAD/<CR><LF>

MSG71: .ASCIZ <CR><LF>/SELECT CORRECT PORT SWITCH ON ALL OTHER DRIVES/<CR><LF>

MSG72: .ASCIZ <CR><LF>/ABORTING BALANCE OF TESTS/

MSG74: .ASCIZ <CR><LF>/PROGRAM ABORT PENDING...PLEASE WAIT/

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

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

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

MSG100: .ASCII <CR><LF>/SORRY, WRITE LOCK SHOULD NOT BE DEPRESSED/

.ASCII <CR><LF>/WHILE ON TRACK 2 SECTORS 19, 20 OR 21/

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SEQ 0147

7901	044210	020122	030462	
7902	044214	005015	046120	040505
7903	044222	042523	052040	054522
7904	044230	040440	040507	047111
7905	044236	005015	000	

.ASCIZ <CR><LF>/PLEASE TRY AGAIN/<CR><LF>

7906				
7907				
7908				

.SBTTL ERROR MESSAGES

7909	044241	015	042412	051122
7910	044246	051117	020054	047117
7911	044254	054514	030040	052040
7912	044262	051110	020125	020067
7913	044270	046101	047514	042527
7914	044276	026104	052040	054522
7915	044304	040440	040507	047111
7916	044312	005015	000	

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

7917	044315	104	044522	042526
7918	044322	021440	044440	020116
7919	044330	045522	051503	020062
7920	044336	040503	047116	052117
7921	044344	041040	020105	042522
7922	044352	042101	041040	041501
7923	044360	020113	047503	051122
7924	044366	041505	046124	020131
7925	044374	047111	051040	046513
7926	044402	031122	000	

EM2: .ASCIZ /DRIVE # IN RKCS2 CANNOT BE READ BACK CORRECTLY IN RKMR2/

7927	044405	015	040412	047502
7928	044412	052122	052040	051505
7929	044420	051524	027056	052456
7930	044426	042516	050130	041505
7931	044434	042524	020104	044524
7932	044442	042515	047440	052125
7933	044450	040440	020124	041520
7934	044456	000075		

EM3: .ASCIZ <CR><LF>/ABORT TESTS...UNEXPECTED TIME OUT AT PC=

7935	044460	005015	041101	051117
7936	044466	020124	042524	052123
7937	044474	027123	027056	047125
7938	044502	054105	042520	052103
7939	044510	042105	044440	052116
7940	044516	051105	052522	052120
7941	044524	040440	020124	041520
7942	044532	000075		

EM4: .ASCIZ <CR><LF>/ABORT TESTS...UNEXPECTED INTERRUPT AT PC=

7943	044534	042115	020123	042523
7944	044542	020124	047111	051040
7945	044550	041513	031123	000

EM5: .ASCIZ /MDS SET IN RKCS2/

7946	044555	125	042506	051440
7947	044562	052105	044440	020116

EM6: .ASCIZ /UFE SET IN RKCS2/

7948	044570	045522	051503	000062
7949	044576	051104	020101	047111
7950	044604	051040	042113	020123
7951	044612	020046	042516	020104
7952	044620	047111	051040	041513
7953	044626	031123	051040	051505
7954	044634	052105	020073	051127
7955	044642	047117	020107	047520
7956	044650	052122	051440	046105

EM7: .ASCIZ /DRA IN RKDS & NED IN RKCS2 RESET; WRONG PORT SELECTED?/

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SEQ 0148

7957	044656	041505	042524	037504	
7958	044664	000			
7959	044665	104	044522	042526	EM8: .ASCIZ /DRIVE PRESENT BUT NOT SPECIFIED BY OPERATOR/
7960	044672	050040	042522	042523	
7961	044700	052116	041040	052125	
7962	044706	047040	052117	051440	
7963	044714	042520	044503	044506	
7964	044722	042105	041040	020131	
7965	044730	050117	051105	052101	
7966	044736	051117	000		
7967	044741	104	044522	042526	EM9: .ASCIZ /DRIVE NOT PRESENT BUT SPECIFIED BY OPERATOR/
7968	044746	047040	052117	050040	
7969	044754	042522	042523	052116	
7970	044762	041040	052125	051440	
7971	044770	042520	044503	044506	
7972	044776	042105	041040	020131	
7973	045004	050117	051105	052101	
7974	045012	051117	000		
7975	045015	101	047502	052122	EM10: .ASCIZ /ABORT TESTS...CANNOT REFERENCE CONTROLLER REGISTER/
7976	045022	052040	051505	051524	
7977	045030	027056	041456	047101	
7978	045036	047516	020124	042522	
7979	045044	042506	042522	041516	
7980	045052	020105	047503	052116	
7981	045060	047522	046114	051105	
7982	045066	051040	043505	051511	
7983	045074	042524	000122		
7984	045100	051104	020101	047111	EM11: .ASCIZ /DRA IN RKDS & NED IN RKCS2 BOTH SET/
7985	045106	051040	042113	020123	
7986	045114	020046	042516	020104	
7987	045122	047111	051040	041513	
7988	045130	031123	041040	052117	
7989	045136	020110	042523	000124	
7990	045144	047503	052116	047522	EM12: .ASCIZ /CONTROLLER NOT READY IN RKCS1/
7991	045152	046114	051105	047040	
7992	045160	052117	051040	040505	
7993	045166	054504	044440	020116	
7994	045174	045522	051503	000061	
7995	045202	047516	040440	052124	EM13: .ASCIZ /NO ATTN IN RKASOF/
7996	045210	020116	047111	051040	
7997	045216	040513	047523	000106	
7998	045224	051127	047117	020107	EM14: .ASCIZ /WRONG ATTN IN RKASOF/
7999	045232	052101	047124	044440	
8000	045240	020116	045522	051501	
8001	045246	043117	000		
8002	045251	104	042122	020131	EM15: .ASCIZ /DRDY NOT CLEARED IN RKMR2/
8003	045256	047516	020124	046103	
8004	045264	040505	042522	020104	
8005	045272	047111	051040	046513	
8006	045300	031122	000		
8007	045303	104	041523	047040	EM16: .ASCIZ /DSC NOT SET IN RKMR2/
8008	045310	052117	051440	052105	
8009	045316	044440	020116	045522	
8010	045324	051115	000062		
8011	045330	042515	051523	043501	EM17: .ASCIZ /MESSAGE AD ERROR/
8012	045336	020105	030101	042440	

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ERROR MESSAGES

SEQ 0149

8013	045344	051122	051117	000	
8014	045351	115	051505	040523	EM18: .ASCIZ /MESSAGE B0 ERROR/
8015	045356	042507	041040	020060	
8016	045364	051105	047522	000122	
8017	045372	042515	051523	043501	EM19: .ASCIZ /MESSAGE A1 ERROR/
8018	045400	020105	030501	042440	
8019	045406	051122	051117	000	
8020	045413	115	051505	040523	EM20: .ASCIZ /MESSAGE B1 ERROR/
8021	045420	042507	041040	020061	
8022	045426	051105	047522	000122	
8023	045434	042503	051122	051440	EM21: .ASCIZ /CERR SET IN RKCS1/
8024	045442	052105	044440	020116	
8025	045450	045522	051503	000061	
8026	045456	047504	051117	051440	EM22: .ASCIZ /DOOR STATUS IN RKMR2 NOT CLEARED/
8027	045464	040524	052524	020123	
8028	045472	047111	051040	046513	
8029	045500	031122	047040	052117	
8030	045506	041440	042514	051101	
8031	045514	042105	000		
8032	045517	123	044520	042116	EM23: .ASCIZ /SPINDLE ON SET IN RKMR2
8033	045524	042514	047440	020116	
8034	045532	042523	020124	047111	
8035	045540	051040	046513	031122	
8036	045546	000			
8037	045547	126	046117	046525	EM24: .ASCIZ /VOLUME VALID NOT SET IN RKMR2/
8038	045554	020105	040526	044514	
8039	045562	020104	047516	020124	
8040	045570	042523	020124	047111	
8041	045576	051040	046513	031122	
8042	045604	000			
8043	045605	103	051101	051124	EM25: .ASCIZ /CARTRIDGE STATUS IN RKMR2 NOT CLEARED/
8044	045612	042111	042507	051440	
8045	045620	040524	052524	020123	
8046	045626	047111	051040	046513	
8047	045634	031122	047040	052117	
8048	045642	041440	042514	051101	
8049	045650	042105	000		
8050	045653	126	046117	046525	EM26: .ASCIZ /VOLUME VALID NOT CLEARED IN RKMR2/
8051	045660	020105	040526	044514	
8052	045666	020104	047516	020124	
8053	045674	046103	040505	042522	
8054	045702	020104	047111	051040	
8055	045710	046513	031122	000	
8056	045715	116	042105	047040	EM27: .ASCIZ /NED NOT SET IN RKCS2/
8057	045722	052117	051440	052105	
8058	045730	044440	020116	045522	
8059	045736	051503	000062		
8060	045742	047526	052514	042515	EM28: .ASCIZ /VOLUME VALID SET IN RKMR2/
8061	045750	053040	046101	042111	
8062	045756	051440	052105	044440	
8063	045764	020116	045522	051115	
8064	045772	000062			
8065	045774	051504	020103	047516	EM29: .ASCIZ /DSC NOT SET IN RKMR2/
8066	046002	020124	042523	020124	
8067	046010	047111	051040	046513	
8068	046016	031122	000		

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ERROR MESSAGES

SEQ 0150

8069	046021	101	052124	020116	EM30:	.ASCIZ	/ATTN NOT RESET IN RKASOF/
8070	046026	047516	020124	042522			
8071	046034	042523	020124	047111			
8072	046042	051040	040513	047523			
8073	046050	000106					
8074	046052	042516	020104	047516	EM31:	.ASCIZ	/NED NOT CLEARED IN RKCS2/
8075	046060	020124	046103	040505			
8076	046066	042522	020104	047111			
8077	046074	051040	041513	031123			
8078	046102	000					
8079	046103	123	044520	042116	EM32:	.ASCIZ	/SPINDLE ON NOT SET IN RKMR2/
8080	046110	042514	047440	020116			
8081	046116	047516	020124	042523			
8082	046124	020124	047111	051040			
8083	046132	046513	031122	000			
8084	046137	104	044522	042526	EM33:	.ASCIZ	/DRIVE NOT READY IN RKMR2/
8085	046144	047040	052117	051040			
8086	046152	040505	054504	044440			
8087	046160	020116	045522	051115			
8088	046166	000062					
8089	046170	047504	051117	051440	EM34:	.ASCIZ	/DOOR STATUS BIT NOT SET IN RKMR2/
8090	046176	040524	052524	020123			
8091	046204	044502	020124	047516			
8092	046212	020124	042523	020124			
8093	046220	047111	051040	046513			
8094	046226	031122	000				
8095	046231	110	040505	051504	EM35:	.ASCIZ	/HEADS HOME NOT SET IN RKMR2/
8096	046236	044040	046517	020105			
8097	046244	047516	020124	042523			
8098	046252	020124	047111	051040			
8099	046260	046513	031122	000			
8100	046265	101	020103	047514	EM37:	.ASCIZ	/AC LOW NOT SET IN RKMR3/
8101	046272	020127	047516	020124			
8102	046300	042523	020124	047111			
8103	046306	051040	046513	031522			
8104	046314	000					
8105	046315	116	042105	047040	EM42:	.ASCIZ	/NED NOT SET IN RKCS2/
8106	046322	052117	051440	052105			
8107	046330	044440	020116	045522			
8108	046336	051503	000062				
8109	046342	041501	047514	047040	EM43:	.ASCIZ	/ACLO NOT CLEARED IN RKMR3/
8110	046350	052117	041440	042514			
8111	046356	051101	042105	044440			
8112	046364	020116	045522	051115			
8113	046372	000063					
8114	046374	047526	052514	042515	EM44:	.ASCIZ	/VOLUME VALID NOT CLEARED IN RKMR2/
8115	046402	053040	046101	042111			
8116	046410	047040	052117	041440			
8117	046416	042514	051101	042105			
8118	046424	044440	020116	045522			
8119	046432	051115	000062				
8120	046436	047526	052514	042515	EM45:	.ASCIZ	/VOLUME VALID SET IN RKMR2 AFTER HEADS LOADED/
8121	046444	053040	046101	042111			
8122	046452	051440	052105	044440			
8123	046460	020116	045522	051115			
8124	046466	020062	043101	042524			

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SEQ 0151

8125	046474	020122	042510	042101	
8126	046502	020123	047514	042101	
8127	046510	042105	000		
8128	046513	116	047117	042455	EM46: .ASCIZ /NON-EXECUTABLE FUNCTION (NXF) NOT SET IN RKMR3/
8129	046520	042530	052503	040524	
8130	046526	046102	020105	052506	
8131	046534	041516	044524	047117	
8132	046542	024040	054116	024506	
8133	046550	047040	052117	051440	
8134	046556	052105	044440	020116	
8135	046564	045522	051115	000063	
8136	046572	054503	044514	042116	EM47: .ASCIZ /CYLINDER ADDRESS CHANGED FROM 0/
8137	046600	051105	040440	042104	
8138	046606	042522	051523	041440	
8139	046614	040510	043516	042105	
8140	046622	043040	047522	020115	
8141	046630	000060			
8142	046632	051127	052111	020105	EM48: .ASCIZ /WRITE LOCK IN RKMR2 NOT CLEARED/
8143	046640	047514	045503	044440	
8144	046646	020116	045522	051115	
8145	046654	020062	047516	020124	
8146	046662	046103	040505	042522	
8147	046670	000104			
8148	046672	051127	052111	020105	EM49: .ASCIZ /WRITE LOCK IN RKMR2 NOT SET/
8149	046700	047514	045503	044440	
8150	046706	020116	045522	051115	
8151	046714	020062	047516	020124	
8152	046722	042523	000124		
8153	046726	051127	052111	020105	EM50: .ASCIZ /WRITE LOCK ERROR IN RKMR3 NOT SET/
8154	046734	047514	045503	042440	
8155	046742	051122	051117	044440	
8156	046750	020116	045522	051115	
8157	046756	020063	047516	020124	
8158	046764	042523	000124		
8159	046770	051127	052111	020105	EM51: .ASCIZ /WRITE LOCK DID NOT OCCUR AT SECTOR BOUNDARY/
8160	046776	047514	045503	042040	
8161	047004	042111	047040	052117	
8162	047012	047440	041503	051125	
8163	047020	040440	020124	042523	
8164	047026	052103	051117	041040	
8165	047034	052517	042116	054522	
8166	047042	000			
8167	047043	125	051116	047040	EM52: .ASCIZ /UNS NOT SET IN RKMR3/
8168	047050	052117	051440	052105	
8169	047056	044440	020116	045522	
8170	047064	051115	000063		
8171					
8172	047070	047125	047514	042101	EM53: .ASCIZ /UNLOAD NOT SET IN RKMR2/
8173	047076	047040	052117	051440	
8174	047104	052105	044440	020116	
8175	047112	045522	051115	000062	
8176	047120	040503	047116	052117	EM54: .ASCIZ /CANNOT FIND MULT. DRIVE SELECT IN RKCS2/
8177	047126	043040	047111	020104	
8178	047134	052515	052114	020056	
8179	047142	051104	053111	020105	
8180	047150	042523	042514	052103	

