SDS 940 OLDS DIAGNOSTIC SYSTEM

UNIT 21 W DISC TEST LISTING

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SDS

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*
* UNIT 21 = 4 CHANNEL DISC
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*
* THIS UNIT TESTS THE DISC ON CHANNEL 4. THE FUNCTIONS INCLUDED
* IN THIS UNIT ARE:
*
* FUNCTION  1 = TMCC DIAGNOSTIC
* FUNCTION  2 = CONTROLLER DIAGNOSTIC WITHOUT DATA TRANSFER
* FUNCTION  3 = CONTROLLER DIAGNOSTIC WITH DATA TRANSFER
* FUNCTION  4 = HEADER VERIFICATION AND ADDRESSING TEST
* FUNCTION  5 = DATA PRODUCTS 5045 DISC FILE DIAGNOSTIC
* FUNCTION 10 = EXERCISER
* FUNCTION 18 = WRITE-PROTECT SWITCH TEST
* FUNCTION 19 = SINGLE INCREMENT VS. TIME PLOTTER
* FUNCTION 20 = MULTIPLE INCREMENT VS. TIME PLOTTER
* FUNCTION 21 = WRITE HEADERS
* FUNCTION 22 = HEADER WRITING TEST
* FUNCTION 23 = SECTOR DUMP
*
* THE THREE UNIT PARAMETERS ARE AS FOLLOWS:
*
* FAW     FUNCTION ACTIVATION WORD. ONE BITS CONTAINED IN THIS
*         WORD CORRESPOND TO FUNCTIONS THAT ARE TO BE ACTIVATED
*         IN THE AUTOMATIC MODE. LEGAL FUNCTIONS ARE FUNCTIONS
*         1, 2, 3, 4, 5, AND 10. FUNCTIONS 18 THROUGH 23 DO NOT
*         NEED TO BE SELECTED, SINCE THEY ARE SPECIAL AND ARE NOT
*         ACTIVATED IN THE AUTOMATIC MODE.
* D00T17  ACTIVATION BITS FOR ARMS 0 THROUGH 17 (OCTAL). BITS IN
*         THE MOST SIGNIFICANT PORTION OF THIS WORD PERMIT THE COR-
*         RESPONDING DISCS TO BE USED. THE ABSENCE OF A BIT PRO-
*         HIBITS A DISC FROM BEING USED. I.E. IF DISC 10 (OCTAL) IS
*         NOT TO BE USED, THE CORRESPONDING BIT (BIT 8) WOULD BE A
*         ZERO.
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* D20T37  ACTIVATION BITS FOR ARMS 20 THROUGH 37 (OCTAL). THIS VAR-
*         IABLE COMBINES WITH THE VARIABLE D00T17 TO PROVIDE SELEC-
*         TIVE CONTROL FOR ALL DISCS. THESE VARIABLES HAVE PRIORITY
*         OVER ALL FUNCTION VARIABLES, PERMITTING DISCS TO BE SKIP-
*         PED WITHIN A LARGE OPERATING RANGE OF DISCS. I.E. FOR A 35
*         DISC SYSTEM, D00T17 = 73777400, D20T37 = 37777400,
*         HIDISC = 777777, AND HODISC = 0 WOULD ALLOW ALL DISCS TO
*         BE USED EXCEPT FOR DISCS 3 AND 20 (OCTAL). THESE VAR-
*         IABLES ARE PRESET WHEN THE UNIT IS LOADED ACCORDING TO
*         THE SYSTEM VARIABLE 'DSCSIZ'.
*
* THERE ARE A FEW CONVENTIONS THAT MUST BE FOLLOWED WHEN USING
* THIS UNIT. THEY ARE AS FOLLOWS:
*
*         CHANGING UNIT VARIABLES - NORMALLY, CHANGING THE UNIT
*         VARIABLES REQUIRES THAT A UNIT TRANSFER (=U 21T) BE EX-
*         ECUTED. HOWEVER, IN MOST CASES, CHANGING 'D00T17' AND
*         'D20T37' DOES NOT REQUIRE RESTARTING THE UNIT, AND A
*         CONTINUE (=T) IS SUFFICIENT. IT SHOULD BE NOTED, HOWEVER,
*         IF THE FILE IS KEYED IN THE EXERCISER WITH A DISC DE-
*         ACTIVATED, AN ERROR WILL RESULT IF A READ ATTEMPT IS MADE
*         ON THAT DISC (THIS WILL BE DISCUSSED UNDER FUNCTION 10).
*
*         CHANGING FUNCTION VARIABLES - NORMALLY WHEN CHANGING
*         FUNCTION VARIABLES, A FUNCTION TRANSFER (=F XXT) FOL-
*         LOWS IN ORDER TO CHECK AND INCORPERATE THE CHANGE. THE
*         SPECIAL FUNCTIONS ARE THE EXCEPTIONS TO THIS RULE.
*
*         SPECIAL FUNCTIONS - FUNCTIONS 18 THROUGH 23 ARE SPECIAL
*         FUNCTIONS AND ARE NOT NORMALLY ACCESSED. IF THE OPERATOR
*         WISHES TO USE ON OF THEM, HE MUST EXECUTE A FUNCTION
*         TRANSFER TO THAT FUNCTION. WHEN THE FUNCTION IS ENTERED,
*         AN IDENTIFICATION MESSAGE IS PRINTED ON THE ERROR DEVICE
*         AND CONTROL RETURNED TO THE KEYBOARD. AT THIS TIME, THE
*         OPERATOR SHOULD SET THE FUNCTION VARIABLES TO HIS RE-
*         QUIREMENTS AND EXECUTE A CONTINUE (=T). WHEN THE OPER-
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*         ATION IS COMPLETED, THE ID MESSAGE WILL BE OUTPUT AND
*         CONTROL RETURNED TO THE KEYBOARD. A NEW FUNCTION WILL NOT
*         BE ENTERED WITHOUT OPERATOR INTERVENTION.
*
*         AUTOMATIC OPERATION . IN ORDER TO INCREASE THE EFFICIENCY
*         OF THE SYSTEM WHEN RUNNING IN THE AUTOMATIC MODE, ALL
*         DIAGNOSTICS WILL BE RUN AND THE DISC WILL BE KEYED IN
*         THE FIRST PASS, WHEN THE DISC HAS BEEN KEYED, A FLAG
*         IS SET IN CONTROL (IT IS NOT A VARIABLE), AND THE UNIT WILL
*         BE DISMISSED. WHEN THE UNIT HAS BEEN RESTARTED, ONLY THOSE
*         DIAGNOSTICS WHICH DO NOT DESTROY THE INTEGRITY OF THE DISC
*         WILL BE RUN (FUNCTIONS 1, 2, AND 5), AS WELL AS THE EXER.
*         CISER, REGARDLESS OF THE FUNCTION ACTIVATION WORD.
*
*         IF THE DISC IS SOFTWARE WRITE-PROTECTED, FUNCTIONS WHICH
*         DESTROY THE INTEGRITY OF THE DISC WILL BE SKIPPED. THESE
*         ARE FUNCTIONS 3 AND 4. IN ADDITION, THE EXERCISER IS FORCED
*         TO A SPECIAL RUNNING MODE (SEE FUNCTION 10 DESCRIPTION).
*
* FUNCTION 1 - TMCC DIAGNOSTIC
* ----------------------------
*
*         THIS FUNCTION TESTS SEVERAL BASIC TMCC OPERATIONS WITHOUT
*         THE USE OF AN EXTERNAL DEVISE. TESTED ARE THE INTERFACE
*         REGISTERS, INTERRUPTS, AND SEVERAL SKIPS. IF AN ERROR IS
*         DETECTED, IT IS REPORTED AS SOURCE LOCATION(S) AND LOGIC
*         PAGE(S). I.E. 20D43(25) INDICATES THAT THE SUSPECTED
*         PROBLEM IS LOCATED ON CARD 20D, PIN 43, AND THE SIGNAL
*         CAN BE FOUND ON LOGIC PAGE 25.
*
*         THERE ARE NO FUNCTION VARIABLES.
*
* FUNCTION 2 - CONTROLLER DIAGNOSTIC WITHOUT DATA TRANSFER
* --------------------------------------------------------
*
*         THIS FUNCTION TESTS AS MANY OPERATIONS OF THE DISC FILE
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*         CONTROLLER AS POSSIBLE WITHOUT INVOLVING DATA TRANSFER.
*         THE ADDRESS REGISTER, SKIPS (LEGAL AND ILLEGAL), HEADER
*         VERIFICATION, AND POSITION VERIFICATION ARE CHECKED IN
*         THIS FUNCTION.
*
*         BECAUSE OF THE COMPLEXITY OF THE DISC FILE CONTROLLER,
*         AN ATTEMPT IS MADE TO GIVE AS MUCH INFORMATION AS POS.
*         SIBLE WHEN AN ERROR OCCURES. INFORMATION DISPLAYED US.
*         UALLY INCLUDES A BRIEF INDICATION OF THE FAILURE, LOGIC
*         EQUATIONS THAT ARE DIRECTLY INVOLVED, AND SOURCE MODULES
*         AND LOGIC PAGES.
*
