

RXV21/RX02

FORMATTER PROGRAM
CZR XEA0

AH-E623A-MC
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IDENTIFICATION

PRODUCT CODE: AC-E662A-MC
PRODUCT NAME: CZRXEAO RX02 FMTR PROG
DATE CREATED: 25 JUL 78
MAINTAINER: DIAGNOSTIC ENGINEERING
AUTHOR: L.S. PRUCHA

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TABLE OF CONTENTS

1.0	ABSTRACT
2.0	REQUIREMENTS
2.1	HARDWARE
2.2	STORAGE
3.0	LOADING PROCEDURE
4.0	STARTING PROCEDURE
5.0	CONSOLE OR SOFTWARE SWITCH SETTINGS
6.0	OPERATION
6.1	CONDITIONS OF OPERATION
7.0	PROGRAM DESCRIPTION
7.1	FLOW
7.2	TEST DESCRIPTIONS
8.0	DEVICE REGISTERS
9.0	LISTING INDEX
9.1	LISTING

5637 1.0 ABSTRACT
5638 -----
5639
5640 THIS PROGRAM IS INTENDED TO FORMAT A FLOPPY DISK TO EITHER SINGLE
5641 OR DOUBLE DENSITY ON A DRIVE CAPABLE OF SETTING DENSITY ON A FLOPPY
5642 DISK. IT WILL RUN UNDER APT, BUT WILL RUN IN A USER MODE WITH
5643 SEVERAL SWITCHABLE OPTIONS TO ENABLE A TESTING AND DEBUGGING.
5644
5645
5646 2.0 REQUIREMENTS
5647 -----
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5650 2.1 HARDWARE
5651 -----
5652
5653 1. ANY PDP-11 PROCESSOR
5654 2. RX02,XX SUBSYSTEM
5655
5656
5657 2.2 STORAGE
5658 -----
5659
5660 THIS PROGRAM REQUIRES AT LEAST 4K WORDS OF CORE. IF LOADING
5661 VIA XXDP MORE STORAGE WILL BE NEEDED FOR THE XXDP MONITOR.
5662
5663
5664 3.0 LOADING PROCEDURE
5665 -----
5666
5667 USE OF STANDARD BINARY LOADING PROCEDURE OR DOWN LINE LOAD VIA
5668 APT.
5669
5670
5671 4.0 STARTING PROCEDURE
5672 -----
5673
5674 1. USER MODE - START AT LOCATION 200(8) TO INITIALIZE
5675 ----- REGISTERS.
5676 - START AT LOCATION 210(8) TO RESTART TEST.
5677 - START AT LOCATION 220(8) TO ENTER DEBUG MODE.
5678
5679 2. APT MODE - ALWAYS START AT LOCATION 200(8).
5680 -----

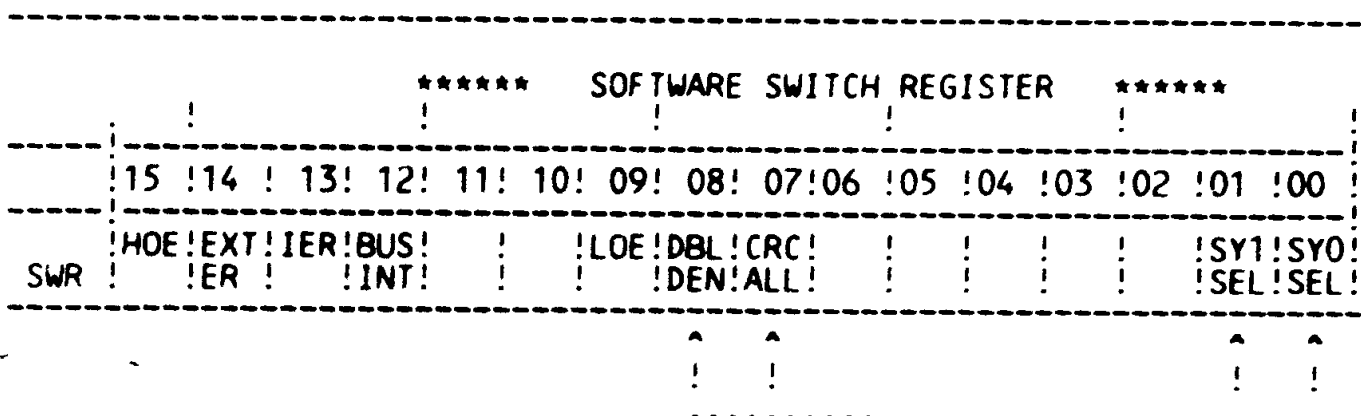
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5.0 SOFTWARE SWITCH SETTINGS

1. USER MODE - THE SWITCH REGISTER IS SETUP FOR THE USER BY THE PROGRAM VIA USER DIALOG.

- SW15: 1 = HALT ON ERROR
0 = CONTINUE
- SW14: 1 = EXTENDED ERROR REPORTS
0 = NORMAL ERROR REPORTS
- SW13: 1 = INHIBIT ERROR REPORTS
0 = PRINT ERRORS
- SW12: 1 = BUS INITIALIZE ON ERROR IF LOOPING
0 = NO BUS INITIALIZE ON ERROR
- SW09: 1 = LOOP ON ERROR
0 = CONTINUE

THESE SWITCH SETTINGS ARE AVAILABLE, BUT ARE INTENDED FOR HARDWARE DEBUG ONLY.



THESE BITS ARE SET BY PROGRAM INTERFACE TO USER - THEY ARE SHOWN HERE TO AID IN PROGRAM MAINTENANCE.

2. APT MODE - THE APT SWITCH REGISTER '\$SWREG' MUST BE SET UP AS FOLLOWS: SY0SEL=1 (BIT0) AND DBLDEN=1 (BIT8) FOR SETTING TO DOUBLE DENSITY. IF CRC CHECK ON ALL TRACKS IS DESIRED THEN SET BIT CRCALL=1 (BIT7) SEE SWITCH REGISTER ABOVE.

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6.0 OPERATION

THE PROGRAM OPERATION IN 'USER MODE' IS SIMPLE. AFTER INITIAL START THE PROGRAM WILL ASK THE OPERATOR IF HELP IS WANTED AND WILL TYPE OUT A SHORT DESCRIPTION OF THE PROGRAM IF ANSWERED YES. THE PROGRAM WILL ALSO ASK IF A FULL DISKETTE SCAN IS WANTED TO VERIFY CRC. IF ADDRESS MODIFICATION IS SELECTED THEN THE PROGRAM WILL THEN ASK THE OPERATOR TO ENTER THE BUS ADDRESS AND VECTOR ADDRESS.

6.1 CONDITIONS OF OPERATION

THE PROGRAM EXPECTS TO RUN ON AN RX02 INTERFACE AND RX02 DRIVE SUBSYSTEM THAT HAVE PASSED ALL DIAGNOSTIC TESTS. ERRORS ARE REPORTED, BUT PRINTOUTS ARE NOT EXTENSIVE ENOUGH TO DIAGNOSE HARDWARE FAILURES.

7.0 PROGRAM DESCRIPTION

THE PROGRAM IS ORGANIZED AS FOLLOWS:

START
DETERMINE IF LSI PROCESSOR
IF NOT APT MODE, CALL OPERATOR INTERFACE
SET UP REGISTERS
CALL SYSTEM SCHEDULER
IF NOT APT MODE-CALL OUTPUT SYSTEM DONE (GET FURTHER OPERATOR INSTRUCTIONS)
PRINT END OF PASS
INCREMENT PASS COUNTER
CHECK IF ACT MODE
BUS RESET
IF IDLE MODE SET THEN IDLE IN LOOP
JUMP BACK TO 'CALL SYSTEM SCHEDULER'

```
5772          7.1  FLOW
5773          ----
5774          BEGINROUTINE (MOD PROGRAM START + CONTROL)
5775          : INITIALIZE STACK POINTER
5776          : IF RO IS FALSE
5777          :   THEN
5778          :     PRINT PROGRAM IDENTIFICATION MSG
5779          :     IF APT MODE IS TRUE
5780          :       THEN
5781          :         GET APT SWITCH REGISTER
5782          :         IF APT_PROCESSOR_Q-BUS TRUE
5783          :           THEN
5784          :             SET LSI PROC PRI
5785          :           ELSE
5786          :             SET PDP11 PROC PRI
5787          :           ENDIF
5788          :         GET APT VECTOR
5789          :         SET SYSTEM VECTOR
5790          :         GET APT BASE ADDRESS OF UNIT UNDER TEST
5791          :         CALL ADDRESSING TEST
5792          :       ELSE
5793          :         SETUP BUS TRAP FOR LSI PROC TEST
5794          :         SET PROCESSOR STATUS WORD
5795          :         IF LSI_PROCESSOR_STATUS_WORD_TRAP TRUE
5796          :           THEN
5797          :             SET LSI PROCESSOR WORD STATUS
5798          :             SET LSI PROCESSOR FLAG
5799          :           ENDIF
5800          :         CALL OPERATOR INTERFACE (MOD 1.0)
5801          :         SET VECTOR INTERRUPT ADDRESS
5802          :       ENDIF
5803          :     SETUP DENSITY PER SWITCH REGISTER
5804          :     CLEAR TABLES + FLAGS
5805          :     CALL MOD-TEST ADDRESS
5806          :   ENDIF
5807          : CLEAR PASS COUNTER
5808          : BGND0
5809          :   CALL SYSTEM SCHEDULER (MOD 2.0)
5810          :   IF APT MODE FALSE
5811          :     THEN
5812          :       CALL OUTPUT DONE (MOD 3.0)
5813          :     ENDIF
5814          :   SET UP/PRINT END OF PASS + PASS COUNT
5815          :   INCREMENT PASS COUNTER
5816          :   IF ACT MODE TRUE
5817          :     THEN
5818          :       RESET
5819          :       CALL ACT HOOKS
5820          :     ENDIF
5821          :   IF SYSTEM_FLAG-IDLE
5822          :     THEN
5823          :       BEGINDO
5824          :       ENDDO
5825          :     ENDIF
5826          :   ENDDO
5827          ENDRROUTINE
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7.2 PROGRAM FUNCTIONAL DESCRIPTIONS

THE PROGRAM WILL ACCOMPLISH THE FOLLOWING FUNCTIONAL ELEMENTS:

1. PROGRAM INITIALIZE SELECTED SYSTEMS + CHECK STATUS
2. READ MAINTENANCE STATUS ON SELECTED DRIVES + CHECK STATUS
3. SET DENSITY ON ALL SELECTED DRIVES + CHECK STATUS
4. CHECK CRC ON TRACKS #76 AND #0 OR ALL TRACKS, IF SELECTED BY USER. REPORT STATUS, IF ANY ERRORS.
5. REPORT WHEN DONE.

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8.0 DEVICE REGISTERS

CODE	FUNCTION
0	= FILL BUFFER
1	= EMPTY BUFFER
2	= WRITE SECTOR
3	= READ SECTOR
4	= SET DENSITY (RX02) ** BE CAREFUL TAKES 15 SECONDS **
5	= READ STATUS ** MAINTENANCE MODE **
6	= WRITE SECTOR WITH DELISTED DATA
7	= READ ERROR CODE

***** RX02 REGISTER BITS *****

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
RXCS:	ERR	INT	XM	XM	RX2	SID	DEN	TR	IE	DON	DRV	FUN	FUN	FUN	GO	
WC:	WORD COUNT															
BA:	BASE ADDRESS															
RXES:	X	X	X	X	NXM	WC	SID	DRV	DRV	DEL	DSK	DEN	AC	INT	SID	CRC
						OVF	#1	#1	RDY	DAT	DEN	ERR	LOW	DON	RDY	ERR
RXDB:	DATA BUFFER															

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9.0 LISTING INDEX

 6042 BASIC DEFINITIONS
 6069 ACT11 HOOKS
 6128 APT MAILBOX-ETABLE
 6130 APT PARAMETER BLOCK
 6186 MODULE 0.0 - PROGRAM START AND CONTROL
 6269 MODULE 1.0 - OPERATOR INTERFACE
 6376 MODULE 1.1 - GET SYSTEM BUS ADDRESS + TEST
 6432 ADDRESSING TEST
 6452 ERROR 1 UNIT NOT RESPONDING TO ADDRESS
 6459 MODULE 1.2 - GET SOFTWARE SWITCH REGISTER
 6476 MODULE 1.3 - CHECK SYSTEM ADDRESS
 6512 MODULE 2.0 - SYSTEM SCHEDULER
 6618 MODULE 2.1 - INITIALIZE CHECK
 6677 ERROR 2 NO DONE BIT AFTER INITIALIZE
 6690 ERROR 3 ERROR BIT SET ON INITIALIZE
 6705 MODULE 2.2 - SYSTEM DRIVER
 6818 MODULE 2.2.1 - GET COMMAND
 6911 MODULE 2.2.2 - TRACK + SECTOR UPDATE
 7040 MODULE 2.2.3 - DRIVE DRIVER
 7083 MODULE 2.2.3.1 - OUTPUT DRIVE COMMAND
 7149 MODULE 2.2.3.1.1 - OUTPUT SINGLE WORD
 7161 MODULE 2.2.5 - ERROR CHECK
 7237 ERROR 4 READ MAINT STATUS COMMAND ERROR
 7253 ERROR 5 SET DENSITY COMMAND ERROR
 7270 ERROR 6 READ SECTOR COMMAND ERROR
 7279 MODULE 2.2.5.1 - DRIVE DROP
 7385 MODULE 2.2.5.2 - DRIVES AVAILABLE CHECK
 7481 MODULE 2.2.5.3 - SET TEST BITS IN CSR + ESR
 7524 MODULE 2.2.5.4 - LOOPING MODULE
 7539 ERROR 7 LOOPING MOD-CSR ERR
 7543 ERROR 10 LOOPING MOD-ESR ERR
 7548 MODULE 2.3 - SYSTEM STATUS
 7659 MODULE 2.3.1 - PRINT SYSTEM STATUS
 7728 MODULE 2.3.2 - SYSTEM DROP
 7758 MODULE 2.3.3 - SYSTEM TIMEOUT CHECK
 7803 MODULE 2.4 - WATCH DOG SYSTEM#0
 7826 MODULE 2.5 - WATCH DOG SYSTEM#1
 7853 MODULE 3.0 - OUTPUT SYSTEM DONE
 7893 MODULE U.PRIHI - SET PROCESSOR PRIORITY HIGH
 7901 MODULE U.PRIL0 - SET PROCESSOR PRIORITY LOW
 7909 MODULE U.PROPRI - SET PROCESSOR PRI
 7922 MODULE U.SADR - SET SYSTEM BUS ADDRESS
 7932 MODULE U.SUC0 - SET SYSTEM UNDER CONTROL OFFSET
 7940 MODULE U.DL - DELAY FOR 'TR' OR 'DONE'
 7963 TIME OUT ERROR PRINT
 7996 RXCS ERROR CHECK
 8037 RXES ERROR CHECK
 8078 TEST HEADER CHECK + PRINT
 8098 MODULE U.PRYSYS - PRINT SYSTEM IDENTIFICATION
 8106 MODULE U.PRTRV - PRINT DRIVE IDENTIFICATION
 8124 MODULE U.PRTKSC - PRINT TRACK + SECTOR ERROR IDENT
 8142 CHECK BITS SET + NOT SET
 8255 ERROR SET SUBROUTINE

5941	8264	BUS INITIALIZE SUBROUTINE
5942	8294	RX02 INTERRUPT HANDLER #0
5943	8301	RX02 INTERRUPT HANDLER #1
5944	8307	TTY INTERRUPT HANDLER
5945	8323	BUS ADDRESS TRAP HANDLER
5946	8346	APT ERROR HANDLER
5947	8358	MODULE U.OPRANS - SETUP + GET OPERATOR ANSWERS
5948	8371	TTY ENTRY SUBROUTINE
5949	8418	TTY ENTRY ERROR SUBROUTINE
5950	8427	TTY ANSWER ENTRY SUBROUTINE
5951	8458	TTY READ SUBROUTINE
5952	8474	TTY ASCII OUTPUT SUBROUTINE
5953	8497	OCTAL OUTPUT SUBROUTINE
5954	8560	DATA CHARACTER OUTPUT SUBROUTINE
5955	8587	TTY OUTPUT
5956	8601	MESSAGE TABLE
5957	8666	TEST HEADERS
5958	8677	ERROR CODE STORAGE
5959	8691	PATCH AREA
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9.1 LISTING

```
&
.TITLE CZRXEAO RX02 FMTR PROG
:RX02-APT
:14-MARCH-78
:L. PRUCHA
.ENABLE ABS,AMA
.LIST ME
.NLIST BEX,CND,MC,MD
```

:***** PROGRAM EQUIVALENTS *****

000040	DNBIT	=	40	:DONE BIT-----<CSR>
000200	TRBIT	=	200	:TR BIT-----<CSR>
000400	DENBIT	=	400	:DENSITY BIT-----<CSR>
001000	SIDE1	=	1000	:SIDE #1 BIT-----<ESR> & <CSR>
000200	DRVRDY	=	200	:DRIVE READY BIT-<ESR>
000010	ACLOW	=	10	:AC LOW BIT-----<ESR>
000004	INITDN	=	4	:INITIALIZE DONE BIT-<ESR>
000002	SIDRDY	=	2	:SIDE READY BIT--<ESR>
000400	DRIVE1	=	400	:DRIVE #1 BIT-----<ESR>
000020	DENERR	=	BIT4	:DENSITY ERROR----<ESR>
000040	DRV DEN	=	BIT5	:DRIVE DENSITY----<ESR>
000001	CRCERR	=	BIT0	:CRC ERROR BIT----<ESR>
100000	ERRBIT	=	100000	:ERROR BIT-----<CSR>
000020	DRV1	=	20	:DRIVE 1-----<CSR>
040000	RXINIT	=	40000	:RXINIT BIT-----<CSR>
004000	RX2BIT	=	4000	:RX02 BIT-----<CSR>
000001	APTENV	=	1	:APT ENVIRONMENT TEST WORD
000040	APTCSP	=	40	:APT CONSOLE SUPPRESSION WORD
000200	CRCALL	=	SW7	:CRC ALL TRACKS & SECTORS FLAG
000006	RDSEC	=	6	:READ SECTOR COMMAND CODE (LEFT SHIFTED)
000012	RDMNST	=	12	:READ MAINT STATUS COMMAND CODE (LS)
000010	SETDEN	=	10	:SET DENSITY COMMAND CODE (LS)
000400	DBLDEN	=	BIT8	:DOUBLE DENSITY BIT
000001	X=1			
000001	N=1			

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.SBTTL BASIC DEFINITIONS

;*INITIAL ADDRESS OF THE STACK POINTER *** 1000 ***

STACK= 1000

.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

```

(1)      000304      SW02= 4
(1)      000002      SW01= 2
(1)      000001      SW00= 1
(1)      .EQUIV SW09,SW9
(1)      .EQUIV SW08,SW8
(1)      .EQUIV SW07,SW7
(1)      .EQUIV SW06,SW6
(1)      .EQUIV SW05,SW5
(1)      .EQUIV SW04,SW4
(1)      .EQUIV SW03,SW3
(1)      .EQUIV SW02,SW2
(1)      .EQUIV SW01,SW1
(1)      .EQUIV SW00,SW0

(1)      ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
(1)      100000      BIT15= 100000
(1)      040000      BIT14= 40000
(1)      020000      BIT13= 20000
(1)      010000      BIT12= 10000
(1)      004000      BIT11= 4000
(1)      002000      BIT10= 2000
(1)      001000      BIT09= 1000
(1)      000400      BIT08= 400
(1)      000200      BIT07= 200
(1)      000100      BIT06= 100
(1)      000040      BIT05= 40
(1)      000020      BIT04= 20
(1)      000010      BIT03= 10
(1)      000004      BIT02= 4
(1)      000002      BIT01= 2
(1)      000001      BIT00= 1
(1)      .EQUIV BIT09,BIT9
(1)      .EQUIV BIT08,BIT8
(1)      .EQUIV BIT07,BIT7
(1)      .EQUIV BIT06,BIT6
(1)      .EQUIV BIT05,BIT5
(1)      .EQUIV BIT04,BIT4
(1)      .EQUIV BIT03,BIT3
(1)      .EQUIV BIT02,BIT2
(1)      .EQUIV BIT01,BIT1
(1)      .EQUIV BIT00,BIT0

(1)      ;*BASIC "CPU" TRAP VECTOR ADDRESSES
(1)      000004      ERRVEC= 4      ;;TIME OUT AND OTHER ERRORS
(1)      000010      RESVEC= 10     ;;RESERVED AND ILLEGAL INSTRUCTIONS
(1)      000014      TBITVEC=14     ;;'T' BIT
(1)      000014      TRTVEC= 14     ;;TRACE TRAP
(1)      000014      EPTVEC= 14     ;;BREAKPOINT TRAP (BPT)
(1)      000020      IOTVEC= 20     ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
(1)      000024      PWRVEC= 24     ;;POWER FAIL
(1)      000030      EMTVEC= 30     ;;EMULATOR TRAP (EMT) **ERROR**
(1)      000034      TRAPVEC=34     ;;'TRAP' TRAP
(1)      000060      TKVEC= 60      ;;TTY KEYBOARD VECTOR
(1)      000064      TPVEC= 64      ;;TTY PRINTER VECTOR
(1)      000240      PIRQVEC-240    ;;PROGRAM INTERRUPT REQUEST VECTOR
  
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6071          ;***** TTY INTERRUPT VECTOR *****
6072
6073          .=60
6074 000060 012420      ITINT          ;TTY INTERRUPT HEADER ADDRESS
6075 000062 000000      0
6076
6077          ;***** START ADDRESS *****
6078
6079          .=200
6080 000200 005000      CLR          R0
6081 000202 000137 001000      JMP          START          ;PROGRAM START
6082
6083          .=210
6084 000210 012700 000001      MOV          #1,R0
6085 000214 000137 001000      JMP          START          ;SET NO HEADER FLAG
6086
6087          .=220
6088 000220 005237 000516      INC          DBGFLG        ;SET DEBUG FLAG
6089 000224 005000          CLR          R0            ;SET SO HEADER WILL PRINT
6090 000226 000137 001000      JMP          START
6091
6092          ;***** RX02 INTERRUPT VECTORS *****
6093
6094          .=264
6095 000264 012404      RXINT0          ;RX02 INTERRUPT HANDLER #0 ADDRESS
6096 000266 000340      340
6097
6098          .=270
6099 000270 012412      RXINT1          ;RX02 INTERRUPT HANDLER #1 ADDRESS
6100 000272 000340      340
6101
6102          .=300
6103
6104          ;***** CONSTANTS *****
6105
6106 000300 177560      TKS:          177560        ;TTY READER STATUS
6107 000302 177562      TKB:          177562        ;TTY READ BUFFER
6108 000304 177564      TPS:          177564        ;TTY PUNCH STATUS
6109 000306 177566      TPB:          177566        ;TTY PUNCH BUFFER
6110
6111
6112          ;***** INITIAL CONSTANTS *****
6113
6114 000310 000264      VECT0:        264          ; INTERRUPT VECTOR SYS #0
6115 000312 000270      VECT1:        270          ; INTERRUPT VECTOR SYS #1
6116 000314 177170      REGS0:       177170        ; STARTING REGISTER ADDRESS SYS #0
6117 000316 177200      REGS1:       177200        ; STARTING REGISTER ADDRESS SYS #1
6118 000320 000004      BTRP:         4            ;BUS TRAP ADDRESS
6119 000322 000006      BTRP2:        6            ;BUS TRAP PRIORITY LEVEL
6120 000324 000401      SWREG:       401          ;SOFTWARE SWITCH REGISTER - PRESET-> DEN-DBL,SYS0
6121

```

```

6123
6124      000400
6125      000401      .=400
6126      000264      ASWREG=401
6127      177170      AVECT1=264      :APT VECTOR 264
6128      .SBTTL APT MAILBOX-ETABLE      ABASE=177170      :APT UNIBUS ADDRESS
(1)
(2)      ::*****
(1)      .EVEN
(1) 000400      $MAIL:      ::APT MAILBOX
(1) 000400 000000      $MSGTY: .WORD   AMSGTY      ::MESSAGE TYPE CODE
(1) 000402 000000      $FATAL: .WORD   AFATAL      ::FATAL ERROR NUMBER
(1) 000404 000000      $TESTN: .WORD   ATESTN     ::TEST NUMBER
(1) 000406 000000      $PASS:  .WORD   APASS      ::PASS COUNT
(1) 000410 000000      $DEVCT: .WORD   ADEVCT     ::DEVICE COUNT
(1) 000412 000000      $UNIT:  .WORD   AUNIT      ::I/O UNIT NUMBER
(1) 000414 000000      $MSGAD: .WORD   AMSGAD     ::MESSAGE ADDRESS
(1) 000416 000000      $MSGLG: .WORD   AMSGLG     ::MESSAGE LENGTH
(1) 000420      $ETABLE:      ::APT ENVIRONMENT TABLE
(1) 000420      000      $ENV:  .BYTE   AENV        ::ENVIRONMENT BYTE
(1) 000421      000      $ENVM: .BYTE   AENVM       ::ENVIRONMENT MODE BITS
(1) 000422 000401      $SWREG: .WORD   ASWREG     ::APT SWITCH REGISTER
(1) 000424 000000      $USWR:  .WORD   AUSWR      ::USER SWITCHES
(1) 000426 000000      $CPUOP: .WORD   ACPUOP     ::CPU TYPE,OPTIONS
(1)      :*      BITS 15-11=CPU TYPE
(1)      :*      11/04=01,11/05=02,11/20=03,11/40 04,11/45 05
(1)      :*      11/70=06,PDQ=07,Q=10
(1)      :*      BIT 10=REAL TIME CLOCK
(1)      :*      BIT 9=FLOATING POINT PROCESSOR
(1)      :*      BIT 8=MEMORY MANAGEMENT
(1) 000430      000      $MAMS1: .BYTE   AMAMS1     ::HIGH ADDRESS,M.S. BYTE
(1) 000431      000      $MTYP1: .BYTE   AMTYP1     ::MEM. TYPE,BLK#1
(1)      :*      MEM.TYPE BYTE -- (HIGH BYTE)
(1)      :*      900 NSEC CORE=001
(1)      :*      300 NSEC BIPOLAR=002
(1)      :*      500 NSEC MOS=003
(1) 000432 000000      $MADR1: .WORD   AMADR1     ::HIGH ADDRESS,BLK#1
(1)      :*      MEM.LAST ADDR.=3 BYTES,THIS WORD AND LOW OF 'TYPE' ABOVE
(1) 000434      000      $MAMS2: .BYTE   AMAMS2     ::HIGH ADDRESS,M.S. BYTE
(1) 000435      000      $MTYP2: .BYTE   AMTYP2     ::MEM.TYPE,BLK#2
(1) 000436 000000      $MADR2: .WORD   AMADR2     ::MEM.LAST ADDRESS,BLK#2
(1) 000440      000      $MAMS3: .BYTE   AMAMS3     ::HIGH ADDRESS,M.S.BYTE
(1) 000441      000      $MTYP3: .BYTE   AMTYP3     ::MEM.TYPE,BLK#3
(1) 000442 000000      $MADR3: .WORD   AMADR3     ::MEM.LAST ADDRESS,BLK#3
(1) 000444      000      $MAMS4: .BYTE   AMAMS4     ::HIGH ADDRESS,M.S.BYTE
(1) 000445      000      $MTYP4: .BYTE   AMTYP4     ::MEM.TYPE,BLK#4
(1) 000446 000000      $MADR4: .WORD   AMADR4     ::MEM.LAST ADDRESS,BLK#4
(1) 000450 000264      $VECT1: .WORD   AVECT1     ::INTERRUPT VECTOR#1,BUS PRIORITY#1
(1) 000452 000000      $VECT2: .WORD   AVECT2     ::INTERRUPT VECTOR#2BUS PRIORITY#2
(1) 000454 177170      $BASE:  .WORD   ABASE      ::BASE ADDRESS OF EQUIPMENT UNDER TEST
(1) 000456
(1)      .MEXIT
    