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ERROR MESSAGES

SEQ 0152

8181	047156	044440	020116	045522	
8182	047164	051503	000062		
8183	047170	052101	047124	047040	EM55: .ASCIZ /ATTN NOT CLEARED IN RKASOF/
8184	047176	052117	041440	042514	
8185	047204	051101	042105	044440	
8186	047212	020116	045522	051501	
8187	047220	043117	000		
8188	047223	125	042516	050130	EM56: .ASCIZ /UNEXPECTED MEMORY PARITY ERROR TRAP/
8189	047230	041505	042524	020104	
8190	047236	042515	047515	054522	
8191	047244	050040	051101	052111	
8192	047252	020131	051105	047522	
8193	047260	020122	051124	050101	
8194	047266	000			
8195	047267	103	051105	020122	EM57: .ASCIZ /CERR IN RKCS1 NOT SET/
8196	047274	047111	051040	041513	
8197	047302	030523	047040	052117	
8198	047310	051440	052105	000	
8199	047315	120	051101	052111	EM58: .ASCIZ /PARITY NOT SET IN RKMR3/
8200	047322	020131	047516	020124	
8201	047330	042523	020124	047111	
8202	047336	051040	046513	031522	
8203	047344	000			
8204	047345	103	047524	051440	EM59: .ASCIZ /CTO SET IN RKCS1/
8205	047352	052105	044440	020116	
8206	047360	045522	051503	000061	
8207	047366	054116	020106	044504	EM61: .ASCIZ /NXF DID NOT SET FAULT/
8208	047374	020104	047516	020124	
8209	047402	042523	020124	040506	
8210	047410	046125	000124		
8211	047414	046104	020124	042523	EM63: .ASCIZ /DLT SET IN RKCS2/
8212	047422	020124	047111	051040	
8213	047430	041513	031123	000	
8214	047435	122	042113	020103	EM64: .ASCII /RKDC & RKDA INDICATE THAT WRITE CHECK ERROR/
8215	047442	020046	045522	040504	
8216	047450	044440	042116	041511	
8217	047456	052101	020105	044124	
8218	047464	052101	053440	044522	
8219	047472	042524	041440	042510	
8220	047500	045503	042440	051122	
8221	047506	051117			
8222	047510	005015	041517	052503	.ASCIZ <CR><LF>/OCCURRED AT CYL 411, TRACK 2, SECTOR 21/
8223	047516	051122	042105	040440	
8224	047524	020124	054503	020114	
8225	047532	030464	026061	052040	
8226	047540	040522	045503	031040	
8227	047546	020054	042523	052103	
8228	047554	051117	031040	000061	
8229	047562	042516	020104	042523	EM67: .ASCIZ /NED SET IN RKCS2/
8230	047570	020124	047111	051040	
8231	047576	041513	031123	000	
8232	047603	103	047101	047516	EM68: .ASCIZ /CANNOT READ BAD SECTOR INFORMATION/
8233	047610	020124	042522	042101	
8234	047616	041040	042101	051440	
8235	047624	041505	047524	020122	
8236	047632	047111	047506	046522	

8237	047640	052101	047511	000116	
8238	047646	047516	042040	044522	EM69: .ASCII /NO DRIVES FOUND ON BUSS/
8239	047654	042526	020123	047506	
8240	047662	047125	020104	047117	
8241	047670	041040	051525	123	
8242	047675	015	051412	052105	.ASCIZ <CR><LF>/SETUP CORRECTLY & PRESS 'CONTINUE'/<CR><LF>
8243	047702	050125	041440	051117	
8244	047710	042522	052103	054514	
8245	047716	023040	050040	042522	
8246	047724	051523	023440	047503	
8247	047732	052116	047111	042525	
8248	047740	006447	000012		
8249	047744	044127	046111	020105	EM70: .ASCIZ /WHILE WAITING FOR CONTR READY OR AFTER CONTR READY REC'D/
8250	047752	040527	052111	047111	
8251	047760	020107	047506	020122	
8252	047766	047503	052116	020122	
8253	047774	042522	042101	020131	
8254	050002	051117	040440	052106	
8255	050010	051105	041440	047117	
8256	050016	051124	051040	040505	
8257	050024	054504	051040	041505	
8258	050032	042047	000		
8259	050035	104	052105	041505	EM71: .ASCIZ /DETECTED 10 BAD SECTORS...ABORTING TEST/
8260	050042	042524	020104	030061	
8261	050050	041040	042101	051440	
8262	050056	041505	047524	051522	
8263	050064	027056	040456	047502	
8264	050072	052122	047111	020107	
8265	050100	042524	052123	000	
8266	050105	104	052105	041505	EM72: .ASCIZ /DETECTED BSE BUT NOT LISTED IN BAD SECTOR FILE/
8267	050112	042524	020104	051502	
8268	050120	020105	052502	020124	
8269	050126	047516	020124	044514	
8270	050134	052123	042105	044440	
8271	050142	020116	040502	020104	
8272	050150	042523	052103	051117	
8273	050156	043040	046111	000105	
8274	050164	042504	042524	052103	EM73: .ASCII /DETECTED BSE IN READ COMMAND/
8275	050172	042105	041040	042523	
8276	050200	044440	020116	042522	
8277	050206	042101	041440	046517	
8278	050214	040515	042116		
8279	050220	005015	052502	020124	.ASCIZ <CR><LF>/BUT NOT IN PREVIOUS WRITE COMMAND TO SAME SECTOR/
8280	050226	047516	020124	047111	
8281	050234	050040	042522	044526	
8282	050242	052517	020123	051127	
8283	050250	052111	020105	047503	
8284	050256	046515	047101	020104	
8285	050264	047524	051440	046501	
8286	050272	020105	042523	052103	
8287	050300	051117	000		
8288	050303	122	055124	047040	EM74: .ASCIZ /RTZ NOT SET IN RKMR2/
8289	050310	052117	051440	052105	
8290	050316	044440	020116	045522	
8291	050324	051115	000062		
8292	050330	005015	042504	042524	EM75: .ASCIZ <CR><LF>/DETECTED 10 BAD CYLINDERS...ABORTING TEST/

8293	050336	052103	042105	030440
8294	050344	020060	040502	020104
8295	050352	054503	044514	042116
8296	050360	051105	027123	027056
8297	050366	041101	051117	044524
8298	050374	043516	052040	051505
8299	050402	000124		
8300	050404	047516	042040	044522
8301	050412	042526	020123	047506
8302	050420	047125	020104	047111
8303	050426	042040	053105	041511
8304	050434	020105	040515	020120
8305	050442	022050	042504	046526
8306	050450	051		
8307	050451	015	051412	052105
8308	050456	050125	041440	051117
8309	050464	042522	052103	054514
8310	050472	023040	051040	051505
8311	050500	040524	052122	005015
8312	050506	000		
8313	050507	127	044522	042524
8314	050514	041440	042510	045503
8315	050522	042440	051122	051117
8316	050530	051440	052105	044440
8317	050536	020116	045522	051503
8318	050544	000062		
8319	050546	040504	040524	041440
8320	050554	042510	045503	042440
8321	050562	051122	051117	051440
8322	050570	052105	044440	020116
8323	050576	045522	051105	000
8324	050603	122	040505	044504
8325	050610	043516	053440	047522
8326	050616	043516	041440	046131
8327	050624	047111	042504	020122
8328	050632	020043	047111	044040
8329	050640	040505	042504	000122
8330				
8331				
8332				
8333	050646	042524	052123	047040
8334	050654	027117	020040	041520
8335	050662	000		
8336	050663	122	046513	030522
8337	050670	051011	046513	031122
8338	050676	051011	046513	031522
8339	050704	051011	042513	004522
8340	050712	045522	051504	051011
8341	050720	041513	030523	051011
8342	050726	041513	031123	000
8343	050733	122	053513	004503
8344	050740	045522	040502	051011
8345	050746	042113	004501	045522
8346	050754	051501	043117	051011
8347	050762	042113	004503	045522
8348	050770	041505	051520	051011

EM76: .ASCII /NO DRIVES FOUND IN DEVICE MAP (\$DEVN)/

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

EM80: .ASCIZ /WRITE CHECK ERROR SET IN RKCS2/

EM83: .ASCIZ /DATA CHECK ERROR SET IN RKER/

EM93: .ASCIZ /READING WRONG CYLINDER # IN HEADER/

.SBTTL DATA HEADERS

DH1: .ASCIZ /TEST NO. PC/

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

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

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DATA HEADERS

SEQ 0155

8349	050776	042513	050103	000124	
8350	051004	043101	042524	020122	DH4: .ASCIZ /AFTER PACK RE-INSERTED & HEADS LOADED/
8351	051012	040520	045503	051040	
8352	051020	026505	047111	042523	
8353	051026	052122	042105	023040	
8354	051034	044040	040505	051504	
8355	051042	046040	040517	042504	
8356	051050	000104			
8357	051052	043101	042524	020122	DH5: .ASCIZ /AFTER AC SWITCHED OFF/
8358	051060	041501	051440	044527	
8359	051066	041524	042510	020104	
8360	051074	043117	000106		
8361	051100	043101	042524	020122	DH8: .ASCIZ /AFTER DRIVE UNLOADED & DOOR OPENED/
8362	051106	051104	053111	020105	
8363	051114	047125	047514	042101	
8364	051122	042105	023040	042040	
8365	051130	047517	020122	050117	
8366	051136	047105	042105	000	
8367	051143	101	052106	051105	DH11: .ASCIZ /AFTER MANUALLY LOADING HEADS WITH DOOR OPEN/
8368	051150	046440	047101	040525	
8369	051156	046114	020131	047514	
8370	051164	042101	047111	020107	
8371	051172	042510	042101	020123	
8372	051200	044527	044124	042040	
8373	051206	047517	020122	050117	
8374	051214	047105	000		
8375	051217	101	052106	051105	DH12: .ASCIZ /AFTER DISK PACK REMOVED/
8376	051224	042040	051511	020113	
8377	051232	040520	045503	051040	
8378	051240	046505	053117	042105	
8379	051246	000			
8380	051247	101	052106	051105	DH13: .ASCIZ /AFTER MANUALLY LOADING HEADS WITH DISK PACK REMOVED/
8381	051254	046440	047101	040525	
8382	051262	046114	020131	047514	
8383	051270	042101	047111	020107	
8384	051276	042510	042101	020123	
8385	051304	044527	044124	042040	
8386	051312	051511	020113	040520	
8387	051320	045503	051040	046505	
8388	051326	053117	042105	000	
8389	051333	127	052111	047510	DH15: .ASCIZ /WITHOUT PACK COMMAND/
8390	051340	052125	050040	041501	
8391	051346	020113	047503	046515	
8392	051354	047101	000104		
8393	051360	043101	042524	020122	DH16: .ASCIZ /AFTER UNIT SELECT PLUG REMOVED/
8394	051366	047125	052111	051440	
8395	051374	046105	041505	020124	
8396	051402	046120	043525	051040	
8397	051410	046505	053117	042105	
8398	051416	000			
8399	051417	101	052106	051105	DH17: .ASCIZ /AFTER RECAL COMMAND/
8400	051424	051040	041505	046101	
8401	051432	041440	046517	040515	
8402	051440	042116	000		
8403	051443	101	052106	051105	DH18: .ASCIZ /AFTER UNLOAD COMMAND/
8404	051450	052440	046116	040517	

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SEQ 0156

8405	051456	020104	047503	046515	
8406	051464	047101	000104		
8407	051470	043101	042524	020122	DH19: .ASCIZ /AFTER PACK COMMAND/
8408	051476	040520	045503	041440	
8409	051504	046517	040515	042116	
8410	051512	000			
8411	051513	101	052106	051105	DH20: .ASCIZ /AFTER SELECT DRIVE COMMAND/
8412	051520	051440	046105	041505	
8413	051526	020124	051104	053111	
8414	051534	020105	047503	046515	
8415	051542	047101	000104		
8416	051546	043101	042524	020122	DH21: .ASCIZ /AFTER SUBSYSTEM CLEAR/
8417	051554	052523	051502	051531	
8418	051562	042524	020115	046103	
8419	051570	040505	000122		
8420	051574	043101	042524	020122	DH22: .ASCIZ /AFTER DRIVE CLEAR COMMAND/
8421	051602	051104	053111	020105	
8422	051610	046103	040505	020122	
8423	051616	047503	046515	047101	
8424	051624	000104			
8425	051626	043101	042524	020122	DH23: .ASCIZ /AFTER WRONG PORT SELECTED/
8426	051634	051127	047117	020107	
8427	051642	047520	052122	051440	
8428	051650	046105	041505	042524	
8429	051656	000104			
8430	051660	043101	042524	020122	DH25: .ASCIZ /AFTER SEEK COMMAND/
8431	051666	042523	045505	041440	
8432	051674	046517	040515	042116	
8433	051702	000			
8434	051703	101	052106	051105	DH26: .ASCIZ /AFTER READ DATA COMMAND/
8435	051710	051040	040505	020104	
8436	051716	040504	040524	041440	
8437	051724	046517	040515	042116	
8438	051732	000			
8439	051733	101	052106	051105	DH27: .ASCIZ /AFTER WRITE DATA COMMAND/
8440	051740	053440	044522	042524	
8441	051746	042040	052101	020101	
8442	051754	047503	046515	047101	
8443	051762	000104			
8444	051764	043101	042524	020122	DH28: .ASCIZ /AFTER BOTH PORTS DESELECTED/
8445	051772	047502	044124	050040	
8446	052000	051117	051524	042040	
8447	052006	051505	046105	041505	
8448	052014	042524	000104		
8449	052020	043101	042524	020122	DH29: .ASCIZ /AFTER CORRECT PORT SELECTED/
8450	052026	047503	051122	041505	
8451	052034	020124	047520	052122	
8452	052042	051440	046105	041505	
8453	052050	042524	000104		
8454	052054	043101	042524	020122	DH30: .ASCIZ /AFTER READ HEADER COMMAND/
8455	052062	042522	042101	044040	
8456	052070	040505	042504	020122	
8457	052076	047503	046515	047101	
8458	052104	000104			
8459	052106	043101	042524	020122	DH31: .ASCIZ /AFTER DRIVE MANUALLY LOADED/
8460	052114	051104	053111	020105	

8461	052122	040515	052516	046101	
8462	052130	054514	046040	040517	
8463	052136	042504	000104		
8464	052142	043101	042524	020122	DH32: .ASCIZ /AFTER WRITE CHECK COMMAND/
8465	052150	051127	052111	020105	
8466	052156	044103	041505	020113	
8467	052164	047503	046515	047101	
8468	052172	000104			
8469	052174	043101	042524	020122	DH34: .ASCIZ /AFTER START SPINDLE COMMAND/
8470	052202	052123	051101	020124	
8471	052210	050123	047111	046104	
8472	052216	020105	047503	046515	
8473	052224	047101	000104		
8474	052230	043101	042524	020122	DH35: .ASCIZ /AFTER MANUALLY UNLOADING/
8475	052236	040515	052516	046101	
8476	052244	054514	052440	046116	
8477	052252	040517	044504	043516	
8478	052260	000			
8479	052261	101	052106	051105	DH37: .ASCIZ /AFTER TIMEOUT TO POWER DOWN/
8480	052266	052040	046511	047505	
8481	052274	052125	052040	020117	
8482	052302	047520	042527	020122	
8483	052310	047504	047527	000	
8484	052315	101	052106	051105	DH38: .ASCIZ /AFTER AC POWERED UP/
8485	052322	040440	020103	047520	
8486	052330	042527	042522	020104	
8487	052336	050125	000		
8488	052341	101	052106	051105	DH39: .ASCIZ /AFTER WRITE HEADER COMMAND/
8489	052346	053440	044522	042524	
8490	052354	044040	040505	042504	
8491	052362	020122	047503	046515	
8492	052370	047101	000104		
8493	052374	052504	044522	043516	DH41: .ASCIZ /DURING RECAL COMMAND/
8494	052402	051040	041505	046101	
8495	052410	041440	046517	040515	
8496	052416	042116	000		
8497	052421	117	020116	042523	DH42: .ASCIZ /ON SECTORS 0,2,4,6 OR 8 CYL 410 TRACK 2/
8498	052426	052103	051117	020123	
8499	052434	026060	026062	026064	
8500	052442	020066	051117	034040	
8501	052450	020040	054503	020114	
8502	052456	030464	020060	051124	
8503	052464	041501	020113	000062	
8504	052472	047506	046522	052101	DH44: .ASCIZ /FORMAT & ALL READ-WRITE TESTS WILL BE BYPASSED/
8505	052500	023040	040440	046114	
8506	052506	051040	040505	026504	
8507	052514	051127	052111	020105	
8508	052522	042524	052123	020123	
8509	052530	044527	046114	041040	
8510	052536	020105	054502	040520	
8511	052544	051523	042105	000	
8512	052551	101	052106	051105	DH45: .ASCIZ /AFTER SEEK WITH VOLUME VALID=0/
8513	052556	051440	042505	020113	
8514	052564	044527	044124	053040	
8515	052572	046117	046525	020105	
8516	052600	040526	044514	036504	