*         THE FOLLOWING ASSUMPTIONS ARE MADE:
*                   WRITE HEADER SWITCH IS OFF
*                   WRITE PROTECT SWITCHES ARE ALL UP
*                   ERROR/STOP SWITCH IS IN CONTINUE
*                   FILE IS ON-LINE
*                   HEADERS ARE GOOD.
*
*         THE OBJECT TESTS WHICH USE DISCS WHICH ARE DELEATED FROM
*         'D00T17' AND 'D20T37' WILL BE SKIPPED.
*
*         THERE ARE NO FUNCTION VARIABLES.
*
* FUNCTION 3 - CONTROLLER DIAGNOSTIC WITH DATA TRANSFER
* -----------------------------------------------------
*
*         THIS FUNCTION TESTS MANY DISC FILE CONTROLLER OPERATIONS
*         WHILE TRANSFERING DATA. PARITY GENERATION AND CHECKING,
*         ADDRESS REGISTER INCREMENTING, TERMINATION OF VARIOUS
*         STATES, AND CHECKING OF MANY GATES ARE INCLUDED IN THIS
*         FUNCTION. ERROR REPORTING IS THE SAME AS IN FUNCTION 2
*         AND THE SAME ASSUMPTIONS ARE MADE.
*
*         OBJECT TESTS USING DISCS DELEATED FROM 'D00T17' AND
*         'D20T37' WILL BE SKIPPED. IN ADDITION, IF THE DISC IS
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*       SOFTWARE WRITE-PROTECTED OR HAS BEEN PREVIOUSLY KEYED,
*       THIS FUNCTION WILL BE SKIPPED.
*
*       THERE ARE NO FUNCTION VARIABLES.
*
* FUNCTION 4 = HEADER VERIFICATION AND ADDRESSING TEST
* ----------------------------------------------------
*
*       THIS FUNCTION VERIFIES THE ABILITY TO ADDRESS THE ENTIRE
*       DISC FILE AND ALSO VERIFIES ALL HEADERS. DURING THE FIRST
*       PASS, THE FIRST WORD OF EACH SECTOR IS TAGGED WITH ITS
*       OWN ADDRESS, AND ON THE SECOND PASS, THE FIRST WORD OF
*       THE SECTOR IS CHECKED. IF THE DATA DOES NOT COMPARE WITH
*       THE ADDRESS, AND ERROR MESSAGE WILL BE PRINTED. IN AD-
*       DITION, IF AN I/O ERROR IS DETECTED, AN APPROPRIATE ERROR
*       MESSAGE WILL BE PRINTED. NO ATTEMPT IS MADE TO DIAGNOSE
*       THE ERROR.
*
*       DISCS WHICH HAVE BEEN DELEATED FROM 'D00T17' AND 'D20T37'
*       WILL BE SKIPPED. IF THE DISC HAS BEEN PREVIOUSLY KEYED
*       OR IS SOFTWARE WRITE-PROTECTED, THIS FUNCTION WILL BE
*       SKIPPED.
*
*       THERE ARE NO FUNCTION VARIABLES.
*
* FUNCTION 5 = DATA PRODUCTS 5045 DISC FILE DIAGNOSTIC
* ----------------------------------------------------
*
*       THIS FUNCTION CONTAINS OBJECT TESTS WHICH ARE DESIGNED
*       TO LOCATE SOME OF THE PROBLEMS IN THE DATA PRODUCTS
*       5045 DISC FILE. SOME OF THE POSITION DECODER (PDBA)
*       LOGIC IS TESTED, AS WELL AS SOME OF THE TIMING AND
*       THE CLEAR LOGIC.
*
*       OBJECT TESTS USING DISCS DELEATED FROM 'D00T17' AND
*       'D20T37' WILL BE SKIPPED.
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*
*       THERE ARE NO FUNCTION VARIABLES.
*
* FUNCTION 10 = EXERCISER
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*
*       THIS FUNCTION EXERCISES THE DISC IN ONE OF SEVERAL DIF-
*       FERENT MODES, AUTOMATICALLY OR UNDER OPERATOR CONTROL.
*       THE EIGHT FUNCTION VARIABLES ARE AS FOLLOWS:
*
*       OPMODE    CONTROL WORD FOR MODE OF OPERATION
*       LOCORE    STARTING CORE ADDRESS. THIS MUST BE GREATER THAN
*                 34000
*       HICORE    ENDING CORE ADDRESS. FOR A 920/930, MAXIMUM CORE
*                 ADDRESS IS 37777. FOR A 940, IT IS 177777.
*       LODISC    STARTING DISC ADDRESS
*       HIDISC    ENDING DISC ADDRESS. MAXIMUM DISC IS 777777 FOR
*                 A 32 DISC SYSTEM.
*       LENGTH    CONTROL FOR TRANSMISSION LENGTH. IF 'LENGTH' IS
*                 NEGATIVE, RANDOM LENGTH RECORDS WILL BE USED. IF
*                 'LENGTH' IS POSITIVE, IT IS THE FIXED RECORD
*                 LENGTH TO BE USED, IN SECTORS. FOR A 940, THE
*                 MAXIMUM FIXED LENGTH IS 340 SECTORS (14K). IF
*                 SET TO 'COMPARE MODE', THE MAXIMUM FIXED LENGTH
*                 IS 160 SECTORS (7K). IN ANY EVENT, THE LENGTH
*                 CANNOT BE GREATER THAN THE DIFFERENCE OF 'HICORE'
*                 AND 'LOCORE'.
*       PATTERN   THE DATA TO BE TRANSMITTED IF IN THE FIXED DATA MODE.
*       COUNTERS  BITS 9 THROUGH 12, THE NUMBER OF RETRY ATTEMPTS TO
*                 BE MADE IF AN I/O ERROR IS DETECTED, BITS 18
*                 THROUGH 23, THE NUMBER OF DATA ERRORS TO BE DIS-
*                 PLAYED AFTER THE FIRST ERROR DETECTED IN A GIVEN
*                 SECTOR.
*
*       THE BITS IN THE VARIABLE 'OPMODE' HAVE THE FOLLOWING
*       SIGNIFICANCE:
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*
*          0  = FIXED DISC ADDRESSING (USES ADDRESS IN !LODISC!)
*          1  = SEQUENTIAL DISC ADDRESSING
*          2  = RANDOM DISC ADDRESSING
*          3  = FIXED CORE ADDRESSING (USES ADDRESS IN !LOCORE!)
*          4  = SEQUENTIAL CORE ADDRESSING
*          5  = RANDOM CORE ADDRESSING
*          6  = FIXED DATA (USES WORD IN !PATTERN!, ADDRESS ADDED
*               TO LAST WORD IN SECTOR)
*          7  = SEQUENTIAL DATA (DISC ADDRESS IN MOST SIG. 18 BITS)
*          8  = RANDOM DATA
*          9  = N/A
*          10 = COMPUTE WHILE TRANSFERING DATA
*          11 = USE INTERRUPTS
*          12 = BUFFER 1 OPERATION FIXED (READ OR WRITE)
*          13 = WRITE BUFFER 1
*          14 = READ BUFFER 1
*          15 = BUFFER 2 OPERATION FIXED (READ OR WRITE)
*          16 = WRITE BUFFER 2
*          17 = READ BUFFER 2
*          18 = N/A
*          19 = COMPARE MODE
*          20 = KEY MODE
*          21 = EXECUTE DUMMY SEEK BEFORE EACH DISC ACCESS
*          22 = TIME ALL SEEKS
*          23 = TIME ALL SEARCHES
*
*          IN THE COMPARE MODE, OPERATION IS CONTROLLED BY THE STATUS
*          OF BUFFER 1. IF BUFFER 1 IS FIXED READ, A READ-READ-COMPARE-
*          WRITE-READ-COMPARE OPERATION WILL RESULT. THIS OPERATION
*          WILL NOT DESTROY THE INTEGRITY OF THE DISC. IF BUFFER 1 IS
*          FIXED WRITE, A WRITE-READ-COMPARE OPERATION WILL RESULT TO
*          ALLOW DATA TO BE CHECKED AS IT IS BEING WRITTEN.
*
*          IN THE KEY MODE, THE DISC WILL BE KEYED WITH THE
*          SELECTED DATA AND THE UNIT DISMISSED. THE UNIT WILL NOT
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*          BE DISMISSED, HOWEVER, UNTIL THE KEYING IS COMPLETE.
*
*          DUE TO THE MANNER IN WHICH THE EXERCISER IS CONTROLLED,