```

6130
(1)
(2)
(1)
(2)
(1) 000456
(1) 000024
(1) 000024 000200
(1) 000044
(1) 000044 000456
(1) 000456
(2)
(1)
(1)
(1)
(1) 000456
(1) 000456 000000
(1) 000460 000400
(1) 000462 000120
(1) 000464 000120
(1) 000466 000120
(1) 000470 000027

.SBTTL APT PARAMETER BLOCK
:*****
:SET LOCATIONS 24 AND 44 AS REQUIRED FOR APT
:*****
.\$X=. ;;SAVE CURRENT LOCATION
.=24 ;;SET POWER FAIL TO POINT TO START OF PROGRAM
200 ;;FOR APT START UP
.=44 ;;POINT TO APT INDIRECT ADDRESS PNTR.
\$APTHDR ;;POINT TO APT HEADER BLOCK
.=.\$X ;;RESET LOCATION COUNTER
:*****
:SETUP APT PARAMETER BLOCK AS DEFINED IN THE APT-PDP11 DIAGNOSTIC
:INTERFACE SPEC.
\$APTHD:
\$HIBTS: .WORD 0 ;;TWO HIGH BITS OF 18 BIT MAILBOX ADDR.
\$MADR: .WORD \$MAIL ;;ADDRESS OF APT MAILBOX (BITS 0-15)
\$STMT: .WORD 120 ;;RUN TIM OF LONGEST TEST
\$PASTM: .WORD 120 ;;RUN TIME IN SECS. OF 1ST PASS ON 1 UNIT (QUICK VERIFY)
\$UNITM: .WORD 120 ;;ADDITIONAL RUN TIME (SECS) OF A PASS FOR EACH ADDITIONAL UNIT
.WORD \$ETEND-\$MAIL/2 ;;LENGTH MAILBOX-ETABLE(WORDS)

```
6132 ;***** FLAGS AND COUNTERS *****
6133
6134 000472 177170 RXCSAD: 177170 ;RX02 CSR ADDRESS
6135 000474 177172 RXDBAD: 177172 ;RX02 DBR ADDRESS
6136 000476 000264 RXVECT: 264 ;RX02 VECTOR ADDRESS
6137 000500 000001 SECTR: 1 ;SECTOR ADDRESS
6138 000502 000000 TRACK: 0 ;TRACK ADDRESS
6139 000504 000324 SWR: #SWREG ;SWITCH REG ADDRESS
6140 000506 000000 DENS: 0 ;DENSITY WORD
6141 000510 000000 REGS: 0 ;REGISTER ADDRESS BUFFER
6142 000512 000000 VECT: 0 ;VECTOR ADDRESS BUFFER
6143 000514 000000 INITPG: 0 ;PROGRAM INITIALIZE FLAG
6144 000516 000000 DBGFLG: 0 ;DEBUG FLAG
6145 000520 000000 LSIFLG: 0 ;LSI OR SWITCHLESS PROCESSOR FLAG
6146 000522 000000 PCNTR: 0 ;PASS COUNTER
6147 000524 000000 TOB: 0 ;TYPE OUTPUT BUFFER
6148 000526 000000 TIB: 0 ;TYPE INPUT BUFFER
6149 000530 000000 ANSWER: 0 ;ANSWER TO QUESTION BUFFER
6150 000532 000000 TTWAIT: 0 ;TTY WAIT FLAG
6151 000534 000000 CSR: 0 ;RXCS TEMP STORE
6152 000536 000000 ESR: 0 ;RXES TEMP STORE
6153 000540 000000 WDOT: 0 ;WORD FOR OUTPUT
6154 000542 000000 CMD: 0 ;RX COMMAND
6155 000544 000000 CSRMSK: 0 ;RXCS MASK WORD
6156 000546 000000 CSRCMP: 0 ;RXCS COMPARE WORD
6157 000550 000000 ESRMSK: 0 ;RXES MASK WORD
6158 000552 000000 ESRCMP: 0 ;RXES COMPARE WORD
6159 000554 000000 TSTERR: 0 ;TEST ERROR FLAG
6160 000556 000000 SOWMLT: 0 ;WATCHDOG MULTIPLIER SYSTEM#0
6161 000560 000000 S1WMLT: 0 ;WATCHDOG MULTIPLIER SYSTEM#1
6162 000562 000000 TEMP1: 0
6163 000564 000000 TEMP2: 0
6164 000566 000000 TEMP3: 0
6165 000570 000000 BTRPFL: 0 ;BUS TRAP FLAG
6166 000572 000000 SYMSG: 0 ;SYSTEM MESSAGE BUFFER
6167 000574 000000 SYSFLG: 0 ;SYSTEM FLAGS
6168 000576 000000 STFLG: 0 ; - START PROGRAM FLAG
6169 000600 000000 TMSGAD: 0 ;MESSAGE ADDRESS-HEADER
6170 000602 000000 HDRFLG: 0 ;HEADER FLAG
6171 000604 000000 ERRTP: 0 ;ERROR TYPE
6172 000606 000000 SYSERR: 0 ;SYSTEM ERROR
6173 000610 000000 SUC: 0 ;SYSTEM UNDER CONTROL
6174 000612 000000 SOAV: 0 ;SYSTEM#0 AVAILABLE
6175 000614 000000 S1AV: 0 ;SYSTEM#1 AVAILABLE
6176 000616 000000 SORDY: 0 ;SYSTEM#0 READY
6177 000620 000000 S1RDY: 0 ;SYSTEM#1 READY
6178 000622 000000 SOCMD: 0 ;SYSTEM#0 COMMAND WORD
6179 000624 000000 S1CMD: 0 ;SYSTEM#1 COMMAND WORD
6180 000626 000000 SODN: 0 ;SYSTEM#0 DONE FLAG
6181 000630 000000 S1DN: 0 ;SYSTEM#1 DONE FLAG
6182 000632 000000 TTITFG: 0 ;TTY INTERRUPT FLAG
6183 000634 000000 ENDFTB: 0 ;*** DO NOT REMOVE THIS LABEL ***
```

```

6185          001000          . =1000
6186          .SBTTL  MODULE 0.0 - PROGRAM START AND CONTROL
6187          ;-----
6188
6189 001000 012706 001000  START:  MOV    #1000,SP      ;SET STACK POINTER
6190 001004 005037 000516      CLR    DBGFLG      ;CLEAR DEBUG FLAG
6191 001010 005037 000406      CLR    $PASS      ;CLEAR APT PASS COUNTER
6192 001014 005037 000570      CLR    BTRPFL     ;CLEAR BUS TRAP FLAG
6193 001020 005700          IA00:  TST    R0        ;IF PRINT HEADER
6194 001022 001115          BNE    EA00       ;INDICATED, THEN
6195 001024 012704 014040      MOV    #MSG3,R4    ;SETUP TITLE MSG
6196 001030 004737 013232      JSR    PC,TTOUT    ;PRINT TITLE
6197 001034 132737 000001 000420  IB00:  BITB   #APTENV,$ENV ;IF APT MODE
6198 001042 001441          BEQ    LB00       ;TRUE, THEN
6199 001044 122737 000100 000427  IC00:  CMPB  #100,$CPUOP+1 ;IF CPU IS
6200 001052 001006          BNE    LC00       ;LSI/0-BUS, THEN
6201 001054 012737 000001 000520      MOV    #1,LSIFLG  ;SET LSI PROCESSOR FLAG
6202 001062 106427 000200      MTPS  #200        ;SET LSI PRIORITY
6203 001066 000403          BR     EC00
6204 001070 012777 000340 176700  LC00:  MOV    #PR7,@PSW   ;SET PDP-11 PRIORITY
6205 001076 012737 000422 000504  EC00:  MOV    #SSWREG,$SWR ;SET SOFTWARE SWITCH ADDRESS
6206 001104 113700 000450      MOVB  $VECT1,R0   ;GET VECTOR FROM ETABLE
6207 001110 042700 177400      BIC   #177400,R0  ;CLEAR TOP BYTE R0
6208 001114 012720 012404      MOV   #RXINT0,(R0)+ ;LOAD INTERRUPT ADR IN VECTOR
6209 001120 012710 000340      MOV   #340,(R0)   ;LOAD PRIORITY
6210 001124 013737 000454 000472      MOV   $BASE,RXCSAD ;SET REGISTER BASE FROM ETABLE
6211 001132 004737 002204      CALL  ADTST       ;CALL ADDRESSING TST
6212 001136 013737 000472 000314      MOV   RXCSAD,REGS0 ;SET SYS#0 BUS ADDR
6213 001144 000444          BR     EA00       ;BR TO END 'A'
6214 001146 042777 000100 177124  LB00:  BIC   #BIT6,@TKS  ;DISABLE TTY KEYBOARD INTERRUPTS
6215 001154 012777 001200 177136      MOV   #LSITRP,@BTRP ;SET BUS TRAP FOR LSI TRAP
6216 001162 012777 000200 177132      MOV   #200,@BTRP2 ;SET UP PROCESSOR PRI-BUS TRAP
6217 001170 012777 000340 176600  ID00:  MOV   #340,@PSW   ;IF PROCESSOR IS
6218 001176 000405          BR     ED00       ;AN LSI, THEN
6219 001200 012737 000001 000520  LSITRP: MOV  #1,LSIFLG   ;SET LSI PROCESSOR FLAG
6220 001206 106427 000200          MTPS  #200        ;SET LSI PROCESSOR PRIORITY
6221 001212 005077 177102  ED00:  CLR   @BTRP       ;RESET BUS TRAP
6222 001216 005077 177100          CLR   @BTRP2     ;RESET BUS TRAP
6223 001222 004737 001456          CALL  OPINT       ;CALL GET USER INPUT (MOD 1.0)
6224 001226 013705 000310          MOV   VECT0,R5   ;GET SYS#0 VECTOR
6225 001232 012725 012404          MOV   #RXINT0,(R5)+ ;SET SYSTEM#0 VECTOR
6226 001236 012715 000340          MOV   #PR7,(R5)   ;SET PROCESSOR PRI
6227 001242 013705 000312          MOV   VECT1,R5   ;GET SYS#1 VECTOR
6228 001246 012725 012412          MOV   #RXINT1,(R5)+ ;SET SYSTEM#1 VECTOR
6229 001252 012715 000340          MOV   #PR7,(R5)   ;SET PROCESSOR PRI
6230 001256 005037 000522  EA00:  CLR   PCNTR       ;CLEAR PASS COUNTER
6231 001262 032777 000400 177214  IJ00:  BIT   #BIT8,@SWR  ;IF SWITCH REG HAS DOUBLE DENSITY BIT
6232 001270 001404          BEQ   LJ00       ;SET, THEN
6233 001272 012737 000400 000506      MOV   #DBLDEN,DENS ;SETUP DENSITY=DOUBLE
6234 001300 000402          BR   BE00       ;BR TO BEGIN DO 'E'
6235 001302 005037 000506  LJ00:  CLR   DENS       ;SETUP DENSITY=SINGLE
6236 001306 012702 000524  BE00:  MOV   #TOB,R2    ;SET BEGINNING OF TABLE
6237 001312 012700 000634          MOV   #ENDFTB,R0  ;SET END OF TABLE
6238 001316 005022  BF00:  CLR   (R2)+       ;CLEAR TABLE OF FLAGS + COUNTERS
6239 001320 020200          CMP   R2,R0       ;DO UNTIL
6240 001322 103775          BLO  BF00        ;END OF TABLES DONE

```



```

6241 001324 005237 000514      INC      INITPG      ;SET PROGRAM INITIALIZE FLAG
6242 001330 004737 002514      CALL     SYSCHD     ;GO FORMAT SCHEDULED SYSTEMS      (MOD 2.0)
6243 001334 132737 000001 000420 IG00:  BITB     #APTENV,$ENV  ;IF APT MODE
6244 001342 001002                BNE     EG00        ;FALSE, THEN
6245 001344 004737 007676      CALL     OTSYDN     ;CALL OUTPUT SYSTEM DONE          (MOD 3.0)
6246 001350 012704 014164      EG00:  MOV     #MSG6,R4 ;SET END OF PASS MSG
6247 001354 004737 013232      JSR     PC,TTOUT    ;PRINT END OF PASS
6248 001360 005237 000532      INC     TTWAIT     ;SET TTY WAIT FLAG
6249 001364 013703 000522      MOV     PCNTR,R3
6250 001370 004737 013346      JSR     PC,OCTP     ;PRINT PASS NUMBER
6251 001374 005237 000522      INC     PCNTR       ;BUMP PASS COUNTER
6252 001400 013737 000522 000406      MOV     PCNTR,$PASS ;BUMP APT PASS COUNTER
6253 001406 013700 000042      IH00:  MOV     @#42,R0 ;IF ACT
6254 001412 001407                BEQ     II00        ;MODE, THEN
6255 001414 005037 000042      CLR     @#42        ;ABORT THIS PROGRAM
6256 001420 000005                RESET
6257 001422 004710                $ENDAD: JSR     PC,(R0) ;ACT HOOKS
6258 001424 000240                NOP          ; * DO NOT
6259 001426 000240                NOP          ;          REMOVE
6260 001430 000240                NOP          ;          THESE NOP'S *
6261 001432 032737 000100 000574      II00:  BIT     #100,SYSFLG ;IF IDLE MODE
6262 001440 001401                BEQ     EI00        ;SET, THEN
6263 001442 000777                BR      1$          ;IDLE LOOP
6264 001444 000005                EI00:  RESET
6265 001446 005037 000532      CLR     TTWAIT     ;CLEAR TTY WAIT FLAG
6266 001452 000137 001306      END00: JMP     BE00     ;DO NEXT PASS
6267
  
```

```
6269 .SBTTL MODULE 1.0 - OPERATOR INTERFACE
6270
6271 ;BEGINROUTINE (MODULE 1.0 - GET USER INPUT)
6272 : SET SOFTWARE SWITCH REG ADDRESS
6273 : SETUP & PRINT 'HELP?'
6274 : CALL GET ANSWER
6275 : IF ANSWER=YES [A]
6276 : : THEN
6277 : : : SETUP & PRINT HELP FILE
6278 : : : ENDF
6279 : : SETUP & PRINT 'SET DISKETTE TO SINGLE DENSITY? (Y OR N)''
6280 : : CALL GET ANSWER
6281 : : IF ANSWER=YES [B]
6282 : : : THEN
6283 : : : : SET DENS & SOFT SWITCH REG DENSITY BIT=SINGLE DENSITY
6284 : : : : ELSE
6285 : : : : SET DENS & SOFT SWITCH REG DENSITY BIT=DOUBLE DENSITY
6286 : : : : ENDF
6287 : : : SETUP & PRINT 'VERIFY DISKETTE CRC (ALL TRACKS)? (Y OR N)''
6288 : : : CALL GET ANSWER
6289 : : : IF ANSWER=YES [C]
6290 : : : : THEN
6291 : : : : : SET SOFT SWITCH REG=CRC ALL BIT
6292 : : : : : ELSE
6293 : : : : : CLEAR SOFT SWITCH REG=CRC ALL BIT
6294 : : : : : ENDF
6295 : : : : SET <SUC>=0
6296 : : : : SETUP & PRINT 'FLOPPY SYS #0 ADDRESS CHANGE? (Y OR N)''
6297 : : : : CALL GET ANSWER
6298 : : : : IF ANSWER=YES [D]
6299 : : : : : THEN
6300 : : : : : : SET YES ANSWER FLAG
6301 : : : : : : ELSE
6302 : : : : : : CLEAR YES ANSWER FLAG
6303 : : : : : : ENDF
6304 : : : : : CALL GET SYSTEM BUS ADDRESS
6305 : : : : : CALL CHECK SYSTEM BUS ADDRESS (SEE IF BOOT SYSTEM)
6306 : : : : : SET SOFT SWITCH REG=SYS #0 AVAILABLE
6307 : : : : : SETUP & PRINT 'IS SECOND FLOPPY SYSTEM AVAILABLE? (Y OR N)''
6308 : : : : : CALL GET ANSWER
6309 : : : : : IF ANSWER=YES [E]
6310 : : : : : : THEN
6311 : : : : : : : SET <SUC>=1
6312 : : : : : : : SET YES ANSWER FLAG
6313 : : : : : : : CALL GET SYSTEM BUS ADDRESS
6314 : : : : : : : CALL CHECK SYSTEM BUS ADDRESS (SEE IF BOT MEDIA)
6315 : : : : : : : SET SOFT SWITCH REG=SYS #1 AVAILABLE
6316 : : : : : : : ENDF
6317 : : : : : : IF DEBUG_FLAG=SET [F]
6318 : : : : : : : THEN
6319 : : : : : : : : CALL GET SOFT SWITCH REG
6320 : : : : : : : : ENDF
6321 ;ENDROUTINE
```

```

6323
6324 001456 012737 000324 000504 OPINT: MOV #SWREG,SWR ;SET SOFTSWITCH REG ADR
6325 001464 012704 015726 MOV #MSG43,R4 ;SETUP MSG 'HELP?'
6326 001470 004737 013232 CALL TTOUT ;PRINT
6327 001474 004737 012624 CALL GETANS ;CALL GET OPERATOR ANSWER
6328 001500 122737 000131 000530 IA10: CMPB #'Y,ANSWER ;IF ANSWER
6329 001506 001004 BNE EA10 ;IS YES, THEN
6330 001510 012704 015300 MOV #MSG39,R4 ;SETUP MSG --> HELP FILE
6331 001514 004737 013232 CALL TTOUT ;PRINT
6332 001520 012704 016045 EA10: MOV #MSG45,R4 ;SETUP MSG 'SET DISKETTE TO SINGLE DENSITY: (Y OR N)?'
6333 001524 004737 013232 CALL TTOUT ;PRINT
6334 001530 004737 012624 CALL GETANS ;CALL GET OPERATOR ANSWER
6335 001534 122737 000131 000530 IB10: CMPB #'Y,ANSWER ;IF ANSWER
6336 001542 001004 BNE LB10 ;IS YES, (SET SINGLE DENSITY), THEN
6337 001544 042777 000400 176732 BIC #DENBIT,@SWR ;CLEAR DENSITY BIT IN SOFT SWITCH REG
6338 001552 000403 BR EB10 ;BR TO END 'B'
6339 001554 052777 000400 176722 LB10: BIS #DENBIT,@SWR ;SET DENSITY BIT IN SOFT SWITCH REG
6340 001562 012704 016125 EB10: MOV #MSG46,R4 ;SETUP MSG 'VERIFY DISKETTE CRC (ALL TRACKS): (Y OR N)?'
6341 001566 004737 013232 CALL TTOUT ;PRINT
6342 001572 004737 012624 CALL GETANS ;CALL GET OPERATOR ANSWER
6343 001576 122737 000131 000530 IC10: CMPB #'Y,ANSWER ;IF ANSWER
6344 001604 001004 BNE LC10 ;IS YES, THEN
6345 001606 052777 000200 176670 BIS #CRCALL,@SWR ;SET CRC ALL FLAG IN SOFT SWITCH REG
6346 001614 000403 BR EC10 ;BR TO END 'C'
6347 001616 042777 000200 176660 LC10: BIC #CRCALL,@SWR ;CLEAR CRC ALL FLAG IN SOFT SWITCH REG
6348 001624 005037 000610 EC10: CLR SUC ;SET <SUC> = 0
6349 001630 012704 016206 MOV #MSG47,R4 ;SETUP MSG 'FLOPPY SYS 0 ADDRESS MODIFICATION (Y OR N)?'
6350 001634 004737 013232 CALL TTOUT ;PRINT
6351 001640 004737 012624 CALL GETANS ;CALL GET OPERATOR ANSWER
6352 001644 122737 000131 000530 ID10: CMPB #'Y,ANSWER ;IF ANSWER
6353 001652 001002 BNE LD10 ;IS YES, THEN
6354 001654 005202 INC R2 ;SET YES ANSWER FLAG
6355 001656 000401 BR ED10 ;BR TO END 'D'
6356 001660 005002 LD10: CLR R2 ;CLEAR YES ANSWER FLAG
6357 001662 004737 001766 ED10: CALL GTSYAD ;CALL GET SYSTEM BUS ADR & TEST
6358 001666 004737 002422 CALL CKSYAD ;CALL CHECK SYSTEM ADR - MEDIA PROTECT
6359 001672 052777 000001 176604 BIS #1,@SWR ;SET SYSTEM#0 AVAIL
6360 001700 012704 016271 MOV #MSG48,R4 ;SETUP MSG 'SECOND FLOPPY SUBSYSTEM (Y OR N)?'
6361 001704 004737 013232 CALL TTOUT ;PRINT
6362 001710 004737 012624 CALL GETANS ;CALL GET OPERATOR ANSWER
6363 001714 122737 000131 000530 IE10: CMPB #'Y,ANSWER ;IF ANSWER
6364 001722 001013 BNE IF10 ;IS YES THEN
6365 001724 012737 000001 000610 MOV #1,SUC ;SET <SUC> = 1
6366 001732 005202 INC R2 ;SET YES ANSWER FLAG
6367 001734 004737 001766 CALL GTSYAD ;CALL GET SYSTEM BUS ADR & TEST
6368 001740 004737 002422 CALL CKSYAD ;CALL CHECK SYSTEM ADR - MEDIA PROTECT
6369 001744 052777 000002 176532 BIS #2,@SWR ;SET SYSTEM#1 AVAIL
6370 001752 005737 000516 IF10: TST DBGFLG ;IF DEBUG FLAG
6371 001756 001402 BEQ X10 ;SET, THEN
6372 001760 004737 002346 CALL GTSWR ;GET SOFTWARE SWITCH REG
6373 001764 000207 X10: RETURN ;RETURN
6374