8517	052606	000060			
8518	052610	043101	042524	020122	DH46: .ASCIZ /AFTER WRITE DATA WITH VOLUME VALID=0/
8519	052616	051127	052111	020105	
8520	052624	040504	040524	053440	
8521	052632	052111	020110	047526	
8522	052640	052514	042515	053040	
8523	052646	046101	042111	030075	
8524	052654	000			
8525	052655	101	052106	051105	DH48: .ASCIZ /AFTER WRITE LOCK SWITCH DISABLED/
8526	052662	053440	044522	042524	
8527	052670	046040	041517	020113	
8528	052676	053523	052111	044103	
8529	052704	042040	051511	041101	
8530	052712	042514	000104		
8531	052716	043101	042524	020122	DH49: .ASCIZ /AFTER WRITE LOCK SWITCH ENABLED/
8532	052724	051127	052111	020105	
8533	052732	047514	045503	051440	
8534	052740	044527	041524	020110	
8535	052746	047105	041101	042514	
8536	052754	000104			
8537	052756	043101	042524	020122	DH50: .ASCIZ /AFTER WRITING WITH WRITE LOCK ENABLED/
8538	052764	051127	052111	047111	
8539	052772	020107	044527	044124	
8540	053000	053440	044522	042524	
8541	053006	046040	041517	020113	
8542	053014	047105	041101	042514	
8543	053022	000104			
8544	053024	054503	020114	004443	DH56: .ASCIZ /CYL # HEADER WORD 0/
8545	053032	042510	042101	051105	
8546	053040	053440	051117	020104	
8547	053046	000060			
8548	053050	043101	042524	020122	DH59: .ASCIZ /AFTER DRIVE SELECT COMMAND WITH EVEN PARITY/
8549	053056	051104	053111	020105	
8550	053064	042523	042514	052103	
8551	053072	041440	046517	040515	
8552	053100	042116	053440	052111	
8553	053106	020110	053105	047105	
8554	053114	050040	051101	052111	
8555	053122	000131			
8556	053124	043101	042524	020122	DH60: .ASCIZ /AFTER WRITE LOCK ENABLED DURING CONTINUOUS WRITING/
8557	053132	051127	052111	020105	
8558	053140	047514	045503	042440	
8559	053146	040516	046102	042105	
8560	053154	042040	051125	047111	
8561	053162	020107	047503	052116	
8562	053170	047111	047525	051525	
8563	053176	053440	044522	044524	
8564	053204	043516	000		
8565	053207	122	042113	004501	DH61: .ASCII /RKDA WORD EXPECTED/
8566	053214	047527	042122	042411	
8567	053222	050130	041505	042524	
8568	053230	104			
8569	053231	015	040012	053440	.ASCIZ <CR><LF>/@ WRL WAS WORD/
8570	053236	046122	053411	051501	
8571	053244	053411	051117	000104	
8572	053252	045522	040504	053411	DH62: .ASCII /RKDA WORD EXPECTED/

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SEQ 0159

8573	053260	051117	004504	054105	
8574	053266	042520	052103	042105	
8575	053274	005015	042502	047506	.ASCII <CR><LF>/BEFORE WAS WORD/
8576	053302	042522	053411	051501	
8577	053310	053411	051117	104	
8578	053315	015	053412	046122	.ASCIZ <CR><LF>/WRL/
8579	053322	000			
8580	053323	101	052106	051105	DH63: .ASCIZ /AFTER WRITE LOCK ENABLED FROM AC FAILURE/
8581	053330	053440	044522	042524	
8582	053336	046040	041517	020113	
8583	053344	047105	041101	042514	
8584	053352	020104	051106	046517	
8585	053360	040440	020103	040506	
8586	053366	046111	051125	000105	
8587	053374	043101	042524	020122	DH64: .ASCIZ /AFTER MDS DETECTED IN RKCS2/
8588	053402	042115	020123	042504	
8589	053410	042524	052103	042105	
8590	053416	044440	020116	045522	
8591	053424	051503	000062		
8592	053430	043101	042524	020122	DH65: .ASCIZ /AFTER SEARCHING ALL DRIVES PRESENT/
8593	053436	042523	051101	044103	
8594	053444	047111	020107	046101	
8595	053452	020114	051104	053111	
8596	053460	051505	050040	042522	
8597	053466	042523	052116	000	
8598	053473	124	051505	020124	DH66: .ASCIZ /TEST NO. TRAP PC/
8599	053500	047516	004456	051124	
8600	053506	050101	050040	000103	
8601	053514	043101	042524	020122	DH67: .ASCIZ /AFTER TIMEOUT TO ENABLE WRITE LOCK/
8602	053522	044524	042515	052517	
8603	053530	020124	047524	042440	
8604	053536	040516	046102	020105	
8605	053544	051127	052111	020105	
8606	053552	047514	045503	000	
8607	053557	011	054105	042520	DH69: .ASCIZ / EXPECT/
8608	053564	052103	000		
8609	053567	011	041501	052524	DH70: .ASCIZ / ACTUAL/
8610	053574	046101	000		
8611	053577	101	004460	030102	DH71: .ASCIZ /A0 B0 A1 B1 A2 B2 B3/
8612	053604	040411	004461	030502	
8613	053612	040411	004462	031102	
8614	053620	041011	000063		
8615	053624	051515	020107	020101	DH73: .ASCIZ /MSG A & B IN RKMR2 & RKMR3 RESP ARE INVALID/
8616	053632	020046	020102	047111	
8617	053640	051040	046513	031122	
8618	053646	023040	051040	046513	
8619	053654	031522	051040	051505	
8620	053662	020120	051101	020105	
8621	053670	047111	040526	044514	
8622	053676	000104			
8623	053700	047117	051440	041505	DH74: .ASCIZ /ON SECTORS 10, 12, 14, 16, 18 OR 20 CYL 410 TRACK 2/
8624	053706	047524	051522	030440	
8625	053714	026060	030440	026062	
8626	053722	030440	026064	030440	
8627	053730	026066	030440	020070	
8628	053736	051117	031040	020060	

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SEQ 0160

8629	053744	054503	020114	030464
8630	053752	020060	051124	041501
8631	053760	020113	000062	

.SBTTL ERROR OUTPUT DATA

8632

8633

8634

8635

8636 053764 001214 001116

8637 053770 005432 005434 005436

8638 053776 005422 005420 005406

8639 054004 005410

8640 054006 005412 005414 005416

8641 054014 005424 005426 005440

8642 054022 005442

8643 054024 001214 001116 001166

8644 054032 001502 001504

8645 054036 005432 005434 005436

8646 054044 005422 005420 005406

8647 054052 005410

8648 054054 005412 005414 005416

8649 054062 005424 005426 005440

8650 054070 005442

8651 054072 001214 001354

8652 054076 001214 001116 001366

8653 054104 001760

8654 054106 005432 005434 005436

8655 054114 005422 005420 005406

8656 054122 005410

8657 054124 005412 005414 005416

8658 054132 005424 005426 005440

8659 054140 005442

8660 054142 001214 001116 005476

8661 054150 005500 005502 005504

8662 054156 005456 005460 005462

8663 054164 005464

8664 054166 005432 005434 005436

8665 054174 005422 005420 005406

8666 054202 005410

8667 054204 005412 005414 005416

8668 054212 005424 005426 005440

8669 054220 005442

8670

8671 054222 001214 001116 005476

8672 054230 005500 005502 005504

8673 054236 005506 005510

8674 054242 005456 005460 005462

8675 054250 005464 005466 005470

8676 054256 005432 005434 005436

8677 054264 005422 005420 005406

8678 054272 005410

8679 054274 005412 005414 005416

8680 054302 005424 005426 005440

8681 054310 005442

8682

8683 054312 001214 001116 005476

8684 054320 005500 005502 005504

DT1: .EVEN
\$TESTN,\$ERRPC
HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2

HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT

DT3: \$TESTN,\$ERRPC,\$TMP3,WD1,WD2
HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2

HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT

DT6: \$TESTN,TRAPPC
DT9: \$TESTN,\$ERRPC,TOCYL,RHTAB

HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2

HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT

DT13: \$TESTN,\$ERRPC,E.A0,E.B0,E.A1,E.B1,H.A0,H.B0,H.A1,H.B1

HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2

HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT

DT14: \$TESTN,\$ERRPC,E.A0,E.B0,E.A1,E.B1,E.A2,E.B2

H.A0,H.B0,H.A1,H.B1,H.A2,H.B2

HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2

HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT

DT15: \$TESTN,\$ERRPC,E.A0,E.B0,E.A1,E.B1,E.A2,E.B2,E.B3

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ERROR OUTPUT DATA

SEQ 0161

8685	054326	005506	005510	005514	
8686	054334	005456	005460	005462	
8687	054342	005464	005466	005470	H.A0,H.B0,H.A1,H.B1,H.A2,H.B2,H.B3
8688	054350	005474			
8689	054352	005432	005434	005436	HMR1,HMR2,HMR3,HER,HDS,HCS1,HCS2
8690	054360	005422	005420	005406	
8691	054366	005410			
8692	054370	005412	005414	005416	HWC,HBA,HDA,HASOF,HDC,HPOS,HPAT
8693	054376	005424	005426	005440	
8694	054404	005442			
8695					

.SBTTL ERROR DATA FORMATS

8696					
8697					
8698	054406	000003			DF1: 3
8699	054410	002	000		.BYTE 2,0
8700	054412	050663			DH2
8701	054414	007	000		.BYTE 7,0
8702	054416	050733			DH3
8703	054420	007	000		.BYTE 7,0
8704					
8705					
8706	054422	000005			DF3: 5
8707	054424	000	000		.BYTE 0,0
8708	054426	050646			DH1
8709	054430	002	000		.BYTE 2,0
8710	054432	053207			DH61
8711	054434	003	000		.BYTE 3,0
8712	054436	050663			DH2
8713	054440	007	000		.BYTE 7,0
8714	054442	050733			DH3
8715	054444	007	000		.BYTE 7,0
8716					
8717	054446	000005			DF4: 5
8718	054450	000	000		.BYTE 0,0
8719	054452	050646			DH1
8720	054454	002	000		.BYTE 2,0
8721	054456	053252			DH62
8722	054460	003	000		.BYTE 3,0
8723	054462	050663			DH2
8724	054464	007	000		.BYTE 7,0
8725	054466	050733			DH3
8726	054470	007	000		.BYTE 7,0
8727					
8728	054472	000001			DF5: 1
8729	054474	002	000		.BYTE 2,0
8730					
8731	054476	000003			DF7: 3
8732	054500	002	000		.BYTE 2,0
8733	054502	050663			DH2
8734	054504	007	000		.BYTE 7,0
8735	054506	050733			DH3
8736	054510	007	000		.BYTE 7,0
8737	054512	000004			DF10: 4
8738	054514	000	000		.BYTE 0,0
8739	054516	050646			DH1
8740	054520	002	000		.BYTE 2,0

H13

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ERROR DATA FORMATS

SEQ 0162

8741	054522	050663		DH2	
8742	054524	007	000	.BYTE	7,0
8743	054526	050733		DH3	
8744	054530	007	000	.BYTE	7,0
8745					
8746	054532	000005		DF12:	5
8747	054534	000	000	.BYTE	0,0
8748	054536	053624		DH73	
8749	054540	000	000	.BYTE	0,0
8750	054542	050646		DH1	
8751	054544	002	000	.BYTE	2,0
8752	054546	050663		DH2	
8753	054550	007	000	.BYTE	7,0
8754	054552	050733		DH3	
8755	054554	007	000	.BYTE	7,0
8756					
8757					
8758	054556	000004		DF15:	4
8759	054560	000	000	.BYTE	0,0
8760	054562	050646		DH1	
8761	054564	002	000	.BYTE	2,0
8762	054566	050663		DH2	
8763	054570	007	000	.BYTE	7,0
8764	054572	050733		DH3	
8765	054574	007	000	.BYTE	7,0
8766					
8767					
8768	054576	000005		DF17:	5
8769	054600	000	000	.BYTE	0,0
8770	054602	052472		DH44	
8771	054604	000	000	.BYTE	0,0
8772	054606	050646		DH1	
8773	054610	002	000	.BYTE	2,0
8774	054612	050663		DH2	
8775	054614	007	000	.BYTE	7,0
8776	054616	050733		DH3	
8777	054620	007	000	.BYTE	7,0
8778	054622	000005		DF20:	5
8779	054624	000	000	.BYTE	0,0
8780	054626	050646		DH1	
8781	054630	002	000	.BYTE	2,0
8782	054632	053024		DH56	
8783	054634	002	000	.BYTE	2,0
8784	054636	050663		DH2	
8785	054640	007	000	.BYTE	7,0
8786	054642	050733		DH3	
8787	054644	007	000	.BYTE	7,0
8788					
8789	054646	000007		DF21:	7
8790	054650	000	000	.BYTE	0,0
8791	054652	050646		DH1	
8792	054654	002	000	.BYTE	2,0
8793	054656	053557		DH69	
8794	054660	000	000	.BYTE	0,0
8795	054662	053577		DH71	
8796	054664	004	000	.BYTE	4,0

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ERROR DATA FORMATS

SEQ 0163

8797	054666	053567	
8798	054670	004	000
8799	054672	050663	
8800	054674	007	000
8801	054676	050733	
8802	054700	007	000
8803			
8804	054702	000007	
8805	054704	000	000
8806	054706	050646	
8807	054710	002	000
8808	054712	053557	
8809	054714	000	000
8810	054716	053577	
8811	054720	006	000
8812	054722	053567	
8813	054724	006	000
8814	054726	050663	
8815	054730	007	000
8816	054732	050733	
8817	054734	007	000
8818			
8819	054736	000007	
8820	054740	000	000
8821	054742	050646	
8822	054744	002	000
8823	054746	053557	
8824	054750	000	000
8825	054752	053577	
8826	054754	007	000
8827	054756	053567	
8828	054760	007	000
8829	054762	050663	
8830	054764	007	000
8831	054766	050733	
8832	054770	007	000
8833			
8834			
8835			
8836			
8837			
8838			
8839			
8840			
8841			
8842			
8843	054772	104413	
8844	054774	032777	020000 124136
8845	055002	001107	
8846	055004	113700	001114
8847	055010	042700	177400
8848	055014	005300	
8849	055016	006300	
8850	055020	006300	
8851	055022	006300	
8852	055024	062700	005560

	DH70	
	.BYTE	4,0
	DH2	
	.BYTE	7,0
	DH3	
	.BYTE	7,0
DF22:	7	
	.BYTE	0,0
	DH1	
	.BYTE	2,0
	DH69	
	.BYTE	0,0
	DH71	
	.BYTE	6,0
	DH70	
	.BYTE	6,0
	DH2	
	.BYTE	7,0
	DH3	
	.BYTE	7,0

DF23:	7	
	.BYTE	0,0
	DH1	
	.BYTE	2,0
	DH69	
	.BYTE	0,0
	DH71	
	.BYTE	7,0
	DH70	
	.BYTE	7,0
	DH2	
	.BYTE	7,0
	DH3	
	.BYTE	7,0

```

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

```

```

+TYPERR: SAVREG
        BIT    #SW13,JSWR      ;INHIBIT ERROR TYPEOUTS?
        BNE    20$            ;YES-BRANCH
        MOVB   $ITEMB,RO      ;ENTER ERROR NUMBER
        BIC    #177400,RO     ;CLEAR SIGN EXTENSION
        DEC    RO             ;FORM INDEX FOR ERROR TABLE
        ASL    RO
        ASL    RO
        ASL    RO
        1$: ADD    #$ERRTB,RO  ;FORM ADDRESS OF ERROR ENTRY