*          THERE ARE SEVERAL PARAMETER COMBINATIONS WHICH ARE NOT
*          ALLOWED AND WILL BE FLAGGED AS ERRORS. THEY ARE:
*
*          DISC ADDRESSING NOT SPECIFIED
*          CORE ADDRESSING NOT SPECIFIED
*          DATA NOT SPECIFIED
*          FIXED CORE, FAST MODE
*          BUFFER 1 FIXED OPERATION, WRITE AND READ
*          BUFFER 2 FIXED OPERATION, WRITE AND READ
*          NO BUFFER SELECTED
*          COMPARE MODE, BUFFER 1 OPERATION NOT FIXED
*          COMPARE MODE, BUFFER 2 OPERATION NOT FIXED
*          COMPARE MODE, BUFFER 2 NOT READ
*          COMPARE MODE, LENGTH RANDOM
*          FIXED LENGTH TOO LARGE
*          FIXED LENGTH GREATER THAN 14K (340B SECTORS)
*          COMPARE MODE, LENGTH GREATER THAN 7K (160B SECTORS)
*          FIXED LENGTH = 0
*          LOCORE LESS THAN 34000B
*          HICORE GREATER THAN 1777778
*          HICORE GREATER THAN 377778, NOT 940
*          HICORE MINUS LOCORE LESS THAN 64D (1 SECTOR)
*          HIDISC LESS THAN LODISC
*          HIDISC GREATER THAN 777777
*          KEY MODE, DISC ADDRESSING NOT SEQUENTIAL, B=1 OR B=2 READ
*
*          IF AN I/O ERROR IS DETECTED THE INFORMATION DISPLAYED
*          INCLUDES THE FOLLOWING:
*
*          IOSTATUS AN INDICATION OF THE STATE AT THE TIME OF FAILURE
*          ERR FLAG A FLAG USED WITH IOSTATUS TO INDICATE WHICH
*                   ERROR WAS DETECTED
*          TIS--TSB TIME IS AND TIME SHOULD BE FOR POSITIONING TIME
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*                ERRORS
*          SRT DISC STARTING DISC ADDRESS
*          END DISC ENDING (PINNED) DISC ADDRESS
*          SRT CORE STARTING CORE ADDRESS
*          END CORE ENDING (PINNED) CORE ADDRESS
*          BLK LGTH TRANSMIT BLOCK LENGTH
*
*          BITS IN THE WORD IOSTATUS AND ERR FLAG HAVE THE
*          FOLLOWING SIGNIFICANCE:
*
*          0  = FILE NOT ON LINE
*          1  = CONTROLLER NOT READY (500 MS TIMEOUT)
*          2  = CONTROLLER ERROR SET
*          3  = TRACK NOT VERIFIED
*          4  = DISC WRITE PROTECTED (DURING WRITE ATTEMPT)
*          5  = WRITE HEADER SWITCH ON
*          6  = N/A
*          7  = SEEK TIME ERROR
*          8  = N/A
*          9  = SEARCH TIME ERROR
*          10 = N/A
*          11 = N/A
*          12 = CHANNEL ERROR SET
*          13 = CHANNEL ACTIVE (500 MS TIMEOUT)
*          14 = WORD COUNT NOT ZERO
*          15 = N/A
*          16 = N/A
*          17 = N/A
*          18-20 = CURRENT RETRY NUMBER
*          21-23 = CURRENT PHASE
*                   0 = INACTIVE
*                   1 = DISC SEEK
*                   2 = DISC SEEK (RETRY)
*                   3 = WRITE BUFFER 1
*                   4 = READ BUFFER 1
*                   5 = WRITE BUFFER 2
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*                   6 = READ BUFFER 2
*
*          IF A DATA ERROR IS DETECTED, THE FOLLOWING INFORMATION IS
*          DISPLAYED:
*
*          WORDIS   BAD DATA
*          WORDSB   GOOD DATA
*          DISC ADD DISC ADDRESS OF BAD DATA
*          CORE ADD CORE ADDRESS OF BAD DATA
*          STRTDISC STARTING DISC ADDRESS
*          LENGTH   TRANSMIT BLOCK LENGTH
*          WORD NO  WORD NUMBER WITHIN THE SECTOR
*          ERROR NO ERROR NUMBER WITHIN THE SECTOR
*
*          IF IN THE COMPARE MODE, WORDIS IS THE BUFFER 2 WORD
*          AND WORDSB IS THE BUFFER 1 WORD.
*
*          WHEN THE FUNCTION IS ENTERED, IF THE DISC HAS NOT BEEN
*          KEYED, THE KEY MODE IS SET UP (OPMODE = 22126610). IF THE
*          DISC HAS BEEN KEYED, THE AUTOMATIC RUNNING MODE IS SET UP
*          (OPMODE = 11133307). IF THE DISC IS SOFTWARE WRITE-
*          PROTECTED, THE R-R-C-W-R-C MODE IS SET UP WHICH WILL NOT
*          DESTROY THE INTEGRITY OF THE DISC (OPMODE = 11136527).
*
*          IN ORDER TO RESET THE SEQUENTIAL DISC POINTER, TYPE
*          -0 15271T. THIS POINTER IS NOT RESET BY TYPING -F 10T. THE
*          POINTER WILL BE RESET AND CONTROL RETURNED TO THE KEYBOARD.
*          IF -T IS TYPED, A FUNCTION 10 TRANSFER WILL BE EXECUTED.
*
* FUNCTION 18 = WRITE PROTECT SWITCH TEST
* ---------------------------------------
*
*          THIS SPECIAL FUNCTION TESTS THE STATUS OF THE WRITE-
*          PROTECT SWITCHES BY POSITIONING THE ARMS TO POSITION 0
*          AND THEN TESTING THE SWITCHES. IF A DISC IS FOUND TO
*          BE WRITE-PROTECTED, THE MESSAGE 'WRITE PROTECTED - DISC XX'
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*          WILL BE PRINTED ON THE ERROR DEVICE.
*
*          THERE ARE TWO FUNCTION VARIABLES, START AND END. THESE
*          ARE THE STARTING AND ENDING ARM NUMBERS RESPECTIVELY,
*          WHERE THE NUMBERS RANGE FROM 0 TO 37 OCTAL. THE
*          FUNCTION WILL CONTINUE TO RUN UNTIL BREAKPOINT 4 IS
*          TOGGLED.
*
*          DISCS DELEATED FROM THE VARIABLES 'D00T17' AND 'D20T37'
*          WILL BE SKIPPED.
*
* FUNCTION 19 = SINGLE INCREMENT VS. TIME PLOTTER
* ----------------------------------------------
*
*          THIS SPECIAL FUNCTION TIMES THE ARM MOVEMENTS FROM POSI-
*          TION 0 TO POSITION 1 TO POSITION 2 ETC. ENDING AT POSI-
*          TION 63. AT THIS POINT, THE MOTION IS REVERSED AND THE
*          TIME IS MEASURED FROM POSITION 63 TO POSITION 62 TO POSI-
*          TION 61 ETC. UNTIL POSITION 0 IS REACHED. THE TIMES FOR
*          ALL MOVEMENTS ARE THEN ENTERED INTO A GRAPH WHICH IS OUTPUT
*          ON THE ERROR DEVICE. THE SYMBOLS USED ARE:
*                    PLUS SIGN  = FORWARD DIRECTION TIMES
*                    MINUS SIGN = REVERSE DIRECTION TIMES
*                    DELTA SIGN = EQUAL FORWARD AND REVERSE TIMES
*
*          DISCS WILL BE SEQUENTIALLY TESTED STARTING AT 'START'
*          AND ENDING WITH 'END', THE TWO FUNCTION VARIABLES. THESE
*          VARIABLES RANGE FROM 0 TO 37 OCTAL.
*
*          IF A DISC DOES NOT COME READY WITHIN 500 MILLISEC, AN
*          ERROR MESSAGE IS OUTPUT AND THE TEST ABORTED.
*
*          THE GRAPH IS SCALED AS FOLLOWS:
*                    HORIZONTAL SCALE = ENDING ARM POSITION
*                    VERTICLE SCALE   = POSITIONING TIME IN MILLISEC.
*
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*          TYPICAL RANGE IN TIMES IS FROM 140 MS TO ABOUT 200 MS.