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6432      .SBTTL ADDRESSING TEST
6433      ;-----
6434
6435      002204 000005      ADTST: RESET      ;INITIALIZE BUS
6436      002206 012737 014367 000600      MOV      #MSG12,TMSGAD ;SET TEST MSG HEADER
6437      002214 012777 012474 176076      MOV      #TRAP,@BTRP   ;SET TRAP HANDLER ADR
6438      002222 012777 000340 176072      MOV      #340,@BTRP2   ;
6439      002230 013701 000472      MOV      RXCSAD,R1     ;GET CSR ADDRESS
6440      002234 005711      AD1:   TST      (R1)    ;REF CS REG
6441      002236 000240      NOP      ;IF ADDRESS IS BAD, BUS TRAP WILL OCCUR
6442      002240 062701 000002      ADD      #2,R1         ;SET ADDRESS OF DB
6443      002244 005711      TST      (R1)         ;REF DB REG
6444      002246 000240      NOP      ;
6445      002250 005737 000570      TST      BTRPFL       ;IF INITIAL ADDRESS TEST
6446      002254 001427      BEQ      AD2          ;DID NOT PASS, THEN
6447      002256 032777 020000 176220      BIT      #BIT13,@SWR   ;IF INHIBIT ERROR REPORT
6448      002264 001004      BNE      2$          ;NOT SET THEN
6449      002266 012704 014326      MOV      #MSG11,R4    ;SET UNIT NOT RESPONDING
6450      002272 004737 013232      JSR      PC,TTOUT     ;PRINT MSG
6451      002276 000240      2$:   NOP      ;
6452      002300 004737 012262      JSR      PC,BSINIT    ;CHECK SWR FOR BUS INITIALIZE
6453      (1) 002304 032777 001000 176172      BIT      #SW09,@SWR   ;CHECK FOR LOOP ON ERROR
6454      (1) 002312 001350      BNE      AD1          ;GO TO LOOP ERROR
6455      (1) 002314 004737 012240      JSR      PC,ERRSET    ;
6456      (2) 002320 000001      .WORD   #1           ;FATAL ERR # 1 - UNIT NOT RESPONDING TO ADDRESS
6457      (1) 002322 005777 176156      TST      @SWR         ;CHECK FOR HALT ON ERROR
6458      (1) 002326 100001      BPL      1$          ;HALT IF SET
6459      (1) 002330 000000      HALT    ;<UNIT NOT RESPONDING TO ADDRESS>
6460      (1) 002332 000240      1$:   NOP      ;
6461      6453 002334 005077 175760      AD2:   CLR      @BTRP   ;CLEAR BUS TRAP
6462      6454 002340 005077 175756      CLR      @BTRP2      ;HANDLER
6463      6455 002344 000207      ADTSTX: RTS      PC   ;RETURN
6464      6456
6465      6457
  
```

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6459      .SBTTL  MODULE 1.2 - GET SOFTWARE SWITCH REGISTER
6460      -----
6461
6462      002346  012704  014002      GTSWR:  MOV      #MSG2,R4      ;REQUEST SWITCH REG MSG
6463      002352  004737  013232      JSR      PC,TTOUT           ;
6464      002356  013703  000324      MOV      SWREG,R3          ;SET CURRENT SWITCH REG
6465      002362  004737  013334      JSR      PC,OCTPE          ;PRINT CURRENT SWITCH REG
6466      002366  012737  000324      MOV      #SWREG,SWR        ;SET SOFTWARE SWITCH REG ADR
6467      002374  012705  000324      MOV      #SWREG,R5         ;SET ADDRESS OF SWITCH REG
6468      002400  012701  000006      MOV      #6,R1             ;SET SIZE OR RESPONSE
6469      002404  012702  177777      MOV      #177777,R2        ;SET UPPER LIMIT
6470      002410  012703  000000      MOV      #0,R3             ;SET LOWER LIMIT
6471      002414  004737  012652      JSR      PC,TTR            ;GO GET RESPONSE
6472      002420  000207      X12:   RETURN              ;RETURN
6473      -----
6474
6475      .SBTTL  MODULE 1.3 - CHECK SYSTEM ADDRESS
6476
6477      ;BEGINROUTINE (MODULE 1.3 - CHECK SYSTEM ADDRESS)
6478      ; IF LOAD MEDIA PROTECT BYTE=RX02 [A]
6479      ; : THEN
6480      ; : IF <SUC> ADDRESS=RX02 STANDARD ADDRESS [B]
6481      ; : : THEN
6482      ; : : : CALL SYSTEM IDENTIFICATION
6483      ; : : : SETUP & PRINT 'REMOVE XXDP MEDIA FROM THIS SYSTEM'
6484      ; : : : SETUP & PRINT '-TYPE 'CR' WHEN READY'
6485      ; : : : BEGINDO [C]
6486      ; : : : : CALL TTY INPUT-GET TTY CHARACTER
6487      ; : : : : DOUNTIL CHARACTER='CR'
6488      ; : : : : CLEAR MEDIA PROTECT BYTE
6489      ; : : : :
6490      ; : : : :
6491      ; : : : :
6492      ; : : : :
6493      ; : : : :
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.SBTTL MODULE 2.0 - SYSTEM SCHEDULER

;BEGINROUTINE (MOD 2.0 SYSTEM SCHEDULER)
: SET SYS#0 & SYS#1 READY BITS
: SET SYS#0 SEL BIT
: SET <SUC> = 0
: SET SYSOAVL = ALL
: CALL INITIALIZE CHECK (MOD 2.1)
: IF SWR = SYS#1 SELECTED [A]
:   THEN
:     SET <SUC>=1
:     SET SYSAVL = ALL
:     CALL INITIALIZE CHECK (MOD 2.1)
:   ENDIF
: IF NO SYSTEM AVAIL [B]
:   THEN
:     SETUP SYMSG 'NO SYSTEM AVAILABLE'
:   ELSE
:     BEGINDO [C]
:       IF SYSO SELECTED [D]
:         THEN
:           IF SYO DONE=NOTSET [H]
:             THEN
:               SET <SUC> = 0
:               IF SYSO RDY SET [E]
:                 THEN
:                   CALL SYSTEM DRIVER (MOD 2.2)
:                 ELSE
:                   CALL WATCH DOG SYS#0 (MOD 2.4)
:                 ENDIF
:             ENDIF
:           ENDIF
:         IF SY1 SELECTED [F]
:           THEN
:             IF SY1 DSONE=NOTSET [I]
:               THEN
:                 SET <SUC> = 1
:                 IF SY1 RDY SET [G]
:                   THEN
:                     CALL SYSTEM DRIVER (MOD 2.2)
:                   ELSE
:                     CALL WATCH DOG SYS#1 (MOD 2.5)
:                   ENDIF
:             ENDIF
:           ENDIF
:         CLEAR PROGRAM INITIALIZE FLAG
:         CALL UPDATE SYSTEM STATUS (MOD 2.3)
:       DO UNTIL ALL SYSTEMS DONE OR NO SYSTEM AVAIL
:       SETUP SYSTEM MSG
:     ENDIF
:   PRINT PRINT SYSTEM MSG
: ENDROUTINE

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6565 ;-----
6566
6567 002514 005237 000616 SYSCHD: INC SORDY ;SET SYS0 RDY
6568 002520 005237 000620 INC S1RDY ;SET SYS1 RDY
6569 002524 052777 000001 175752 BIS #1,@SWR ;SET SYS1 SELECT IN SOFT SWITCH REG
6570 002532 005037 000610 CLR SUC ;SET SYS UNDER CONTROL=#0
6571 002536 012737 000017 000612 MOV #17,SOAV ;SET SYSTEM#0 AVAIL=ALL
6572 002544 004737 003002 CALL INITCK ;CALL INITIALIZE CHECK (MOD 2.1)
6573 002550 032777 000002 175726 IA20: BIT #2,@SWR ;IF SYS #1
6574 002556 001410 BEQ IB20 ;SELECTED, THEN
6575 002560 012737 000001 000610 MOV #1,SUC ;SET SYS UNDER CONTROL=#1
6576 002566 012737 000017 000614 MOV #17,S1AV ;SET SYSTEM#1 AVAIL=ALL
6577 002574 004737 003002 CALL INITCK ;CALL INITIALIZE CHECK (MOD 2.1)
6578 002600 005737 000612 IB20: TST SOAV ;IF SYSTEM#0
6579 002604 001007 BNE ID20 ;NOT AVAIL AND
6580 002606 005737 000614 TST S1AV ;IF SYSTEM#1
6581 002612 001004 BNE ID20 ;NOT AVAIL, THEN
6582 002614 012704 016357 MOV #MSG49,R4 ;SET MSG='NO SYS AVAIL TO THIS PROG'
6583 002620 000465 BR EB20 ;BR TO END 'B'
6584 002622 000240 BC20: NOP ;BEGIN DO UNTIL 'C'
6585 002624 032777 000001 175652 ID20: BIT #1,@SWR ;IF SYS #0
6586 002632 001421 BEQ IF20 ;SELECTED, THEN
6587 002634 005737 000626 IH20: TST SODN ;IF SYS0 DONE
6588 002640 001016 BNE IF20 ;NOT SET, THEN
6589 002642 005037 000610 CLR SUC ;SET SYSTEM UNDER CONTROL SYS #0
6590 002646 005737 000616 IE20: TST SORDY ;IF SYS#0 READY FLAG
6591 002652 001407 BEQ LE20 ;IS SET, THEN
6592 002654 005037 000616 CLR SORDY ;CLEAR SYS #0 READY
6593 002660 005237 007670 INC WATINO ;SET WATCHDOG INIT #0 FLAG
6594 002664 004737 003272 CALL SYSDVR ;CALL SYS DRIVER (MOD 2.2)
6595 002670 000402 BR IF20 ;BR TO IF 'F'
6596 002672 004737 007474 LE20: CALL WATCHO ;CALL WATCH DOG SYS#0 (MOD 2.4)
6597 002676 032777 000002 175600 IF20: BIT #2,@SWR ;IF SYS #1
6598 002704 001422 BEQ EF20 ;SELECTED, THEN
6599 002706 005737 000630 I120: TST S1DN ;IF SYS1 DONE
6600 002712 001017 BNE EF20 ;NOT SET, THEN
6601 002714 012737 000001 000610 MOV #1,SUC ;SET SYSTEM UNDER CONTROL SYS #1
6602 002722 005737 000620 IG20: TST S1RDY ;IF SYS #1 READY FLAG
6603 002726 001407 BEQ LG20 ;IS SET, THEN
6604 002730 005037 000620 CLR S1RDY ;CLEAR SYS #1 READY
6605 002734 005237 007672 INC WATIN1 ;SET WATCHDOG INIT #1 FLAG
6606 002740 004737 003272 CALL SYSDVR ;CALL SYS DRIVER (MOD 2.2)
6607 002744 000402 BR OF END 'G' ;BR OT END 'G'
6608 002746 004737 007572 LG20: CALL WATCH1 ;CALL WATCH DOG SYS #1 (MOD 2.5)
6609 002752 005037 000514 EF20: CLR INITPG ;CLEAR PROGRAM INITIALIZE FLAG
6610 002756 004737 006570 CALL SYSTAT ;CALL SYSTEM STATUS (MOD 2.3)
6611 002762 005737 000574 DC20: TST SYSFLG ;DO UNTIL SYSTEM FLAG
6612 002766 001715 BEQ BC20 ;SET (EITHER SYSTEM DONE OR NO SYS AVAIL)
6613 002770 013704 000572 MOV SYMSG,R4 ;SETUP SYSTEM MSG
6614 002774 004737 013232 EB20: CALL TTOUT ;PRINT SYSTEM MSG
6615 003000 000207 X20: RETURN ;RETURN
6616 ;-----
  
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6618 .SBTTL MODULE 2.1 - INITIALIZE CHECK
6619
6620 ;BEGINROUTINE (MOD 2.1 - INITIALIZE CHECK
6621 : CLEAR INITIALIZE DROP FLAG
6622 : SET <SUC> ADDRESS & OFFSET
6623 : SET <SUC> COMMAND=INITIALIZE
6624 : INITIALIZE SYSTEM AT ADDRESS
6625 : SETUP DELAY FOR DONE
6626 : CALL DELAY ROUTINE
6627 : SET <SUC> OFFSET
6628 : IF <SUC> CSR = NO DONE BIT SET [A]
6629 : : THEN
6630 : : SET INITIALIZE DROP FLAG
6631 : : CALL PRINT SYSTEM IDENTIFICATION
6632 : : SET APT ERROR #
6633 : : ELSE
6634 : : IF <SUC> CSR=ERR BIT SET [B]
6635 : : : THEN
6636 : : : SET INITIALIZE DROP FLAG
6637 : : : CALL PRINT SYSTEM IDENTIFICATION
6638 : : : SETUP & PRINT 'ERROR BIT SET AFTER INITIALIZE'
6639 : : : IF <SUC> ESR = AC LOW BIT SET [C]
6640 : : : : THEN
6641 : : : : SETUP & PRINT 'AC-LOW-IS FLOPPY SYSTEM POWERED UP?'
6642 : : : : ENDIF
6643 : : : IF <SUC> ESR = INITIALIZE DONE NOT SET [D]
6644 : : : : THEN
6645 : : : : SETUP & PRINT 'INITIALIZE NOT DONE - RUN DIAG UNLESS ERROR'
6646 : : : : ENDIF
6647 : : : SET APT ERROR #
6648 : : : ENDIF
6649 : : IF <SUC> CSR NOT=DOUBLE DENSITY TYPE SYSTEM [E]
6650 : : : THEN
6651 : : : SET INITIALIZE DROP FLAG
6652 : : : SETUP & PRINT 'THIS SYSTEM NOT CAPABLE OF DOUBLE DEN OPS'
6653 : : : ENDIF
6654 : : ENDIF
6655 : : IF INITIALIZE_DROP FLAG SET [F]
6656 : : : THEN
6657 : : : CLEAR <SUC> AVAIL
6658 : : : ENDIF
6659 :ENDROUTINE
```

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6661 ;-----
6662 ;
6663 003002 005037 003270 INITCK: CLR INITDP ;CLEAR INITIALIZE DROP FLAG
6664 003006 004737 010076 CALL SSUCAD ;CALL SET <SUC> ADDRESS
6665 003012 012761 040000 000622 MOV #RXINIT,SOCMD(R1) ;SET <SUC> COMMAND = INITIALIZE
6666 003020 012777 040000 175444 MOV #RXINIT,@RXCSAD ;INITIALIZE SYSTEM AT <SUC> CSR ADDRESS
6667 003026 013737 000472 010230 MOV RXCSAD,CSRADR ;SET ADDRESS FOR DELAY TEST
6668 003034 012737 000040 010226 MOV #DNBIT,RDYWD ;SET DONE BIT FOR DELAY TEST
6669 003042 012737 000015 010222 MOV #15,RYDX ;SET DELAY MULTIPLIER
6670 003050 004737 010136 CALL DELAY ;DELAY FOR DONE BIT
6671 003054 004737 010126 CALL SSUCOF ;CALL SET <SUC> OFFSET
6672 003060 032777 000040 175404 IA21: BIT #DNBIT,@RXCSAD ;IF <SUC> CSR DONE BIT
6673 003066 001014 BNE IB21 ;NOT SET, THEN
6674 003070 005237 003270 INC INITDP ;SET INITIALIZE DROP FLAG
6675 003074 004737 011132 CALL PRSYS ;CALL PRINT SYSTEM IDENT
6676 003100 012704 016436 MOV #MSG52,R4 ;SET MSG-> 'NO DONE BIT AFTER INITIALIZE'
(1) 003104 004737 013232 CALL TTOUT ;PRINT MSG
6677 003110 004737 012240 JSR PC,ERRSET
(2) 003114 000002 .WORD #2 ;FATAL ERR # 2 - NO DONE BIT AFTER INITIALIZE
6678 003116 000453 BR EA21 ;BR TO MOD EXIT
6679 003120 032777 100000 175344 IB21: BIT #ERRBIT,@RXCSAD ;IF <SUC> CSR ERROR BIT
6680 003126 001433 BEQ IE21 ;SET, THEN
6681 003130 005237 003270 INC INITDP ;SET INITIALIZE DROP FLAG
6682 003134 004737 011132 CALL PRSYS ;CALL PRINT SYSTEM IDENT
6683 003140 012704 014776 MOV #MSG29,R4 ;SET MSG-> 'ERROR BIT SET AFTER INITIALIZE'
(1) 003144 004737 013232 CALL TTOUT ;PRINT MSG
6684 003150 032777 000010 175316 IC21: BIT #ACLOW,@RXDBAD ;IF <SUC> ESR AC LOW BIT
6685 003156 001404 BEQ ID21 ;IS SET THEN
6686 003160 012704 016530 MOV #MSG54,R4 ;SET MSG-> 'AC LOW ERROR-IS DISK SYSTEM POWERED UP?'
(1) 003164 004737 013232 CALL TTOUT ;PRINT MSG
6687 003170 032777 000004 175276 ID21: BIT #INITDN,@RXDBAD ;IF <SUC> ESR INITIALIZE DONE BIT
6688 003176 001004 BNE ED21 ;NOT SET, THEN
6689 003200 012704 015752 MOV #MSG44,R4 ;SET MSG-> 'INITIALIZE NOT DONE-RUN DIAG UNLESS ERR OBVI
(1) 003204 004737 013232 CALL TTOUT ;PRINT MSG
6690 003210 ED21:
(1) 003210 004737 012240 JSR PC,ERRSET
(2) 003214 000003 .WORD #3 ;FATAL ERR # 3 - ERROR BIT SET ON INITIALIZE
6691 003216 032777 004000 175246 IE21: BIT #RX2BIT,@RXCSAD ;IF <SUC>-DOUBLE DENSITY SYSTEM TYPE
6692 003224 001010 BNE EA21 ;BIT NOT SET, THEN
6693 003226 005237 003270 INC INITDP ;SET INITIALIZE DROP FLAG
6594 003232 004737 011132 CALL PRSYS ;CALL PRINT SYSTEM IDENT
6695 003236 012704 014610 MOV #MSG23,R4 ;SET MSG-> 'THIS SYS NOT CAPABLE OF DOUBLE DEN OPS'
(1) 003242 004737 013232 CALL TTOUT ;PRINT MSG
6696 003246 012761 000017 000612 EA21: MOV #17,SOAV(R1) ;SET <SUC> SYSTEM AVAIL
6697 003254 005737 003270 IF21: TST INITDP ;IF INITIALIZE DROP FLAG
6698 003260 001402 BEQ X21 ;SET, THEN
6699 003262 005061 000612 CLR SOAV(R1) ;CLEAR <SUC> SYSTEM AVAILABLE
6700 003266 000207 X21: RETURN ;RETURN
6701 ;-----
6702 003270 000000 INITDP: 0 ;INITIALIZE DROP FLAG
6703 ;-----

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6705 .SBTTL MODULE 2.2 - SYSTEM DRIVER
6706
6707 :BEGINROUTINE (MOD 2.2 SYSTEM DRIVER)
6708 :   CLEAR WATCHDOG INITIALIZE FLAG FOR <SUC>
6709 :   CALL ERROR CHECK ROUTINE (MOD 2.2.5)
6710 :   IF THIS_SYSTEM_AVAILABLE NOT = 0 [A]
6711 :   THEN
6712 :   BEGINDO [C]
6713 :   :   SET <SUC> DRIVE_DONE=GET NEXT COMMAND FLAG
6714 :   :   CLEAR GET NEXT COMMAND FLAG
6715 :   :   CALL GET NEXT COMMAND (MOD 2.2.1)
6716 :   :   IF COMMAND = DONE [D]
6717 :   :   THEN
6718 :   :   SET SUC->SYS_DONE_FLAG
6719 :   :   ELSE
6720 :   :   GET SYSTEM UNDER CONTROL OFFSET
6721 :   :   IF COMMAND = DRIVE #1 SELECTED [E]
6722 :   :   THEN
6723 :   :   :   IF SUC-> DRIVE #1 AVAIL [F]
6724 :   :   :   THEN
6725 :   :   :   :   IF COMMAND=SIDE #1 SELECTED [G]
6726 :   :   :   :   THEN
6727 :   :   :   :   :   IF SUC-> SIDE#1_AVAIL NOT SET [H]
6728 :   :   :   :   :   THEN
6729 :   :   :   :   :   SET GET NEXT COMMAND FLAG
6730 :   :   :   :   ENDIF
6731 :   :   :   ENDIF
6732 :   :   ELSE
6733 :   :   SET GET NEXT COMMAND FLAG
6734 :   :   ENDIF
6735 :   :   ELSE
6736 :   :   IF SUC-> DRIVE #0_AVIAL SET [I]
6737 :   :   THEN
6738 :   :   :   IF COMMAND = SIDE #1 SELECTED [J]
6739 :   :   :   THEN
6740 :   :   :   :   IF SUC-> SIDE #1_AVIAL NOT SET [K]
6741 :   :   :   :   THEN
6742 :   :   :   :   SET GET NEXT COMMAND FLAG
6743 :   :   :   :   ENDIF
6744 :   :   :   ENDIF
6745 :   :   ELSE
6746 :   :   SET GET NEXT COMMAND FLAG
6747 :   :   ENDIF
6748 :   :   ENDIF
6749 :   :   ENDIF
6750 :   DOUNTIL GET NEXT_COMMAND=0
6751 :   IF COMMAND NOT = "DONE" [L]
6752 :   THEN
6753 :   :   IF COMMAND = READ SECTOR [M]
6754 :   :   THEN
6755 :   :   :   CALL TRK & SECTOR (MOD 2.2.2)
6756 :   :   :   ENDIF
6757 :   :   CALL DRVR (MOD 2.2.3)
6758 :   :   ENDIF
6759 :   ENDIF
6760 :ENDROUTINE
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6762
6763 003272 053737 000514 004360 SYSVDR: BIS INITPG,INITTS ;PASS INITIALIZE FLAG TO TRACK & SECTOR MOD
6764 003300 005037 003556 CLR GTCMD ;CLEAR GET COMMAND FLAG
6765 003304 004737 010126 CALL SSUCOF ;CALL SET <SUC> OFFSET
6766 003310 005261 007670 INC WATINO(R1) ;INCREMENT SYSTEM WATCH DOG INITIALIZE
6767 003314 004737 005164 CALL ERRCHK ;CALL ERROR CHECK (MOD 2.2.5)
6768 003320 004737 010126 CALL SSUCOF ;CALL SET <SUC> OFFSET
6769 003324 005761 000612 IA22: TST SOAV(R1) ;IF SYSTEM AVAILABLE
6770 003330 001511 BEQ X22 ;NOT = 0, THEN
6771 003332 053761 003556 003560 BC22: BIS GTCMD,SODVDN(R1) ;SET <SUC> DRIVE DONE =GET COMMAND FLAG
6772 003340 005037 003556 CLR GTCMD ;CLEAR GET COMMAND FLAG
6773 003344 004737 003564 CALL GETCMD ;CALL GET COMMAND (MOD 2.2.1)
6774 003350 005737 000542 ID22: TST CMD ;IF COMMAND
6775 003354 002005 BGE LD22 ;EQUALS DONE (= -1), THEN
6776 003356 004737 010126 CALL SSUCOF ;CALL SET <SUC> OFFSET
6777 003362 005261 000626 INC SODN(R1) ;SET SYSTEM DONE FLAG
6778 003366 000451 BR UC22 ;BR TO UNTIL 'C'
6779 003370 004737 010126 LD22: CALL SSUCOF ;CALL SET <SUC> OFFSET
6780 003374 032737 000020 000542 IE22: BIT #DRV1,CMD ;IF COMMAND
6781 003402 001422 BEQ I122 ;HAS DRIVE #1 SELECTED
6782 003404 032761 000012 000612 IF22: BIT #12,SOAV(R1) ;IF SYSTEM DRIVE #1 AVAILABLE
6783 003412 001413 BEQ LF22 ;SET, THEN
6784 003414 032737 001000 000542 IG22: BIT #SIDE1,CMD ;IF COMMAND
6785 003422 001433 BEQ UC22 ;HAS SIDE # SELECTED
6786 003424 032761 000010 000612 IH22: BIT #10,SOAV(R1) ;IF <SUC> SIDE #1 AVAILABLE
6787 003432 001027 BNE UC22 ;NOT SET, THEN
6788 003434 005237 003556 INC GTCMD ;SET GET COMMAND FLAG
6789 003440 000424 BR UC22 ;BR TO ENDIF 'E'
6790 003442 005237 003556 LF22: INC GTCMD ;ELSE SET GET COMMAND FLAG
6791 003446 000421 BR UC22 ;BR TO END IF 'E'
6792 003450 032761 000005 000612 I122: BIT #5,SOAV(R1) ;IF SYSTEM DRIVE #0 AVAILABLE
6793 003456 001413 BEQ L122 ;SET, THEN
6794 003460 032737 001000 000542 IJ22: BIT #SIDE1,CMD ;IF COMMAND
6795 003466 001411 BEQ UC22 ;HAS SIDE #1 SELECTED, THEN
6796 003470 032761 000004 000612 IK22: BIT #4,SOAV(R1) ;IF SYSTEM SIDE #1 AVAILABLE
6797 003476 001005 BNE UC22 ;NOT SET, THEN
6798 003500 005237 003556 INC GTCMD ;SET GET COMMAND FLAG
6799 003504 000402 BR UC22 ;BR TO ENDIF 'E'
6800 003506 005237 003556 LI22: INC GTCMD ;SET GET COMMAND FLAG
6801 003512 005737 003556 UC22: TST GTCMD ;DO UNTIL GET NEXT CMD FLAG
6802 003516 001305 BNE BC22 ;EQUALS 0
6803 003520 005737 000542 IL22: TST CMD ;IF COMMAND
6804 003524 100413 BMI X22 ;NOT=DONE(-1), THEN
6805 003526 013702 000542 MOV CMD,R2 ;GET COMMAND TO TEST
6806 003532 042702 177761 BIC #177761,R2 ;CLEAR ALL BUT ACTUAL COMMAND
6807 003536 022702 000006 IM22: CMP #RDSEC,R2 ;IF COMMAND
6808 003542 001002 BNE EM22 ;SET TO READ SECTOR, THEN
6809 003544 004737 004016 CALL TRKSEC ;CALL TRACK & SECTOR UPDATE (MOD 2.2.2)
6810 003550 004737 004402 EM22: CALL DRV ;CALL UNIT DRIVER (MOD 2.2.3)
6811 003554 000207 X22: RETURN ;RETURN TO CALLER
6812
6813 003556 000000 GTCMD: 0 ;GET COMMAND FLAG
6814 003560 000000 SODVDN: 0 ;SYSTEM#0 DRIVE DONE FLAG
6815 003562 000000 SIDVDN: 0 ;SYSTEM#1 DRIVE DONE FLAG
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.SBTTL MODULE 2.2.1 - GET COMMAND  
:BEGINROUTINE (MOD 2.2.1 - GET COMMAND)  
: INITIALIZE SYSTEM COMMAND TABLE POINTERS, IF INIT SET  
: GET SYSTEM UNDER CONTROL <SUC> COMMAND TABLE POINTER.  
: GET COMMAND AT POINTER  
: IF COMMAND = DONE [A]  
: THEN  
: RESET <SUC> COMMAND POINTER  
: ELSE  
: IF COMMAND = READ SECTOR [B]  
: THEN  
: GET <SUC> DRIVE DONE FLAG  
: IF DRIVE_DONE_FLAG SET [C]  
: THEN  
: CLEAR <SUC> DRIVE DONE FLAG  
: IF <SUC> NEW COMMAND FLAG NOT SET [E]  
: THEN  
: INCREMENT <SUC> COMMAND TABLE POINTER  
: GET COMMAND AT POINTER  
: IF COMMAND = DONE [D]  
: THEN  
: RESET <SUC> COMMAND TABLE POINTER  
: ENDIF  
: ENDIF  
: CLEAR <SUC> NEW COMMAND FLAG  
: ENDIF  
: ELSE  
: INCREMENT <SUC> COMMAND TABLE POINTER  
: SET <SUC> NEW COMMAND FLAG  
: ENDIF  
: ENDIF  
: CLEAR <SUC> DRIVE DONE FLAG  
: SET SELECTED DENSITY ONTO COMMAND  
:ENDROUTINE
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6854
6855 003564 005737 000514 GETCMD: TST INITPG ;IF INITIALIZE
6856 003570 001404 BEQ 1$ ;SET, THEN
6857 003572 005037 003762 CLR SYOTPT ;CLEAR SYS #0 TABLE PTR
6858 003576 005037 003764 CLR SY1TPT ;CLEAR SYS #1 TABLE PTR
6859 003602 004737 010126 1$: CALL SSUCOF ;CALL SET <SUC> OFFSET
6860 003606 016102 003762 MOV SYOTPT(R1),R2 ;GET <SUC> CMD TABLE PTR
6861 003612 016237 003772 000542 MOV CMDTBL(R2),CMD ;GET COMMAND AT POINTER
6862 003620 013703 000542 MOV CMD,R3 ;SAVE COMMAND TEMP #3
6863 003624 005703 IA221: TST R3 ;IF COMMAND
6864 003626 002003 BGE LA221 ;EQUALS 'DONE', THEN
6865 003630 005061 003762 CLR SYOTPT(R1) ;RESET <SUC> CMD TABLE PTR
6866 003634 000444 BR EA221 ;BR TO EXIT MOD
6867 003636 042703 177761 LA221: BIC #177761,R3 ;CLEAR ALL BUT COMMAND
6868 003642 022703 000006 IB221: CMP #6,R3 ;IF COMMAND
6869 003646 001032 BNE LB221 ;EQUALS 'READ SECTOR', THEN
6870 003650 016104 003560 MOV SODVDN(R1),R4 ;GET <SUC> DRIVE DONE FLAG
6871 003654 005704 IC221: TST R4 ;IF <SUC> DRIVE DONE FLAG
6872 003656 001433 BEQ EA221 ;SET, THEN
6873 003660 005061 003560 CLR SODVDN(R1) ;CLEAR <SUC> DRIVE DONE FLAG
6874 003664 005761 003766 IE221: TST SOCMDF(R1) ;IF <SUC> NEW COMMAND FLAG
6875 003670 001016 BNE EE221 ;NOT SET, THEN
6876 003672 062761 000002 003762 ADD #2,SYOTPT(R1) ;INCREMENT <SUC> CMD TABLE PTR
6877 003700 016102 003762 MOV SYOTPT(R1),R2 ;GET <SUC> CMD TABLE PTR
6878 003704 016237 003772 000542 MOV CMDTBL(R2),CMD ;GET COMMAND AT POINTER
6879 003712 013703 000542 MOV CMD,R3 ;SAVE COMMAND IN TEMP#3
6880 003716 005703 ID221: TST R3 ;IF COMMAND
6881 003720 002012 BGE EA221 ;EQUALS 'DONE', THEN
6882 003722 005061 003762 CLR SYOTPT(R1) ;RESET CMD TABLE POINTER
6883 003726 005061 003766 EE221: CLR SOCMDF(R1) ;CLEAR <SUC> NEW COMMAND FLAG
6884 003732 000405 BR EA221 ;BR TO EXIT MOD
6885 003734 062761 000002 003762 LB221: ADD #2,SYOTPT(R1) ;INCREMENT <SUC> CMD TABLE PTR
6886 003742 005261 003766 INC SOCMDF(R1) ;SET <SUC> NEW COMMAND FLAG
6887 003746 053737 000506 000542 EA221: BIS DENS,CMD ;SET SELECTED DENSITY
6888 003754 005061 003560 CLR SODVDN(R1) ;CLEAR <SUC> DRIVE DONE FLAG
6889 003760 000207 X221: RETURN ;RETURN
6890
6891
6892 003762 000000 SYOTPT: 0 ;SYSTEM#0 COMMAND TABLE POINTER
6893 003764 000000 SY1TPT: 0 ;SYSTEM#1 COMMAND TABLE POINTER
6894 003766 000000 SOCMDF: 0 ;SYS#0 NEW COMMAND FLAG
6895 003770 000000 SICMDF: 0 ;SYS#1 NEW COMMAND FLAG
6896
6897
6898
6899 003772 000113 CMDTBL: .WORD 0113 ; 0 / 0 / READ MAINT STATUS /0
6900 003774 000133 .WORD 0133 ; 1 / 0 / READ MAINT STATUS /2
6901 003776 000111 .WORD 0111 ; 0 / 0 / SET DENSITY /4
6902 004000 000131 .WORD 0131 ; 1 / 0 / SET DENSITY /6
6903 004002 000107 .WORD 0107 ; 0 / 0 / READ SECTOR /10
6904 004004 000127 .WORD 0127 ; 1 / 0 / READ SECTOR /12
6905 004006 001107 .WORD 1107 ; 0 / 1 / READ SECTOR /14
6906 004010 001127 .WORD 1127 ; 1 / 1 / READ SECTOR /16
6907 004012 177777 .WORD -1 ;DONE TERMINATOR /20
6908 004014 177777 .WORD -1 ;DONE TERMINATOR /22
6909

```

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6911 .SBTTL MODULE 2.2.2 - TRACK & SECTOR UPDATE
6912
6913 ;BEGINROUTINE (MOD 2.2.2 TRACK & SECTOR UPDATE)
6914 ; INITIALIZE MODULE, IF INITIALIZE PROGRAM SET
6915 ; IF SOFT_SWITCH_REG->CRC ALL TRACKS SET [A]
6916 ; THEN
6917 ; IF <SUC> DRIVE SECTOR DONE [B]
6918 ; THEN
6919 ; IF <SUC> DRIVE TRACK DONE [C]
6920 ; THEN
6921 ; CLEAR <SUC> DRIVE TRACK DONE
6922 ; SET <SUC> DRIVE TRACK = 76
6923 ; SET <SUC> DRIVE DONE
6924 ; ELSE
6925 ; DECREMENT <SUC> DRIVE TRACK
6926 ; SET TRACK=<SUC> DRIVE TRACK
6927 ; IF <SUC> DRIVE TRACK=0 [D]
6928 ; THEN
6929 ; SET <SUC> DRIVE TRACK DONE
6930 ; ENDIF
6931 ; SET SECTOR = <SUC> DRIVE SECTOR
6932 ; ENDIF
6933 ; CLEAR <SUC> DRIVE SECTOR DONE
6934 ; ELSE
6935 ; SET <SUC> DRIVE SECTOR=INTERLEAVE + <SUC> DRIVE SECTOR
6936 ; SET SECTOR=<SUC> DRIVE SECTOR
6937 ; IF <SUC> DRIVE SECTOR=26 [E]
6938 ; THEN
6939 ; SET <SUC> DRIVE SECTOR DONE FLAG
6940 ; SET <SUC> DRIVE SECTOR=1
6941 ; ELSE
6942 ; IF SECTOR >26 [F]
6943 ; THEN
6944 ; SET <SUC> DRIVE SECTOR & SECTOR 2
6945 ; ENDIF
6946 ; ENDIF
6947 ; SET TRACK = <SUC> DRIVE TRACK
6948 ; ENDIF
6949 ; ELSE
6950 ; IF <SUC> DRIVE TRACK DONE FLAG SET [G]
6951 ; THEN
6952 ; SET TRACK=0
6953 ; SET <SUC> DRIVE TRACK=0
6954 ; CLEAR <SUC> DRIVE TRACK DONE
6955 ; SET <SUC> DRIVE DONE
6956 ; ELSE
6957 ; SET TRACK =76
6958 ; SET <SUC> DRIVE TRACK DONE FLAG
6959 ; ENDIF
6960 ; SET <SUC> DRIVE SECTOR=1
6961 ; SET SECTOR= <SUC> DRIVE SECTOR
6962 ; ENDIF
6963 ;ENDROUTINE
```