```

8853	055030	012037	055044		MOV	(R0)+,2\$	:GET EM POINTER
8854	055034	001404			BEQ	3\$	:BRANCH IF THERE ISN'T ONE
8855	055036	104401	001205		TYPE	, \$CRLF	:TYPE CARRIAGE RETURN LINE FEED
8856	055042	104401			TYPE		:TYPE ERROR MESSAGE (EM)
8857	055044	00000C		2\$:	.WORD	0	:EM POINTER GOES HERE
8858	055046	012037	055062	3\$:	MOV	(R0)+,4\$	:GET DH POINTER
8859	055052	001404			BEQ	5\$	:BRANCH IF THERE ISN'T ONE
8860	055054	104401	001205		TYPE	, \$CRLF	:TYPE CR-LF
8861	055060	104401			TYPE		:TYPE DATA HEADER
8862	055062	000000		4\$:	.WORD	0	:DH POINTER GOES HERE
8863	055064	012001		5\$:	MOV	(R0)+,R1	:GET DT POINTER
8864	055066	001455			BEQ	20\$	:BRANCH IF THERE ARE NONE
8865	055070	005004			CLR	R4	:SET INDENT SWITCH
8866	055072	012000			MOV	(R0)+,R0	:GET DF POINTER
8867	055074	012002			MOV	(R0)+,R2	:STORE NUMBER OF DH'S
8868	055076	001446			BEQ	17\$	:DH NUM IS 0-BRANCH
8869	055100	005104			COM	R4	:NO INDENT
8870	055102	104401	001205		TYPE	, \$CRLF	
8871	055106	112003		10\$:	MOVB	(R0)+,R3	:GET & STORE NUMBER OF DATA WORDS
8872	055110	105720			TSTB	(R0)+	:BUMP PAST FORMAT WORD
8873	055112	005703			TST	R3	:TEST IF ANY DATA FOR THIS HEADER
8874	055114	001407			BEQ	14\$	:NO - SKIP DATA PRINT
8875	055116	013146		11\$:	MOV	2(R1)+,-(SP)	:PUT FIRST DATA WORD ON STACK
8876	055120	104402			TYPOC		:TYPE IT
8877	055122	005303			DEC	R3	:MORE DATA WORDS
8878	055124	001403			BEQ	14\$	:NO-BRANCH
8879	055126	104401	055256		TYPE	, SPACE2	:TYPE SEPARATORS
8880	055132	000771			BR	11\$	:LOOP
8881	055134	005302		14\$:	DEC	R2	:MORE DH'S?
8882	055136	003431			BLE	20\$	:NO-BRANCH
8883	055140	104401	001205		TYPE	, \$CRLF	
8884	055144	005760	000002		TST	2(R0)	:ONLY A DH IN THIS REQUEST?
8885	055150	001404			BEQ	15\$	:YES-BRANCH BYPASS INDENT
8886	055152	005104			COM	R4	:INDENT?
8887	055154	001002			BNE	15\$	:NO-BRANCH
8888	055156	104401	055256		TYPE	, SPACE2	:YES-TYPE SPACES
8889	055162	012037	055170	15\$:	MOV	(R0)+,16\$	:GET NEXT DH POINTER
8890	055166	104401			TYPE		:TYPE DH
8891	055170	000000		16\$:	.WORD	0	:DH POINTER GOES HERE
8892	055172	105710			TSTB	(R0)	:TYPE A DT?
8893	055174	001003			BNE	21\$	:YES-BRANCH
8894	055176	062700	000002		ADD	#2,R0	:INCREMENT OF POINTER
8895	055202	000754			BR	14\$	:SEE IF END OF DF BLOCK
8896	055204	104401	001205	21\$:	TYPE	, \$CRLF	
8897	055210	005704			TST	R4	:INDENT?
8898	055212	001335			BNE	10\$	:NO-BRANCH
8899	055214	104401	055256	17\$:	TYPE	, SPACE2	:YES-TYPE SPACES
8900	055220	000732			BR	10\$	:LOOP
8901	055222	104414		20\$:	RESREG		
8902	055224	032777	010000 123706		BIT	#SW12,2\$WR	:SEE IF EXIT AFTER 20 ERRORS
8903	055232	001410			BEQ	25\$	:BR IF NO
8904	055234	023727	001103 000024		CMP	\$ERFLG, #20.	:ELSE SEE IF HAVE 20 ERRORS
8905	055242	001004			BNE	25\$	:BR IF NO
8906	055244	012706	001100		MOV	#STACK, SP	:ELSE RESTORE STACK
8907	055250	000137	023416		JMP	ENDRV	:AND BYPASS DRIVE
8908	055254	000207		25\$:	RTS	PC	

K13

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TYPE ERROR ROUTINE

SEQ 0165

8909 055256 020040 000

SPACE2: .ASCIZ/ / ;2 SPACES
; ODT-11 -- VDOSA

8910

8911

8912

8913

8914

8915

8916

8917

8918 055262

8919 055342

8920 000000

8921 000001

8922 000002

8923 000003

8924 000004

8925 000005

8926 000006

8927 000007

8928 177776

8929

8930 000014

8931 000340

8932 000020

8933 000003

8934 000006

8935

8936

8937

8938

8939

8940

8941 177562

8942 177560

8943 177566

8944 177564

8945

8946

8947

8948

8949

8950

8951

8952

8953

8954

8955 055342 000413

8956 055344 000417

8957 055346 013737 177776 055322

8958 055354 013737 000016 177776

Z 8959 055362 010737 055320

8960 055366 000137 056520

8961

8962 055372 012706 055302

8963 055376 010637 055316

8964 055402 000414

```

R0 = %0 ; REGISTER
R1 = %1 ; NAMING
R2 = %2 ; CONVENTIONS
R3 = %3
R4 = %4
R5 = %5
SP = %6
PC = %7
ST = 177776 ; STATUS REGISTER

O.TVEC = 14 ; TRT VECTOR LOCATION
O.STM = 340 ; PRIORITY MASK - STATUS REGISTER
O.TBT = 20 ; T-BIT MASK - STATUS REGISTER
TRT = 000003 ; TRT INSTRUCTION
RTT = 000006 ; RTT INSTRUCTION

```

```

; RS IS USUALLY CONSIDERED SAFE. THE CURRENT ADDRESS WORD
; RESIDES IN IT. AFTER A BREAKPOINT, IT IS SET TO ZERO, AND SEARCH
; OPERATIONS LEAVE IT RANDOMLY FILLED. OTHERWISE, IT SHOULD NOT
; BE USED EXCEPT FOR JSR'S AND THE CURRENT ADDRESS POINTER (CAD).

```

```

O.RDB = 177562 ; R DATA BUFFER
O.RCSR = 177560 ; R C/SR
O.TDB = 177566 ; T DATA BUFFER
O.TCSR = 177564 ; T C/SR

```

```

; INITIALIZE ODT
; USE O.ODT FOR A NORMAL ENTRY
; USE O.ODT+2 TO RESTART ODT - WIPING OUT ALL BREAKPOINTS
; USE O.ODT+4 TO RE-ENTER (I.E. - FAKE A BREAKPOINT)

```

```

O.ODT: BR O.STRT ; NORMAL ENTRY
      BR O.RST ; RESTART
O.ENTR: MOV ST, O.UST ; RE-ENTER -- SAVE STATUS
      MOV O.TVEC+2, ST ; SET UP LOCAL STATUS
      MOV PC, O.UPC ; FAKE THE PC
      JMP O.BK1

O.STRT: MOV #O.URO, SP ; SET UP STACK
      MOV SP, O.USR ; FAKE THE SAVED STACK
      BR O.RST1 ; CLEAR BREAKPOINT TABLES

```

8965	055404	004037	056726		0.RST: JSR	0,0.SVR	;SAVE REGISTERS
8966	055413	013777	055340	177716	MOV	0.UIN,20.ADR1	;REMOVE THE BREAKPOINT
8967	055416	113734	055324		MOV	0.PRI,R4	;GET OOT PRIORITY
8968	055422	106004			RORB	R4	;SHIFT
8969	055424	106004			RORB	R4	;INTO
8970	055426	106004			RORB	R4	;POSITION
8971	055430	110437	177776		MOV	R4,ST	;STORE IN STATUS
2 8972	055434	000127			0.RST1: JMP	(PC)+	
8973	055436	000403			BR	0.45	
8974	055440	012737	000002	056430	MOV	#RTI,0.RTIT	;SET TO RTI IF 11/20 OR /05
8975	055446	105037	057347		0.45: CLRB	0.P	;DISALLOW PROCEED
8976	055452	012737	000340	000016	MOV	#0.STM,0.TVEC+2	;STATUS WORD TO TRT VECTOR + 2
8977	055460	012737	056510	000014	MOV	#0.BRK,0.TVEC	;PC TO TRT VECTOR
8978	055466	000447			BR	0.RALL	;CLEAR BREAKPOINT TABLES
8979							
8980							
8981							
8982							
8983	055470	004537	057150		0.REGT: JSR	5,0.GET	;SPECIAL NAME, GET ONE MORE CHARACTER
8984	055474	012704	057373		MOV	#0.TL,R4	;TABLE START ADDRESS
8985	055500	120024			0.RSP: CMPB	R0,(R4)+	;IS THIS THE CORRECT CHARACTER?
8986	055502	001413			BEQ	0.SP	;JUMP IF YES
8987	055504	022704	057401		CMP	#0.TL+0.LG,R4	;IS THE SEARCH DONE?
8988	055510	101373			BHI	0.RSP	;BRANCH IF NOT
8989	055512	042700	177770		BIC	#177770,R0	;MASK OFF OCTAL
8990	055516	010004			MOV	R0,R4	
8991	055520	006304			0.SP1: ASL	R4	
8992	055522	062704	055302		ADD	#0.URD,R4	;GENERATE ADDRESS
8993	055526	005202			INC	R2	;SET FOUND FLAG
8994	055530	000444			BR	0.SCAN	;GO FIND NEXT CHARACTER
8995	055532	162704	057364		0.SP: SUB	#0.TL-7,R4	;CORRECT CONSTANT
8996	055536	000770			BR	0.SP1	
8997							
8998							
8999							
9000	055540	004737	057274		0.ORPC: JSR	PC,0.TCLS	
9001	055544	010502			MOV	R5,R2	;CURRENT ADDRESS IN R2
9002	055546	061202			ADD	2R2,R2	;COMPUTE
9003	055550	006202			ASR	R2	;MOVE ONE BIT TO CARRY
9004	055552	103421			BCS	0.ERR	;ERROR IF OOD NUMBER
9005	055554	006302			ASL	R2	;RESTORE WORD
9006	055556	005722			TST	(R2)+	;AND INCREMENT BY TWO
9007	055560	010205			MOV	R2,R5	;UPDATE CAD
9008	055562	000137	056034		JMP	0.OP2	;GO FINISH UP
9009							
9010							
9011							
9012	055566	005702			0.BKPT: TST	R2	;IF NO NUMBER TYPED
9013	055570	001406			BEQ	0.RALL	;REMOVE BREAKPOINT
9014	055572	006204			ASR	R4	;CHECK IF OOD
9015	055574	103410			BCS	0.ERR	;JUMP IF OOD
9016	055576	006304			ASL	R4	;RESTORE ONE BIT
9017	055600	010437	055334		MOV	R4,0.ADR1	;SET A BREAKPOINT
9018							
9019	055604	000412			BR	0.DCD	
9020							

```

9021
9022
9023 055606 012737 057410 055334 0.RALL: MOV #0,TRTC,0.ADR1 ;CLEAR BREAKPOINT
9024 055614 000406 BR 0.DCD
9025
9026 : COMMAND DECODER - 0DT11
9027
9028 : REGISTERS R0-R4 MAY BE USED
9029 : REGISTER R5 WILL BE CONSIDERED SAFE
9030
9031 055616 052705 000001 0.ERR: BIS #1,R5 ;CLOSE EVERYTHING
9032 055622 012700 000077 MOV #1,R0 ;? TO BE TYPED
9033 055626 004537 057226 JSR 5,0.FTYP ;OUTPUT ?
9034 055632 004537 057326 0.DCD: JSR 5,0.CRLS ;TYPE <CR><LF>*
9035 055636 005004 0.DCD1: CLR R4 ;R4 CONTAINS THE CONVERTED OCTAL
9036 055640 005002 CLR R2 ;R2 IS THE NUMBER FOUND FLAG
9037 055642 004537 057150 0.SCAN: JSR 5,0.GET ;GET A CHAR, RETURN IN R0
9038 055646 022700 000060 CMP #0,R0 ;COMPARE WITH ASCII 0
9039 055652 101013 BHI 0.CLGL ;CHECK LEGALITY IF NON-NUMERIC
9040 055654 022700 000067 CMP #7,R0 ;COMPARE WITH ASCII 7
9041 055660 103410 BLO 0.CLGL ;CHECK LEGALITY IF NOT OCTAL
9042 055662 042700 177770 BIC #177770,R0 ;CONVERT TO BCD
9043 055666 006304 ASL R4 ;MAKE ROOM
9044 055670 006304 ASL R4 ;IN
9045 055672 006304 ASL R4 ;R4
9046 055674 060004 ADD R0,R4 ;PACK THREE BITS IN R4
9047 055676 006302 INC R2 ;R2 HAS NUMERIC FLAG
9048 055678 006300 BR 0.SCAN ;AND TRY AGAIN
9049 055702 005001 0.CLGL: CLR R1 ;CLEAR INDEX
9050 055704 120061 057357 0.LGL1: CMPB R0,0.LGCH(R1) ;DO THE CODES MATCH?
9051 055710 001405 BEQ 0.LGL2 ;JUMP IF YES
9052 055712 005201 INC R1 ;SET INDEX FOR NEXT SEARCH
9053 055714 020127 000014 CMP R1,#0.CLGT ;IS THE SEARCH DONE?
9054 055720 103336 BHS 0.ERR ;OOPS!
9055 055722 000770 BR 0.LGL1 ;RE-LOOP
9056 055724 006301 0.LGL2: ASL R1 ;MULTIPLY BY TWO
9057 055726 000171 055732 JMP #0.LGDR(R1) ;GO TO PROPER ROUTINE
9058
9059
9060 055732 055762 0.LGDR: 0.WRD ; / OPEN WORD
9061 055734 056014 0.CRET ; CARRIAGE RETURN CLOSE
9062 055736 055470 0.REGT ; $ REGISTER OPS
9063 055740 056324 0.GO ; G GO TO ADDRESS K
9064 055742 056026 0.OPI ; <LF> MODIFY, CLOSE, OPEN NEXT
9065 055744 055540 0.ORPC ; + OPEN RELATED, INDEX - PC
9066 055746 056060 0.BACK ; † OPEN PREVIOUS
9067 055750 056070 0.OFST ; 0 OFFSET
9068 055752 056146 0.WSCH ; W SEARCH WORD
9069 055754 056142 0.EFF ; E SEARCH EFFECTIVE ADDRESS
9070 055756 055566 0.BKPT ; B BREAKPOINTS
9071 055760 056432 0.PROC ; P PROCEED
9072 000030 0.LGL = -0.LGDR ;LGL MUST EQUAL 2X CHLGT ALWAYS
9073
9074 : PROCESS / - OPEN WORD
9075
9076 055762 005702 0.WRD: TST R2 ;GET VALUE IF R2 IS NON-ZERO

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N13

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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TYPE ERROR ROUTINE

SEQ 0168

9077	055764	001410		BEQ	0.WRDA	;SKIP OTHERWISE
9078	055766	010405		MOV	R4,R5	;PUT VALUE IN CAD
9079	055770	006205		0.WRD1: ASR	R5	;MOVE ONE BIT TO CARRY
9080	055772	103711		0.ERR2: BCS	0.ERR	;JUMP IF ODD ADDRESS
9081	055774	006305		ASL	R5	;RESTORE THE CARRY BIT
9082	055776	011500		MOV	R5,R0	;GET CONTENTS OF WORD
9083	056000	004537	057064	JSR	5,0.CADV	;GO GET AND TYPE OUT 2CAD
9084	056004	000714		BR	0.DCD1	;GO BACK TO DECODER
9085	056006	042705	000001	0.WRDA: BIC	#1,R5	;CLEAR CLOSED BIT
9086	056012	000766		BR	0.WRD1	;GO BACK TO MAIN-LINE
9087						
9088						
9089						
9090	056014	004737	057274	0.CRET: JSR	PC,0.TCLS	;CLOSE LOCATION
9091	056020	052705	000001	BIS	#1,R5	;CLOSE EVERYTHING
9092	056024	000702		BR	0.DCD	;RETURN TO DECODER
9093						
9094						
9095						
9096	056026	004737	057274	0.OP1: JSR	PC,0.TCLS	;CLOSE PRESENT CELL
9097	056032	005725		TST	(R5)+	;GENERATE NEW ADDRESS
9098	056034	004537	057320	0.OP2: JSR	5,0.CRLF	;CR><LF>
9099	056040	010500		MOV	R5,R0	;NUMBER TO TYPE
9100	056042	004537	057064	JSR	5,0.CADV	;TYPE OUT ADDRESS
9101	056046	012700	000057	MOV	#1,R0	;TYPE A /
9102	056052	004537	057226	JSR	5,0.FTYP	
9103	056056	000744		BR	0.WRD1	;GO PROCESS IT
9104						
9105						
9106						
9107	056060	004737	057274	0.BACK: JSR	PC,0.TCLS	
9108	056064	005745		TST	-(R5)	;GENERATE NEW ADDRESS
9109	056066	000762		BR	0.OP2	;GO DO THE REST
9110						
9111						
9112						
9113	056070	006205		0.OFST: ASR	R5	;GET LOW ORDER BIT
9114	056072	103737		BCS	0.ERR2	;ERROR IF CLOSED
9115	056074	006305		ASL	R5	;RESTORE WORD
9116	056076	012700	000040	MOV	#1,R0	;TYPE ONE BLANK
9117	056102	004537	057226	JSR	5,0.FTYP	;AS A SEPARATOR
9118	056106	160504		SUB	R5,R4	;COMPUTE
9119	056110	005304		DEC	R4	
9120	056112	005304		DEC	R4	;16 BIT OFFSET
9121	056114	010400		MOV	R4,R0	;TYPE A
9122	056116	010402		MOV	R4,R2	;SAVE R4
9123	056120	004537	057064	JSR	5,0.CADV	;NUMBER IN R0 - WORD MODE
9124	056124	010200		MOV	R2,R0	
9125	056126	006200		ASR	R0	;DIVIDE BY TWO
9126	056130	103402		BCS	0.OF1	;BRANCH IF ODD
9127	056132	004537	057064	JSR	5,0.CADV	;NUMBER IN R0 - BYTE MODE
9128	056136	000137	055636	0.OF1: JMP	0.DCD1	;ALL DONE
9129						
9130						
9131						
9132						

SEARCHES - \$MSK HAS THE MASK
\$MSK+2 HAS THE FWA
\$MSK+4 HAS THE LWA

9133					
9134					
9135					
9136					
9137					
9138	056142	005201	0.EFF:	INC R1	;SET EFFECTIVE SEARCH
9139	056144	000401		BR 0.WDS	
9140	056146	005001	0.WSCH:	CLR R1	;SET WORD SEARCH
9141	056150	005702	0.WDS:	TST R2	;CHECK FOR OBJECT FOUND
9142	056152	001621	0.ERR1:	BEQ 0.ERR	;ERROR IF NO OBJECT
9143	056154	013702		MOV 0.MSK+2,R2	;SET ORIGIN
9144	056160	013705		MOV 0.MSK,R5	;SET MASK
9145	056164	005105		COM R5	;AND COMPLEMENT IT
9146	056166	020237	0.WDS2:	CMP R2,0.MSK+4	;IS THE SEARCH ALL DONE?
9147	056172	101217		BHI 0.DCD	;YES
9148	056174	011200		MOV 2R2,R0	;GET OBJECT
9149	056176	005701		TST R1	;NO
9150	056200	001027		BNE 0.EFF1	;BRANCH IF EFFECTIVE SEARCH
9151	056202	010046		MOV R0,-(SP)	
9152	056204	010403		MOV R4,R3	;EXCLUSIVE OR
9153	056206	040400		BIC R4,R0	;IS DONE
9154	056210	042603		BIC (SP)+,R3	;IN A VERY
9155	056212	050033		BIS R0,R3	;FANCY MANNER HERE
9156	056214	040503		BIC R5,R3	;AND RESULT WITH MASK
9157	056216	001016	0.WDS3:	BNE 0.WDS4	;RE-LOOP IF NO MATCH
9158	056220	010446		MOV R4,-(SP)	;REGISTERS R2,R4, AND R5 ARE SAFE
9159	056222	004537		JSR 5,0.CRLF	;TYPE (CR,LF)
9160	056226	010200		MOV R2,R0	;GET READY TO TYPE
9161	056230	004537		JSR 5,0.CADV	;TYPE ADDRESS
9162	056234	012700		MOV #1,R0	;SLASH TO R0
9163	056240	004537		JSR 5,0.FTYP	;TYPE IT
9164	056244	011200		MOV 2R2,R0	;GET CONTENTS
9165	056246	004537		JSR 5,0.CADV	;TYPE CONTENTS
9166	056252	012604		MOV (SP)+,R4	;RESTORE R4
9167	056254	005722	0.WDS4:	TST (R2)+	;INCREMENT TO NEXT CELL AND
9168	056256	000743		BR 0.WDS2	;RETURN
9169	056260	020004	0.EFF1:	CMP R0,R4	;IS (X)=K?
9170	056262	001755		BEQ 0.WDS3	;TYPE IF EQUAL
9171	056264	010003		MOV R0,R3	; (X) TO R3
9172	056266	060203		ADD R2,R3	; (X)+X
9173	056270	005203		INC R3	
9174	056272	005203		INC R3	; (X)+X+2
9175	056274	020304		CMP R3,R4	;IS (X)+X+2=K?
9176	056276	001747		BEQ 0.WDS3	;BRANCH IF EQUAL
9177	056300	042700		BIC #177400,R0	;WIPE OUT EXTRA BITS
9178	056304	110000		MOVB R0,R0	;EXTEND SIGN
9179	056306	000257		CCC	
9180	056310	006300		ASL R0	;MULTIPLY BY TWO
9181	056312	005200		INC R0	;ADD TWO
9182	056314	005200		INC R0	
9183	056316	060200		ADD R2,R0	;ADD PC
9184	056320	020004		CMP R0,R4	;IS THE RESULT A PROPER REL. BRANCH?
9185	056322	000735		BR 0.WDS3	
9186					
9187					
9188					

PROCESS G - GO

9189	056324	105037	057347	0.G0:	CLRB	0.P	:DISALLOW PROCEED
9190	056330	006204			ASR	R4	:CHECK LOW ORDER BIT
9191	056332	103617			BCS	0.ERR2	:ERROR IF ODD NUMBER
9192	056334	006304			ASL	R4	:RESTORE WORD
9193	056336	010437	055320		MOV	R4,0.UPC	:SET UP NEW PC
9194	056342	112737	000340	177776	MOVB	#0.STM,ST	:SET HIGH PRIORITY
9195	056350	004537	057016		JSR	5,0.RST	:RESTORE TELETYPE
9196	056354	105037	057346		0.TBIT:	CLRB	:CLEAR BOTH
9197	056360	042737	000020	055322	BIC	#0.TBT,0.UST	:T-BIT FLAGS
9198	056366	017737	176742	055340	MOV	#0.ADR1,0.UIN	:SAVE INSTRUCTION
9199	056374	013777	057410	176732	MOV	0.TRTC,20.ADR1	:REPLACE WITH TRAP
9200	056402	012600			0.G02:	MOV	(SP)+,R0
9201	056404	012601				MOV	(SP)+,R1
9202	056406	012602				MOV	(SP)+,R2
9203	056410	012603				MOV	(SP)+,R3
9204	056412	012604				MOV	(SP)+,R4
9205	056414	012605				MOV	(SP)+,R5
9206	056416	012606				MOV	(SP)+,SP
9207	056420	013746	055322			MOV	0.UST,-(SP)
9208	056424	013746	055320			MOV	0.UPC,-(SP)
9209	056430	000006			0.RTIT:	RTT	:CHANGED TO RTI FOR 11/20 AND /05
9210							
9211							
9212							
9213							
9214	056432	105737	057347		0.PROC:	TSTB	:CHECK LEGALITY OF PROCEED
9215	056436	001645				BEQ	0.ERR1
9216	056440	105037	057347			CLRB	:NOT LEGAL
9217	056444	005702				TST	0.P
9218	056446	001402				BEQ	0.P
9219	056450	010437	055336			MOV	R4,0.PRI
9220	056454	112737	000340	177776	0.PRI:	MOVB	:YES, PUT AWAY COUNT
9221	056462	004537	057016			JSR	#0.STM,ST
9222	056466	112737	000340	177776	0.C1:	MOVB	:FORCE HIGH PRIORITY
9223	056474	105237	057346			INCB	5,0.RST
9224	056500	052737	000020	055322		BIS	#0.STM,ST
9225	056506	000735				BR	0.T
9226							0.TBIT,0.UST
9227							0.G02
9228							
9229							
9230							
9231							
9232	056510	012637	055320		0.BRK:	MOV	:PRIORITY IS 7 UPON ENTRY
9233	056514	012637	055322			MOV	(SP)+,0.UST
9234	056520	004037	056726		0.BK1:	JSR	:SAVE STATUS AND PC
9235	056524	105737	057346			TSTB	0,0.SVR
9236	056530	001311				BNE	:SAVE VARIOUS REGISTERS
9237	056532	013777	055340	176574		MOV	0.T
9238	056540	105737	055324			TSTB	:CHECK FOR T-BIT SET
9239	056544	100003				BPL	JUMP IF SET
9240	056546	113705	055322			MOVB	0.TBIT
9241	056552	000407				BR	0.UIN,20.ADR1
9242	056554	113705	055324		0.BK2:	MOVB	:REMOVE BREAKPOINTS
9243	056560	000257				CCC	CHECK IF PRIORITY
9244	056562	106005				RORB	IS AS SAME AS USER PGM

A TRT BREAKPOINT CAUSES 0.BRK TO BE ENTERED, WHICH SAVES
VARIOUS ODDS AND ENDS, FINDS OUT IF THE BREAKPOINT WAS LEGAL,
AND GIVES CONTROL TO THE COMMAND DECODER

:PICK UP USER UST IF SO
AND DON'T COMPUTE THE PRIORITY
OTHERWISE PICK UP ACTUAL PRIORITY
CLEAR CARRY
SHIFT LOW ORDER BITS