*          THERE ARE NO EXISTING SPECIFICATIONS TO INDICATE JUST
*          WHAT ARE GOOD AND BAD TIMES, HOWEVER, IN MANY CASES, A
*          PROBLEM HAS BEEN INDICATED BY IRREGULARITIES IN THE
*          GRAPHS. FOR EXAMPLE, A DISC FILE THAT IS ROTATING TOO
*          SLOWLY, AND A DISC FILE WITH TIMING LOGIC SET INCORRECTLY
*          BOTH HAD GRAPHS WHOSE MINIMUM POSITIONING TIMES WERE 5 TO
*          10 MILLISEC TOO LONG (EFFECTIVELY DISPLACING THE GRAPH).
*          OTHER PROBLEMS SUCH AS STICKY ARMS WILL RESULT IN HIGH
*          POSITIONING TIMES. IN SEVERAL CASES, COMPARING THE GRAPH
*          OF A SUSPECTED BAD ARM, WITH THAT OF A GOOD ARM HAS SHOWN
*          UP PROBLEMS.
*
* FUNCTION 20 = MULTIPLE INCREMENT VS. TIME PLOTTER
* ------------------------------------------------
*
*          THIS SPECIAL FUNCTIONS TIMES ALL POSSIBLE COMBINATIONS OF
*          1, 2, 3, ... 64 POSITIONS MOVED AND RECORDS THE MAXI-
*          MUM AND MINIMUM TIMES FOR EACH INCREMENT VALUE ON A GRAPH.
*          DISCS ARE TESTED SEQUENTIALLY FROM 'START' TO 'END', THE
*          TWO FUNCTION VARIABLES, THESE VARIABLES RANGE FROM 0 TO
*          37 OCTAL. TIMING FOR EACH ARM IS APPROXIMATELY 18 MINUTES
*          PER ARM WHEN THE GRAPH IS OUTPUT TO THE LINE PRINTER.
*
*          THE GRAPH IS SCALED AS FOLLOWS:
*                    HORIZONTAL SCALE = NUMBER OF POSITIONS MOVED
*                    VERTICLE SCALE   = MAX AND MIN POSITIONING TIMES
*                                       IN MILLISEC.
*
*          TYPICAL POSITIONING TIMES RANGE FROM 140 TO 350 MILLISEC,
*          DEPENDING UPON THE AMOUNT OF POSITIONS MOVED.
*
*          IF THE DISC DOES NOT COME READY WITHIN 500 MILLISEC, AN
*          ERROR MESSAGE IS OUTPUT AND THE DISC IS ABORTED.
*
* FUNCTION 21 = WRITE HEADER
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*  ---------------------------
*
*         THIS SPECIAL FUNCTION WILL WRITE THE HEADERS ON SEQUENTIAL
*         ADDRESSES ACCORDING TO THE VARIABLES 'START' AND 'END'.
*         THESE VARIABLES ARE IN THE FORM OF DISC POT WORDS. 'START'
*         SHOULD HAVE AND ADDRESS STARTING AT SECTOR 0, HEAD PAIR 0.
*         I.E. 777600 IS DISC 37, TRACK 77, HEAD PAIR 0, SECTOR 0.
*
* FUNCTION 22 - WRITE HEADER TEST
* -------------------------------
*
*         THE PURPOSE OF THIS FUNCTION IS TO PROVIDE THE OPERATOR
*         WITH A TOOL FOR USE IN LOCATING PROBLEMS ENCOUNTERED IN
*         HEADER WRITING. NO ATTEMPT IS MADE TO DIAGNOSE ERRORS,
*         JUST TO PROVIDE A PROGRAM FOR USE WHILE SCOPING.
*
*         THE FUNCTION VARIABLES ARE 'START' AND 'END', WHICH ARE
*         THE STARTING AND ENDING DISC ADDRESSES IN THE FORM OF
*         DISC POT WORDS. THE SAME VARIABLES WILL BE USED UNTIL
*         BREAKPOINT 1 IS RESET, AT WHICH POINT THE CONTROL WILL
*         REVERT TO THE KEYBOARD. THE SECTOR COUNT MUST RANGE FROM
*         1 TO 128.
*
* FUNCTION 23 - SECTOR DUMP
* -------------------------
*
*         THE PURPOSE OF THIS SPECIAL FUNCTION IS TO PROVIDE THE
*         OPERATOR WITH A MEANS OF DUMPING ONE SECTOR ON THE DISC
*         ON THE ERROR DEVICE. WHEN COMPLETED, THE CONTROL WILL BE
*         RETURNED TO THE KEYBOARD.
*
*         THE ONLY VARIABLE IS 'SECTOR', WHICH IS THE DISC ADDRESS
*         TO BE DUMPED.
*
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            00010          OCTAL
                *
                *          EQU'S
                *
      0 01 00000 ONE      OPD     0100000,1
      0 02 00000 TWO      OPD     0200000,1
      0 03 00000 THREE    OPD     0300000,1
      0 04 00000 FOUR     OPD     0400000,1
      0 05 00000 FIVE     OPD     0500000,1
      0 06 00000 SIX      OPD     0600000,1
      0 07 00000 SEVEN    OPD     0700000,1
      0 10 00000 EIGHT    OPD     01000000,1
                *
        00000242 INT31    EQU     242
        00000243 I31      EQU     243
        00000246 INT33    EQU     246
        00000247 I33      EQU     247
        00000332 FLAGS    EQU     332
        00000401 STATUS   EQU     401
        00000404 DSCSIZ   EQU     404
        00000405 SYSIZE   EQU     405
        00000406 SEED     EQU     406
        00000414 ERRORS   EQU     414
        00000415 RL1      EQU     415
        00000416 RL2      EQU     416
        00000420 UNIT     EQU     420
        00000424 FUNCTN   EQU     424
        00000430 OBJECT   EQU     430
        00000434 END      EQU     434
        00000440 RETURN   EQU     440
        00000450 DIVERT   EQU     450
        00000452 DONE     EQU     452
        00000454 REPORT   EQU     454
        00000456 FDONE    EQU     456
        00000460 ERROR    EQU     460
        00034000 STADDR   EQU     34000
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                DISCW   IDENT
  00000242      INTX1   EQU     INT31
  00000246      INTX2   EQU     INT33
  00000243      IX1     EQU     I31
  00000247      IX2     EQU     I33
                *
                *       OPD'S FOR 925 COMPATABILITY
                *
0 46 10012      BAC     OPD     04610012,2
0 46 20005      ABC     OPD     04620005,2
0 46 30003      CLR     OPD     04630003,2
                *
                *       UNCONDITIONAL MACRO DEFINITIONS
                *
                DSCC    MACRO   D
                        EOM     0               DISCONNECT CHANNEL
                        ENDM
                ALCC    MACRO   D
                        EOM*    10000           ALERT CHANNEL
                        ENDM
                ASCC    MACRO   D
                        EOM     12000           ALERT TO PIN CHANNEL ADDRESS
                        ENDM
                TOPC    MACRO   D
                        EOM     14000           TERMINATE OUTPUT
                        ENDM
                CATC    MACRO   D
                        SKS     14000           CHANNEL ACTIVE TEST
                        ENDM
                CETC    MACRO   D
                        SKS     11000           CHANNEL ERROR TEST
                        ENDM
                CITC    MACRO   D
                        SKS     10400           CHANNEL INTER-RECORD TEST
                        ENDM
                CZTC    MACRO   D
```