CZRXEAO RX02 FMTR PROG MACY11 30(1046) 20-SEP-78 10:48 PAGE 67-24
CZRXEAO.P11 20-SEP-78 10:48 MODULE 2.2.2 - TRACK & SECTOR UPDATE

SEQ 0035

6965
6966 004016 005737 004360

TRKSEC: TST INITTS ;IF INITIALIZE PROGRAM

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6968 004022 001426 BEQ 1$ ;SET, THEN
6969 004024 005037 004360 CLR INITTS ;CLEAR INITIALIZE FLAG
6970 004030 005037 004362 CLR DVTKDN ;CLEAR SYS#0 DRIVE TRK DONE
6971 004034 005037 004364 CLR DVTKDN+2 ;CLEAR SYS#1 DRIVE TRK DONE
6972 004040 005037 004366 CLR DVSCDN ;CLEAR SYS#0 DRIVE SEC DONE
6973 004044 005037 004370 CLR DVSCDN+2 ;CLEAR SYS#1 DRIVE SEC DONE
6974 004050 012737 000114 004376 MOV #76.,DVTRK ;SET SYS#0 DRIVE TRK = 76
6975 004056 012737 000114 004400 MOV #76.,DVTRK+2 ;SET SYS#1 DRIVE TRK = 76
6976 004064 012737 000001 004372 MOV #1,DVSEC ;SET SYSTEM#0 DRVSEC=1
6977 004072 012737 000001 004374 MOV #1,DVSEC+2 ;SET SYSTEM#1 DRVSEC=1
6978 004100 004737 010126 1$: CALL SSUCOF ;CALL SET <SUC> OFFSET
6979 004104 032777 000200 174372 IA222: BIT #CRCALL,@SWR ;IF SWR -> CRC ALL TRACKS
6980 004112 001474 BEQ IG222 ;SET, THEN
6981 004114 005761 004366 IB222: TST DVSCDN(R1) ;IF <SUC> DRIVE SECTOR DONE FLAG
6982 004120 001433 BEQ LB222 ;SET, THEN
6983 004122 005761 004362 IC222: TST DVTKDN(R1) ;IF <SUC> DRIVE TRACK DONE FLAG
6984 004126 001410 BEQ LC222 ;SET, THEN
6985 004130 005061 004362 CLR DVTKDN(R1) ;CLEAR <SUC> DRIVE TRACK DONE FLAG
6986 004134 012761 000114 004376 MOV #76.,DVTRK(R1) ;SET <SUC> DRIVE TRACK =76
6987 004142 005261 003560 INC SODVDN(R1) ;SET <SUC> DRIVE DONE FLAG
6988 004146 000415 BR EC222 ;BR TO ENDF 'C'
6989 004150 016137 004376 000502 LC222: MOV DVTRK(R1),TRACK ;SET TRACK = <SUC> DRIVE TRACK
6990 004156 005361 004376 DEC DVTRK(R1) ;DECREMENT <SUC> DRIVE TRACK
6991 004162 005761 004376 ID222: TST DVTRK(R1) ;IF <SUC> DRIVE TRACK
6992 004166 001002 BNE ED222 ;EQUALS ZERO, THEN
6993 004170 005261 004362 INC DVTKDN(R1) ;SET <SUC> DRIVE TRACK DONE FLAG
6994 004174 012761 000001 004372 ED222: MOV #1,DVSEC(R1) ;SET <SUC> DRIVE SECTOR=1
6995 004202 005061 004366 EC222: CLR DVSCDN(R1) ;CLEAR <SUC> DRIVE SECTOR DONE FLAG
6996 004206 000463 BR X222 ;BR TO MOD EXIT
6997 004210 062761 000002 004372 LB222: ADD #INTLV,DVSEC(R1) ;SET <SUC> DRV SEC=INTERLEAVE + OLD DRV SEC
6998 004216 016137 004372 000500 MOV DVSEC(R1),SECTR ;SET SECTOR=<SUC> DRIVE SECTOR
6999 004224 026127 004372 000032 IE222: CMP DVSEC(R1),#26. ;IF <SUC> DRVE SECTOR
7000 004232 001006 BNE IF222 ;EQUALS 26, THEN
7001 004234 005261 004366 INC DVSCDN(R1) ;SET <SUC> DRIVE SECTOR DONE FLAG
7002 004240 012761 000001 004372 MOV #1,DVSEC(R1) ;SET <SUC> DRIVE SECTOR=1
7003 004246 000412 BR EE222 ;BR TO END 'E'
7004 004250 023727 000500 000032 IF222: CMP SECTR,#26. ;IF SECTOR
7005 004256 103406 BLO EE222 ;>26, THEN
7006 004260 012737 000002 000500 MOV #2,SECTR ;SET SECTOR=2
7007 004266 012761 000002 004372 MOV #2,DVSEC(R1) ;SET <SUC> DRIVE SECTOR = 2
7008 004274 016137 004376 000502 EE222: MOV DVTRK(R1),TRACK ;SET TRACK = <SUC> DRIVE TRACK
7009 004302 000425 BR X222 ;BR TO MOD EXIT
7010 004304 005761 004362 IG222: TST DVTKDN(R1) ;IF <SUC> DRIVE TRACK DONE FLAG
7011 004310 001407 BEQ LG222 ;SET, THEN
7012 004312 005061 004362 CLR DVTKDN(R1) ;CLEAR <SUC> DRIVE TRACK DONE FLAG
7013 004316 005037 000502 CLR TRACK ;SET TRACK=0
7014 004322 005261 003560 INC SODVDN(R1) ;SET <SUC> DRIVE DONE FLAG
7015 004326 000405 BR EG222 ;BR TO ENDF 'G'
7016 004330 012737 000114 000502 LG222: MOV #76.,TRACK ;SET TRACK=76
7017 004336 005261 004362 INC DVTKDN(R1) ;SET <SUC> DRIVE TRACK DONE FLAG
7018 004342 012761 000001 004372 EG222: MOV #1,DVSEC(R1) ;SET <SUC> DRIVE SECTOR=1
7019 004350 016137 004372 000500 MOV DVSEC(R1),SECTR ;SET SECTOR=<SUC> DRIVE SECTOR
7020 004356 000207 X222: RETURN ;RETURN - MOD EXIT
7021

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7023  
7024          000002  
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7026  
7027 004360 000000  
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7029  
7030 004362 000000  
7031 004364 000000  
7032 004366 000000  
7033 004370 000000  
7034 004372 000001  
7035 004374 000001  
7036 004376 000114  
7037 004400 000114  
7038  
7039
```

; INTLV = 2

; INITTS: 0 ; INITIALIZE TRACK & SECTOR FLAG

DVTKDN: .WORD 0 ; DRIVE TRACK DONE (DVTKDN) SYS #0
; DRIVE TRACK DONE (DVTKDN) SYS #1
DVSCDN: .WORD 0 ; DRIVE SECTOR DONE (DVSCDN) SYS #0
; DRIVE SECTOR DONE (DVSCDN) SYS #1
DVSEC: .WORD 1 ; DRIVE SECTOR (DVSEC) SYS #0
; DRIVE SECTOR (DVSEC) SYS #1
DVTRK: .WORD 76. ; DRIVE TRACK (DVTRK) SYS #0
; DRIVE TRACK (DVTRK) SYS #1

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.SBTTL MODULE 2.2.3 - DRIVE DRIVER

:BEGINROUTINE (MOD 2.2.3 - DRIVE DRIVER)
: CALL SET <SUC> ADDRESS AND OFFSET
: SAVE COMMAND IN <SUC> COMMAND
: IF COMMAND=SET DENSITY
:   THEN
:     SET <SUC> WATCHDOG MULTIPLIER LIMIT=400
:   ELSE
:     SET <SUC> WATCHDOG MULTIPLIER LIMIT=20
: ENDIF
: SETUP SECTOR FOR PRINT
: SETUP TRACK FOR PRINT
: SETUP SECTOR ADR FOR OUTPUT
: SETUP TRACK ADR FOR OUTPUT
: SETUP COMMAND FOR OUTPUT
: CALL SET PRIORITY HIGH
: CALL OUTPUT COMMAND
: CALL SET PRIORITY LOW
:ENDROUTINE

-----
DRVR:  CALL  SSUCAD      ;CALL SET <SUC> ADDRESS & OFFSET
      MOV   CMD,SOCMD(R1) ;SAVE COMMAND IN <SUC> COMMAND
      MOV   CMD,R2       ;GET COMMAND
      BIC   #177761,R2   ;CLEAR ALL BUT COMMAND
IA223: CMP   #SETDEN,R2  ;IF COMMAND
      BNE   LA223        ;EQUALS 'SET DENSITY'
      MOV   #400,SOWMLT(R1) ;SET <SUC> WATCHDOG MULT LIMIT=400
      BR    EA223        ;BR TO END 'A'
LA223: MOV   #20,SOWMLT(R1) ;SET <SUC> WATCHDOG MULT LIMIT=20
EA223: MOV   SECTR,SOSEC(R1) ;SETUP SECTOR FOR PRINT
      MOV   TRACK,SOTRK(R1) ;SETUP TRACK FOR PRINT
      MOV   SECTR,SECADR   ;SETUP SECTOR ADR FOR OUTPUT
      MOV   TRACK,TRKADR  ;SETUP TRACK ADR FOR OUTPUT
      MOV   CMD,WDOT      ;SETUP COMMAND FOR OUTPUT
      CALL  PRIHI         ;CALL SET PRIORITY HIGH
      CALL  OUTCMD        ;CALL OUTPUT COMMAND
      CALL  PRILO         ;CALL SET PRIORITY LOW
X223:  RETURN            ;RETURN
-----

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7084 .SBTTL MODULE 2.2.3.1 - OUTPUT DRIVE COMMAND
7085 -----
7086 004524 012737 000040 010226 OUTCMD: MOV #DNBIT,RDYWD ;READY TEST WD (PASS TO 2.2.3.1.1)
7087 004532 013737 000540 005102 MOV WDOT,WRDS ;WORD FOR OUTPUT (PASS TO 2.2.3.1.1)
7088 004540 013737 000472 005104 MOV RXCSAD,ADRS ;ADDRESS OF OUTPUT (PASS TO 2.2.3.1.1)
7089 004546 004737 005124 JSR PC,OUTSWD ;OUTPUT FUNCTION WD (FW DO 2.2.3.1.1)
7090 004552 032737 000010 000540 IB2231: BIT #10,WDOT ;THEN, IF FUNCTION IS
7091 004560 001043 BNE IC2231 ;'READ, WRITE, FILL, EMPTY' (FW BIT #3=0)
7092 004562 032737 000004 000540 IH2231: BIT #4,WDOT ;AND THEN IF FUNCTION IS
7093 004570 001047 BNE LH2231 ;'EMPTY, FILL' (FW BIT#2=0)
7094 004572 012737 000200 010226 MOV #TRBIT,RDYWD ;THEN SET OUTPUT READY TEST WORD (PASS TO 2.2.3.1.1)
7095 004600 013737 005122 005102 MOV WDCT,WRDS ;AND SET WORD FOR OUTPUT (PASS TO 2.2.3.1.1)
7096 004606 013737 000474 005104 MOV RXDBAD,ADRS ;AND SET ADDRESS OF OUTPUT (PASS TO 2.2.3.1.1)
7097 004614 004737 005124 JSR PC,OUTSWD ;OUTPUT BASE ADDRESS WORD DO 2.2.3.1.1
7098 004620 032737 000002 000540 IK2231: BIT #2,WDOT ;IF 'FILL' (FW BIT#1=0)
7099 004626 001004 BNE LK2231 ;THEN
7100 004630 013737 005116 005102 MOV BAFILL,WRDS ;SET DATA FILL BUFFER ADR (PASS TO 2.2.3.1.1)
7101 004636 000403 BR EK2231 ;BR TO END IF 'K'
7102 004640 013737 005120 005102 LK2231: MOV BAEMPTY,WRDS ;SET DATA EMPTY BUFFER ADR (PASS TO 2.2.3.1.1)
7103 004646 012737 000200 010226 EK2231: MOV #TRBIT,RDYWD ;SET OUTPUT READY TEST WORD (PASS TO 2.2.3.1.1)
7104 004654 013737 000474 005104 MOV RXDBAD,ADRS ;ADDRESS OF OUTPUT (PASS TO 2.2.3.1.1)
7105 004662 004737 005124 JSR PC,OUTSWD ;OUTPUT WORD COUNT WORD DO 2.2.3.1.1
7106 004666 000444 BR EH2231 ;BRANCH TO END IF 'H'
7107 004670 032737 000004 000540 IC2231: BIT #4,WDOT ;IF FUNCTION WORD IS
7108 004676 001455 BEQ IE2231 ;'WRITE D.D' OR 'READ E.C' (FW BIT #2=1)
7109 004700 032737 000002 000540 ID2231: BIT #2,WDOT ;THEN, IF FUNCTION IS
7110 004706 001035 BNE LD2231 ;'WRITE D.D', THEN (FW BIT#1=0)
7111 004710 012737 000200 010226 LH2231: MOV #TRBIT,RDYWD ;SET OUTPUT READY TEST WORD
7112 004716 013737 005114 005102 MOV SECADR,WRDS ;MOVE TRACK AND SECTOR ADDRESS
7113 004724 042737 177700 005102 BIC #177700,WRDS ;FORMAT TO SECTOR ADDRESS
7114 004732 013737 000474 005104 MOV RXDBAD,ADRS ;ADDRESS OF OUTPUT
7115 004740 004737 005124 JSR PC,OUTSWD ;OUTPUT SECTOR ADDRESS
7116 004744 013737 005112 005102 MOV TRKADR,WRDS ;MOVE TRACK AND SECTOR ADDRESS
7117 004752 042737 177600 005102 BIC #177600,WRDS ;FORMAT TRACK ADDRESS
7118 004760 012737 000200 010226 MOV #TRBIT,RDYWD ;SET OUTPUT READY TEST WORD
7119 004766 013737 000474 005104 MOV RXDBAD,ADRS ;ADDRESS OF OUTPUT
7120 004774 004737 005124 JSR PC,OUTSWD ;OUTPUT TRACK ADDRESS
7121 005000 000437 BR EH2231 ;ENDIF H -DONE
7122 005002 012737 000200 010226 LD2231: MOV #TRBIT,RDYWD ;SET READY WD TO TR MODE
7123 005010 012737 017446 005102 MOV #XER,WRDS ;EXT ERR. CODE TABLE ADD
7124 005016 013737 000474 005104 MOV RXDBAD,ADRS ;ADDRESS OF OUTPUT, RXDB
7125 005024 004737 005124 JSR PC,OUTSWD ;O/P BASE ADD FOR ERR. CODE
7126 005030 000423 BR END2231 ;DONE
7127 005032 032737 000002 000540 IE2231: BIT #2,WDOT ;IF FUNCTION IS
7128 005040 001404 BEQ LE2231 ;'READ STATUS' (FW BIT#1=1)
7129 005042 012737 000001 005106 TE2231: MOV #1,ERSTAT ;THEN-SET ERR STATUS FLAG
7130 005050 000413 BR END2231 ;DONE
7131 005052 012737 000200 010226 LE2231: MOV #TRBIT,RDYWD ;SET OUTPUT READY TEST WD
7132 005060 013737 005110 005102 MOV VALWD,WRDS ;VALIDATION WORD
7133 005066 013737 000474 005104 MOV RXDBAD,ADRS ;ADDRESS OF OUTPUT, RXDB
7134 005074 004737 005124 JSR PC,OUTSWD ;OUTPUT VALIDATION WORD
7135 005100 000207 END2231: RTS PC ;RETURN TO MOD 2.3
7136 -----
  
```

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7138 ;-----  
7139 005102 000000 WRDS: 0 ;MODULE 2.2.3.1.1 OUTPUT WORD  
7140 005104 000000 ADRS: 0 ;MODULE 2.2.3.1.1 OUTPUT ADDRESS  
7141 005106 000000 ERSTAT: 0 ;MODULE 0.0 ERR STATUS READ FLAG  
7142 005110 000111 VALWD: 111 ;VALIDATION WD (SET DENS-ASCII 'I')  
7143 005112 000000 TRKADR: 0 ;TRACK ADDRESS  
7144 005114 000000 SECADR: 0 ;SECTOR ADDRESS  
7145 005116 000000 BAFILL: 0 ;BASE ADDRESS FILL BUFFER  
7146 005120 000000 BAEMPT: 0 ;BASE ADDRESS FMPTY BUFFER  
7147 005122 000000 WDCT: 0 ;WORD COUNT  
7148 ;MOD 2.2.3.1 ----- END MODULE -----  
7149  
7150 .SBTTL MODULE 2.2.3.1.1 - OUTPUT SINGLE WORD  
7151 ;-----  
7152  
7153 005124 013737 000472 010230 OUTSWD: MOV RXCSAD,CSRADR ;SET C&S REG ADR  
7154 005132 013737 010226 010226 MOV RDYWD,RDYWD ;OUTPUT READY WORD (PASS TO DELAY)  
7155 005140 004737 010136 JSR PC,DELAY ;DELAY FOR READY DO DELAY  
7156 005144 033777 010226 173320 BIT RDYWD,@RXCSAD ;IF READY,  
7157 005152 001403 BEQ X22311 ;THEN  
7158 005154 013777 005102 177722 MOV WRDS,@ADRS ;MOV WORD TO ADDRESS  
7159 005162 000207 X22311: RTS PC ;RETURN  
7160 ;MOD 2.2.3.1.1 ----- END MODULE -----
```

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7162 .SBTTL MODULE 2.2.5 - ERROR CHECK
7163
7164 ;BEGINROUTINE (MOD 2.2.5 - ERROR CHECK)
7165 : CLEAR PRINT HEADER FLAG & ERROR FLAG
7166 : CALL SET <SUC> ADDRESS & OFFSET
7167 : GET <SUC> COMMAND (FROM LAST OPERATION)
7168 : IF <SUC> COMMAND=READ MAINT STATUS [A]
7169 : : THEN
7170 : : SET COMMAND HEADER='READ MAINT STATUS'
7171 : : SETUP CSR & ESR CHECK BITS & DON'T CARE BITS
7172 : : CALL CSR ERROR CHECK & CALL ESR ERROR CHECK
7173 : : SET ERROR FLAG, IF ANY ERRORS
7174 : : IF ERROR_FLAG SET [B]
7175 : : : THEN
7176 : : : SET ERROR=<READ MAINT STATUS COMMAND ERROR>
7177 : : : CALL DRIVES DROP (MOD 2.2.5.1)
7178 : : : CALL LOOP (MOD 2.2.5.4)
7179 : : : ELSE
7180 : : : CALL DRIVES AVAILABLE CHECK (MOD 2.2.5.2)
7181 : : : ENDF
7182 : : ELSE
7183 : : IF <SUC> COMMAND=SET DENSITY [C]
7184 : : : THEN
7185 : : : SET COMMAND HEADER='SET DENSITY ERROR'
7186 : : : CALL SET TEST BITS (MOD 2.2.5.3)
7187 : : : CALL CSR ERROR CHECK & CALL ESR ERROR CHECK
7188 : : : SET ERROR FLAG, IF ANY ERRORS
7189 : : : IF ERROR_FLAG SET [D]
7190 : : : : THEN
7191 : : : : SET ERROR=<SET DENSITY COMMAND ERROR>
7192 : : : : CALL DRIVES DROP (MOD 2.2.5.1)
7193 : : : : CALL LOOP (MOD 2.2.5.4)
7194 : : : : ENDF
7195 : : : ELSE
7196 : : : IF <SUC> COMMAND=READ SECTOR [F]
7197 : : : : THEN
7198 : : : : SET COMMAND HEADER='READ SECTOR COMMAND ERROR'
7199 : : : : CALL SET TEST BITS (MOD 2.2.5.3)
7200 : : : : CALL CSR ERROR CHECK & CALL ESR ERROR CHECK
7201 : : : : SET ERROR FLAG, IF ANY ERRORS
7202 : : : : IF ERROR_FLAG SET [E]
7203 : : : : : THEN
7204 : : : : : IF RXDB=CRC ERROR [G]
7205 : : : : : : THEN
7206 : : : : : : CALL TRACK & SECTOR IDENT
7207 : : : : : : ENDF
7208 : : : : : SET ERROR=<READ SECTOR COMMAND ERROR>
7209 : : : : : CALL DRIVES DROP (MOD 2.2.5.1)
7210 : : : : : CALL LOOP (MOD 2.2.5.4)
7211 : : : : : ENDF
7212 : : : : ENDF
7213 : : : ENDF
7214 : : ENDF
7215 ;ENDROUTINE
```

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7217 ;-----
7218
7219 005164 005037 000602 ERRCHK: CLR HDRFLG ;CLEAR HEADER FLAG
7220 005170 005037 005526 CLR ERRFLG ;CLEAR ERROR FLAGS
7221 005174 004737 010076 CALL SSUCAD ;CALL SET <SUC> ADDRESS & OFFSET
7222 005200 016102 000622 MOV SOCMD(R1),R2 ;GET <SUC> LAST COMMAND
7223 005204 042702 177761 BIC #177761,R2 ;CLEAR ALL BUT COMMAND
7224 005210 022702 000012 IA225: CMP #RDMNST,R2 ;IF COMMAND
7225 005214 001047 BNE IC225 ;EQUALS 'READ MAINT STATUS', THEN
7226 005216 012737 017346 000600 MOV #MSGCD5,TMSGAD ;SETUP COMMAND HEADER
7227 005224 012737 000040 000546 MOV #DNBIT,CSRCP ;SET DONE BIT CK-CSR COMPARE
7228 005232 052737 004000 000546 BIS #RX2BIT,CSRCP ;SET DOUBLE DENSITY BIT CK-CSR COMPARE
7229 005240 012737 173537 000544 MOV #173537,CSRMSK ;SET CSR DON'T CARE BITS
7230 005246 005037 000552 CLR ESRCP ;SET DRV RDY-ESR COMPARE
7231 005252 012737 171662 000550 MOV #171662,ESRMSK ;SET-ESR DON'T CARE BITS
7232 005260 004737 010404 CALL CSRCHK ;CALL CSR ERROR CHECK
7233 005264 010037 005526 MOV RO,ERRFLG ;SET ERROR FLAG, IF ANY ERRORS
7234 005270 004737 010624 CALL ESRCHK ;CALL ESR ERROR CHECK
7235 005274 050037 005526 BIS RO,ERRFLG ;SET ERROR FLAG, IF ANY ERRORS
7236 005300 005737 005526 IB225: TST ERRFLG ;IF ERROR FLAG
7237 005304 001410 BEQ LB225 ;SET, THEN
7238 005306 004737 012240 JSR PC,ERRSET
(2) 005312 000004 .WORD #4 ;FATAL ERR # 4 - READ MAINT STATUS COMMAND ERROR
7239 005314 004737 005530 CALL DRVDRP ;CALL DRIVES DROP (MOD 2.2.5.1)
7240 005320 004737 006406 CALL LOOP ;CALL LOOPING MODULE (MOD 2.2.5.4)
7241 005324 000476 BR EA225 ;BR TO MOD EXIT
7242 005326 004737 006040 LB225: CALL DRVAVL ;CALL DRIVES AVAIL CHK (MOD 2.2.5.2)
7243 005332 000473 BR EA225 ;BR TO MOD EXIT
7244 005334 022702 000010 IC225: CMP #SETDEN,R2 ;IF COMMAND
7245 005340 001030 BNE IF225 ;EQUALS 'SET DENSITY', THEN
7246 005342 012737 017311 000600 MOV #MSGCD4,TMSGAD ;SETUP COMMAND HEADER
7247 005350 004737 006266 CALL STSTBT ;CALL SET TEST BITS (MOD 2.2.5.3)
7248 005354 004737 010404 CALL CSRCHK ;CALL CSR ERROR CHECK
7249 005360 010037 005526 MOV RO,ERRFLG ;SET ERROR FLAG, IF ANY ERRORS
7250 005364 004737 010624 CALL ESRCHK ;CALL ESR ERROR CHECK
7251 005370 050037 005526 BIS RO,ERRFLG ;SET ERROR FLAG, IF ANY ERRORS
7252 005374 005737 005526 ID225: TST ERRFLG ;IF ERROR FLAG
7253 005400 001450 BEQ EA225 ;SET, THEN
7254 005402 004737 012240 JSR PC,ERRSET
(2) 005406 000005 .WORD #5 ;FATAL ERR # 5 - SET DENSITY COMMAND ERROR
7255 005410 004737 005530 CALL DRVDRP ;CALL DRIVES DROP (MOD 2.2.5.1)
7256 005414 004737 006406 CALL LOOP ;CALL LOOPING MODULE (MOD 2.2.5.4)
7257 005420 000440 BR EA225 ;
7258 005422 022702 000006 IF225: CMP #RDSEC,R2 ;IF COMMAND
7259 005426 001035 BNE EA225 ;EQUALS 'READ SECTOR', THEN
7260 005430 012737 017254 000600 MOV #MSGCD3,TMSGAD ;SET COMMAND HEADER
7261 005436 004737 006266 CALL STSTBT ;CALL SET TEST BITS (MOD 2.2.5.3)
7262 005442 004737 010404 CALL CSRCHK ;CALL CSR ERROR CHECK
7263 005446 010037 005526 MOV RO,ERRFLG ;SET ERROR FLAG, IF ANY ERRORS
7264 005452 004737 010624 CALL ESRCHK ;CALL ESR ERROR CHECK
7265 005456 050037 005526 BIS RO,ERRFLG ;SET ERROR FLAG, IF ANY ERRORS
7266 005462 005737 005526 IE225: TST ERRFLG ;IF ERROR FLAG
7267 005466 001415 BEQ EA225 ;SET, THEN
7268 005470 032777 000001 172776 IG225: BIT #CRCERR,@RXDBAD ;IF CRC ERROR
7269 005476 001402 BEQ EG225 ;SET, THEN
7270 005500 004737 011232 CALL PRTKSC ;CALL PRINT TRACK/SECTOR
  
```

7271 005504
(1) 005504 004737 012240
(2) 005510 000006
7272 005512 004737 005530
7273 005516 004737 006406
7274 005522 000240
7275 005524 000207
7276
7277 005526 000000
7278

EG225: JSR PC,ERRSET
.WORD #6 ;FATAL ERR # 6 - READ SECTOR COMMAND ERROR
CALL DRVDRP ;CALL DRIVES DROP (MOD 2.2.5.1)
CALL LOOP ;CALL LOOPING MODULE (MOD 2.2.5.4)
EA225: NOP
X225: RETURN ;RETURN

ERRFLG: 0 ;ERROR FLAG

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```
.SBTTL MODULE 2.2.5.1 - DRIVE DROP

:BEGINROUTINE (MOD 2.2.5.1 - DRIVE DROP)
:  CLEAR DROP DRIVE CONTROL WORD
:  CLEAR PRINT SIDE FLAG
:  CALL SET <SUC> OFFSET
:  IF <SUC> COMMAND=DRIVE #1 SELECTED [A]
:  THEN
:  :  IF <SUC> COMMAND=SIDE #1 SELECTED [B]
:  :  THEN
:  :  :  IF <SUC> SYS_AVAIL=SIDE #1 [C]
:  :  :  THEN
:  :  :  :  SETUP PRINT SIDE=#1, DRIVE=#1
:  :  :  :  SET DROP_DRIVE=SIDE 1/DRIVE 1
:  :  :  :  SET PRINT SIDE FLAG
:  :  :  :  ENDIF
:  :  :  ELSE
:  :  :  SET DROP_DRIVE=SIDE 0/DRIVE 1
:  :  :  IF <SUC> SYS_AVAIL=SIDE #1 [D]
:  :  :  THEN
:  :  :  :  SETUP PRINT SIDE=#0, DRIVE=#1
:  :  :  :  SET PRINT_SIDE_FLAG
:  :  :  :  ELSE
:  :  :  :  SETUP PRINT DRIVE=#1
:  :  :  :  ENDIF
:  :  :  ENDIF
:  :  ELSE
:  :  IF <SUC> COMMAND=SIDE #1 SELECTED [E]
:  :  THEN
:  :  :  IF <SUC> SYS_AVAIL=SIDE #1 [F]
:  :  :  THEN
:  :  :  :  SETUP PRINT SIDE=#1, DRIVE=#0
:  :  :  :  SET DROP_DRIVE=SIDE 1/DRIVE 0
:  :  :  :  ENDIF
:  :  :  ELSE
:  :  :  SET DROP_DRIVE=SIDE 0/ DRIVE 0
:  :  :  IF <SUC> SYS_AVAIL=SIDE #1 [G]
:  :  :  THEN
:  :  :  :  SETUP PRINT SIDE=#0, DRIVE=#0
:  :  :  :  SET PRINT_SIDE_FLAG
:  :  :  :  ELSE
:  :  :  :  SETUP PRINT DRIVE=#0
:  :  :  :  ENDIF
:  :  :  ENDIF
:  :  ENDIF
:  IF DROP_DRIVE NOT=0 [H]
:  THEN
:  :  CALL PRINT SYSTEM IDENTIFICATION
:  :  CALL PRINT DRIVE IDENTIFICATION
:  :  DROP DRIVES SET IN DROP_DRIVE FROM <SUC> AVAIL
:  :  ENDIF
:ENDROUTINE
```