```

9245 056564 106005          RORB R5      ; INTO
9246 056566 106005          RORB R5      ; HIGH ORDER
9247 056570 106005          RORB R5      ; POSITION
9248 056572 110537 177776 0. BK3: MOVB R5, ST ; PUT THE STATUS AWAY WHERE IT BELONGS
9249 056576 013705 055320    MOV 0. UPC, R5 ; GET PC, IT POINTS TO THE TRT
9250 056602 005745          TST -(R5)      ; SUBTRACT TWO
9251 056604 010537 055320    MOV R5, 0. UPC ; FROM THE USER'S PC
9252 056610 020537 055334    CMP R5, 0. ADR1 ; COMPARE WITH LIST
9253 056614 001417          BEQ 0. B2      ; JUMP IF FOUND
9254 056616 004537 056764    JSR 5, 0. SVTT ; SAVE TELETYPE STATUS
9255 056622 004537 057320    JSR 5, 0. CRLF ; ERROR, NOTHING FOUND
9256 056626 012704 057352    MOV #0. B0, R4 ;
9257 056632 012703 057353    MOV #0. B0+1, R3 ;
9258 056636 004537 057212    JSR 5, 0. TYPE ; OUTPUT "BE" FOR BAD ENTRY
9259 056642 010500          MOV R5, R0      ;
9260 056644 042737 000020 055322    BIC #0. TBT, 0. UST ; CLEAR OUT ANY POSSIBLE FAKE T-BIT
9261 056652 000420          BR 0. B3      ; AND CONTINUE
9262 056654 005337 055336 0. B2: DEC 0. CT ;
9263 056660 003302          BGT 0. C1      ; JUMP IF REPEAT
9264 056662 012737 000001 055336    MOV #1, 0. CT ; RESET COUNT TO 1
9265 056670 105237 057347    INCB 0. P      ; ALLOW PROCEED
9266 056674 004537 056764    JSR 5, 0. SVTT ; SAVE TELETYPE STATUS, R4 IS SAFE
9267 056700 012700 000102    MOV #1, R0 ;
9268 056704 004537 057226    JSR 5, 0. FTYP ; TYPE "B"
9269 056710 013700 055334    MOV 0. ADR1, R0 ; GET ADDRESS OF BREAK
9270 056714 004537 057064 0. B3: JSR 5, 0. CADV ; TYPE ADDRESS
9271 056720 005005          CLR R5      ; CLEAR CAD
9272 056722 000137 055632    JMP 0. DCD ; GO TO DECODER
9273
9274      ; SAVE REGISTERS R0-R6 IN INTERNAL STACK
9275
9276 056726 012637 057344 0. SVR: MOV (SP)+, 0. XXX ; PICK REGISTER FROM STACK AND SAVE
9277 056732 010637 055316    MOV SP, 0. USP ; SAVE USER STACK ADDRESS
9278 056736 012706 055316    MOV #0. USP, SP ; SET TO INTERNAL STACK
9279 056742 010546          MOV R5, -(SP) ; SAVE
9280 056744 010446          MOV R4, -(SP) ; REGISTERS
9281 056746 010346          MOV R3, -(SP) ; 1
9282 056750 010246          MOV R2, -(SP) ; THRU
9283 056752 010146          MOV R1, -(SP) ; 5
9284 056754 013746 057344    MOV 0. XXX, -(SP) ; PUT SAVED REGISTER ON STACK
9285 056760 005746          TST -(SP) ;
9286 056762 000200          RTS R0 ;
9287
9288      ; SAVE TELETYPE STATUS
9289
9290 056764 113737 177560 057350 0. SVTT: MOVB 0. RCSR, 0. CSR1 ; SAVE R C/SR
9291 056772 113737 177564 057351    MOVB 0. TCSR, 0. CSR2 ; SAVE T C/SR
9292 057000 105037 177560    CLRB 0. RCSR ; CLEAR ENABLE AND MAINTENANCE
9293 057004 105037 177564    CLRB 0. TCSR ; BITS IN BOTH C/SR
9294 057010 004537 057320    JSR 5, 0. CRLF ; TYPE <CR, LF>
9295 057014 000205          RTS R5 ;
9296
9297      ; RESTORE TELETYPE STATUS
9298
9299 057016 004537 057320 0. RSTT: JSR 5, 0. CRLF ; <CR, LF> BEFORE RESTORING
9300 057022 105737 177564    TSTB 0. TCSR ; WAIT READY ON PRINTER

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9301 057026 100375      BPL      -4
9302 057030 032737 004000 177560  BIT      #4000,0.RCSR      ;CHECK BUSY FLAG ON READER
9303 057036 001403      BEQ      0.RSE1      ;SKIP READY LOOP IF NOT BUSY
9304 057040 105737 177560  TSTB     0.RCSR      ;WAIT READY
9305 057044 100375      BPL      -4              ;ON READER
9306 057046 113737 057350 177560 0.RSE1: MOVB   0.CSR1,0.RCSR      ;RESTORE
9307 057054 113737 057351 177564  MOVB   0.CSR2,0.TCSR      ;THE STATUS REGISTERS
9308 057062 000205      RTS      R5
9309
9310      ; TYPE OUT CONTENTS OF WORD OR BYTE WITH ONE TRAILING SPACE
9311      ; WORD IS IN R0
9312
9313 057064 010246      0.CADV: MOV    R2,-(SP)      ;SAVE R2
9314 057066 012704 057407  MOV      #0.BUF+6,R4      ;BUFFER START ADDRESS
9315 057072 012746 000060  MOV      #'0,-(SP)      ;CONSTANT ASCII 0
9316 057076 010002      0.SPC: MOV    R0,R2      ; GET
9317 057100 042702 177770  BIC      #177770,R2      ;OCTAL CHARACTER
9318 057104 061602      ADD      2SP,R2      ;CONVERT TO ASCII
9319 057106 110244      MOV      R2,-(R4)      ;STORE IN BUFFER
9320 057110 006200      ASR      R0      ;SHIFT THIS MESS
9321 057112 006200      ASR      R0      ;RIGHT
9322 057114 006200      ASR      R0      ;THREE WHOLE PLACES
9323 057116 020427 057402  CMP      R4,#0.BUF+1      ;DONE?
9324 057122 101365      BHI      0.SPC      ;NO
9325 057124 042700 177776  BIC      #177776,R0      ;GET LAST BIT
9326 057130 062600      ADD      (SP)+,R0      ;CONVERT TO ASCII
9327 057132 110044      MOV      R0,-(R4)      ;AND PUT IT AWAY
9328 057134 012703 057407  MOV      #0.BUF+6,R3      ;LWA
9329 057140 004537 057212  JSR      5,0.TYPE      ;TYPE WHOLE STRING OF CHARACTERS
9330 057144 012602      MOV      (SP)+,R2      ;RESTORE R2
9331 057146 000205      RTS      R5
9332
9333      ; GENERAL CHARACTER INPUT ROUTINE
9334      ; CHARACTER INPUT GOES TO R0
9335
9336 057150 105737 177560  0.GET: TSTB   0.RCSR      ;WAIT FOR
9337 057154 100375      BPL      -4              ;INPUT FROM KEYBOARD
9338 057156 113700 177562  MOV      0.RDB,R0      ;GET A CHARACTER
9339 057162 004537 057226  JSR      5,0.F1YP      ;ECHO CHARACTER
9340 057166 042700 177600  BIC      #177600,R0      ;STRIP OFF PARITY FROM CHARACTER
9341 057172 001766      BEQ      0.GET      ;IGNORE NULLS
9342 057174 122700 000040  CMPB     #40,R0      ;CHECK FOR SPACES
9343 057200 001763      BEQ      0.GET      ;IGNORE NULLS
9344 057202 122700 000073  CMPB     #' :,R0      ;CHECK FOR SEMI-COLON
9345 057206 001760      BEQ      0.GET      ;IGNORE THEM IF FOUND
9346 057210 000205      RTS      R5
9347
9348      ; GENERAL CHARACTER OUTPUT ROUTINE
9349      ; ADDRESS OF FIRST BYTE IN R4,
9350      ; ADDRESS OF LAST BYTE IN R3, (R3)>(R4)
9351
9352 057212 020304      0.TYPE: CMP      R3,R4      ;CHECK FOR COMPLETION
9353 057214 103426      BLO      0.TYP1      ;EXIT WHEN DONE
9354 057216 112400      MOV      (R4)+,R0      ;GET A CHARACTER
9355 057220 004537 057226  JSR      5,0.F1YP      ;TYPE ONE CHARACTER
9356 057224 000772      BR       0.TYPE      ;LOOP UNTIL DONE