```
                        SKS     12000           CHANNEL ZERO WORD COUNT TEST
                        ENDM
                BETC    MACRO   D
                        SKS     20010           W=BUFFER ERROR TEST
                        ENDM
                BRTC    MACRO   D
                        SKS     21000           W=BUFFER READY TEST
                        ENDM
                DOLT    MACRO   D
                        SKS     10226           FILE ON LINE TEST
                        ENDM
                DFRT    MACRO   D
                        SKS     10026           DISC FILE READY TEST
                        ENDM
                DFET    MACRO   D
                        SKS     11026           DISC FILE ERROR TEST
                        ENDM
                DFVT    MACRO   D
                        SKS     12026           TRACK VERIFIED TEST
                        ENDM
                DWPT    MACRO   D
                        SKS     13026           DISC WRITE PROTECT TEST
                        ENDM
                DWHT    MACRO   D
                        SKS     14026           WRITE HEADER TEST
                        ENDM
                ALDF    MACRO   D
                        EOM     10026           ALERT DISC FILE
                        ENDM
                CLDF    MACRO   D
                        EOM     10226           CLEAR FILE
                        ENDM
                WDFC    MACRO   D
                        EOM     2666            WRITE DISC FILE . CHAIN
                        ENDM
                WDFS    MACRO   D
```