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7333
7334
7335 005530 005037 006036      DRVDRP: CLR      DROPDV      ;CLEAR DROP DRIVES CONTROL WORD
7336 005534 005037 011230      CLR      PTSIDF      ;CLEAR PRINT SIDE FLAG
7337 005540 004737 010126      CALL     SSUCOF      ;CALL SET <SUC> OFFSET
7338 005544 032761 000020 000622 IA2251: BIT      #DRV1,SOCMD(R1) ;IF <SUC> COMMAND=DRIVE #1
7339 005552 001447      BEQ      IE2251      ;SELECTED, THEN
7340 005554 032761 001000 000622 IB2251: BIT      #SIDE1,SOCMD(R1) ;IF <SUC> COMMAND=SIDE #1
7341 005562 001420      BEQ      LB2251      ;SELECTED, THEN
7342 005564 032761 000010 000612 IC2251: BIT      #10,SOAV(R1) ;IF <SUC> SYS AVAIL=SIDE #1
7343 005572 001502      BEQ      IH2251      ;SET, THEN
7344 005574 012737 000001 011226 MOV      #1,SIDE      ;SETUP PRINT SIDE=#1
7345 005602 012737 000001 011224 MOV      #1,DRIVE     ;SETUP PRINT DRIVE=#1
7346 005610 012737 000010 006036 MOV      #10,DROPDV   ;SET DROP DRIVE=SIDE 1/DRIVE 1
7347 005616 005237 011230      INC      PTSIDF      ;SET PRINT SIDE FLAG
7348 005622 000466      BR       IH2251      ;BR TO IF 'H'
7349 005624 012737 000002 006036 LB2251: MOV      #2,DROPDV ;SET DROP DRIVE=SIDE 0/DRIVE 1
7350 005632 032761 000010 000612 ID2251: BIT      #10,SOAV(R1) ;IF <SUC> SYS AVAIL=SIDE #1
7351 005640 001410      BEQ      LD2251      ;SET, THEN
7352 005642 005037 011226      CLR      SIDE       ;SETUP PRINT SIDE=#0
7353 005646 012737 000001 011224 MOV      #1,DRIVE     ;SETUP PRINT DRIVE=#1
7354 005654 005237 011230      INC      PTSIDF      ;SET PRINT SIDE FLAG
7355 005660 000447      BR       IH2251      ;BR TO IF 'H'
7356 005662 012737 000001 011224 LD2251: MOV      #1,DRIVE     ;SETUP PRINT DRIVE=#1
7357 005670 000443      BR       IH2251      ;BR TO IF 'H'
7358 005672 032761 001000 000622 IE2251: BIT      #SIDE1,SOCMD(R1) ;IF <SUC> COMMAND=SIDE #1
7359 005700 001417      BEQ      LE2251      ;SELECTED, THEN
7360 005702 032761 000001 000612 IF2251: BIT      #1,SOAV(R1) ;IF <SUC> AVAIL=SIDE #1/DRIVE #0
7361 005710 001433      BEQ      IH2251      ;SET, THEN
7362 005712 012737 000001 011226 MOV      #1,SIDE     ;SETUP PRINT SIDE=#1
7363 005720 005037 011224      CLR      DRIVE      ;SETUP PRINT DRIVE=#0
7364 005724 012737 000004 006036 MOV      #4,DROPDV   ;SET DROP DRIVE=SIDE 1/DRIVE 0
7365 005732 005237 011230      INC      PTSIDF      ;SET PRINT SIDE FLAG
7366 005736 000420      BR       IH2251      ;BR TO IF 'H'
7367 005740 012737 000001 006036 LE2251: MOV      #1,DROPDV ;SET DROP DRIVE=SIDE 0/DRIVE 0
7368 005746 032761 000004 000612 IG2251: BIT      #4,SOAV(R1) ;IF <SUC> SYS AVAIL=SIDE #1/DRIVE #0
7369 005754 001407      BEQ      LG2251      ;SET, THEN
7370 005756 005037 011226      CLR      SIDE       ;SETUP PRINT SIDE=#0
7371 005762 005037 011224      CLR      DRIVE      ;SETUP PRINT DRIVE=#0
7372 005766 005237 011230      INC      PTSIDF      ;SET PRINT SIDE FLAG
7373 005772 000402      BR       IH2251      ;BR TO IF 'H'
7374 005774 005037 011224      LG2251: CLR      DRIVE     ;SETUP PRINT DRIVE=#0
7375 006000 005737 006036      IH2251: TST      DROPDV   ;IF DROP DRIVE CONTROL WORD
7376 006004 001413      BEQ      X2251      ;SET, THEN
7377 006006 004737 011132      CALL     PRSYS      ;CALL PRINT SYSTEM IDENT
7378 006012 004737 011154      CALL     PRDRV      ;CALL PRINT DRIVE IDENT
7379 006016 043761 006036 000612 BIC      DROPDV,SOAV(R1) ;DROP DRIVES SET IN <SUC> AVAIL
7380 006024 012704 015121      MOV      #MSG33,R4   ;SET MSG-> 'DROPPED'
(1) 006030 004737 013232      CALL     TTOUT      ;PRINT MSG
7381 006034 000207      X2251: RETURN      ;RETURN
7382
7383 006036 000000      DROPDV: 0          ;DROP DRIVE CONTROL WORD
7384
  
```

```
7386 .SBTTL MODULE 2.2.5.2 - DRIVES AVAILABLE CHECK
7387
7388 :BEGINROUTINE (MOD 2.2.5.2 - DRIVES AVAILABLE CHECK)
7389 : CLEAR DROP AVAILABLE DRIVES CONTROL
7390 : IF <SUC> COMMAND=DRIVE #1 SELECTED [A]
7391 : THEN
7392 : : IF RXES=DRIVE NOT RDY [B]
7393 : : THEN
7394 : : : IF <SUC> AVAIL=DRIVE #1 SET [C]
7395 : : : THEN
7396 : : : : SET DRIVE=1
7397 : : : : SET DROP_AVAIL_DRIVE=#1
7398 : : : : ENDF
7399 : : : ENDF
7400 : : IF RXES=SIDE NOT RDY [D]
7401 : : THEN
7402 : : : DROP <SUC> AVAIL-SIDE #1/DRIVE #1
7403 : : : ENDF
7404 : : ELSE
7405 : : : IF RXES=DRIVE NOT RDY [E]
7406 : : : THEN
7407 : : : : IF <SUC> AVAIL=DRIVE #0 SET [F]
7408 : : : : THEN
7409 : : : : : SET DRIVE=0
7410 : : : : : SET DROP_AVAIL_DRIVE=#0
7411 : : : : : ENDF
7412 : : : : ENDF
7413 : : : IF RXES=SIDE NOT RDY [G]
7414 : : : THEN
7415 : : : : DROP <SUC> AVAIL-SIDE #1/DRIVE #1
7416 : : : : ENDF
7417 : : : ENDF
7418 : : IF DROP_AVAIL_DRIVE NOT=0 [H]
7419 : : THEN
7420 : : : CALL PRINT SYSTEM IDENT
7421 : : : SETUP PRINT 'DRIVE NOT READY-IS DISK IN DRIVE B'
7422 : : : CALL PRINT SYSTEM IDENT
7423 : : : CLEAR SIDE PRINT FLAG
7424 : : : CALL PRINT DRIVE IDENT
7425 : : : DROP THE DRIVE SET IN DROP_AVAIL_DRIVE IN <SUC> AVAIL
7426 : : : SETUP & PRINT 'DROPPED'
7427 : : : ENDF
7428 : : ENDF
:ENDROUTINE
```



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7430
7431
7432 006040 005037 006264      DRVAVL: CLR      DROP AV      :CLEAR DROP AVAIL DRIVE
7433 006044 004737 010076      CALL     SSUCAD      :CALL SET <SUC> ADDRESS & OFFSET
7434 006050 032761 000020 000622 IA2252: BIT      #DRV1,SOCMD(R1) :IF <SUC> COMMAND
7435 006056 001426                BEQ      IE2252      :HAS DRIVE #1 SELECTED, THEN
7436 006060 032777 000200 172406 IB2252: BIT      #DRVRDY,@RXDBAD :IF RXES
7437 006066 001012                BNE     ID2252      :DRIVE RDY NOT SET, THEN
7438 006070 032761 000002 000612 IC2252: BIT      #2,SOAV(R1)  :IF <SUC> DRIVE #1
7439 006076 001406                BEQ     ID2252      :AVAILABLE, THEN
7440 006100 012737 000001 011224      MOV     #1,DRIVE    :SET DRIVE=1 FOR PRINT
7441 006106 012737 000002 006264      MOV     #2,DROPAV   :SET DROP AVAIL SIDE #0, DRIVE #1
7442 006114 032777 000002 172352 ID2252: BIT      #SIDRDY,@RXDBAD :IF RXES
7443 006122 001030                BNE     IH2252      :SIDE RDY NOT SET, THEN
7444 006124 042761 000010 000612      BIC     #10,SOAV(R1) :DROP SIDE #1, DRIVE #1
7445 006132 000424                BR      IH2252      :BR TO IF 'H'
7446 006134 032777 000200 172332 IE2252: BIT      #DRVRDY,@RXDBAD :IF RXES
7447 006142 001011                BNE     IG2252      :DRIVE RDY NOT SET, THEN
7448 006144 032761 000001 000612 IF2252: BIT      #1,SOAV(R1)  :IF <SUC> DRIVE #0
7449 006152 001405                BEQ     IG2252      :AVAILABLE, THEN
7450 006154 005037 011224      CLR     DRIVE      :SET DRIVE=0
7451 006160 012737 000001 006264      MOV     #1,DROPAV   :SET DROP AVAIL SIDE #0, DRIVE #0
7452 006166 032777 000002 172300 IG2252: BIT      #SIDRDY,@RXDBAD :IF RXES
7453 006174 001003                BNE     IH2252      :SIDE RDY NOT SET, THEN
7454 006176 042761 000004 000612      BIC     #4,SOAV(R1)  :DROP SIDE #1, DRIVE #0
7455 006204 005737 006264      IH2252: TST     DROPAV    :IF DROP AVAIL SIDE/DRIVE
7456 006210 001423                BEQ     EH2252      :SET, THEN
7457 006212 004737 011132      CALL    PRTSYS     :CALL PRINT SYSTEM IDENT
7458 006216 012704 016613      MOV     #MSG55,R4   :SET MSG-> 'DRIVE NOT RDY-IS DISK IN DRIVE & DOOR CLOSED
(1) 006222 004737 013232      CALL    TTOUT      :PRINT MSG
7459 006226 004737 011132      CALL    PRTSYS     :CALL PRINT SYSTEM IDENT
7460 006232 005037 011230      CLR     PTSIDF     :CLEAR PRINT SIDE FLAG
7461 006236 004737 011154      CALL    PRTDRV     :CALL PRINT DRIVE/SIDE IDENT
7462 006242 043761 006264 000612      BIC     DROPAV,SOAV(R1) :DROP DRIVE SET -> IN <SUC> AVAIL
7463 006250 012704 015121      MOV     #MSG33,R4   :SET MSG-> 'DROPPED'
(1) 006254 004737 013232      CALL    TTOUT      :PRINT MSG
7464 006260 000240      EH2252: NOP
7465 006262 000207      X2252: RETURN
7466
7467 006264 000000      DROPAV: 0          :DROP AVAIL DRIVES/SIDES CONTROL
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```

SYSTEM AVAILABLE WORD

```

+---+---+---+---+
! 10! 4 ! 2 ! 1 ! <-- SIDE & DRIVE BIT AVAILABLE
+---+---+---+---+
! 11! 10! 01! 00! <-- SIDE & DRIVE CODE
+---+---+---+---+
! SD! SD! SD! SD!
                ^^
                !.....DRIVE
                !.....SIDE
  
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```
.SBTTL MODULE 2.2.5.3 - SET TEST BITS IN CSR & ESR
;BEGINROUTINE (MOD 2.2.5.3 - SET TEST BITS IN CSR & ESR)
:   SETUP CSR_COMPARE=DONE BIT
:   SETUP CSR_COMPARE=DOUBLE DENSITY BIT
:   GET <SUC> LAST COMMAND
:   SAVE ALL READ/WRITE BITS
:   SETUP CSR_COMPARE=SET ALL READ/WRITE BITS
:   SETUP CSR_MASK=DON'T CARE BITS
:   CLEAR ALL BUT SIDE BIT FROM <SUC> LAST COMMAND
:   SETUP ESR_COMPARE=SIDE BIT AS SET FROM <SUC> LAST CMD
:   IF <SUC> LAST COMMAND=DRIVE#1 SELECTED [A]
:   : THEN
:   :   SETUP ESR_COMPARE=DRIVE#1
:   ENDIF
:   IF <SUC> LAST COMMAND=DOUBLE DENSITY BIT SET [B]
:   : THEN
:   :   SETUP ESR_COMPARE=DRIVE DOUBLE DENSITY BIT SET
:   ENDIF
:   SETUP ESR_MASK=DON'T CARE BITS
:ENDROUTINE
```

```
-----
7505 006266 012737 000040 000546 STSTBT: MOV #DNBIT,CSRCMP ;SET DONE BIT CK-CSR MODULE
7506 006274 052737 004000 000546 BIS #RX2BIT,CSRCMP ;SET DOUBLE DENSITY BIT CK-CSR COMPARE
7507 006302 016103 000622 MOV SOCMD(R1),R3 ;SET <SUC> COMMAND
7508 006306 042703 176257 BIC #176257,R3 ;SAVE ALL R/W BITS
7509 006312 050337 000546 BIS R3,CSRCMP ;SET R/W BITS FOR-CSR COMPARE
7510 006316 012737 070017 000544 MOV #70017,CSRMSK ;SET-CSR DON'T CARE BIT MASK
7511 006324 016103 000622 MOV SOCMD(R1),R3 ;GET <SUC> COMMAND
7512 006330 042703 176777 BIC #^CSIDE1,R3 ;CLEAR ALL BIT SIDE BIT
7513 006334 010337 000552 MOV R3,ESRCMP ;SET SIDE BIT (IF SELECTED)-ESR COMAPRE
7514 006340 032761 000020 000622 IA2253: BIT #DRV1,SOCMD(R1) ;IF DRIVE #1
7515 006346 001403 BEQ IB2253 ;SELECTED IN COMMAND, THEN
7516 006350 052737 000400 000552 BIS #DRIVE1,ESRCMP ;SET DRIVE #1 BIT-ESR COMPARE
7517 006356 032761 000400 000622 IB2253: BIT #DENBIT,SOCMD(R1) ;IF DOUBLE DENSITY
7518 006364 001403 BEQ EB2253 ;SELECTED IN COMMAND, THEN
7519 006366 052737 000040 000552 BIS #DRV1DEN,ESRCMP ;SET DRIVE DENSITY BIT-ESR COMPARE
7520 006374 012737 170000 000550 EB2253: MOV #170000,ESRMSK ;SET ESR DON'T CARE BIT MASK
7521 006402 000240 NOP
7522 006404 000207 X2253: RETURN
7523
```

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7525          .SBTTL  MODULE 2.2.5.4 - LOOPING MODULE
7526          ;-----
7527
7528 006406 000240          LOOP:  NOP
7529 006410 005737 000516    TST   DBGFLG          ;IF DEBUG FLAG
7530 006414 001464          BEQ   X2254          ;SET, THEN
7531 006416 032777 101000 172060 BIT   #101000,@SWR   ;IF HALT ON ERR OR LOOP ON ERR
7532 006424 001460          BEQ   X2254          ;SET, THEN
7533 006426 005037 000602    CLR   HDRFLG        ;CLEAR HEADER FLAG
7534 006432 012737 017417 000600 MOV   #MSGLP,TMSGAD ;SET MODULE MESSAGE
7535 006440 016137 000622 000542 MOV   SOCMD(R1),CMD ;GET <SUC> COMMAND
7536 006446 013737 000542 000540 LOOP1: MOV  CMD,WDOT   ;PASS COMMAND TO OUTPUT MODULE
7537 006454 004737 010404    CALL  CSRCHK        ;CALL CSR CHECK
7538 006460 005700          TST   R0            ;IF RXCS ERROR
7539 006462 001416          BEQ   LOOP2         ;SET, THEN
7540 006464 004737 012262    JSR   PC,BSINIT     ;CHECK SWR FOR BUS INITIALIZE
(1) 006470 032777 001000 172006 BIT   #SW09,@SWR   ;CHECK FOR LOOP ON ERROR
(1) 006476 001363          BNE   LOOP1         ;GO TO LOOP ERROR
(1) 006500 004737 012240    JSR   PC,ERRSET     ;FATAL ERR # 7 - LOOPING MOD-CSR ERR
(2) 006504 000007          .WORD #7
(1) 006506 005777 171772    TST   @SWR          ;CHECK FOR HALT ON ERROR
(1) 006512 100001          BPL   1$           ;HALT IF SET
(1) 006514 000000          HALT
(1) 006516 000240          1$:  NOP           ;<LOOPING MOD-CSR ERR>
7541 006520 004737 010624    LOOP2: CALL  ESRCHK   ;CALL ESR CHECK
7542 006524 005700          TST   R0            ;IF RXES ERROR
7543 006526 001416          BEQ   LOOP3         ;SET, THEN
7544 006530 004737 012262    JSR   PC,BSINIT     ;CHECK SWR FOR BUS INITIALIZE
(1) 006534 032777 001000 171742 BIT   #SW09,@SWR   ;CHECK FOR LOOP ON ERROR
(1) 006542 001341          BNE   LOOP1         ;GO TO LOOP ERROR
(1) 006544 004737 012240    JSR   PC,ERRSET     ;FATAL ERR # 10 - LOOPING MOD-ESR ERR
(2) 006550 000010          .WORD #10
(1) 006552 005777 171726    TST   @SWR          ;CHECK FOR HALT ON ERROR
(1) 006556 100001          BPL   1$           ;HALT IF SET
(1) 006560 000000          HALT               ;<LOOPING MOD-ESR ERR>
(1) 006562 000240          1$:  NOP
7545 006564 000240    LOOP3: NOP
7546 006566 000207    X2254: RETURN
7547          ;RETURN
          ;-----

```

```
7549 .SBTTL MODULE 2.3 - SYSTEM STATUS
7550
7551 :BEGINROUTINE (MOD 2.3 - SYSTEM STATUS)
7552 : IF SYSTEM#0_AVAIL=0 & SYSTEM#0=SELECTED [A]
7553 : : THEN
7554 : : SET <SUC>=0
7555 : : CALL DROP SYSTEM (MOD 2.3.2)
7556 : : ENDF
7557 : IF SYSTEM#1_AVAIL=0 & SYSTEM#1=SELECTED [B]
7558 : : THEN
7559 : : SET <SUC>=1
7560 : : CALL DROP SYSTEM (MOD 2.3.2)
7561 : : ENDF
7562 : IF SYSTEM#0 & SYSTEM#1=NOT SELECTED [C]
7563 : : THEN
7564 : : SET SYSTEM FLAG
7565 : : SET MSG 'NO SYSTEM AVAILABLE TO FORMATER''
7566 : : ELSE
7567 : : IF SYSTEM#1=SELECTED [D]
7568 : : : THEN
7569 : : : IF SYSTEM#1_DONE=1 [E]
7570 : : : : THEN
7571 : : : : IF SYSTEM#0 SELECTED [F]
7572 : : : : : THEN
7573 : : : : : IF SYSTEM#0_DONE=1 [G]
7574 : : : : : : THEN
7575 : : : : : : SET SYSTEM FLAG
7576 : : : : : : CALL PRINT SYSTEM STATUS (MOD 2.3.1)
7577 : : : : : : CLEAR SYSTEM#0 & SYSTEM#1 DONE
7578 : : : : : : SETUP FORMATTER MSG
7579 : : : : : : ELSE
7580 : : : : : : CALL SYSTEM TIMEOUT CHECK (MOD 2.3.3)
7581 : : : : : : ENDF
7582 : : : : : : ELSE
7583 : : : : : : SET SYSTEM FLAG
7584 : : : : : : CALL PRINT SYSTEM STATUS (MOD 2.3.1)
7585 : : : : : : CLEAR SYSTEM#1 DONE
7586 : : : : : : SETUP FORMATTER MSG
7587 : : : : : : ENDF
7588 : : : : : : ELSE
7589 : : : : : : CALL SYSTEM TIMEOUT CHECK (MOD 2.3.3)
7590 : : : : : : ENDF
7591 : : : : : : ELSE [H]
7592 : : : : : : IF SYSTEM#0_DONE=1
7593 : : : : : : : THEN
7594 : : : : : : : SET SYSTEM FLAG
7595 : : : : : : : CALL PRINT SYSTEM STATUS (MOD 2.3.1)
7596 : : : : : : : CLEAR SYSTEM#0 DONE
7597 : : : : : : : SETUP FORMATTER MSG
7598 : : : : : : : ELSE
7599 : : : : : : : CALL SYSTEM TIMEOUT CHECK (MOD 2.3.3)
7600 : : : : : : : ENDF
7601 : : : : : : : ENDF
7602 : : : : : : ENDF
7603 : : : : : : ENDF
7603 :ENDROUTINE
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7605 ;-----
7606
7607 006570 000240 SYSTAT: NOP
7608 006572 005737 000612 IA23: TST SOAV ; IF SYSTEM#0 AVAIL
7609 006576 001010 BNE IB23 ; EQUALS ZERO AND
7610 006600 032777 000001 171676 BIT #1,@SWR ; SYSTEM#0
7611 006606 001404 BEQ IB23 ; SELECTED, THEN
7612 006610 005037 000610 CLR SUC ; SET <SUC>=0
7613 006614 004737 007264 CALL SYSDRP ; CALL SYSTEM DROP (MOD 2.3.2)
7614 006620 005737 000614 IB23: TST S1AV ; IF SYSTEM#1 AVAIL
7615 006624 001011 BNE IC23 ; EQUALS ZERO AND
7616 006626 032777 000002 171650 BIT #2,@SWR ; SYSTEM#1
7617 006634 001405 BEQ IC23 ; SELECTED THEN
7618 006636 012737 000001 000610 MOV #1,SUC ; SET <SUC>=1
7619 006644 004737 007264 CALL SYSDRP ; CALL SYSTEM DROP (MOD 2.3.2)
7620 006650 032777 000003 171626 IC23: BIT #3,@SWR ; IF SYS#0 & SYS#1
7621 006656 001006 BNE ID23 ; NOT SELECTED OR DESELECTED, THEN
7622 006660 005237 000574 INC SYSFLG ; SET SYSTEM FLAG
7623 006664 012737 014206 000572 MOV #MSG8,SYSMSG ; SET SYSTEM MSG 'NO SYSTEMS TO FORMAT'
7624 006672 000471 BR EC23 ; BR TO END 'C'
7625 006674 032777 000002 171602 ID23: BIT #2,@SWR ; IF SYSTEM#1
7626 006702 001446 BEQ IH23 ; SELECTED, THEN
7627 006704 005737 000630 IE23: TST S1DN ; IF SYSTEM#1 DONE
7628 006710 001440 BEQ LE23 ; SET, THEN
7629 006712 032777 000001 171564 IF23: BIT #1,@SWR ; IF SYSTEM#0
7630 006720 001422 BEQ LF23 ; SELECTED, THEN
7631 006722 005737 000626 IG23: TST SODN ; IF SYSTEM#0 DONE
7632 006726 001414 BEQ LG23 ; SET, THEN
7633 006730 005237 000574 INC SYSFLG ; SET SYSTEM FLAG
7634 006734 004737 007062 CALL PTSYST ; CALL PRINT SYSTEM STATUS (MOD 2.3.1)
7635 006740 005037 000626 CLR SODN ; CLEAR SYSTEM#0 DONE
7636 006744 005037 000630 CLR S1DN ; CLEAR SYSTEM#1 DONE
7637 006750 012737 014246 000572 MOV #MSG9,SYSMSG ; SET SYSTEM MSG 'FORMAT COMPLETED'
7638 006756 000437 BR EC23 ; BR TO END 'C'
7639 006760 004737 007342 LG23: CALL SYTMCK ; CALL SYSTEM TIMEOUT CHECK (MOD 2.3.3)
7640 006764 000434 BR EC23 ; BR TO END 'C'
7641 006766 005237 000574 LF23: INC SYSFLG ; SET SYSTEM FLAG
7642 006772 004737 007062 CALL PTSYST ; CALL PRINT SYSTEM STATUS (MOD 2.3.1)
7643 006776 005037 000630 CLR S1DN ; CLEAR SYSTEM#1 DONE
7644 007002 012737 014246 000572 MOV #MSG9,SYSMSG ; SET SYSTEM MSG 'FORMAT COMPLETED'
7645 007010 000422 BR EC23 ; BR TO END 'C'
7646 007012 004737 007342 LE23: CALL SYTMCK ; CALL SYSTEM TIMEOUT CHECK (MOD 2.3.3)
7647 007016 000417 BR EC23 ; BR TO END 'C'
7648 007020 005737 000626 IH23: TST SODN ; IF SYSTEM#0 DONE
7649 007024 001412 BEQ LH23 ; SET, THEN
7650 007026 005237 000574 INC SYSFLG ; SET SYSTEM FLAG
7651 007032 004737 007062 CALL PTSYST ; CALL PRINT SYSTEM STATUS (MOD 2.3.1)
7652 007036 005037 000626 CLR SODN ; CLEAR SYSTEM#0 DONE
7653 007042 012737 014246 000572 MOV #MSG9,SYSMSG ; SET SYSTEM MSG 'FORMAT COMPLETED'
7654 007050 000402 BR EC23 ; BR TO END 'C'
7655 007052 004737 007342 LH23: CALL SYTMCK ; CALL SYSTEM TIMEOUT CHECK (MOD 2.3.3)
7656 007056 000240 EC23: NOP
7657 007060 000207 X23: RETURN ; RETURN
7658 ;-----

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.SBTTL MODULE 2.3.1 - PRINT SYSTEM STATUS  
:BEGINROUTINE (MOD 2.3.1 - PRINT SYSTEM STATUS)  
: SET <SUC>=0  
: BEGINDO  
: : INITIALIZE DRIVE_PTR=1, DRIVE_CTR=0 [A]  
: : IF <SUC> DONE=SET [B]  
: : : THEN  
: : : PRINT 'SYSTEM: <SUC> FORMAT DONE ON FOLLOWING:'  
: : : BEGINDO [C]  
: : : : IF <SUC> AVAIL=BIT SET AT SYSTEM AVAIL PTR [D]  
: : : : : THEN  
: : : : : IF <SUC> AVAIL=EITHER SIDE AVAIL [E]  
: : : : : : THEN  
: : : : : : SET SIDE FLAG  
: : : : : : ELSE  
: : : : : : CLEAR SIDE FLAG  
: : : : : : ENDIF  
: : : : : : SET DRIVE #  
: : : : : : SET SIDE #  
: : : : : : CALL PRINT DRIVES IDENT  
: : : : : : ENDIF  
: : : : : : INCREMENT DRIVE COUNTER  
: : : : : : SHIFT LEFT DRIVE POINTER  
: : : : : : DO UNTIL DRIVE_COUNTER=1  
: : : : : ENDDO  
: : : : ENDIF  
: : : INCREMENT <SUC> '  
: : : DO UNTIL <SUC>=2  
: : ENDDO  
:ENDROUTINE
```