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F14

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
DZR6JD.P11 28-JAN-77 11:05

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TYPE ERROR ROUTINE

SEQ 0173

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9357
9358
9359
9360 057226 105737 177564
9361 057232 100375
9362 057234 110037 177566
9363 057240 120037 000045
9364 057244 001012
9365 057246 113746 000044
9366 057252 105737 177564
9367 057256 100375
9368 057260 105037 177566
9369 057264 105316
9370 057266 003371
9371 057270 005726
9372 057272 000205
9373
9374
9375
9376
9377 057274 006205
9378 057276 103405
9379 057300 006305
9380 057302 005702
9381 057304 001401
9382 057306 010415
9383 057310 000207
9384 057312 005746
9385 057314 000137 055616
9386
9387
9388
9389
9390 057320 012703 057355
9391 057324 000402
9392 057326 012703 057356
9393 057332 012704 057354
9394 057336 004537 057212
9395 057342 000205
9396
9397 057344 000000
9398 057346 000
9399 057347 000
9400
9401 057350 000
9402 057351 000
9403
9404
9405 057352 042502
9406
9407 057354 015
9408 057355 012
9409 057356 052
9410
9411 057357 057
9412 057360 015

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

; CLOSE WORD OR BYTE AND EXIT
; UPON ENTERING, R2 HAS NUMERIC FLAG, R4 HAS CONTENTS
O.TCLS: ASR R5 ;GET LOW ORDER BIT
        BCS 0.TC ;JUMP IF ALREADY CLOSED
        ASL R5
        TST R2 ;IF NO NUMBER WAS TYPED THERE IS
        BEQ 0.CLS1 ;NO CHANGE TO THE OPEN CELL
        MOV R4,0R5 ;STORE WORD
O.CLS1: RTS PC
O.TC: TST -(SP) ;POP EXTRA CELL FROM STACK
        JMP 0.ERR ;AND SCREAM BLOODY MURDER

; O.CRLF - TYPE <CR,LF>
; O.CRLS - TYPE <CR,LF>*
O.CRLF: MOV #0.CR+1,R3 ;LWA <CR,LF>
        BR 0.CRS
O.CRLS: MOV #0.CR+2,R3 ;LWA <CR,LF>*
O.CRS: MOV #0.CR,R4 ;FWA
        JSR 5,0.TYPE ;TYPE SOMETHING
        RTS R5

; O.XXX: .WORD 0 ;TEMPORARY STORAGE
; O.T: .BYTE 0 ;T-BIT FLAG
; O.P: .BYTE 0 ;PROCEED FLAG = 0 IF PROCEED NOT ALLOWED
; ; = 1 IF PROCEED ALLOWED
O.CSR1: .BYTE 0 ;SAVE CELL - R C/SR
O.CSR2: .BYTE 0 ;SAVE CELL - T C/SR
;
; O.BD: .EVEN
; .WORD "BE
;
; O.CR: .BYTE 015 ; <CR>
; .BYTE 012 ; <LF>
; .BYTE '*' ; *
;
; O.LGCH: .BYTE '/' ; /
; .BYTE 015 ; CARRIAGE RETURN

```

9413 057361 044
 9414 057362 107
 9415 057363 012
 9416 057364 137
 9417 057365 136
 9418 057366 117
 9419 057367 127
 9420 057370 105
 9421 057371 102
 9422 057372 120
 9423 000014
 9424
 9425 057373 123
 9426 057374 120
 9427 057375 115
 9428 057376 000
 9429 057377 000
 9430 057400 102
 9431 000006
 9432
 9433 057401
 9434 057407
 9435 057407 040
 9436
 9437
 9438 057410 000003
 9439
 9440
 9441
 9442 055302 055302
 9443 055302 000000
 9444 055304 000000
 9445 055306 000000
 9446 055310 000000
 9447 055312 000000
 9448 055314 000000
 9449 055316 000000
 9450 055320 000000
 9451 055322 000000
 9452 055324 000007
 9453 055326 000000
 9454 055330 000000
 9455 055332 000000
 9456
 9457
 9458
 9459
 9460 055334 000000
 9461 055336 000000
 9462 055340 000000
 9463 000001