```
                    E0M     3666            WRITE DISC FILE = SECTOR
                    ENDM
               RDFC MACR0   D
                    E0M     2626            READ DISC FILE = CHAIN
                    ENDM
               RDFS MACR0   D
                    E0M     3626            READ DISC FILE = SECTOR
                    ENDM
               DE0M MACR0   D
                    E0M     2045            DUMMY E0M
                    ENDM
               XE0M MACR0   D
                    E0M     D(1)          EXTENDED M0DE E0M
                    ENDM
```



```
                    *
                    *
                    *       PRESET UNIT PARAMETERS
                    *
                    *
00000       04000           BSS     4000
04000  0 20 00000           N0P     0               DUMMY CELL
04001  0 20 04773           N0P     UPT             UNIT PARAMETER TABLES
04002  0 75 33550           LDB     =0              SET 940 FLAG
04003  0 76 00401           LDA     STATUS
04004  0 72 15463           SKA     BIT21
04005  0 75 33551           LDB     ==1
04006  0 36 23350           STB     NEFLG
04007  0 76 00404           LDA     DSCSIZ          PRESET D00T17 AND D20T37
04010  0 66 00011           RSH     9D
04011  0 14 33552           ETR     =7
04012  0 75 33550           LDB     =0
04013  0 73 33550           SKG     =0
04014  0 01 04020           BRU     *+4
04015  0 46 00014           XAB
04016  0 16 33553           MRG     =77600000
04017  0 46 00014           XAB
04020  0 73 15465           SKG     BIT23
04021  0 01 04025           BRU     *+4
04022  0 46 00014           XAB
04023  0 16 33554           MRG     =177400
04024  0 46 00014           XAB
04025  0 36 05001           STB     D00T17
04026  0 75 33550           LDB     =0
04027  0 73 15464           SKG     BIT22
04030  0 01 04034           BRU     *+4
04031  0 46 00014           XAB
04032  0 16 33553           MRG     =77600000
04033  0 46 00014           XAB
04034  0 73 33555           SKG     =3
04035  0 01 04041           BRU     *+4
```

```
04036  0 46 00014          XAB
04037  0 16 33554          MRG     =177400
04040  0 46 00014          XAB
04041  0 36 05002          STB     D20T37
04042  0 43 00420          BRM     UNIT
04043  0 20 04773          NBP     UPT             UNIT PARAMETER TABLES
```



```
                    *
                    *
                    *       FUNCTION 1 = TMCC TEST
                    *
                    *
04044  0 43 00424  FUNC1  BRM     FUNCTN          FUNCTION LINK
04045  0 20 05003          NBP     FPT1            FUNCTION PARAMETER TABLES
                    *
                    *       TEST CAT (NOT ACTIVE CONDITION)
                    *
04046  0 43 00430          BRM     SBJECT
04047  0 43 00440          BRM     RETURN
04050  0 20 23371          NBP     ENTER
04051  0 02 00000          EOM     0               DISCONNECT CHANNEL
04052  0 40 14000          SKS     14000           CHANNEL ACTIVE TEST
04053  0 43 00460          BRM     ERROR           CHANNEL TESTS ACTIVE
04054  0 20 23675          NBP     F1M1
04055  0 43 00434          BRM     END
                    *
                    *       TEST CAT (ACTIVE CONDITION)
                    *
04056  0 43 00430          BRM     SBJECT
04057  0 43 00440          BRM     RETURN
04060  0 20 23371          NBP     ENTER
04061  0 02 20004          DIR                     DISABLE INTERRUPTS
04062  0 02 00000          EOM     0               DISCONNECT CHANNEL
04063  0 02 14000          EOM     14000           TERMINATE OUTPUT
04064  0 40 14000          SKS     14000           CHANNEL ACTIVE TEST
04065  0 01 04070          BRU     **3
04066  0 02 00000          EOM     0               DISCONNECT CHANNEL
04067  0 43 00460          BRM     ERROR
04070  0 20 23700          NBP     F1M2
04071  0 02 00000          EOM     0               DISCONNECT CHANNEL
04072  0 43 00434          BRM     END
                    *
                    *       TEST BRTN (NOT ACTIVE CONDITION)
```