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7692 ;-----
7693 ;
7694 007062 PTSYST:
(1) 007062 012704 014452 MOV #MSG14,R4 ;SET MSG-> 'FORMAT DONE ON FOLLOWING'
(1) 007066 004737 013232 CALL TTOUT ;PRINT MSG
7695 007072 005037 000610 CLR SUC ;SET <SUC>=0
7696 007076 012737 000001 007262 BA231: MOV #1,DRVPTR ;INITIALIZE DRIVE POINTER=1
7697 007104 005037 007260 CLR DRVCNT ;INITIALIZE DRIVE COUNTER=0
7698 007110 004737 010126 CALL SSUCOF ;CALL SET <SUC> OFFSET
7699 007114 005761 000626 IB231: TST SODN(R1) ;IF <SUC> DONE
7700 007120 001450 BEQ EB231 ;SET, THEN
7701 007122 004737 011132 CALL PRSYS ;CALL PRINT SYSTEM IDENT
7702 007126 000240 BC231: NOP ;
7703 007130 033761 007262 000612 ID231: BIT DRVPTR,SOAV(R1) ;IF DRIVE POINTER=<SUC> AVAIL BIT
7704 007136 001431 BEQ ED231 ;SET, THEN
7705 007140 032761 000014 000612 IE231: BIT #14,SOAV(R1) ;IF EITHER SIDE IN <SUC> AVAIL
7706 007146 001403 BEQ LE231 ;SET, THEN
7707 007150 005237 011230 INC PTSIDF ;SET PRINT SIDE FLAG
7708 007154 000402 BR EE231 ;BR TO END 'E'
7709 007156 005037 011230 LE231: CLR PTSIDF ;CLEAR PRINT SIDE FLAG
7710 007162 013737 007260 011224 EE231: MOV DRVCNT,DRIVE ;GET DRIVE COUNT
7711 007170 042737 000002 011224 BIC #2,DRIVE ;CLEAR SIDE BIT (DRIVE=DRIVE#) PRINT
7712 007176 013737 007260 011226 MOV DRVCNT,SIDE ;GET DRIVE COUNT
7713 007204 006237 011226 ASR SIDE ;SHIFT IT RIGHT TO SHOW SIDE BIT
7714 007210 042737 177776 011226 BIC #177776,SIDE ;CLEAR ANY JUNK BITS
7715 007216 004737 011154 CALL PRTRV ;CALL PRINT DRIVE IDENT
7716 007222 005237 007260 ED231: INC DRVCNT ;INCREMENT DRIVE COUNTER
7717 007226 006337 007262 ASL DRVPTR ;SHIFT LEFT DRIVE POINTER
7718 007232 022737 000004 007260 UC231: CMP #4,DRVCNT ;DO UNTIL DRIVE COUNT
7719 007240 001332 BNE BC231 ;EQUALS 4
7720 007242 005237 000610 EB231: INC SUC ;INCREMENT <SUC> TO NEXT SYSTEM
7721 007246 022737 000002 000610 UA231: CMP #2,SUC ;DO UNTIL <SUC>
7722 007254 001310 BNE BA231 ;EQUALS 2
7723 007256 000207 X231: RETURN ;RETURN
7724 ;-----
7725 007260 000000 DRVCNT: 0 ;DRIVE COUNTER
7726 007262 000000 DRVPTR: 0 ;DRIVE POINTER
7727 ;-----

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7729 .SBTTL MODULE 2.3.2 - SYSTEM DROP
7730
7731 ;BEGINROUTINE (MOD 2.3.2 SYSTEM DROP)
7732 ;   SETUP & PRINT MSG 'SYSTEM'
7733 ;   SETUP & PRINT SYSTEM#
7734 ;   IF SUC = 0
7735 ;       THEN
7736 ;           DESELECT SYSTEM#0
7737 ;       ELSE
7738 ;           DESELECT SYSTEM#1
7739 ;   ENDIF
7740 ;   SETUP & PRINT MSG 'NO DRIVES AVAIL - DROPPED'
7741 ;ENDROUTINE
7742
7743
7744
  
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7745 007264 012704 016425 SYSDRP: MOV #MSG51,R4 ;SETUP MSG 'SYSTEM:'
7746 007270 004737 013232 CALL TTOUT ;PRINT IT!
7747 007274 013703 000610 MOV SUC,R3 ;SET SYSTE #
7748 007300 004737 013346 CALL OCTP ;PRINT IT!
7749 007304 005737 000610 IA232: TST SUC ;IF SYSTEM UNDER CONTROL
7750 007310 001004 BNE LA232 ;IS ZERO, THEN
7751 007312 042777 000001 171164 BIC #1,@SWR ;DESELECT SYSTEM ZERO
7752 007320 000403 BR EA232 ;BR TO ENDIF 'A'
7753 007322 042777 000002 171154 LA232: BIC #2,@SWR ;ELSE DESELECT SYSTEM ONE
7754 007330 012704 016475 EA232: MOV #MSG53,R4 ;SETUP MSG 'DROPPED FROM FORMATTER'
7755 007334 004737 013232 CALL TTOUT ;PRINT IT!
7756 007340 000207 X232: RETURN ;RETURN
7757
  
```



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7759 .SBTTL MODULE 2.3.3 - SYSTEM TIMEOUT CHECK
7760
7761 ;BEGINROUTINE (MOD 2.3.3 - SYSTEM TIMEOUT CHECK)
7762 : IF SYSTEM_ERROR NOT=0 [A]
7763 : : THEN
7764 : : IF SYSTEM_ERROR=SYS#0 TIME OUT ERROR [B]
7765 : : : THEN
7766 : : : SET <SUC>=0
7767 : : : CALL SYSTEM IDENT
7768 : : : SETUP & PRINT TIME OUT ERROR
7769 : : : CLEAR SYS #0 AVAILABLE WORD
7770 : : ENDIF
7771 : IF SYSTEM_ERROR=SYS#1 TIMEOUT ERROR [C]
7772 : : THEN
7773 : : SET <SUC>=1
7774 : : CALL SYSTEM IDENT
7775 : : SETUP & PRINT TIMEOUT ERROR
7776 : : CLEAR SYS#1 AVAILABLE WORD
7777 : : ENDIF
7778 : ENDIF
7779 ;ENDROUTINE
7780
7781 -----
  
```

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7782 007342 000240 SYTMCK: NOP
7783 007344 005737 000606 IA233: TST SYSERR
7784 007350 001446 BEQ EA233
7785 007352 032737 000010 000606 IB233: BIT #10,SYSERR
7786 007360 001417 BEQ IC233
7787 007362 005037 000610 CLR SUC
7788 007366 004737 011132 CALL PRSYS
7789 007372 012704 014272 MOV #MSG10,R4
7790 007402 012704 015702 MOV #MSG41,R4
7791 007412 005037 000612 CLR SOAV
7792 007416 000423 BR EA233
7793 007420 032737 000020 000606 IC233: BIT #20,SYSERR
7794 007426 001417 BEQ EA233
7795 007430 012737 000001 000610 MOV #1,SUC
7796 007436 004737 011132 CALL PRSYS
7797 007442 012704 014272 MOV #MSG10,R4
7798 007452 012704 015702 MOV #MSG41,R4
7799 007462 005037 000614 CLR S1AV
7800 007466 005037 000606 EA233: CLR SYSERR
7801 007472 000207 RETURN
7802
  
```

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 7806 007474 005737 007670
 7807 007500 001406
 7808 007502 005037 007670
 7809 007506 005037 007566
 7810 007512 005037 007570
 7811 007516 005237 007566
 7812 007522 023737 007566 007674
 7813 007530 103415
 7814 007532 005037 007566
 7815 007536 005237 007570
 7816 007542 023737 007570 000556
 7817 007550 103405
 7818 007552 005037 007570
 7819 007556 052737 000010 000606
 7820 007564 000207
 7821
 7822 007566 000000
 7823 007570 000000
 7824
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 7826
 7827
 7828
 7829 007572 005737 007672
 7830 007576 001406
 7831 007600 005037 007672
 7832 007604 005037 007664
 7833 007610 005037 007666
 7834 007614 005237 007664
 7835 007620 023737 007664 007674
 7836 007626 103415
 7837 007630 005037 007664
 7838 007634 005237 007666
 7839 007640 023737 007666 000560
 7840 007646 103405
 7841 007650 005037 007666
 7842 007654 052737 000020 000606
 7843 007662 000207
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 7845 007664 000000
 7846 007666 000000
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 7848 007670 000000
 7849 007672 000000
 7850 007674 177777
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.SBTTL MODULE 2.4 - WATCH DOG SYSTEM#0
-----
WATCH0: TST      WATINO      ;IF WATCH DOG INIT0
        BEQ      1$          ;NOT = 0, THEN
        CLR      WATINO      ;CLEAR WATCHDOG INIT #0 FLAG
        CLR      WCNTRO      ;CLEAR WATCH DOG COUNTER #0
        CLR      WMLTO       ;CLEAR WATCH DOG MULTIPLIER #0
1$:     INC      WCNTRO      ;INCREMENT WATCH DOG COUNTER #0
        CMP      WCNTRO,WCNTMX ;IF COUNTER
        BLO      XWAT0       ;IS = TO COUNT MAX
        CLR      WCNTRO      ;CLEAR WATCH DOG COUNTER #0
        INC      WMLTO       ;INCREMENT WATCH DOG MULTIPLIER #0
        CMP      WMLTO,SOWMLT ;IF MULTIPLIER
        BLO      XWAT0       ;IS = TO MULTIPLIER MAX
        CLR      WMLTO       ;CLEAR WATCH DOG MULTIPLIER #0
        BIS      #10,SYSERR   ;SET SYSTEM ERR = TIME OUT
XWAT0:  RETURN              ;RETURN
-----
WCNTRO: 0                    ;WATCH DOG COUNTER #0
WMLTO:  0                    ;WATCH DOG MULTIPLIER #0
-----

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.SBTTL MODULE 2.5 - WATCH DOG SYSTEM#1
-----
WATCH1: TST      WATIN1      ;IF WATCH DOG INIT1
        BEQ      1$          ;NOT = 1, THEN
        CLR      WATIN1      ;CLEAR WATCH DOG INIT #1 FLAG
        CLR      WCNTR1      ;CLEAR WATCH DOG COUNTER #1
        CLR      WMLT1       ;CLEAR WATCH DOG MULTIPLIER #1
1$:     INC      WCNTR1      ;INCREMENT WATCH DOG COUNTER #1
        CMP      WCNTR1,WCNTMX ;IF COUNTER
        BLO      XWAT1       ;IS = TO COUNT MAX
        CLR      WCNTR1      ;CLEAR WATCH DOG COUNTER #1
        INC      WMLT1       ;INCREMENT WATCH DOG MULTIPLIER #1
        CMP      WMLT1,S1WMLT ;IF MULTIPLIER
        BLO      XWAT1       ;IS = TO MULTIPLIER MAX
        CLR      WMLT1       ;CLEAR WATCH DOG MULTIPLIER #1
        BIS      #20,SYSERR   ;SET SYSTEM ERR = TIME OUT
XWAT1:  RETURN              ;RETURN
-----
WCNTR1: 0                    ;WATCH DOG COUNTER #1
WMLT1:  0                    ;WATCH DOG MULTIPLIER #1
-----
WATINO: 0                    ;WATCH DOG INITIALIZE FLAG #0
WATIN1: 0                    ;WATCH DOG INITIALIZE FLAG #1
WCNTMX: -1                   ;WATCH DOGS MAX COUNT LIMIT
-----

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7854 .SBTTL MODULE 3.0 - OUTPUT SYSTEM DONE
7855
7856 ;BEGINROUTINE (MOD 3.0 - OUTPUT SYSTEM DONE)
7857 ; SETUP & PRINT 'DO YOU WANT TO FORMAT MORE DISKETTES?'
7858 ; CALL GET ANSWER
7859 ; IF ANSWER=YES [A]
7860 ; THEN
7861 ; : SETUP & PRINT 'REMOVE FORMATTED DISKETTS & INSERT DISKETTS TO BE FORMATTED''
7862 ; : SETUP & PRINT '-->TYPE 'CR' WHEN READY''
7863 ; : BGND0 [B]
7864 ; : GET OPERATOR RESPONSE-CALL TTY INPUT
7865 ; : DO UNTIL TTY CTR='CR'
7866 ; : ENDD0
7867 ; ELSE
7868 ; : SETUP & PRINT 'FORMATTER DONE-RESTART MONITOR, UPDATE PROGRAM-->TYPE CTRL-C TO S
7869 ; : SET SYSTEM FLAG=IDLE
7870 ; : ENABLE TTY INTERRUPTS & SET TTY GO BIT
7871 ; ENDIF
7872 ;ENDROUTINE
7873
7874 -----
7875
  
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7876 007676 OTSYDN:
(1) 007676 012704 016703 MOV #MSG56,R4 ;SET MSG-> DO YOU WANT TO FORMAT MORE DISKETTES?
(1) 007702 004737 013232 CALL TTOUT ;PRINT MSG
7877 007706 004737 012624 CALL GETANS ;CALL GET OPERATOR ANSWER
7878 007712 122737 000131 000530 IA30: CMPB #'Y,ANSWER ;IF ANSWER
7879 007720 001022 BNE LA30 ;IS YES, THEN
7880 007722 012704 016766 MOV #MSG57,R4 ;SET MSG-> REMOVE FORMATTED DISKETTES & INSERT DISKETTES
(1) 007726 004737 013232 CALL TTOUT ;PRINT MSG
7881 007732 012704 017065 MOV #MSG58,R4 ;SET MSG-> TYPE 'CR' WHEN READY
(1) 007736 004737 013232 CALL TTOUT ;PRINT MSG
7882 007742 004737 013156 BB30: CALL TTIN ;CALL TTY INPUT
7883 007746 122737 000015 000526 CMPB #15,TIB ;DO UNTIL
7884 007754 001372 BNE BB30 ;CHARACTER='CR'
7885 007756 012737 000002 000574 MOV #2,SYSFLG ;SET SYSTEM FLAG=RESTART
7886 007764 000414 BR X30 ;BR TO MODULE EXIT
7887 007766 LA30:
(1) 007766 012704 017117 MOV #MSG59,R4 ;SET MSG-> FORMATTER DONE-RESTART MONITOR, UPDATE PROGRA
(1) 007772 004737 013232 CALL TTOUT ;PRINT MSG
7888 007776 012737 000100 000574 MOV #100,SYSFLG ;SET SYSTEM FLAG=IDLE
7889 010004 052777 000100 170266 BIS #BIT6,@TKS ;SET TTY KEYBOARD INTERRUPT BIT
7890 010012 005277 170262 INC @TKS ;SET TTY KEYBOARD GO BIT
7891 010016 000207 X30: RETURN ;RETURN
7892 -----
  
```

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7894      .SBTTL MODULE U.PRIHI - SET PROCESSOR PRIORITY HIGH
7895      ;-----
7896
7897 010020 012737 000340 010074 PRIHI: MOV      #PR7,NEWPRI      ;SETUP FOR PROCESSOR PRI LEV-7
7898 010026 004737 010050          CALL     SETPRI        ;SET PROCESSOR FLAG
7899 010032 000207          RETURN      ;RETURN
7900      ;-----
7901
7902      .SBTTL MODULE U.PRILO - SET PROCESSOR PRIORITY LOW
7903      ;-----
7904
7905 010034 012737 000000 010074 PRILO: MOV      #PRO,NEWPRI      ;SETUP FOR PROCESSOR PRI LEV=0
7906 010042 004737 010050          CALL     SETPRI        ;SET PROCESSOR PRI
7907 010046 000207          RETURN      ;RETURN
7908      ;-----
7909
7910      .SBTTL MODULE U.PROPRI - SET PROCESSOR PRI
7911      ;-----
7912
7913 010050 005737 000520          SETPRI: TST      LSIFLG          ;IF PROCESSOR IS
7914 010054 001403          BEQ      1$                ;LSI, THEN
7915 010056 106437 010074          MTPS     NEWPRI            ;SET PROCESSOR PRI
7916 010062 000403          BR      SETPIX           ;BR TO END
7917 010064 013777 010074 167704 1$: MOV      NEWPRI,@PSW       ;SET PROCESSOR PRI
7918 010072 000207          SETPIX: RTS      PC          ;RETURN
7919      ;-----
7920 010074 000000          NEWPRI: 0                ;NEW PROCESSOR PRIORITY
7921      ;-----
7922
7923      .SBTTL MODULE U.SADR - SET SYSTEM BUS ADDRESS
7924      ;-----
7925
7926 010076 004737 010126          SSUCAD: CALL     SSUCOF          ;CALL SET <SUC> OFFSET
7927 010102 016137 000314 000472  MOV     REGS0(R1),RXCSAD ;SET NEW SYSTEM ADDRESS
7928 010110 016137 000314 000474  MOV     REGS0(R1),RXDBAD ;SET NEW SYSTEM DB ADDR
7929 010116 062737 000002 000474  ADD     #2,RXDBAD        ;BUMP ADDRESS
7930 010124 000207          RETURN      ;RETURN
7931      ;-----
7932
7933      .SBTTL MODULE U.SUCO - SET SYSTEM UNDER CONTROL OFFSET
7934      ;-----
7935
7936 010126 013701 000610          SSUCOF: MOV      SUC,R1        ;GET SYSTEM UNDER CONTROL
7937 010132 006301          ASL     R1                ;DOUBLE IT! FOR WORD OFFSET ADDRESSING
7938 010134 000207          RETURN      ;RETURN
7939      ;-----
  
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7941      .SBTTL  MODULE U.DL - DELAY FOR 'TR' OR 'DONE'
7942      :-----
7943 010136 013704 010222      DELAY:  MOV      RYDX,R4      ;SET READY DELAY MULT
7944 010142 013703 010224      BDAUDL: MOV      RYDLY,R3     ;SET READY DELAY
7945 010146 033777 010226 000054 BDBUDL: BIT      RDYWD,@CSRADR ;IF READY
7946 010154 001021              BNE      XUDL              ;EQUAL TO '1' ,THEN BR TO EXIT
7947 010156 005303              DEC      R3                ;ELSE DECREMENT DELAY
7948 010160 001372              BNE      BDBUDL           ;DO UNTIL R3=0
7949 010162 012737 000007 000524 MOV      #7,TOB           ;SET UP BELL
7950 010170 004737 013700      JSR      PC,TOG           ;PRINT BELL
7951 010174 005304              DEC      R4                ;DECREMENT DELAY MULT.
7952 010176 001361              BNE      BDAUDL           ;DO UNTIL R4=0
7953 010200 052737 040000 000606 BIS      #40000,SYSERR    ;SET TIME OUT ERR
7954 010206 013737 010226 010402 MOV      RDYWD,TOERBT     ;SET T.O. WORD
7955 010214 004737 010232      JSR      PC,TOPT         ;GO PRINT TIMEOUT ERRORS
7956 010220 000207      XUDL:  RTS      PC        ;RETURN TO CALLING MOD
7957      :-----
7958 010222 000015      RYDX:   15                ;READY MULTIPLIER
7959 010224 100000      RYDLY: 100000            ;READY DELAY
7960 010226 000000      RDYWD: 0                 ;READY WORD - TEST FOR DEVICE READY
7961 010230 000000      CSRADR: 0                ;C&S REG OF UNIT- WAITING FOR
7962      :-----
7963      .SBTTL  TIME OUT ERROR PRINT
7964      :-----
7965      :-----
7966 010232 032777 020000 170244 TOPRT:  BIT      #BIT13,@SWR ;IF INHIBIT ERROR RESULTS
  
```

7968	010240	001057				BNE	TOPRTX	: IS NOT SET, THEN
7969	010242	004737	011042			JSR	PC,TSHDCK	: CALL TEST HEADER CHECK
7970	010246	032737	000040	010402	1\$:	BIT	#DNBIT,TOERBT	: IF READY WORD WAS SET TO
7971	010254	001405				BEQ	2\$: TEST DONE BIT, THEN
7972	010256	012704	015031			MOV	#MSG30,R4	: SET DONE NOT SET MSG
7973	010262	004737	013232			JSR	PC,TTOUT	: PRINT MSG
7974	010266	000404				BR	3\$: GO PRINT MSG
7975	010270	012704	015055		2\$:	MOV	#MSG31,R4	: SET TR BIT NOT SET MSG
7976	010274	004737	013232			JSR	PC,TTOUT	: PRINT MSG
7977	010300	012704	015702		3\$:	MOV	#MSG41,R4	: SET TIME OUT MSG
7978	010304	004737	013232			JSR	PC,TTOUT	: PRINT MSG
7979	010310	032777	040000	170166		BIT	#SW14,@SWR	: IF EXTENDED ERROR REPORTS
7980	010316	001430				BEQ	TOPRTX	: SET, THEN
7981	010320	012704	013742			MOV	#MSG1,R4	: SET REG MSG
7982	010324	004737	013232			JSR	PC,TTOUT	: PRINT MSG
7983	010330	017703	170136			MOV	@RXCSAD,R3	: SET TO PRINT RXCS
7984	010334	004737	013334			JSR	PC,OCTPE	: PRINT
7985	010340	012704	014564			MOV	#MSG21,R4	: SET SPACES MSG
7986	010344	004737	013232			JSR	PC,TTOUT	: PRINT
7987	010350	017703	170120			MOV	@RXDBAD,R3	: SET TO PRINT RXES
7988	010354	004737	013334			JSR	PC,OCTPE	: PRINT
7989	010360	012704	014564			MOV	#MSG21,R4	: SET SPACES
7990	010364	004737	013232			JSR	PC,TTOUT	: PRINT
7991	010370	013703	000542			MOV	CMD,R3	: SET COMMAND
7992	010374	004737	013346			JSR	PC,OCTP	: PRINT COMMAND
7993	010400	000207				TOPRTX: RTS	PC	: RETURN
7994						-----		
7995	010402	000000				TOERBT: 0		
7996						-----		

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010404 017701 170062
 010410 043701 000544
 010414 023701 000546
 010420 001471
 010422 010137 011540
 010426 013737 000546 011536
 010434 012737 011544 011542
 010442 012737 000004 011534
 010450 012737 000014 011532
 010456 032777 020000 170020
 010464 001044
 010466 004737 011042
 010472 012704 014722
 010476 004737 013232
 010502 032777 040000 167774
 010510 001430
 010512 012704 014411
 010516 004737 013232
 010522 013703 000546
 010526 004737 013334
 010532 012704 014564
 010536 004737 013232
 010542 013703 011540
 010546 004737 013334
 010552 012704 014564
 010556 004737 013232
 010562 017703 167704
 010566 004737 013334
 010572 004737 011314
 010576 012700 177777
 010602 000405
 010604 005000
 010606 053700 000606
 010612 005037 000606
 010616 050037 000554
 010622 000207

```

.SBTTL RXCS ERROR CHECK
-----
CSRCHK: MOV @RXCSAD,R1 ;GET RXCS
        BIC CSRMSK,R1 ;MASK OFF BITS DON'T CARE ABOUT
        CMP CSRCMP,R1 ;IF RXCS CONTAINS
        BEQ 5$ ;ERRORS, THEN
1$: MOV R1,BADWRD ;SET BAD WORD
    MOV CSRCMP,CMPWRD ;SET COMPARE WORD
    MOV #CMSTB,TABADR ;SET MSG TABLE ADDRESS
    MOV #4,BITOFF ;SET # BITS TO OFFSET WORD
    MOV #12,BITLIM ;SET # BITS TO CHECK
    BIT #SW13,@SWR ;IF INHIBIT ERROR REPORTS
    BNE 4$ ;NOT SET, THEN
    CALL TSHDCK ;CALL TEST HEADER CHECK
2$: MOV #MSG26,R4 ;SET RXCS MSG HEADER
    JSR PC,TTOUT ;PRINT MSG
    BIT #SW14,@SWR ;IF EXTENDED ERROR REPORTS
    BEQ 3$ ;SET, THEN
    MOV #MSG13,R4 ;SET REG FORMAT MSG
    JSR PC,TTOUT ;PRINT MSG
    MOV CSRCMP,R3 ;SET GOOD RXCS
    JSR PC,OCTPE ;PRINT GOOD RXCS
    MOV #MSG21,R4 ;SET SPACES MSG
    JSR PC,TTOUT ;PRINT SPACES
    MOV BADWRD,R3 ;SET COMPARED RXCS
    JSR PC,OCTPE ;PRINT COMPARED RXCS
    MOV #MSG21,R4 ;SET SPACES MSG
    JSR PC,TTOUT ;PRINT MSG
    MOV @RXCSAD,R3 ;SET FULL RXCS
    JSR PC,OCTPE ;PRINT FULL RXCS
3$: JSR PC,CKBITS ;REPORT BAD BITS
4$: MOV #-1,R0 ;SET ERR
    BR CSRCKX ;BR TO END
5$: CLR R0 ;CLEAR ERRORS
    BIS SYSERR,R0 ;SET ANY SYSTEM ERRORS
    CLR SYSERR ;CLEAR SYS ERROR
CSRCKX: BIS R0,TSTERR ;SET TEST ERROR FLAG, IF ERRORS
        RTS PC ;RETURN
-----
    