```

      .BYTE 'S      : $
      .BYTE 'G      : G
      .BYTE 012     : <LF>
      .BYTE '+'      : +
      .BYTE '0'      : 0
      .BYTE 'W'      : W
      .BYTE 'E'      : E
      .BYTE 'B'      : B
      .BYTE 'P'      : P
      .CLGT = -.LGCH ;TABLE LENGTH
      .TL: .BYTE 'S      : DO
      .BYTE 'P'      : NOT
      .BYTE 'M'      : CHANGE
      .BYTE 0        : THE
      .BYTE 0        : ORDER
      .BYTE 'B'      : HERE
      .LG = -.TL
      .BUF: = ;+6 ;6 CHAR. BUFFER WITH
      .EVEN ;TRAILING BLANK
      .TRTC: TRT ;TRACE TRAP PROTOTYPE
      ;THE ORDER OF THE FOLLOWING ENTRIES IS CRITICAL
      .URO: = 0.0DT-40
      00 ;USER R0
      00 ;R1
      00 ;R2
      00 ;R3
      00 ;R4
      00 ;R5
      0. USP: 0 ;USER SP
      0. UPC: 0 ;USER PC
      0. UST: 0 ;USER ST
      0. PRI: 7 ;ODT PRIORITY
      0. MSK: 0 ;MASK
      0 ;LOW LIMIT
      0 ;HIGH LIMIT
      ; BREAK POINT LISTS, ADRI = ADDRESS OF BREAKPOINT, CT = COUNT,
      ; UIN = CONTENTS
      .ADRI: 0
      .CT: 0
      .UIN: 0
      .END
  
```

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UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0175

ABASE = 177440	1822	1863	1887*
ACDW1 = 000000	1822	1865	
ACDW2 = 000000	1822	1866	
ACLO = 000010	1171*		
ACPUOP= 000000	1822	1837	
ACT11 = 005522	2071*	3017*	
ADDW0 = 000000	1822	1867	
ADDW1 = 000000	1822	1868	
ADDW10= 000000	1822	1877	
ADDW11= 000000	1822	1878	
ADDW12= 000000	1822	1879	
ADDW13= 000000	1822	1880	
ADDW14= 000000	1822	1881	
ADDW15= 000000	1822	1882	
ADDW2 = 000000	1822	1869	
ADDW3 = 000000	1822	1870	
ADDW4 = 000000	1822	1871	
ADDW5 = 000000	1822	1872	
ADDW6 = 000000	1822	1873	
ADDW7 = 000000	1822	1874	
ADDW8 = 000000	1822	1875	
ADDW9 = 000000	1822	1876	
ADEVCT= 000000	1822	1828	
ADEVN = 000000	1822	1864	
RENV = 000000	1822	1833	
RENVN = 000000	1822	1834	
AFATAL= 000000	1822	1825	
AMADR1= 000000	1822	1850	
AMADR2= 000000	1822	1854	
AMADR3= 000000	1822	1857	
AMADR4= 000000	1822	1860	
AMAMS1= 000000	1822	1844	
AMAMS2= 000000	1822	1852	
AMAMS3= 000000	1822	1855	
AMAMS4= 000000	1822	1858	
AMSGAD= 000000	1822	1830	
AMSGLG= 000000	1822	1831	
AMSGTY= 000000	1822	1824	
AMTYP1= 000000	1822	1845	
AMTYP2= 000000	1822	1853	
AMTYP3= 000000	1822	1856	
AMTYP4= 000000	1822	1859	
APASS = 000000	1822	1827	
APRIOR= 000000	1822		
APTCU= 000040	6445	6617*	
APTEV= 000001	6392	6438	6573 6615*
APTSIZ= 000200	2945	6614*	
APTSPO= 000100	6440	6575	6616*
ASWREG= 000000	1822	1835	
ATESTN= 000000	1822	1826	
ATTN = 005376	2006*	5307	5327 5354
AUNIT = 000000	1822	1829	
AUSWR = 000000	1822	1830	
AVECT1= 000000	1822	1861	
AVECT2= 000000	1822	1862	
BADHOR 005372	1996*	3025*	6099

BAOTMO	=	030740	3098	6155#										
BAT	=	000020	1134#	4271	4321	4375	4407	4471	4563	4623	4736	4797	4884	4944
BA16	=	000400	1120#											
BA17	=	001000	1121#											
BIT0	=	000001	1063#	1117	1149	1168	2061	3136	4465	4555	4617	4791	4876	4938
BIT00	=	000001	1053#	1063										6005
BIT01	=	000002	1052#	1062										
BIT02	=	000004	1051#	1061										
BIT03	=	000010	1050#	1060										
BIT04	=	000020	1049#	1059										
BIT05	=	000040	1048#	1058										
BIT06	=	000100	1047#	1057										
BIT07	=	000200	1046#	1056										
BIT08	=	000400	1045#	1055	6327									
BIT09	=	001000	1044#	1054	6335	6403								
BIT1	=	000002	1062#	1150	2062									
BIT10	=	002000	1043#	1122	1140	1159	1191	1205	1219	1232	1246	6380		
BIT11	=	004000	1042#	1123	1141	1160	1177	1192	1206	1220	1233	1247	6342	
BIT12	=	010000	1041#	1124	1142	1161	1193	1207	1221	1234	1248			
BIT13	=	020000	1040#	1125	1143	1162	1178	1194	1208	1222	1235	1249	6387	
BIT14	=	040000	1039#	1126	1144	1163	1179	1195	1209	1223	1236	1250	1263	5815
BIT15	=	100000	1038#	1127	1128	1145	1164	1180	1196	1266	5811			6313
BIT2	=	000004	1061#	1151	1170	2063								
BIT3	=	000010	1060#	1133	1152	1171								
BIT4	=	000020	1059#	1134	1153	1172	1185	1213	1240					
BIT5	=	000040	1058#	1135	1154	1173	1186	1200	1214	1227	1241			
BIT6	=	000100	1057#	1118	1136	1155	1174	1187	1201	1215	1228	1242		
BIT7	=	000200	1056#	1119	1137	1156	1175	1188	1202	1216	1229	1243	3126	
BIT8	=	000400	1055#	1120	1138	1157	1176	1189	1203	1217	1230	1244		
BIT9	=	001000	1054#	1121	1139	1158	1190	1204	1218	1231	1245			
BPTVEC	=	000014	1070#											
BSE	=	000200	1156#	4282	4492	4746								
BSERR	=	001542	1980#	4149*	4154*	4210	4686	4779	4863					
BSE22H	=	002370	1990#	4102	4151	4172	5809	5909						
BSE22S	=	003370	1991#	4161	5813	5913								
BYP	=	025130	3213	3236	3240	3255	3307	3315	3333	3341	3345	5381#		
BYP CER	=	001550	1983#	3124*	3359*	3523*	5495							
CALAD	=	001402	1917#	4236*	4705*	5782	5788	5790	5836					
CALDIF	=	001374	1914#											
CCLR	=	100000	1128#	3616	3635	3693	3702	3708	3747	3763	3778	3873	3921	3951
			4293	4367	4852	5058	5537	5547	5557	5567	6102	6120		4059
CCSP	=	030306	3527	3680	3829	3905	4000	4219	4683	5042	5082	6034#	6043	
CCYL	=	001370	1912#											
CDT	=	002000	1122#											
CERR	=	100000	1127#	3193	3293	3912	4114	4191	4254	4279	4331	4384	4417	4480
			4633	4722	4744	4807	4895	4954	5497	5593				4574
CFMT	=	010000	1124#	5904										
CHKFLG	=	001552	1984#	5391*	5473	5476	5480							
CHKMSG	=	025144	3549	3574	3628	4046	4126	4306	4349	4396	4435	4592	4651	4757
			4913	4972	5391#									4830
CKCERR	=	025676	5257	5261	5272	5277	5495#							
CKSWR	=	104407	6312	6376	6402	7277#								
CLEAR	=	000005	1105#	6122										
CLKOF	=	030160	5976#											
CLKON	=	030064	5954#											
CLOCK	=	030124	3047	5965#										

SEQ 0177

2967	5133#											
1158#												
1921#	5966*	5968*										
978#	6484	6494	7289	7294	7299	7304	7314	7323	7330	7338	7343	7348
7352	7358	7364	7370	7377	7382	7389	7398	7403	7408	7412	7417	7421
7427	7429	7434	7439	7443	7445	7449	7454	7459	7464	7470	7479	7483
7489	7494	7500	7507	7516	7518	7524	7533	7542	7553	7564	7570	7577
7586	7592	7596	7605	7614	7622	7627	7632	7639	7647	7655	7660	7670
7675	7680	7687	7697	7707	7716	7721	7728	7739	7746	7755	7767	7775
7780	7787	7793	7798	7805	7810	7820	7827	7835	7841	7849	7853	7862
7868	7875	7880	7884	7887	7895	7902	7909	7927	7935	8222	8242	8279
8292	8307	8569	8575	8578								
979#	6455	6494										
1123#	5501											
1938#												
1916#	4052	5632*	5633*	5634*	5635*	5636*	5637*	5655*	5656*	5657*	5658*	5659*
5660*												
1915#	5616*	5618*	5619*	5620*	5621*	5622*	5623	5625*	5642*	5643*	5644*	5645*
5646*	5647*	5648	5650*	5711	5715	5718						
1971#	4270	4320	4323	4406	4409	4467	4562	4619	4793	4883	4940	
1972#												
1973#	4374	4470	4557	4622	4735	4796	4878	4943				
1164#												
1172#												
1125#												
985#	1797	2933										
2070#	3013*	3201	3388									
1176#												
2069#	2980*	5133										
2111	2117	2123	2129	2134	2140	2146	2152	2258	2321	2366	8698#	
2157	2162	2167	2172	2177	2182	2187	2192	2197	2202	2212	2233	2253
2278	2284	2290	2295	2300	2315	2346	2371	2386	2411	2441	2466	2471
2476	2481	2486	2491	2496	2501	2506	2511	2516	2521	2526	2531	2541
2561	2566	2571	2576	2601	2606	2611	2616	2621	2626	2631	2636	2641
2646	2651	2656	2661	2666	2671	2701	2726	2731	2746	2751	2756	2781
2786	2796	2801	2821	2871	8737#							
2806	2811	2816	8746#									
2736	2741	2761	2766	2876	8758#							
2706	2716	8768#										
2326	8778#											
2207	2222	2227	2238	2243	2248	2263	2268	2273	2305	2310	2331	2336
2341	2351	2356	2361	2376	2381	2391	2396	2401	2406	2421	2426	2431
2436	2536	2546	2551	2556	2681	2686	2691	2696	2776	2826	2831	2836
2841	8789#											

SEQ 0178

[illegible]

SEQ 0179

DPAT1	001532	1974#												
DPAT2	001534	1975#												
DRA	= 000001	1168#	3230	3323										
DRDY	= 000200	1175#												
DRIVS	005526	2073#	3131*	3138*	3155	3177*	3203*	3220	3311*	3377	5002	5035	5188*	
DRIVO	005530	2078#	3028	3133	3179	3279	5171							
DRIV1	005532	2079#												
DRIV2	005534	2080#												
DRIV3	005536	2081#												
DRIV4	005540	2082#												
DRIV5	005542	2083#												
DRIV6	005544	2084#												
DRIV7	005546	2085#												
DROT	= 000040	1173#												
DRPAR	= 000010	1152#												
DRVMSK	= 000007	1132#	3196	3296										
DRVPTR	001362	1906#	3028*	3382	3392*									
DSC	= 040000	1179#												
DSWR	= 177570	984#	1796	2932										
DTE	= 010000	1161#												
DTYE	= 000040	1154#												
DT1	053764	2110	2116	2122	2128	2133	2139	2145	2151	2156	2161	2166	2171	2176
		2181	2186	2191	2196	2201	2211	2232	2252	2257	2277	2283	2289	2294
		2299	2314	2320	2345	2365	2370	2385	2410	2440	2465	2470	2475	2480
		2485	2490	2495	2500	2505	2510	2515	2520	2525	2530	2540	2560	2565
		2570	2575	2600	2605	2610	2615	2620	2625	2630	2635	2640	2645	2650
		2655	2660	2665	2670	2700	2705	2715	2725	2730	2735	2740	2745	2750
		2755	2760	2765	2780	2785	2790	2795	2800	2805	2810	2815	2820	2870
		2875	8636#											
DT13	054142	2206	2221	2226	2237	2242	2247	2262	2267	2272	2304	2309	2330	2335
		2340	2350	2355	2360	2375	2380	2390	2395	2400	2405	2420	2425	2430
		2435	2535	2545	2550	2555	2680	2685	2690	2695	2775	2825	2830	2835
		2840	8660#											
		2675	8671#											
DT14	054222	8683#												
DT15	054312	2580	2585	2590	2595	8643#								
DT3	054024	2770	8651#											
DT6	054072	2325	8652#											
DT9	054076	1228#	3942	4820	4826	4847								
D.ACLO=	000100	1215#	3546	3571	3625	4043	4120	4300	4343	4393	4429	4586	4645	4751
D.BRHM=	000100	4827	4907	4966										
D.CART=	000400	1217#	3546	3571	3591	3625	4043	4120	4300	4343	4393	4429	4586	4645
		4751	4827	4907	4966									
D.DOT =	000400	1203#												
D.DOOR=	000200	1216#	3540	3625	4043	4120	4300	4343	4393	4429	4586	4645	4751	4827
		4907	4966											
D.DRA =	000040	1200#	3544	3569	3623	4041	4118	4298	4341	4391	4427	4584	4643	4749
		4825	4905	4964										
D.DRDY=	000200	1202#	3623	3937	4041	4118	4298	4341	4391	4427	4584	4643	4749	4905
		4964												
D.DROT=	020000	1235#												
D.DSC =	040000	1209#	3623	3689	4041	4391	4825							
D.FLT =	000200	1229#	4036	4042	4392	4826								
D.FORM=	001000	1204#												
D.FWD =	002000	1219#												
D.HOFL=	000200	1243#												

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[illegible]

SEQ 0181

[illegible]

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SEQ 0182

E.A1	005502	2052#	3546#	3571#	3625#	4043#	4120#	4300#	4343#	4393#	4429#	4586#	4645#	4751#
E.A2	005506	4827#	4907#	4966#	5396#	5406	5408#	5453	8660	8671	8683	5397#	5410	5412#
E.A3	005512	2054#	4122#	4302#	4345#	4431#	4588#	4647#	4753#	4909#	4968#			
E.B0	005500	8671	8683											
E.B1	005504	2056#	5398#											
E.B2	005510	2051#	3545#	3570#	3624#	4042#	4119#	4299#	4342#	4392#	4428#	4585#	4644#	4750#
E.B3	005514	4826#	4906#	4965#	5414	5416#	5443	8660	8671	8683				
FATT1	024736	2053#	3547#	3572#	3626#	4044#	4121#	4301#	4344#	4394#	4430#	4587#	4646#	4752#
FATT2	025032	4828#	4908#	4967#	5418	5420#	5463	8660	8671	8683				
FCYL	027102	2055#	4123#	4303#	4346#	4432#	4589#	4648#	4754#	4910#	4969#	5422	5424#	8671
FHDHM	027172	8683												
FHDTAB	027314	2057#	4124#	4304#	4347#	4433#	4590#	4649#	4755#	4911#	4970#	5426	5428#	8683
FLGTST	027544	3988	5324#	6093	6117									
FLOAD	027246	4028	4188	5352#										
FMT1	000020	5709#												
FMT2	001520	5734#	5743											
FORM	030740	4240	4709	5768#										
FORMAT	001516	5810	5814	5829#										
FRCYL	001364	5752#												
FRDY	024422	1153#												
FRDY1	024470	1968#	5778#	5779#	5780#	5785								
FSEC17	027012	6132	6145#											
FTITLE	001360	1967#	4238#	4707#	5778	5807								
GBA	024324	1910#												
GDRVS	024164	3170	3186	3191	3286	3291	3469	3494	3639	3653	3751	3767	3782	3955
GETSP	030346	3984	4024	4063	4111	4184	4251	4276	4328	4380	4414	4477	4571	4630
GINT	024352	4719	4741	4803	4856	4892	4951	5252#	5255	5527	5588	6089	6108	6124
GNS	***** U	5266#	5269	5542	5552	5562	5571							
GO	000001	5685#												
GSTAT	025760	1904#	5144	5146#										
GSTAT1	026022	2999	5211#											
GTSWR	104406	2997	5166#											
HASOF	005424	3532	3537	3562	3587	3602	3613	3700	3717	3808	3834	3844	3855	3864
HBA	005414	3879	3932	4005	4227	4365	4451	4487	4506	4696	4782	4814	4842	5047
HCS1	005406	5054	6051#	6057										
HCS2	005410	3001	5224#											
HDA	005416	1274	7269	7270	7271	7272	7273	7275	7277	7278	7279	7280	7281	7282
HDB	005430	7283												
HDC	005426	1117#												
HDS	005420	3422	3539	3564	3590	3604	3618	3684	3694	3703	3709	3799	3836	3856
		3874	3911	3922	4007	4113	4222	4229	4253	4278	4330	4368	4383	4416
		4452	4573	4632	4690	4698	4721	4743	4806	4894	4953	5334	5339	5359
		5363	5523#	5592	5603	5615	5631	5736	5754	6112				
		5393	5535#											
		5155	7275#											
		2022#	5291#	5307	8640	8648	8657	8667	8679	8692				
		2018#	5287#	8640	8648	8657	8667	8679	8692					
		2015#	3193	3293	3912	4114	4191	4254	4279	4331	4384	4417	4480	4574
		4633	4722	4744	4807	4895	4954	5284#	5497	5501	5593	5904	8637	8645
		8654	8664	8676	8689									
		2016#	3226	3228	3232	3244	3319	3321	3325	3328	4333	4419	4576	4635
		4897	4956	5285#	5506	5510	8637	8645	8654	8664	8676	8689	8679	8692
		2019#	4508	4509	4837	4838	5288#	5941	8640	8648	8657	8667		
		2024#												
		2023#	5292#	5933	8640	8648	8657	8667	8679	8692				
		2020#	3230	3323	5289#	8637	8645	8654	8664	8676	8689			

SEQ 0183

NOTAB	001554	1986#	4242	4711	5770									
HOWD	001540	1978#												
HD1	001514	1966#	5772*	5773*	5774*	5775*	5776*	5777*	5784					
HEAD	001510	1964#	4237*	4244*	4245	4246*	4260*	4261	4706*	4713*	4714	4715*	4727*	4728
		5772	5841											
HEADA	001512	1965#	5675*	5676*	5677*	5678*								
HER	005422	2021#	4282	4492	4746	5290*	8637	8645	8654	8664	8676	8689		
HMR1	005432	2025#	5293*	8637	8645	8654	8664	8676	8689					
HMR2	005434	2026#	3195	3295	3423	3458	3472	3540	3565	3591	3605	3619	3642	3689
		3761	3800	3937	3946	3958	3978	4008	4013	4066	4223	4230	4369	4453
		4691	4699	4859	5270*	5275*	5294*	5544	5554	5564	5573	5616	5737	5755
		6083	6113	8637	8645	8654	8664	8676	8689					
HMR3	005436	2027#	3685	3942	4031	4036	4387	4500	4820	4847	5271*	5276*	5295*	5545
		5555	5565	5574	5604	5632	8637	8645	8654	8664	8676	8689		
HOLD	024556	5256	5260	5284*	5536									
HPAT	005442	2029#	5297*	8640	8648	8657	8667	8679	8692					
HPEND	005374	1998#	3026*	6101*										
HPOS	005440	2028#	5296*	8640	8648	8657	8667	8679	8692					
HT	= 000011	976#	6453	6494										
HVRC	= 000400	1157#												
HWC	005412	2017#	5286*	8640	8648	8657	8667	8679	8692					
HZ	001404	1919#	5968											
H.A0	005456	2039#	5433	5573*	8660	8674	8686							
H.A1	005462	2041#	5453	5564*	8660	8674	8686							
H.A2	005466	2043#	5554*	5642	8674	8686								
H.A3	005472	2045#	5544*											
H.B0	005460	2040#	5443	5574*	8660	8674	8686							
H.B1	005464	2042#	5463	5565*	8660	8674	8686							
H.B2	005470	2044#	5555*	5655	8674	8686								
H.B3	005474	2046#	5545*	5665	5675	8686								
IDAE	= 002000	1159#												
IE	= 000100	1118#												
ILF	= 000001	1149#												
INTER	031070	5239	6199#											
IOTVEC	= 000020	1071#	2914*	2915*										
IR	= 000100	1136#												
LCLKF	005550	2087#	3033*											
LCVEC	001350	1895#	3034											
LF	= 000012	977#	6488	6494	7289	7294	7299	7304	7314	7323	7330	7338	7343	7348
		7352	7358	7364	7370	7377	7382	7389	7398	7403	7408	7412	7417	7421
		7427	7429	7434	7439	7443	7445	7449	7454	7459	7464	7470	7479	7483
		7489	7494	7500	7507	7516	7518	7524	7533	7542	7553	7564	7570	7577
		7586	7592	7596	7605	7614	7622	7627	7632	7639	7647	7655	7660	7670
		7675	7680	7687	7697	7707	7716	7721	7728	7739	7746	7755	7767	7775
		7780	7787	7793	7798	7805	7810	7820	7827	7835	7841	7849	7853	7862
		7868	7875	7880	7884	7887	7895	7902	7909	7927	7935	8222	8242	8279
		8292	8307	8569	8575	8578								
LIMERR	001544	1981#												
LKS	001346	1893#	3032	5957*	5978*									
LPCNT	001466	1950#												
LPTIM	001470	1951#												
MCLK	= 000400	1189#												
MDS	= 001000	1139#	3226	3319	5064	5510								
MDSERR	001546	1982#												
MEMBAS	= 172100	1899#	2953	2962										
MEMERR	031026	2956	6185#											

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[illegible]

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SEQ 0185

[illegible]

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SEQ 0186

0.BRK	056510	8977	9232#						
0.BUF	057401	9314	9323	9328	9433#				
0.B2	056654	9253	9262#						
0.B3	056714	9261	9270#						
0.CADV	057064	9083	9100	9123	9127	9161	9165	9270	9313#
0.CLGL	055702	9039	9041	9049#					
0.CLGT=	000014	9053	9423#						
0.CLS1	057310	9381	9383#						
0.CR	057354	9390	9392	9393	9407#				
0.CRET	056014	9061	9090#						
0.CRLF	057320	9098	9159	9255	9294	9299	9390#		
0.CRLS	057326	9034	9392#						
0.CRS	057332	9391	9393#						
0.CSR1	057350	9290#	9306	9401#					
0.CSR2	057351	9291#	9307	9402#					
0.CT	055336	9219#	9262#	9264#	9461#				
0.C1	056466	9222#	9263						
0.DCD	055632	9019	9024	9034#	9092	9147	9272		
0.DCD1	055636	9035#	9084	9128					
0.EFF	056142	9069	9138#						
0.EFF1	056260	9150	9169#						
0.ENTR	055346	8957#							
0.ERR	055616	9004	9015	9031#	9054	9070	9142	9385	
0.ERR1	056152	9142#	9215						
0.ERR2	055772	9080#	9114	9191					
0.FTYP	057226	9033	9102	9117	9163	9268	9339	9355	9360#
0.GET	057150	8983	9037	9336#	9341	9343	9345		
0.GO	056324	9063	9189#						
0.G02	056402	9200#	9225						
0.LG =	000006	8987	9431#						
0.LGCH	057357	9050	9411#	9423					
0.LGDR	055732	9057	9060#	9072					
0.LGL =	000030	9072#							
0.LGL1	055704	9050#	9055						
0.LGL2	055724	9051	9056#						
0.MSK	055326	9143	9144	9146	9453#				
0.OOT	055342	1283	8955#	9442					
0.OFST	056070	9067	9113#						
0.OF1	056136	9126	9128#						
0.OP1	056026	9064	9096#						
0.OP2	056034	9008	9098#	9109					
0.ORPC	055540	9000#	9065						
0.P	057347	8975#	9189#	9214	9216*	9265*	9399#		
0.PRI	055324	8967	9238	9242	9452#				
0.PROC	056432	9071	9214#						
0.PR1	056454	9218	9220#						
0.RALL	055606	8978	9013	9023#					
0.RCSR=	177560	8942#	9290	9292#	9302	9304	9306*	9336	
0.R08 =	177562	8941#	9338						
0.REGT	055470	8983#	9062						
0.RSE1	057046	9303	9306#						
0.RSP	055500	8985#	8988						
0.RST	055404	8956	8965#						
0.RSTT	057016	9195	9221	9299#					
0.RST1	055434	8964	8972#						
0.RTIT	056430	8974#	9209#						

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SEQ 0187

0.SCAN	055642	8994	9037#	9048					
0.SP	055532	8986	8995#						
0.SPC	057076	9316#	9324						
0.SP1	055520	8991#	8996						
0.STM =	000340	8931#	8976	9194	9220	9222			
0.STRT	055372	8955	8962#						
0.SVR	056726	8965	9234	9276#					
0.SVTT	056764	9254	9266	9290#					
0.T	057346	9196#	9223#	9235	9398#				
0.TBIT	056354	9196#	9236						
0.TBT =	000020	8932#	9197	9224	9260				
0.TC	057312	9378	9384#						
0.TCLS	057274	9000	9090	9096	9107	9377#			
0.TCSR=	177564	8944#	9291	9293#	9300	9307#	9360	9366	
0.TDB =	177566	8943#	9362#	9368#					
0.TL	057373	8984	8987	8995	9425#	9431			
0.TRTC	057410	9023	9199	9438#					
0.TVEC=	000014	8930#	8958	8976#	8977#				
0.TYPE	057212	9258	9329	9352#	9356	9394			
0.TYP1	057272	9353	9364	9372#					
0.TYP2	057252	9366#	9367	9370					
0.UIN	055340	8966	9198#	9237	9462#				
0.UPC	055320	8959#	9193#	9208	9232#	9249	9251#	9450#	
0.UR0	055302	8962	8992	9443#					
0.USP	055316	8963#	9277#	9278	9449#				
0.UST	055322	8957#	9197#	9207	9224#	9233#	9240	9260#	9451#
0.WDS	056150	9139	9141#						
0.WDS2	056166	9146#	9168						
0.WDS3	056216	9157#	9170	9176	9185				
0.WDS4	056254	9157	9167#						
0.WRD	055762	9060	9076#						
0.WROA	056006	9077	9085#						
0.WRD1	055770	9079#	9086	9103					
0.WSCH	056146	9068	9140#						
0.XXX	057344	9276#	9284	9397#					
0.45	055446	8973	8975#						
PACK =	000003	1104#	3467	3637	3765	3953	4061	4854	
PARAM	001356	1903#	2880#	2883#	2993				
PARSRT	010050	1280	2880#						
PAT =	000020	1185#	3683						
PCA =	004000	1192#							
PCD =	010000	1193#							
PCLKF	005552	2088#	3037#	3044#	5955	5976			
PCVEC	001352	1896#	3038	3045					
PCYL	001372	1913#							
PFSRT	012440	3403#	6234						
PGE =	002000	1140#							
PIP =	020000	1178#							
PIR0 =	177772	983#							
PIRQVE=	000240	1077#							
PKRB	001344	1892#							
PKS	001340	1890#	3036	3043	5960#	5980#			
PKSB	001342	1891#	5959#						
PPTP	005524	2072#	2984#						
PRGSRT	010064	2881	2884#	5198					
PRO =	000000	1000#	2886	3075					

SEQ 0188

[illegible]

RKVEC	= 001334	1888#	3020*	5228*	5231*	5238								
RKWC	= 000002	1084#	3084	4108*	4243*	4272*	4322*	4376*	4408*	4472*	4564*	4624*	4712*	4737*
		4798*	4885*	4945*	5286									
RLS	= 000010	1133#												
RSEC	026726	5482	5665#											
RTT	= 000006	8934#												
SAVREG	= 104413	7015	7056	7281#	8843									
SBPAR	030202	5403	5407	5411	5415	5419	5423	5427	5993#					
SCLR	= 000040	1135#	3163	3184	3284	5586								
SCOP1	= 104415	3181	3281	3461	7283#									
SCOP1S	030254	6017#	7283											
SEC	001410	1923#	5969*											
SECFLG	027474	5786	5806#											
SECNT	001414	1925#												
SECTOR	001422	1928#	4267*	4268	4287*	4288	4324	4377	4410	5604*	5605*	5606*	5607*	5608*
		5609*	5665*	5666*	5667*	5668*	5669*	5670*	5687	5691	5694	5860*	5864	5865*
		5866*	5878	5888*	5889	5890*	5891*							
SEEK	= 000017	1110#	4022	4182										
SELDIV	= 000001	1103#	3189	3289	3749	3780	5060	5525	5540	5550	5560	5569		
SETINT	024404	3021	5229	5238#										
SIZFLG	005556	2090#	3022*	3174	5184*	5204*								
SKI	= 000002	1150#												
SORT	027622	5857#												
SPACE2	055256	8879	8888	8899	8909#									
SPBAR	= 000040	1909#	6037	6054										
SRTSPL	= 000011	1107#	3982	6087										
SRTTAB	002164	1988#	5869											
ST	= 177776	8928#	8957	8958*	8971*	9194*	9220*	9222*	9248*					
STACK	= 001100	971#	2885	2912	3073	3122	3182	3277	3282	3373	3413	3453	3462	3485
		3518	3673	3822	3897	3973	4094	4209	4675	4999	5029	5488	6194	6231
		8536												
START	010060	1278	2883#											
START1	010466	2975#												
STKLMT	= 177774	982#												
STOP	030374	6066#	6737	6820										
STOP1	030376	3741	6068#											
ST2	010534	2982	2993#											
ST3	010600	2983	3011#											
ST4	010632	2995	3016	3019#										
ST5	010656	3002	3024#	3161	3224	5123	6143							
SUBCLR	026332	3417	3455	3464	3489	3520	3556	3581	3596	3648	3675	3796	3824	3846
		3866	3899	3934	3975	3995	4018	4056	4096	4132	4178			

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[illegible]

SEQ 0191

TST13	014762	3870	3876	3895#										
TST14	015302	3971#												
TST15	015752	4092#												
TST16	016476	4150	4207#											
TST17	021426	4673#												
TST2	011216	3099	3120#											
TST20	023416	4997#												
TST21	023452	5003	5027#											
TST3	011756	3175	3275#											
TST4	012306	3305	3371#											
TST5	012440	3411#												
TST6	012576	3416	3451#											
TST7	012700	3459	3473	3483#										
TPDS =	104405	5112	7273#											
TYPE =	104401	2981	2996	2998	3000	3015	3056	3130	3140	3176	3205	3246	3379	3393
		3401	3420	3442	3443	3525	3526	3530	3531	3534	3535	3536	3559	3560
		3561	3584	3585	3586	3599	3600	3601	3609	3610	3611	3612	3678	3679
		3698	3699	3715	3716	3719	3720	3721	3727	3742	3774	3787	3793	3802
		3803	3806	3807	3827	3828	3832	3833	3842	3843	3853	3854	3862	3863
		3877	3878	3902	3903	3907	3929	3930	3931	3980	3998	3999	4003	4004
		4153	4171	4175	4176	4217	4218	4225	4226	4312	4355	4363	4364	4441
		4449	4450	4457	4485	4486	4504	4505	4513	4518	4523	4528	4598	4657
		4680	4681	4694	4695	4776	4777	4781	4812	4813	4840	4841	4919	4978
		5037	5040	5041	5045	5046	5052	5053	5072	5078	5080	5081	5110	5113
		5147	5197	5381	6042	6056	6075	6077	6085	6136	6141	6159	6204	6232
		6382	6390	6458	6552	6678	6734	6746	6800	6801	6804	6815	6825	6836
		6855	6903	6909	6914	6918	6923	6924	6926	6929	6933	6999	7001	7141
		7269#	8855	8856	8860	8861	8870	8879	8883	8888	8890	8896	8899	
		6389	8843#											
		6803	7270#	8876										
		7272#												
		3143	3208	3249	3397	3724	3771	3790	5075	5384	6162	6207	7271#	
		2061#	4047	4307	4350	4436	4593	4652	4758	4914	4973	5473		
		2062#	4047	4307	4350	4436	4593	4652	4758	4914	4973	5476		
		2063#	5480											
		1930#												
		1931#	3169	3185	3190	3285	3290	3493	3638	3652	3750	3766	3781	3954
		3983	4023	4062	4855	5526	5541	5551	5561	5570	5587	6088	6107	6116
		6123												
		1934#	3987	6092</										

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SEQ 0192

[illegible]

M15

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SEQ 0193

[illegible]

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SEQ 0194

\$MXCNT	031646	6350	6360#											
\$NULL	001154	1802#	6465	6494										
\$NWTST=	000001	3061#	3063	3106#	3108	3260#	3262	3362#	3364	3404#	3406	3445#	3447	3476#
		3478	3502#	3504	3659#	3661	3812#	3814	3883#	3885	3964#	3966	4072#	4074
		4198#	4200	4664#	4666	4987#	4989	5006#	5008					
\$OCNT	033246	6650#	6679#	6692#										
\$OCTL	034764	3424	7017	7042#										
\$UMODE	033250	6645#	6649#	6654	6657#	6668#	6694#							
\$OVER	031632	6314	6330	6338	6348	6357#								
\$PASS	001216	1827#	2944#	3415	4167	5031	5102#	5103#	5111	5124	6344	6361		
\$PASTH	001006	1315#												
\$PWRC	031210	6225#	6226#	6236#										
\$PWRCN	031124	2920	6219#	6228										
\$PWRCUP	031136	6219	6225#											
\$QUES	001204	1815#	6415	6494	6855	6926	6943	7001	7004					
\$RDCHR	034112	6868#	7278											
\$RDEC=	***** U	7281												
\$ROLIN	034202	6891#	7279											
\$ROCT	034522	6965#	7280											
\$ROSZ =	000022	6884#												
\$RESRE	035442	7226#	7282											
\$RTNAD	024042	5123#												
\$R2A =	***** U	7283												
\$SAVRE	035404	7210#	7281											
\$S82D	035176	7116#												
\$SCOPE	031370	2914	6311#											
\$SETUP=	000137	2877#	2913	2914	2916	2918	2920	2922	2923	2924	2926	5100	5148	6312
		6376	6402	6410	6738	6743	6744	6774	6950					
\$STUP =	177777	2877#												
\$SUPRS	035232	3441	4174	7133#										
\$SVLAD	031576	6322	6351#											
\$SVPC =	000244	1289#	1294											
\$SWR =	167400	933#	947	951	952	953	954	955	956	957	958	1812	1813	1814
		2923	2924	2926	2927	3072	3121	3276	3372	3412	3452	3484	3517	3672
		3821	3896	3972	4093	4208	4674	4998	5028	5095	5101	5116	5122	5124
		6303	6304	6305	6306	6307	6313	6325	6327	6328	6331	6332	6333	6340
		6341	6342	6354	6357	6360	6367	6368	6369	6370	6371	6380	6387	6399
		6403	6415											
\$SWREG	001232	1835#	2947											
\$SWRMK=	000000	958	959	6307	6308	6329								
\$TESTN	001214	1826#	3374#	6352#	8636	8643	8651	8652	8660	8671	8683			
\$TIMES	001174	1812#	2923#	3072#	3121#	3276#	3372#	3412#	3452#	3484#	3517#	3672#	3821#	3896#
		3972#	4093#	4208#	4674#	4998#	5028#	5101#	6340#	6347	6350#	6360		
\$TKB	001146	1799#	6034	6051	6698	6719	6730	6755	6783	6810				
\$TKCNT	033252	6699#	6714#	6744	6761#	6875	6877#							
\$TKINT	033262	2890	3740	3744	3777	6714#	6735	6796						
\$TKQEN=	033261	6703#	6769	6880										
\$TKQIN	033261	6700#	6715#	6716	6767#	6768#	6769	6771#						
\$TKQOU	033260	6701#	6716#	6878	6879#	6880	6882#							
\$TKQSR	033260	3729#	3732	3743#	6702#	6715	6771	6882						
\$TKS	001144	1798#	6698	6720#	6751#	6753	6759#	6781	6797#	6807	6819#	6839#		
\$TKSRV	033332	6717	6730#											
\$TMP0	001160	1806#	3730#	3732#	3733#	3734	3736	3738	4458#	4482#	4785#	4809#		
\$TMP1	001162	1807#	4459#	4465	4490#	4555	4617	4786#	4791	4817#	4876	4938		
\$TMP2	001164	1808#	4508#	4511	4516	4521	4526	4531	4536	4541#	4542	4551	4553	4605
		4609	4614#	4615	4837#	4872	4874	4926	4930	4935#	4936			

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```
STMP3      001166
STMP4      001170
STMP5      001172
STN        = 000022
```

```
STNPWR 035112
STPB 001152
STPFLG 001157
STPS 001150
STRAP 035500
STRAP2 035522
STRP = 000016
```