```
                    *
04073  0 43 00430       BRM     OBJECT
04074  0 43 00440       BRM     RETURN
04075  0 20 23371       NOP     ENTER
04076  0 02 00000       EOM     0               DISCONNECT CHANNEL
04077  0 40 21000       SKS     21000           W=BUFFER READY TEST
04100  0 43 00460       BRM     ERROR           CHANNEL TESTED ACTIVE
04101  0 20 23713       NOP     F1M3
04102  0 43 00434       BRM     END
                    *
                    *   TEST BRTW (ACTIVE CONDITION)
                    *
04103  0 43 00430       BRM     OBJECT
04104  0 43 00440       BRM     RETURN
04105  0 20 23371       NOP     ENTER
04106  0 02 20004       DIR                     DISABLE INTERRUPTS
04107  0 02 00000       EOM     0               DISCONNECT CHANNEL
04110  0 02 14000       EOM     14000           TERMINATE OUTPUT
04111  0 40 21000       SKS     21000           W=BUFFER READY TEST
04112  0 01 04115       BRU     *+3
04113  0 02 00000       EOM     0               DISCONNECT CHANNEL
04114  0 43 00460       BRM     ERROR           CHANNEL TESTED NOT ACTIVE
04115  0 20 23716       NOP     F1M4
04116  0 02 00000       EOM     0               DISCONNECT CHANNEL
04117  0 43 00434       BRM     END
                    *
                    *   TEST CET (NO ERROR CONDITION)
                    *
04120  0 43 00430       BRM     OBJECT
04121  0 43 00440       BRM     RETURN
04122  0 20 23371       NOP     ENTER
04123  0 02 00000       EOM     0               DISCONNECT CHANNEL
04124  0 40 11000       SKS     11000           CHANNEL ERROR TEST
04125  0 43 00460       BRM     ERROR           ERROR TESTED SET
04126  0 20 23721       NOP     F1M5
04127  0 43 00434       BRM     END
```



```
                    *
                    *   TEST BETW (NO ERROR CONDITION)
                    *
04130  0 43 00430       BRM     OBJECT
04131  0 43 00440       BRM     RETURN
04132  0 20 23371       NOP     ENTER
04133  0 02 00000       EOM     0               DISCONNECT CHANNEL
04134  0 40 20010       SKS     20010           W=BUFFER ERROR TEST
04135  0 43 00460       BRM     ERROR           ERROR TESTED SET
04136  0 20 23727       NOP     F1M6
04137  0 43 00434       BRM     END
                    *
                    *   TEST TOP
                    *
04140  0 43 00430       BRM     OBJECT
04141  0 43 00440       BRM     RETURN
04142  0 20 23371       NOP     ENTER
04143  0 02 20004       DIR                     DISABLE INTERRUPTS
04144  0 02 02045       EOM     2045            DUMMY EOM
04145  0 02 14000       EOM     14000           TERMINATE OUTPUT
04146  0 40 14000       SKS     14000           CHANNEL ACTIVE TEST
04147  0 43 00460       BRM     ERROR           CHANNEL TESTED ACTIVE
04150  0 20 23732       NOP     F1M7
04151  0 02 00000       EOM     0               DISCONNECT CHANNEL
04152  0 43 00434       BRM     END
                    *
                    *   TEST W14
                    *
04153  0 43 00430       BRM     OBJECT
04154  0 43 00440       BRM     RETURN
04155  0 20 23371       NOP     ENTER
04156  0 02 20004       DIR                     DISABLE INTERRUPTS
04157  0 02 00001       EOM     01              SET W14
04160  0 40 14000       SKS     14000           CHANNEL ACTIVE TEST
04161  0 01 04164       BRU     *+3
04162  0 02 00000       EOM     0               DISCONNECT CHANNEL
```

```
04163  0 43 00460        BRM     ERR0R           CHANNEL N0T ACTIVE
04164  0 20 23745        N0P     F1M8
04165  0 02 00000        E0M     0               DISC0NNECT CHANNEL
04166  0 43 00434        BRM     END
                  *
                  *     TEST W13
                  *
04167  0 43 00430        BRM     0BJECT
04170  0 43 00440        BRM     RETURN
04171  0 20 23371        N0P     ENTER
04172  0 02 20004        DIR                     DISABLE INTERRUPTS
04173  0 02 00002        E0M     02              SET W13
04174  0 40 14000        SKS     14000           CHANNEL ACTIVE TEST
04175  0 01 04200        BRU     **3
04176  0 02 00000        E0M     0               DISC0NNECT CHANNEL
04177  0 43 00460        BRM     ERR0R           CHANNEL N0T ACTIVE
04200  0 20 23760        N0P     F1M9
04201  0 02 00000        E0M     0               DISC0NNECT CHANNEL
04202  0 43 00434        BRM     END
                  *
                  *     TEST W12
                  *
04203  0 43 00430        BRM     0BJECT
04204  0 43 00440        BRM     RETURN
04205  0 20 23371        N0P     ENTER
04206  0 02 20004        DIR                     DISABLE INTERRUPTS
04207  0 02 00004        E0M     04              SET W12
04210  0 40 14000        SKS     14000           CHANNEL ACTIVE TEST
04211  0 01 04214        BRU     **3
04212  0 02 00000        E0M     0               DISC0NNECT CHANNEL
04213  0 43 00460        BRM     ERR0R           CHANNEL N0T ACTIVE
04214  0 20 23770        N0P     F1M10
04215  0 02 00000        E0M     0               DISC0NNECT CHANNEL
04216  0 43 00434        BRM     END
                  *
                  *     TEST W10
```