```

```

8039      .SBTTL  RXES ERROR CHECK
8040      :-----
8041
8042 010624 017701 167644      ESRCHK: MOV      @RXDBAD,R1      .GET RXES
8043 010630 043701 000550      BIC      ESRMSK,R1      ;MASK OFF BITS DON'T CARE ABOUT
8044 010634 023701 000552      CMP      ESRCMP,R1      ;IF RXES CONTAINS
8045 010640 001470      BEQ      5$              ;ERRORS, THEN
8046 010642 010137 011540      1$: MOV      R1,BADWRD      ;SET BAD WORD
8047 010646 013737 000552 011536      MOV      ESRCMP,CMPWRD      ;SET COMPARE WORD
8048 010654 012737 011574 011542      MOV      #EMSGT8,TABADR      ;SET MSG TABLE ADR
8049 010662 005037 011534      CLR      BITOFF          ;SET BIT OFFSET
8050 010666 012737 000014 011532      MOV      #12,BITLIM        ;SET # BITS TO CHECK
8051 010674 032777 020000 167602      BIT      #SW13,@SWR        ;IF INHIBIT ERROR REPORTS
8052 010702 001044      BNE      4$              ;NOT SET, THEN
8053 010704 004737 011042      CALL     TSHDCK           ;CALL TEST HEADER CHECK
8054 010710 012704 014736      2$: MOV      #MSG27,R4      ;SET RXES MSG HEADER
8055 010714 004737 013232      JSR      PC,TTOUT         ;PRINT MSG
8056 010720 032777 040000 167556      BIT      #SW14,@SWR        ;IF EXTENDED ERROR REPORTS
8057 010726 001430      BEQ      3$              ;SET, THEN
8058 010730 012704 014411      MOV      #MSG13,R4        ;SET REG FORMAT MSG
8059 010734 004737 013232      JSR      PC,TTOUT         ;PRINT MSG
8060 010740 013703 000552      MOV      ESRCMP,R3        ;SET GOOD RXES
8061 010744 004737 013334      JSR      PC,OCTPE         ;PRINT GOOD RXES
8062 010750 012704 014564      MOV      #MSG21,R4        ;SET SPACES MSG
8063 010754 004737 013232      JSR      PC,TTOUT         ;PRINT SPACES
8064 010760 013703 011540      MOV      BADWRD,R3        ;SET COMPARED RXES
8065 010764 004737 013334      JSR      PC,OCTPE         ;PRINT COMPARED RXCS
8066 010770 012704 014564      MOV      #MSG21,R4        ;SET SPACES MSG
8067 010774 004737 013232      JSR      PC,TTOUT         ;PRINT MSG
8068 011000 017703 167470      MOV      @RXDBAD,R3      ;SET FULL RXCS
8069 011004 004737 013334      JSR      PC,OCTPC         ;PRINT FULL RXCS
8070 011010 004737 011314      3$: JSR      PC,CKBITS       ;REPORT BAD BITS
8071 011014 012700 177777      4$: MOV      #-1,R0        ;SET ERR
8072 011020 000405      BR       ESRCKX          ;BR TO END
8073 011022 005000      5$: CLR      R0            ;CLEAR ERRORS
8074 011024 053700 000606      BIS      SYSERR,R0        ;SET ANY SYSTEM ERRORS
8075 011030 005037 000606      CLR      SYSERR          ;CLEAR SYSTEM ERRORS
8076 011034 050037 000554      ESRCKX: BIS      R0,TSTERR      ;SET TEST ERROR FLAG, IF ERRORS
8077 011040 000207      RTS      PC              ;RETURN
8078      :-----

```



```
8080      .SBTTL TEST HEADER CHECK & PRINT
8081      :-----
8082
8083 011042 005737 000602      TSHDCK: TST      HDRFLG      ;IF HEADER FLAG
8084 011046 001030              BNE      ENDTSH      ;NOT SET, THEN
8085 011050 005237 000602      INC      HDRFLG      ;SET TEST HEADER FLAG
8086 011054 013704 000600      MOV      TMSGAD,R4   ;SET TEST MSG #
8087 011060 004737 013232      JSR      PC,TTOUT    ;PRINT TEST MSG
8088 011064 004737 010126      CALL    SSUCOF       ;CALL SET <SUC> OFFSET
8089 011070 004737 011132      CALL    PRTSYS       ;CALL PRINT SYSTEM IDENTIFICATION
8090 011074 032761 000020 000622 BIT      #DRV1,SOCMD(R1) ;IF DRIVE #1
8091 011102 001404              BEQ      1$          ;SELECTED, THEN
8092 011104 012737 000001 011224 MOV      #1,DRIVE     ;SET DRIVE=#1
8093 011112 000402              BR       2$          ;BR TO 2$
8094 011114 005037 011224      1$: CLR      DRIVE    ;SET DRIVE=#0
8095 011120 005037 011230      2$: CLR      PTSIDF   ;CLEAR PRINT SIDE FLAG
8096 011124 004737 011154      CALL    PRTDRV       ;CALL PRINT DRIVE
8097 011130 000207              ENDTSH: RTS      PC   ;RETURN
8098      :-----
```

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8101
8102 011132
 (1) 011132 012704 016425
 (1) 011136 004737 013232
8103 011142 013703 000610
8104 011146 004737 013346
8105 011152 000207
8106
8107
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8110
8111 011154
 (1) 011154 012704 014547
 (1) 011160 004737 013232
8112 011164 013703 011224
8113 011170 004737 013346
8114 011174 005737 011230
8115 011200 001410
8116 011202 012704 014556
 (1) 011206 004737 013232
8117 011212 013703 011226
8118 011216 004737 013346
8119 011222 000207
8120
8121 011224 000000
8122 011226 000000
8123 011230 000000
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8125
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8127
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8129 011232
 (1) 011232 012704 014570
 (1) 011236 004737 013232
8130 011242 012704 014506
 (1) 011246 004737 013232
8131 011252 016103 011304
8132 011256 004737 013346
8133 011262 012704 014526
 (1) 011266 004737 013232
8134 011272 016103 011310
8135 011276 004737 013346
8136 011302 000207
8137
8138 011304 000000
8139 011306 000000
8140 011310 000000
8141 011312 000000
8142

.SBTTL MODULE U.PRTSYS - PRINT SYSTEM IDENTIFICATION

PRTSYS:

```
MOV    #MSG51,R4      ;SET MSG-> 'SYSTEM:'  
CALL   TTOUT          ;PRINT MSG  
MOV    SUC,R3         ;SET SYSTEM# FOR PRINT  
CALL   OCTP           ;PRINT IT!  
RETURN                          ;RETURN
```

.SBTTL MODULE U.PRTRV - PRINT DRIVE IDENTIFICATION

PRTRV:

```
MOV    #MSG17,R4     ;SET MSG-> 'DRIVE: '  
CALL   TTOUT        ;PRINT MSG  
MOV    DRIVE,R3     ;GET DRIVE #  
CALL   OCTP         ;PRINT IT!  
TST   PTSIDF       ;IF SIDE FLAG  
BEQ   XUPTDV        ;SET, THEN  
MOV    #MSG20,R4    ;SET MSG-> 'SIDE: '  
CALL   TTOUT        ;PRINT MSG  
MOV    SIDE,R3      ;GET SIDE #  
CALL   OCTP         ;PRINT IT!  
XUPTDV: RETURN      ;RETURN
```

```
DRIVE: 0      ;DRIVE # TO PRINT  
SIDE: 0      ;SIDE # TO PRINT  
PTSIDF: 0    ;SIDE PRINT CONTROL FLAG
```

.SBTTL MODULE U.PRTKSC - PRINT RACK & SECTOR ERROR IDENT

PRTKSC:

```
MOV    #MSG22,R4     ;SET MSG-> 'CRC ERROR-'  
CALL   TTOUT        ;PRINT MSG  
MOV    #MSG15,R4     ;SET MSG-> 'TRACK='  
CALL   TTOUT        ;PRINT MSG  
MOV    SOTRK(R1),R3 ;GET TRACK #  
CALL   OCTP         ;PRINT IT!  
MOV    #MSG16,R4     ;SET MSG-> 'SECTOR='  
CALL   TTOUT        ;PRINT MSG  
MOV    SOSEC(R1),R3 ;GET SECTOR #  
CALL   OCTP         ;PRINT IT!  
RETURN                          ;RETURN
```

```
SOTRK: 0      ;SYS#0 TRACK  
SOTRK: 0      ;SYS#1 TRACK  
SOSEC: 0      ;SYS#0 SECTOR  
SOSEC: 0      ;SYS#1 SECTOR
```

```

8144      .SBTTL CHECK BITS SET & NOT SET
8145      ;-----
8146
8147 011314 005037 011524      CKBITS: CLR      BITPAS      ;CLEAR BIT PASS COUNT
8148 011320 012737 012222 011530  MOV      #SETMSG,BITMSG ;SET, SET BITS MSG ADR
8149 011326 013700 011536      MOV      CMPWRD,R0      ;GET COMPARE WORD
8150 011332 013701 011540      MOV      BADWRD,R1     ;GET BAD WORD
8151 011336 040001      BIC      R0,R1         ;R1 = BITS THAT SHOULDN'T BE SET
8152 011340 005100      COM      R0            ;COMPLIMENT COMPARE WORD
8153 011342 053700 011540      BIS      BADWRD,R0     ;SET BITS
8154 011346 005100      COM      R0            ;R0 = BITS THAT SHOULD BE SET
8155 011350 005737 011534      TST      BITOFF        ;IF BIT OFFSET
8156 011354 001411      BEQ      2$            ;NOT=0, THEN
8157 011356 005337 011534      1$: DEC      BITOFF
8158 011362 000241      CLC
8159 011364 006000      ROR      R0
8160 011366 000241      CLC
8161 011370 006001      ROR      R1
8162 011372 005737 011534      TST      BITOFF        ;IF BIT OFFSET
8163 011376 001367      BNE      1$            ;EQUALS 0, THEN
8164 011400 005037 011526      2$: CLR      BITCNT      ;CLEAR BIT COUNTER
8165 011404 032701 000001      3$: BIT      #1,R1
8166 011410 001420      BEQ      4$
8167 011412 012704 015210      MOV      #MSG35,R4     ;SET UP '-' MSG
8168 011416 004737 013232      JSR      PC,TTOUT      ;PRINT MSG
8169 011422 013704 011526      MOV      BITCNT,R4     ;GET BIT COUNT
8170 011426 006304      ASL      R4            ;DOUBLE FOR WORD ADDRESSING
8171 011430 063704 011542      ADD      TABADR,R4     ;ADD TABLE ADDRESS
8172 011434 011404      MOV      (R4),R4       ;SET MSG TO PRINT
8173 011436 004737 013232      JSR      PC,TTOUT      ;PRINT MSG
8174 011442 013704 011530      MOV      BITMSG,R4     ;SET SET BITS MSG
8175 011446 004737 013232      JSR      PC,TTOUT      ;PRINT MSG
8176 011452 005237 011526      4$: INC      BITCNT      ;INCREMENT BIT# COUNTER
8177 011456 000241      CLC
8178 011460 006001      ROR      R1            ;CLEAR CARRY BIT
8179 011462 023737 011532 011526  CMP      BITLIM,BITCNT ;SHIFT NEXT BIT FOR TEST
8180 011470 101345      BHI      3$            ;IF ALL BITS SPECIFIED
8181 011472 005037 011526      CLR      BITCNT        ;DONE, THEN
8182 011476 005737 011524      TST      BITCNT        ;RESET BIT COUNT
8183 011502 001007      BNE      5$
8184 011504 005237 011524      INC      BITPAS        ;SET BITPASS TO GET OUT NEXT PASS
8185 011510 012737 012200 011530  MOV      #NSMSG,BITMSG ;SET NOT SET BITS MSG ADR
8186 011516 010001      MOV      R0,R1         ;GET NOT SET BITS FOR TEST
8187 011520 000731      BR      3$            ;DO NOT SET BITS
8188 011522 000207      5$: RTS      PC        ;RETURN
8189
8190 011524 000000      BITPAS: 0
8191 011526 000000      BITCNT: 0
8192 011530 000000      BITMSG: 0
8193 011532 000000      BITLIM: 0
8194 011534 000000      BITOFF: 0
8195 011536 000000      CMPWRD: 0
8196 011540 000000      BADWRD: 0
8197 011542 000000      TABADR: 0
8198

```



```

8257      .SBTTL  ERROR SET SUBROUTINE
8258      ;-----
8259
8260 012240 017637 000000 000402 ERRSET: MOV    @ (SP), $FATAL ;MOVE ERR# TO $FATAL MAILBOX
8261 012246 012737 000001 000400      MOV    #1, $MSGTY ;SET MAIL BOX FLAG
8262 012254 062716 000002      ADD    #2, (SP) ;ADJUST STACK RETURN ADDRESS
8263 012260 000207      ERSETX: RTS    PC ;RETURN
8264      ;-----
8265
8266      .SBTTL  BUS INITIALIZE SUBROUTINE
8267      ;-----
8268
8269 012262 032777 041000 166214 BSINIT: BIT    #41000, @SWR ;IF LOOP
8270 012270 001407      BEQ    1$ ;IS SET, THEN
8271 012272 004737 011042      CALL   TSHDCK ;PRINT TEST HEADER
8272 012276 032777 010000 166200      BIT    #SW12, @SWR ;IF BUS INITIALIZE
8273 012304 001401      BEQ    1$ ;BIT SET, THEN
8274 012306 000005      RESET ;INITIALIZE BUS
8275 012310 005737 012402      1$: TST    _PPRT ;IF LOOP MESSAGE
8276 012314 001026      BNE    5$ ;NOT PRINTED, THEN
8277 012316 032777 001000 166160 2$: BIT    #SW09, @SWR ;IF LOOP ON
8278 012324 001405      BEQ    3$ ;ERROR, THEN
8279 012326 012704 014752      MOV    #MSG28, R4 ;SET LOOP ON ERROR MSG
8280 012332 004737 013232      CALL   TTOUT ;PRINT MSG
8281 012336 000407      BR     4$ ;
8282 012340 005777 166140      3$: TST    @SWR ;IF HALT ON ERROR
8283 012344 100012      BPL    5$ ;IS SET, THEN
8284 012346 012704 015223      MOV    #MSG37, R4 ;SET HALT ON ERROR MSG
8285 012352 004737 013232      CALL   TTOUT ;PRINT MSG
8286 012356 011603      4$: MOV    (SP), R3 ;GET RETURN ADR
8287 012360 062703 000014      ADD    #14, R3 ;ADJ. ADDRESS FOR ERR NO.
8288 012364 011303      MOV    (R3), R3 ;GET ERR NO.
8289 012366 004737 013346      CALL   OCTP ;PRINT ERR #
8290 012372 012737 000001 012402 5$: MOV    #1, LPPRT ;SET LOOP MSG PRINTED FLAG
8291 012400 000207      BSINTX: RTS    PC ;RETURN
8292      ;-----
8293 012402 000000      LPPRT: 0 ;LOOP FLAG
8294      ;-----

```

```
8296      .SBTTL RX02 INTERRUPT HANDLER #0
8297      ;-----
8298
8299 012404 005237 000616  RXINT0: INC      SORDY      ;INCREMENT SYS #0 READY
8300 012410 000002                RTI          ;RETURN TO CALLER
8301      ;-----
8302
8303      .SBTTL RX02 INTERRUPT HANDLER #1
8304      ;-----
8305
8306 012412 005237 000620  RXINT1: INC      S1RDY      ;INCREMENT SYS #1 READY
8307 012416 000002                RTI          ;RETURN TO CALLER
8308      ;-----
8309      .SBTTL TTY INTERRUPT HANDLER
8310      ;-----
8311
8312 012420 004737 013156  TTINT:  CALL      TTIN          ;CALL TTY INPUT ROUTINE
8313 012424 113737 000520 000632  MOVB     T1B,TTITFG        ;SAVE TTY INPUT CHARACTER
8314 012432 022737 000003 000632  CMP      #3,TTITFG        ;IF TTY INTERRUPT
8315 012440 001007                BNE      1$                ;WAS CTRL C, THEN
8316 012442 012704 014715  MOV      #MSG25,R4        ;SET MSG->'^C'
(1) 012446 004737 013232  CALL     TTOUT            ;PRINT MSG
8317 012452 005000                CLR      R0                ;
8318 012454 000137 001000                JMP      START            ;JUMP TO START OVER
8319 012460 052777 000100 165612 1$:  BIS      #BIT6,@TKS      ;SET TTY INTERRUPT BIT
8320 012466 005277 165606                INC      @TKS              ;SET TTY GO BIT
8321 012472 000602                RTI
8322      ;-----
8323
```

```

8325      .SBTTL  BUS ADDRESS TRAP HANDLER
8326      ;-----
8327
8328 012474 005237 000570      TRAP:  INC      BTRPFL      ;SET BUS TRAP FLAG
8329 012500 032777 020000 165776  BIT      #20000,@SWR    ;SEE IF SHOULD PRINT ERRORS
8330 012506 001020                BNE      TRAP2        ;IF NOT, BR
8331 012510 005737 000602      TST      HDRFLG      ;SEE IF DONE HEADER
8332 012514 001006                BNE      TRAP1        ;IF SO, BR
8333 012516 005237 000602      INC      HDRFLG      ;ELSE SET HEADER FLAG
8334 012522 013704 000600      MOV      TMSGAD,R4
8335 012526 004737 013232      JSR      PC,TTOUT    ;PRINT HEADER
8336 012532 012704 014701      TRAP1: MOV      #MSG24,R4
8337 012536 004737 013232      JSR      PC,TTOUT    ;PRINT ERROR
8338 012542 010103                MOV      R1,R3
8339 012544 004737 013346      JSR      PC,OCTP     ;PRINT ADDRESS OF TRAP
8340 012550 004737 012570      TRAP2: JSR      PC,APTER
8341 012554 000055                .WORD   '55          ;BUS TRAP ERROR
8342 012556 005777 165722      TST      @SWR        ;SEE IF HALT ON ERROR
8343 012562 100001                BPL      TRAPX       ;IF NOT, BR
8344 012564 000000                HALT
8345 012566 000002      TRAPX: RTI          ;RETURN FROM INTERRUPT
8346      ;-----
8347
8348      .SBTTL  APT ERROR HANDLER
8349      ;-----
8350
8351 012570 132737 000001 000420  APTER: BITB     #APTENV,$ENV ;IF IN
8352 012576 001407                BEQ     2$           ;APT MODE, THEN
8353 012600 017637 000000 000402  MOV     @(SP),$FATAL ;MOVE ERR # TO $FATAL MAILBOX
8354 012606 012737 000001 000400  MOV     #1,$MSGTY   ;SET MAIL BOX FLAG
8355 012614 000777                BR      1$          ;APT ERROR LOOP
8356 012616 062716 000002      2$:   ADD     #2,(SP)
8357 012622 000207                RTS      PC          ;RETURN
8358      ;-----
8359
8360      .SBTTL  MODULE U.OPRANS - SETUP & GET OPERATOR ANSWERS
8361      ;-----
8362
8363 012624 012737 000116 012646  GETANS: MOV     #'N,ANSDEF ;SET DEFAULT ANSWER-'NO'
8364 012632 012737 000131 012650  MOV     #'Y,ANSCHG ;SET CHANGE ANSWER-'YES'
8365 012640 004737 013036                CALL    TTAR        ;GET ANSWER-CALL TTY ANSWER
8366 012644 000207                RETURN             ;RETURN
8367      ;-----
8368 012646 000000      ANSDEF: 0          ;DEFAULT ANSWER BUFFER
8369 012650 000000      ANSCHG: 0          ;CHANGE ANSWER BUFFER
8370      ;-----
    
```

```

8372
8373      .SBTTL TTY ENTRY SUBROUTINE
8374      ;-----
8375
8376      ;THIS SUBROUTINE IS USED BY THE TEST CONDITION ENTRY ROUTINE TO READ
8377      ;THE RESPONSE ENTERED AT THE TTY AND CHECK THEM FOR LEGALITY AND LIMITS.
8378      ;ALL RESPONSE MUST BE TYPED IN OCTAL (0 - 7) AND MUST FALL WITHIN THE
8379      ;LIMITS SET BY THE CALLING ROUTINE. IF AN ENTRY IS ILLEGAL OR OUTSIDE
8380      ;THE LIMITS, A QUESTION MARK (?) IS TYPED AND THE RESPONSE MAY BE RE-
8381      ;ENTERED. ENTRIES MAY NOT EXCEED SIX (6) CHARACTERS AND MAY BE TERMIN-
8382      ;ATED AT LESS THAN SIX BY TYPING A CARRIAGE RETURN.
8383
8384      012652 005037 000562      TTR:   CLR      TEMP1      ;CLEAR FIRST CHARACTER FLAG
8385      012656 005000              CLR      RO
8386      012660 004737 013156      TTR0:  JSR      PC,TTIN    ;GO READ CHARACTER
8387      012664 122737 000015 000526      CMPB    #15,TIB      ;SEE IF CR
8388      012672 001005              BNE     TTR1         ;IF NOT, BR
8389      012674 005737 000562              TST     TEMP1       ;SEE IF FIRST CHARACTER
8390      012700 001446              BEQ     TTR5         ;IF SO, BR
8391      012702 000137 012774              JMP     TTR2         ;ELSE, GO LOAD VALUE
8392      012706 122737 000060 000526      TTR1:  CMPB    #60,TIB    ;SEE IF CHAR IS LESS THAN 0
8393      012714 101402              BLOS   TTR1A        ;IF NOT, BR
8394      012716 000137 013020              JMP     T1NER        ;ELSE, GO TO ERROR
8395      012722 122737 000070 000526      TTR1A: CMPB    #70,TIB    ;SEE IF CHAR IS GREATER THAN 7
8396      012730 101002              BHI     TTR1B        ;IF NOT, BR
8397      012732 000137 013020              JMP     T1NER        ;ELSE, GO TO ERROR
8398      012736 005237 000562      TTR1B: INC     TEMP1     ;SET FIRST CHARACTER FLAG
8399      012742 000241              CLC
8400      012744 006100              ROL     RO
8401      012746 000241              CLC
8402      012750 006100              ROL     RO           ;SHIFT 3 LEFT
8403      012752 000241              CLC
8404      012754 006100              ROL     RO
8405      012756 042737 177770 000526      BIC     #177770,TIB  ;STRIP ASCII
8406      012764 053700 000526      BIS     TIB,RO       ;LOAD CHARACTER
8407      012770 005301              DEC     R1           ;SEE IF DONE
8408      012772 001332              BNE     TTR0         ;IF NOT, BR
8409      012774 020002              TTR2:  CMP     R0,R2    ;SEE IF EXCEEDED MAXIMUM LIMIT
8410      012776 101402              BLOS   TTR3         ;IF NOT, BR
8411      013000 000137 013020              JMP     T1NER        ;ELSE, GO TO ERROR
8412      013004 020300              TTR3:  CMP     R3,R0    ;SEE IF BELOW MINIMUM LIMIT
8413      013006 101402              BLOS   TTR4         ;IF NOT, BR
8414      013010 000137 013020              JMP     T1NER        ;ELSE, GO TO ERROR
8415      013014 010015      TTR4:  MOV     RO,(R5)  ;LOAD VALUE
8416      013016 000207      TTR5:  RTS     PC      ;EXIT
  
```

```

8417      ;-----
8418
8419      .SBTTL TTY ENTRY ERROR SUBROUTINE
8420      ;-----
8421
8422
8423      013020 012704 014202      T1NER: MOV     #MSG7,R4
8424      013024 004737 013232      JSR     PC,TTOUT    ;PRINT?
8425      013030 1627'6 000020      SUB     #20,(SP)    ;RESET SP TO START OF VALUE ROUTINE
8426      013034 000207      RTS     PC          ;REDO VALUE ENTRY
8427
  
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 8437 013036 105037 000530
 8438 013042 005000
 8439 013044 004737 013156
 8440 013050 122737 000032 000526
 8441 013056 001003
 8442 013060 005237 000576
 8443 013064 000433
 8444 013066 122737 000015 000526
 8445 013074 001004
 8446 013076 113737 012646 000530
 8447 013104 000423
 8448 013106 042737 000040 000526
 8449 013114 123737 012650 000526
 8450 013122 001411
 8451 013124 123737 012646 000526
 8452 013132 001405
 8453 013134 012704 014202
 8454 013140 004737 013232
 8455 013144 000734
 8456 013146 113737 000526 000530
 8457 013154 000207
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 8460
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 8463 013156 005077 165116
 8464 013162 005037 000526
 8465 013166 005277 165106
 8466 013172 105777 165102
 8467 013176 100375
 8468 013200 017737 165076 000526
 8469 013206 105777 165072
 8470 013212 100375
 8471 013214 113777 000526 165064
 8472 013222 042737 000200 000526
 8473 013230 000207
 8474

.SBTTL TTY ANSWER ENTRY SUBROUTINE

 : THIS SUBROUTINE IS USED BY THE TEST CONDITION ENTRY ROUTINE TO
 : READ THE RESPONSE ENTERED AT THE TTY AND CHECK THEM FOR LEGALITY.
 : ALL RESPONSES MUST BE EQUAL TO RETURN THE DEFAULT ANSWER, CHANGED ANSWER
 : OR A CARRIAGE RETURN, IF ENTRY IS ILLEGAL A QUESTION MARK IS TYPED AND
 : THE RESPONSE MAY BE REENTERED.

```

TTAR:  CLR      ANSWER      ;CLEAR ANSWER
        CLR      RO
        CALL     TTIN        ;GO READ A CHARACTER
        CMPB     #32,TIB     ;IF '^L'
        BNE     TTAR1       ;THEN
        INC      STFLG       ;SET START PROGRAM
        BR       XTTAR       ;BR TO END
TTAR1:  CMPB     #15,TIB     ;IF 'CR'
        BNE     TTAR2       ;THEN
        MOVB     ANSDEF,ANSWER ;SET DEFAULT ANSWER
        BR       XTTAR       ;BR TO END
TTAR2:  BIC      #40,TIB     ;CLEAR LOWER CASE BIT
        CMPB     ANSCHG,TIB  ;IF ANSWER NOT OK WITH CHANGE ANS
        BEQ     TTAR3       ;THEN
        CMPB     ANSDEF,TIB  ;IF ANSWER NOT OK WITH DEFAULT ANS
        BEQ     TTAR3       ;THEN
        MOV      #MSG7,R4    ;SETUP MSG '?'
        CALL     TTOUT       ;PRINT MSG
        BR       TTAR        ;START OVER
TTAR3:  MOVB     TIB,ANSWER  ;SAVE ANSWER
XTTAR:  RETURN              ;RETURN
  
```

.SBTTL TTY READ SUBROUTINE

```

TTIN:   CLR      @TKS
        CLR      TIB
        INC      @TKS
TTIN1:  TSTB     @TKS
        BPL      TTIN1
        MOV      @TKB,TIB
TTIN2:  TSTB     @TPS
        BPL      TTIN2
        MOVB     TIB,@TPB
        BIC      #200,TIB    ;STRIP OFF TOP BIT OF BYTE
        RTS      PC
  
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013232 112437 000524
013236 122737 000043 000524
013244 001432
013246 122737 000045 000524
013254 001403
013256 004737 013700
013262 000763
013264 112737 000015 000524
013272 004737 013700
013276 012703 000001
013302 005037 000524
013306 004737 013700
013312 005303
013314 001372
013316 112737 000012 000524
013324 004737 013700
013330 000740
013332 000207

```
.SBTTL TTY ASCII OUTPUT SUBROUTINE  
-----  
TTOUT:  MOVB  (R4)+,TOB  
        CMPB  #43,TOB      ;IF TOB= '#'  
        BEQ   TCEX  
        CMPB  #45,TOB      ;IF TOB= '%'  
        BEQ   TCRLF  
        JSR   PC,TOG  
        BR    TTOUT  
TCRLF:  MOVB  #15,TOB      ;SET TOB= 'CR'  
        JSR   PC,TOG  
        MOV   #1,R3  
TCRLFA: CLR   TOB  
        JSR   PC,TOG  
        DEC   R3  
        BNE   TCRLFA      ;DO FILLERS  
        MOVB  #12,TOB      ;SET TOB= 'LF'  
        JSR   PC,TOG  
        BR    TTOUT  
TCEX:   RTS    PC          ;RETURN  
-----
```