STPAD	035534
STSTM	001004
STSTNM	001102
STTYIN	034436
STYPEN:	*****
STYPD5	032332
STYPE	032050
STYPEC	032262
STYPEX	032330
STYPOC	033050
STYPON	033064
STYPOS	033024
SUNIT	001222

```
SUNITH      001010
SUSWR       001234
SVECT1      001260
SVECT2      001262
SXTSTR      031402
SSGET4=     000000
SOFILL      033247
$HOCAT=     *****
.           = 055342
```

```
.SASTA= ***** U
.SX    = 001000
```

[illegible]

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CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0196

CALIB	1403#	6102													
CHECK	1361#	3548	3573	3627	4045	4125	4305	4348	4395	4434	4591	4650	4756	4829	4912
	4971														
COMMEN	1078#														
CWD2	1376#														
DRCLR	1387#	6119													
ENDCOM	1078#														
ERROR	972#	3102	3159	3171	3187	3192	3214	3222	3237	3241	3252	3256	3287	3292	3308
	3316	3334	3338	3342	3346	3418	3456	3465	3470	3474	3490	3495	3497	3521	3542
	3551	3552	3553	3554	3557	3567	3576	3577	3578	3579	3582	3543	3597	3607	3621
	3630	3631	3632	3633	3640	3644	3649	3654	3656	3676	3687	3691	3696	3706	3712
	3752	3768	3783	3797	3825	3839	3847	3851	3859	3867	3871	3900	3919	3927	3935
	3939	3944	3948	3956	3960	3976	3985	3989	3996	4010	4015	4019	4025	4029	4033
	4038	4048	4049	4050	4051	4054	4057	4064	4068	4097	4112	4116	4128	4129	4130
	4131	4133	4139	4141	4179	4185	4189	4193	4215	4232	4252	4256	4265	4277	4290
	4296	4308	4309	4310	4311	4314	4318	4329	4336	4339	4351	4352	4353	4354	4361
	4371	4381	4386	4389	4398	4399	4400	4401	4404	4415	4422	4425	4437	4438	4439
	4440	4447	4463	4478	4484	4497	4502	4549	4572	4579	4582	4594	4595	4596	4597
	4631	4638	4641	4653	4654	4655	4656	4678	4701	4720	4724	4733	4742	4759	4760
	4761	4762	4768	4774	4789	4804	4811	4822	4832	4833	4834	4835	4845	4849	4857
	4861	4870	4893	4900	4903	4915	4916	4917	4918	4952	4959	4962	4974	4975	4976
	4977	5050	5069	5089	5503	5508	5512	5528	5543	5553	5563	5572	5589	6069	6081
	6090	6094	6109	6115	6118	6125	6128	6187							
ESCAPE	1078#														
F.EAB	1341#	4117	4297	4340	4426	4583	4642	4748	4904	4963					
GETPRI	1078#														
GETSWR	1078#	5148													
HDCHK3	1482#														
HDLBL	1495#														
LOOP	1325#	3180	3280	3461											
MSG	3061#	3063	3106#	3108	3260#	3262	3362#	3364	3404#	3406	3445#	3447	3476#	3478	3502#
	3504	3659#	3661	3812#	3814	3883#	3885	3964#	3966	4072#	4074	4198#	4200	4664#	4666
	4987#	4989	5006#	5008											
MULT	1078#														
NEWTST	1078#	3061	3106	3260	3362	3404	3445	3476	3502	3659	3812	3883	3964	4072	4198
	4664	4987	5006												
OWNTAG	1319#	1887													
POP	1078#	6547	6607	6608	6993	7189	7231								
PUSH	1078#	6506	6568	6570	6591	6967	7150	7211							
QKPACK	1734#	3635	3950	4059	4852										
QKSEEK	1507#	4181													
QKSRT	1709#	3974	6078												
QKUNLD	1751#	3488	3647												
RDATA	1578#														
RHDOR	1452#														
REPORT	1078#														
SBOUND	1654#	4547	4867												
SCOPE	973#	3071	3120	3275	3371	3411	3451	3483	3516	3671	3820	3895	3971	4092	4207
	4673	4997	5027	5099											
SETPRI	1078#	6871													
SETTRA	7261#	7270	7271	7272	7273	7275	7277	7278	7279	7280	7281	7282	7283		
SETUP	1078#	2906													
SKIP	1078#	3049	3099	3175	3305	3416	3459	3473	3870	3876	4150	5003			
SLASH	1078#														
SPACE	1078#														
STARS	1078#	1287	1298	1300	1307	1771	1818	1821	3061	3070	3106	3119	3260	3274	3362

D16

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
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CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0197

	3370	3404	3410	3445	3450	3476	3482	3502	3515	3659	3670	3812	3819	3883	3894
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	6417	6496	6563	6620	6697	6774	6789	6860	6884	6953	7006	7045	7107	7125	7148
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TRMTRP	7261#														
TYPBIN	1078#														
TYPDEC	1078#	5111													
TYPNAM	1078#														
TYPNUM	1078#														
TYPOCS	1078#	3141	3206	3247	3395	3722	3769	3788	5073	5382	6160	6205			
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TYPTXT	1078#														
WDATA	1535#	4273													
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WRHOR	1430#	4248	4716												
SSCMRE	1769#														
SSCHTH	1769#	1806	1807	1808	1903	1810	1811								
SSESCA	1078#														
SSNEWT	1078#	3061	3106	3260	3362	3404	3445	3476	3502	3659	3812	3883	3964	4072	4198
	4664	4987	5006												
SSSET	7261#	7270	7271	7272	7273	7275	7277	7278	7279	7280	7281	7282	7283		
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.STYPE	933#	6415													
.STYPO	933#	6618													

. ABS. 057412 000

% ERRORS DETECTED: 0 HARD 2 SOFT

E16

UNIBUS RK6 DRIVE DIAGNOSTIC PART 3
DZR6JD.P11 28-JAN-77 11:05

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CROSS REFERENCE TABLE -- MACRO NAMES

SEQ 0198

DEFAULT GLOBALS GENERATED: 0

DZR6JD, DZR6JD.SEG/SOL/CRF/NL:TOC/DOC=DZR6JD.P11

RUN-TIME: 23 20 2 SECONDS

RUN-TIME RATIO: 482/47=10.2

CORE USED: 31K (62 PAGES)

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