```

8499          .SBTTL OCTAL OUTPUT SUBROUTINE
8500          ;-----
8501
8502 013334 012737 000001 013570 OCTPE: MOV #1,OFL
8503 013342 010304          MOV R3,R4
8504 013344 000410          BR OCTP0
8505 013346 005037 013570 OCTP: CLR OFL ;CLEAR FLAG FOR LEADING ZERO
8506 013352 010304 OCTPE1: MOV R3,R4 ;SEE IF NUMBER IS ZERO
8507 013354 001004          BNE OCTP0 ;IF NOT ZERO, BR
8508 013356 004737 013550          JSR PC,OCTPG1 ;ELSE PRINT ZERO
8509 013362 000137 013512          JMP OCTP3 ;SPACE AND EXIT
8510 013366 032704 100000 OCTP0: BIT #100000,R4 ;SEE IF MSG=1
8511 013372 001406          BEQ OCTP1 ;IF NOT, BR
8512 013374 012704 000001          MOV #1,R4
8513 013400 004737 013526          JSR PC,OCTPG ;PRINT 1
8514 013404 000137 013416          JMP OCTP2
8515 013410 005004          OCTP1: CLR R4
8516 013412 004737 013526          JSR PC,OCTPG ;PRINT 0
8517 013416 010304          OCTP2: MOV R3,R4
8518 013420 006004          ROR R4
8519 013422 006004          ROR R4
8520 013424 006004          ROR R4
8521 013426 006004          ROR R4 ;POSITION DIGIT
8522 013430 000304          SWAB R4
8523 013432 004737 013526          JSR PC,OCTPG ;PRINT DIGIT 2
8524 013436 010304          MOV R3,R4
8525 013440 006004          ROR R4
8526 013442 000304          SWAB R4
8527 013444 004737 013526          JSR PC,OCTPG ;PRINT DIGIT 3
8528 013450 010304          MOV R3,R4
8529 013452 006104          ROL R4
8530 013454 006104          ROL R4
8531 013456 000304          SWAB R4
8532 013460 004737 013526          JSR PC,OCTPG ;PRINT DIGIT 4
8533 013464 010304          MOV R3,R4
8534 013466 006004          ROR R4
8535 013470 006004          ROR R4
8536 013472 006004          ROR R4
8537 013474 004737 013526          JSR PC,OCTPG ;PRINT DIGIT 5
8538 013500 005237 013526          INC OFL ;SET FLAG TO PRINT LSD
8539 013504 010304          MOV R3,R4
8540 013506 004737 013526          JSR PC,OCTPG ;PRINT DIGIT 6
8541 013512 012737 000240 000524 OCTP3: MOV #240,TOB ;PRINT SPACE
8542 013520 004737 013700          JSR PC,TOG ;EXIT
8543 013524 000207          OCTPX: RTS PC ;EXIT
8544          ;-----
  
```

8546
8547 013526 042704 177770
8548 013532 001004
8549 013534 005737 013570
8550 013540 001001
8551 013542 000207
8552 013544 005237 013570
8553 013550 052704 000260
8554 013554 010437 000524
8555 013560 004737 013700
8556 013564 010304
8557 013566 000207
8558
8559 013570 000000
8560

OCTPG: BIC #177770,R4
BNE OCTPG0
TST OFL
BNE OCTPG0
RTS PC
OCTPG0: INC OFL
OCTPG1: BIS #260,R4
MOV R4,TOB
JSR PC,TOG
MOV R3,R4
OCTPGX: RTS PC

OFL: 0 ;FIRST CHAR FLAG

```

8562      .SBTTL DATA CHARACTER OUTPUT SUBROUTINE
8563      ;-----
8564
8565
8566      013572  J05037  000524      DOUT:  CLR      TOB
8567      013576  012704  000010      MOV      #10,R4      ;SET NUMBER TO PRINT
8568      013602  110337  000524      MOVB     R3,TOB
8569      013606  105777  164472      DOUT1:  TSTB     @TPS
8570      013612  100375      BPL      DOUT1
8571      013614  132737  000200  000524      BITB     #200,TOB
8572      013622  001404      BEQ      DOUT2
8573      013624  012777  000061  164454      MOV      #061,@TPB
8574      013632  000403      BR       DOUT3
8575      013634  012777  000060  164444      DOUT2:  MOV      #060,@TPB
8576      013642  006137  000524      DOUT3:  ROL      TOB
8577      013646  005304      DEC      R4
8578      013650  001356      BNE      DOUT1
8579      013652  000207      RTS      PC
8580      ;-----
8581      013654  013703  000566      DOUTD:  MOV      TEMP3,R3
8582      013660  000303      SWAB     R3
8583      013662  004737  013572      JSR      PC,DOUT
8584      013666  013703  000566      MOV      TEMP3,R3
8585      013672  004737  013572      JSR      PC,DOUT
8586      013676  000207      RTS      PC
8587      ;-----
8588
8589      .SBTTL TTY OUTPUT
8590      ;-----
8591      013700  132737  000040  000421      TOG:    BITB     #APTCSP,$ENVM  ;SEE IF CONSOLE SUPPRESS MODE
8592      013706  001014      BNE      TEX      ;IF SO, BR
8593      013710  105777  164370      TSTB     @TPS
8594      013714  100371      BPL      TOG
8595      013716  113777  000524  164362      MOVB     TOB,@TPB
8596      013724  005737  000532      TST      TTWAIT      ;IS TTY WAIT FLAG SET
8597      013730  001403      BEQ      TEX      ;THEN
8598      013732  105777  164346      1$:     TSTB     @TPS      ;WAIT FOR CHARACTER
8599      013736  100375      BPL      1$      ;TO BE PRINTED
8600      013740  000207      TEX:    RTS      PC
8601      ;-----

```

Line No	Address	Offset	Code	Text
8603				.SBTTL MESSAGE TABLE
8604				-----
8605				
8606	013742	020045	020040	054122 MSG1: .ASCII /% RXCS RXDB CMD% #/
8607	014002	051445	043117	053524 MSG2: .ASCII /%SOFTWARE SWITCH REG (OCT) = #/
8608	014040	022445	055103	054122 MSG3: .ASCII /%CZRXEAO RX02 FMTR PROG%#/
8609	014072	020045	020040	020040 MSG4: .ASCII /% RXCS ADDRESS (OCT) = #/
8610	014127	045	020040	020040 MSG5: .ASCII /% VECTOR (OCT) = #/
8611	014164	042445	042116	047440 MSG6: .ASCII /%END OF PASS #/
8612	014202	037440	021440	MSG7: .ASCII / ? #/
8613	014206	047045	020117	054523 MSG8: .ASCII /%NO SYSTEM AVAILABLE TO FORMAT #/
8614	014246	022445	047506	046522 MSG9: .ASCII /%FORMAT COMPLETED #/
8615	014272	020045	044440	052116 MSG10: .ASCII /% INTERRUPT DID NOT OCCUR #/
8616	014326	052445	044516	020124 MSG11: .ASCII /%UNIT NOT RESPONDING TO ADDRESS #/
8617	014367	045	042101	051104 MSG12: .ASCII /%ADDRESSING TEST #/
8618	014411	045	020040	054105 MSG13: .ASCII /% EXPECT RCVD ACTUAL% #/
8619	014452	022445	047506	046522 MSG14: .ASCII /%FORMAT DONE ON FOLLOWING #/
8620	014506	020040	051124	041501 MSG15: .ASCII / TRACK (OCT) =#/
8621	014526	020040	042523	052103 MSG16: .ASCII / SECTOR (OCT) =#/
8622	014547	104	044522	042526 MSG17: .ASCII /DRIVE: #/
8623	014556	044523	042504	021472 MSG20: .ASCII /SIDE: #/
8624	014564	020040	021440	MSG21: .ASCII / #/
8625	014570	020045	051103	020103 MSG22: .ASCII /% CRC ERROR -> #/
8626	014610	020045	044124	051511 MSG23: .ASCII /% THIS SYSTEM NOT CAPABLE OF DOUBLE DENSITY OPERATIONS #/
8627	014701	045	052502	020123 MSG24: .ASCII /%BUS TRAP: #/
8628	014715	045	041536	021440 MSG25: .ASCII /% ^C #/
8629	014722	020045	054122	051503 MSG26: .ASCII /% RXCS ERR #/
8630	014736	020045	054122	051505 MSG27: .ASCII /% RXES ERR #/
8631	014752	020040	046055	047517 MSG28: .ASCII / -LOOPING ON ERR: #/
8632	014776	042445	051122	051117 MSG29: .ASCII /%ERROR BIT SET AFTER INIT #/
8633	015031	045	042040	047117 MSG30: .ASCII /% DONE BIT NOT SET #/
8634	015055	045	052040	020122 MSG31: .ASCII /% TR BIT NOT SET #/
8635	015077	045	020040	020040 MSG32: .ASCII /% = #/
8636	015121	040	026440	020076 MSG33: .ASCII / -> DROPPED #/
8637	015140	026445	051076	046505 MSG34: .ASCII /% ->REMOVE XXDP MEDIA FROM THIS SYSTEM.!#/
8638	015210	020045	020040	020055 MSG35: .ASCII /% - #/
8639	015217	045	037040	043 MSG36: .ASCII /% >#/
8640	015223	040	026440	040510 MSG37: .ASCII / -HALT ON ERR: #/
8641	015244	042445	052116	051105 MSG38: .ASCII /%ENTER CONDITIONS IN OCTAL #/
8642	015300	052045	044510	020123 MSG39: .ASCII /%THIS PROGRAM FORMATS DISKETTES TO SINGLE OR DOUBLE(DEFAULT) DENSITY/
8643	015404	047445	020116	047502 MSG40: .ASCII /%ON BOTH DRIVES OF A FLOPPY DISK SUBSYSTEM CAPABLE OF DOUBLE DENSITY/
8644	015510	047445	042520	040522 .ASCII /%OPERATIONS. A CRC VERIFY IS PERFORMED ON TRACKS: 0 & 76 (DEFAULT) OR/
8645	015615	045	046101	020114 .ASCII /%ALL TRACKS OF THE FORMATTED DISKETTE, IF SELECTED.%#/
8646	015702	052055	046511	020105 MSG41: .ASCII /-TIME OUT ERROR #/
8647	015723	045	021440	MSG42: .ASCII /% #/
8648	015726	044045	046105	037520 MSG43: .ASCII /%HELP? (Y OR N) N #/
8649	015752	004445	047111	052111 MSG44: .ASCII /% INITIALIZE NOT DONE - RUN DIAGNOSTICS UNLESS OBVIOUS ERR#/
8650	016045	045	042523	020124 MSG45: .ASCII /%SET DISKETTE TO SINGLE DENSITY? (Y OR N) N #/
8651	016125	045	042526	044522 MSG46: .ASCII /%VERIFY DISKETTE CRC (ALL TRACKS)? (Y OR N) N #/
8652	016206	043045	047514	050120 MSG47: .ASCII /%FLOPPY DISK SYSTEM: 0 ADDRESS CHANGE? (Y OR N) N #/
8653	016271	045	051511	040440 MSG48: .ASCII /%IS ANOTHER FLOPPY DISK SYSTEM AVAILABLE? (Y OR N) N #/
8654	016357	045	047516	051440 MSG49: .ASCII /%NO SYSTEM AVAILABLE TO FORMATTER #/
8655	016422	004445	011	MSG50: .ASCII /% /
8656	016425	045	054523	052123 MSG51: .ASCII /%SYSTEM: #/
8657	016436	047045	020117	047504 MSG52: .ASCII /%NO DONE BIT AFTER INITIALIZE #/
8658	016475	040	037055	051104 MSG53: .ASCII / ->DROPPED FROM FORMATTER%#/

8659 016530 004445 041501 046040 MSG54: .ASCII /% AC LOW ERROR - IS FLOPPY DISK SYSTEM POWERED UP?#/

8660 016613 045 042011 044522 MSG55: .ASCII /% DRIVE NOT READY - IS DISKETTE IN DRIVE & DOOR CLOSED?#/

8661 016703 045 047504 054440 MSG56: .ASCII /%DO YOU WANT TO FORMAT MORE DISKETTES? (Y OR N) N #/

8662 016766 051045 046505 053117 MSG57: .ASCII /%REMOVE FORMATTED DISKETTES & INSERT DISKETTES TO BE FORMATTED#/

8663 017065 045 026455 020076 MSG58: .ASCII /%--> TYPE 'CR' WHEN READY#/

8664 017117 045 047506 046522 MSG59: .ASCII /%FORMATTER DONE-RESTART MONITOR OR UPDATE PROGRAM-->TYPE CTRL C TO/

8665 017221 045 052123 051101 .ASCII /%START THIS PROGRAM AGAIN #/

: .SBTTL TEST HEADERS
:-----

8671 017254 022445 037055 042522 MSGCD3: .ASCII /%%-->READ SECTOR COMMAND ERR #/

8672 017311 045 026445 051476 MSGCD4: .ASCII /%%-->SET DENSITY COMMAND ERR #/

8673 017346 022445 037055 042522 MSGCD5: .ASCII /%%-->READ MAINTENANCE STATUS COMMAND ERR #/

8674 017417 045 026445 037055 MSGLP: .ASCII /%%-->LOOP MODULE-ERR #/

8675 017446 .EVEN

: .SBTTL ERROR CODE STORAGE
:-----

8681 017446 000 XER: .BYTE 0 ;ERR CODE - EXTENDED

8682 017447 000 .BYTE 0 ;

8683 017450 000 .BYTE 0 ;

8684 017451 000 .BYTE 0 ;

8685 017452 000 .BYTE 0 ;

8686 017453 000 .BYTE 0 ;

8687 017454 000 .BYTE 0 ;

8688 017455 000 .BYTE 0 ;

: .SBTTL PATCH AREA
:-----

8696 017456 000000 PATCH: 0

8697 017660 017660 .+.200

8698 017660 000000 LASTAD: 0 ;LAST ADDRESS NOT TO EXCEED 17776

8700
8701 000001 .END

AUNIT = 000000	6128						
AUSWR = 000000	6128						
AVECT1= 000264	6126#	6128					
AVECT2= 000000	6128						
BADWRD 011540	8005*	8023	8046*	8064	8150	8153	8196#
BAEMPT 005120	7102	7146#					
BAFILL 005116	7100	7145#					
BA11 001770	6395#	6425					
BA231 007076	7696#	7722					
BB30 007742	7882#	7884					
BC13 002470	6503#	6505					
BC20 002622	6584#	6612					
BC22 003332	6771#	6802					
BC231 007126	7702#	7719					
BDAUDL 010142	7944#	7952					
BDBUDL 010146	7945#	7948					
BE00 001306	6234	6236#	6266				
BF00 001316	6238#	6240					
BITCNT 011526	8164*	8169	8176*	8179	8181*	8191#	
BITLIM 011532	8009*	8050*	8179	8193#			
BITMSG 011530	8148*	8174	8185*	8192#			
BITOFF 011534	8008*	8049*	8155	8157*	8162	8194#	
BITPAS 011524	8147*	8182	8184*	8190#			
BIT0 = 000001	5994	6042#					
BIT00 = 000001	6042#						
BIT01 = 000002	6042#						
BIT02 = 000004	6042#						
BIT03 = 000010	6042#						
BIT04 = 000020	6042#						
BIT05 = 000040	6042#						
BIT06 = 000100	6042#						
BIT07 = 000200	6042#						
BIT08 = 000400	6042#						
BIT09 = 001000	6042#						
BIT1 = 000002	6042#						
BIT10 = 002000	6042#						
BIT11 = 004000	6042#						
BIT12 = 010000	6042#						
BIT13 = 020000	6042#	6447	7966				
BIT14 = 040000	6042#						
BIT15 = 100000	6042#						
BIT2 = 000004	6042#						
BIT3 = 000010	6042#						
BIT4 = 000020	5992	6042#					
BIT5 = 000040	5993	6042#					
BIT6 = 000100	6042#	6214	7889	8319			
BIT7 = 000200	6042#						
BIT8 = 000400	6005	6042#	6231				
BIT9 = 001000	6042#						
BPTVEC= 000014	6042#						
BSINIT 012262	6452	7540	7544	8269#			
BSINTX 012400	8291#						
BTRP 000320	6118#	6215*	6221*	6437*	6453*		
BTRPFL 000570	6165#	6192*	6421*	6424	6445	8328*	
BTRP2 000322	6119#	6216*	6222*	6438*	6454*		
CKBITS 011314	8029	8070	8147#				

CKSYAD	002422	6358*	6368*	6495#														
CMD	000542	6154#	6774	6780	6784	6794	6803	6805	6861*	6862	6878*	6879	6887*	7055				
		7066	7077	7535*	7536	7991												
CMDTBL	003772	6861	6878	6899#														
CMPWRD	011536	8006*	8047*	8149	8195#													
CMSGTB	011544	8007	8201#															
CMSG10	011704	8207	8233#															
CMSG11	011713	8208	8234#															
CMSG12	011750	8209	8210	8235#														
CMSG15	011770	8212	8236#															
CMSG4	011624	8201	8227#															
CMSG5	011634	8202	8228#															
CMSG6	011641	8203	8229#															
CMSG7	011662	8204	8230#															
CMSG8	011665	8205	8231#															
CMSG9	011675	8206	8232#															
CR	= 000015	6042#																
CRCALL	= 000200	6001#	6345	6347	6979													
CRCERR	= 000001	5994#	7268															
CRLF	= 000200	6042#																
CSR	000534	6151#																
CSRADR	010230	6667*	7153*	7945	7961#													
CSRCHK	010404	7232*	7248*	7262*	7537*	8001#												
CSRCKX	010616	8031	8035#															
CSRCMP	000546	6156#	7227*	7228*	7505*	7506*	7509*	8003	8006	8019								
CSRMSK	000544	6155#	7229*	7510*	8002													
DBGFLG	000516	6088*	6144#	6190*	6370	7529												
DBLDEN	= 000400	6005#	6233															
DC20	002762	6611#																
DDISP	= 177570	6042#																
DELAY	010136	6670*	7155	7943#														
DENBIT	= 000400	5985#	6337	6339	7517													
DENERR	= 000020	5992#																
DENS	000506	6140#	6233*	6235*	6887													
DNBIT	= 000040	5983#	6668	6672	7086	7227	7505	7970										
DCUT	013572	8566#	8583	8585														
DOUTD	013654	8581#																
DOUT1	013606	8569#	8570	8578														
DOUT2	013634	8572	8575#															
DOUT3	013642	8574	8576#															
DRIVE	011224	7345*	7353*	7356*	7363*	7371*	7374*	7440*	7450*	7710*	7711*	8092*	8094*	8112				
		8121#																
DRIVE1	= 000400	5991#	7516															
DROPAV	006264	7432*	7441*	7451*	7455	7462	7467#											
DROPDV	006036	7335*	7346*	7349*	7364*	7367*	7375	7379	7383#									
DRVAVL	006040	7242*	7432#															
DRVCNT	007260	7697*	7710	7712	7716*	7718	7725#											
DRV DEN	= 000040	5993#	7519															
DRVDRP	005530	7239*	7255*	7272*	7335#													
DRV PTR	007262	7696*	7703	7717*	7726#													
DRV R	004402	6810*	7064#															
DRVRLY	= 000200	5987#	7436	7446														
DRV1	= 000020	5996#	6780	7338	7434	7514	8090											
DSWR	= 177570	6042#																
DVSCDN	004366	6972*	6973*	6981	6945*	7001*	7032#											
DVSEC	004372	6976*	6977*	6994*	6997*	6998	6999	7002*	7007*	7018*	7019	7034#						

DVTKDN	004362	6970*	6971*	6983	6985*	6993*	7010	7012*	7017*	7030#
DVTRK	00437c	6974*	6975*	6986*	6989	6990*	6991	7008	7036#	
EA00	00125o	6194	6213	6230#						
EA10	001520	6329	6332#							
EA13	002510	6497	6499	6507#						
EA21	003246	6678	6692	6696#						
EA221	003746	6866	6872	6881	6884	6887#				
EA223	004450	7071	7073#							
EA225	005522	7241	7243	7253	7257	7259	7267	7274#		
EA232	007330	7752	7754#							
EA233	007466	7784	7792	7794	7800#					
EB10	001562	6338	6340#							
EB11	002136	6400	6421#							
EB20	002774	6583	6614#							
EB2253	006374	7518	7520#							
EB231	007242	7700	7720#							
EC00	001076	6203	6205#							
EC10	001624	6346	6348#							
EC222	004202	6988	6995#							
EC23	007056	7624	7638	7640	7645	7647	7654	7656#		
ED00	001212	6218	6221#							
ED10	001662	6355	6357#							
ED21	003210	6688	6690#							
ED222	004174	6992	6994#							
ED231	007222	7704	7716#							
EE221	003726	6875	6883#							
EE222	004274	7003	7005	7008#						
EE231	007162	7708	7710#							
EF20	002752	6598	6600	6607	6609#					
EG00	001350	6244	6246#							
EG222	004342	7015	7018#							
EG225	005504	7269	7271#							
EH2231	005000	7106	7121#							
EH2252	006260	7456	7464#							
E100	001444	6262	6264#							
EK2231	004646	7101	7103#							
EMSGTB	011574	8048	8214#							
EMSG0	011777	8214	8238#							
EMSG1	012003	8215	8239#							
EMSG10	012134	8224	8248#							
EMSG11	012156	8225	8249#							
EMSG2	012014	8216	8240#							
EMSG3	012026	8217	8241#							
EMSG4	012035	8218	8242#							
EMSG5	012051	8219	8243#							
EMSG6	012066	8220	8244#							
EMSG7	012103	8221	8245#							
EMSG8	012115	8222	8246#							
EMSG9	012125	8223	8247#							
EMTVEC=	000030	6042#								
EM22	003550	6808	6810#							
ENDFTB	000634	6183#	6237							
ENDTSH	011130	8084	8097#							
END00	001452	6266#								
END223	005100	7121	7126	7130	7135#					
ERRBIT=	100000	5995#	6679							

IC222	004122	6983#							
IC2231	004670	7091	7107#						
IC225	005334	7225	7244#						
IC2251	005564	7342#							
IC2252	006070	7438#							
IC23	006650	7615	7617	1620#					
IC233	007420	7786	7793#						
ID00	001170	6217#							
ID10	001644	6352#							
ID20	002624	6579	6581	6585#					
ID21	003170	6685	6687#						
ID22	003350	6774#							
ID221	003716	6880#							
ID222	004162	6991#							
ID2231	004700	7109#							
ID225	005374	7252#							
ID2251	005632	7350#							
ID2252	006114	7437	7439	7442#					
ID23	006674	7621	7625#						
ID231	007130	7703#							
IE10	001714	6363#							
IE20	002646	6590#							
IE21	003216	6680	6691#						
IE22	003374	6780#							
IE221	003664	6874#							
IE222	004224	6999#							
IE2231	005032	7108	7127#						
IE225	005462	7266#							
IE2251	005672	7339	7358#						
IE2252	006134	7435	7446#						
IE23	006704	7627#							
IE231	007140	7705#							
IF10	001752	6364	6370#						
IF20	002676	6586	6588	6595	6597#				
IF21	003254	6697#							
IF22	003404	6782#							
IF222	004250	7000	7004#						
IF225	005422	7245	7258#						
IF2251	005702	7360#							
IF2252	006144	7448#							
IF23	006712	7629#							
IG00	001334	6243#							
IG20	002722	6602#							
IG22	003414	6784#							
IG222	004304	6980	7010#						
IG225	005470	7268#							
IG2251	005746	7368#							
IG2252	006166	7447	7449	7452#					
IG23	006722	7631#							
IH00	001406	6253#							
IH20	002634	6587#							
IH22	003424	6786#							
IH2231	004562	7092#							
IH2251	006000	7343	7348	7355	7357	7361	7366	7373	7375#
IH2252	006204	7443	7445	7453	7455#				
IH23	007020	7626	7648#						

I100	001432	6254	6261#				
I120	002706	6599#					
I122	003450	6781	6792#				
IJ00	001262	6231#					
IJ22	003460	6794#					
IK22	003470	6796#					
IK2231	004620	7098#					
IL22	003520	6803#					
IM22	003536	6807#					
INITCK	003002	6572*	6577*	6663#			
INITDN=	000004	5989#	6687				
INITDP	003270	6663*	6674*	6681*	6693*	6697	6702#
INITPG	000514	6143#	6241*	6609*	6763	6855	
INITTS	004360	6763*	6966	6969*	7027#		
INTLV =	000002	5997	7024#				
IOTVEC=	000020	6042#					
LASTAD	017660	8698#					
LA221	003636	6864	6867#				
LA223	004442	7069	7072#				
LA232	007322	7750	7753#				
LA30	007766	7879	7887#				
LB00	001146	6198	6214#				
LB10	001554	6336	6339#				
LB221	003734	6869	6885#				
LB222	004210	6982	6997#				
LB225	005326	7237	7242#				
LB2251	005624	7341	7349#				
LC00	001070	6200	6204#				
LC10	001616	6344	6347#				
LC222	004150	6984	6989#				
LD10	001660	6353	6356#				
LD22	003370	6775	6779#				
LD2231	005002	7110	7122#				
LD2251	005662	7351	7356#				
LE20	002672	6591	6596#				
LE2231	005052	7128	7131#				
LE2251	005740	7359	7367#				
LE23	007012	7628	7646#				
LE231	007156	7706	7709#				
LF =	000012	6042#					
LF22	003442	6783	6790#				
LF23	006766	7630	7641#				
LG20	002746	6603	6608#				
LG222	004330	7011	7016#				
LG2251	005774	7369	7374#				
LG23	006760	7632	7639#				
LH2231	004710	7093	7111#				
LH23	007052	7649	7655#				
LI22	003506	6793	6800#				
LJ00	001302	6232	6235#				
LK2231	004640	7099	7102#				
LOOP	006406	7240*	7256*	7273*	7528#		
LOOP1	006446	7536#	7540	7544			
LOOP2	006520	7539	7541#				
LOOP3	006564	7543	7545#				
LPPRT	012402	8275	8290*	8293#			

LSIFLG	000520	6145#	6201*	6219*	7913				
LSITRP	001200	6215	6219#						
MSGCD3	017254	7260	8671#						
MSGCD4	017311	7246	8672#						
MSGCD5	017346	7226	8673#						
MSGLP	017417	7534	8674#						
MSG1	013742	7981	8606#						
MSG10	014272	7789	7797	8615#					
MSG11	014326	6449	8616#						
MSG12	014367	6436	8617#						
MSG13	014411	8017	8058	8618#					
MSG14	014452	7694	8619#						
MSG15	014506	8130	8620#						
MSG16	014526	8133	8621#						
MSG17	014547	8111	8622#						
MSG2	014002	6462	8607#						
MSG20	014556	8116	8623#						
MSG21	014564	7985	7989	8021	8025	8062	8066	8624#	
MSG22	014570	8129	8625#						
MSG23	014610	6695	8626#						
MSG24	014701	8336	8627#						
MSG25	014715	8316	8628#						
MSG26	014722	8013	8629#						
MSG27	014736	8054	8630#						
MSG28	014752	8279	8631#						
MSG29	014776	6683	8632#						
MSG3	014040	6195	8608#						
MSG30	015031	7972	8633#						
MSG31	015055	7975	8634#						
MSG32	015077	8635#							
MSG33	015121	7380	7463	8636#					
MSG34	015140	6501	8637#						
MSG35	015210	8167	8638#						
MSG36	015217	8639#							
MSG37	015223	8284	8640#						
MSG38	015244	8641#							
MSG39	015300	6330	8642#						
MSG4	014072	6402	8609#						
MSG40	015404	8643#							
MSG41	015702	7790	7798	7977	8646#				
MSG42	015723	8647#							
MSG43	015726	6325	8648#						
MSG44	015752	6689	8649#						
MSG45	016045	6332	8650#						
MSG46	016125	6340	8651#						
MSG47	016206	6349	8652#						
MSG48	016271	6360	8653#						
MSG49	016357	6582	8654#						
MSG5	014127	6411	8610#						
MSG50	016422	8655#							
MSG51	016425	7745	8102	8656#					
MSG52	016436	6676	8657#						
MSG53	016475	7754	8658#						
MSG54	016530	6686	8659#						
MSG55	016613	7458	8660#						
MSG56	016703	7876	8661#						

.SRDOC 3723#
.\$READ 3328#
.\$R2AZ 4858#
.\$SAVE 3889#
.\$SB2D 4675#
.\$SB2O 4776#
.\$SLOP 2397#
.\$SIZE 4271#
.\$SUPR 4814#
.\$TRAP 3991#
.\$TYPB 3221#
.\$TYPD 3144#
.\$TYPE 2925#
.\$TYPO 3048#
.\$4OCA 944#
.1170 498#

. ABS. 017662 000

ERRORS DETECTED: 0

CZR XEA,CZR XEA/CRF=CZR XEA.SML,CZR XEA.P11
RUN-TIME: 16 14 1 SECONDS
RUN-TIME RATIO: 38/31 1.2
CORE USED: 35K (70 PAGES)