```
                  *
04217  0 43 00430        BRM     0BJECT
04220  0 43 00440        BRM     RETURN
04221  0 20 23371        N0P     ENTER
04222  0 02 20004        DIR                     DISABLE INTERRUPTS
04223  0 02 00020        E0M     20              SET W10
04224  0 40 14000        SKS     14000           CHANNEL ACTIVE TEST
04225  0 01 04230        BRU     **3
04226  0 02 00000        E0M     0               DISC0NNECT CHANNEL
04227  0 43 00460        BRM     ERR0R           CHANNEL N0T ACTIVE
04230  0 20 24000        N0P     F1M11
04231  0 02 00000        E0M     0               DISC0NNECT CHANNEL
04232  0 43 00434        BRM     END
                  *
                  *     TEST CZT (C0UNT = 0 C0NDITI0N)
                  *
04233  0 43 00430        BRM     0BJECT
04234  0 43 00440        BRM     RETURN
04235  0 20 23371        N0P     ENTER
04236  0 02 20004        DIR
04237  0 76 33556        LDA     =77740000
04240  0 35 23352        STA     P0TWRD
04241  0 02*10000        E0M*    10000           ALERT CHANNEL
04242  0 02 14037        E0M     14037           EXTENDED M0DE E0M
04243  0 13 23352        P0T     P0TWRD          SET W0RD C0UNT T0 77777
04244  0 76 33550        LDA     =0
04245  0 35 23352        STA     P0TWRD
04246  0 02*10000        E0M*    10000           ALERT CHANNEL
04247  0 02 14000        E0M     14000           EXTENDED M0DE E0M
04250  0 13 23352        P0T     P0TWRD          WC=0
04251  0 40 12000        SKS     12000           CHANNEL ZER0 W0RD C0UNT TEST
04252  0 43 00460        BRM     ERR0R           W0RD C0UNT TESTED N0T ZER0
04253  0 20 24010        N0P     F1M12
04254  0 43 00434        BRM     END
                  *
                  *     TEST =C14
```

```
                    *
04255  0 43 00430       BRM     OBJECT
04256  0 43 22212       BRM     F1S1            PERFORM TEST
04257    00040000       DATA    40000
04260  0 02 14000       EOM     14000           EXTENDED MODE EOM
04261  0 20 24016       NOP     F1M13
                    *
                    *   TEST WC13
                    *
04262  0 43 00430       BRM     OBJECT
04263  0 43 22212       BRM     F1S1            PERFORM TEST
04264    00100000       DATA    100000
04265  0 02 14000       EOM     14000           EXTENDED MODE EOM
04266  0 20 24026       NOP     F1M14
                    *
                    *   TEST WC12
                    *
04267  0 43 00430       BRM     OBJECT
04270  0 43 22212       BRM     F1S1            PERFORM TEST
04271    00200000       DATA    200000
04272  0 02 14000       EOM     14000           EXTENDED MODE EOM
04273  0 20 24036       NOP     F1M15
                    *
                    *   TEST WC11
                    *
04274  0 43 00430       BRM     OBJECT
04275  0 43 22212       BRM     F1S1            PERFORM TEST
04276    00400000       DATA    400000
04277  0 02 14000       EOM     14000           EXTENDED MODE EOM
04300  0 20 24046       NOP     F1M16
                    *
                    *   TEST WC10
                    *
04301  0 43 00430       BRM     OBJECT
04302  0 43 22212       BRM     F1S1            PERFORM TEST
04303    01000000       DATA    1000000
```



```
04304  0 02 14000       EOM     14000           EXTENDED MODE EOM
04305  0 20 24056       NOP     F1M17
                    *
                    *   TEST WC9
                    *
04306  0 43 00430       BRM     OBJECT
04307  0 43 22212       BRM     F1S1            PERFORM TEST
04310    02000000       DATA    2000000
04311  0 02 14000       EOM     14000           EXTENDED MODE EOM
04312  0 20 24066       NOP     F1M18
                    *
                    *   TEST WC8
                    *
04313  0 43 00430       BRM     OBJECT
04314  0 43 22212       BRM     F1S1            PERFORM TEST
04315    04000000       DATA    4000000
04316  0 02 14000       EOM     14000           EXTENDED MODE EOM
04317  0 20 24076       NOP     F1M19
                    *
                    *   TEST WC7
                    *
04320  0 43 00430       BRM     OBJECT
04321  0 43 22212       BRM     F1S1            PERFORM TEST
04322    10000000       DATA    10000000
04323  0 02 14000       EOM     14000           EXTENDED MODE EOM
04324  0 20 24106       NOP     F1M20
                    *
                    *   TEST WC6
                    *
04325  0 43 00430       BRM     OBJECT
04326  0 43 22212       BRM     F1S1            PERFORM TEST
04327    20000000       DATA    20000000
04330  0 02 14000       EOM     14000           EXTENDED MODE EOM
04331  0 20 24116       NOP     F1M21
                    *
                    *   TEST WC5
```

```
                    *
04332  0 43 00430       BRM     0BJECT
04333  0 43 22212       BRM     F1S1            PERFORM TEST
04334    40000000       DATA    40000000
04335  0 02 14000       E0M     14000           EXTENDED MODE E0M
04336  0 20 24126       N0P     F1M22
                    *
                    *   TEST WC4
                    *
04337  0 43 00430       BRM     0BJECT
04340  0 43 22212       BRM     F1S1            PERFORM TEST
04341    00000000       DATA    0
04342  0 02 14001       E0M     14001           EXTENDED MODE E0M
04343  0 20 24136       N0P     F1M23
                    *
                    *   TEST WC3
                    *
04344  0 43 00430       BRM     0BJECT
04345  0 43 22212       BRM     F1S1            PERFORM TEST
04346    00000000       DATA    0
04347  0 02 14002       E0M     14002           EXTENDED MODE E0M
04350  0 20 24153       N0P     F1M24
                    *
                    *   TEST WC2
                    *
04351  0 43 00430       BRM     0BJECT
04352  0 43 22212       BRM     F1S1            PERFORM TEST
04353    00000000       DATA    0
04354  0 02 14004       E0M     14004           EXTENDED MODE E0M
04355  0 20 24163       N0P     F1M25
                    *
                    *   TEST WC1
                    *
04356  0 43 00430       BRM     0BJECT
04357  0 43 22212       BRM     F1S1            PERFORM TEST
04360    00000000       DATA    0
```



```
04361  0 02 14010       E0M     14010           EXTENDED MODE E0M
04362  0 20 24173       N0P     F1M26
                    *
                    *   TEST WC0
                    *
04363  0 43 00430       BRM     0BJECT
04364  0 43 22212       BRM     F1S1            PERFORM TEST
04365    00000000       DATA    0
04366  0 02 14020       E0M     14020           EXTENDED MODE E0M
04367  0 20 24203       N0P     F1M27
                    *
                    *   TEST WA14
                    *
04370  0 43 00430       BRM     0BJECT
04371  0 43 22235       BRM     F1S2            PERFORM TEST
04372    00000001       DATA    1
04373    00000001       DATA    1
04374  0 02 14000       E0M     14000           EXTENDED MODE E0M
04375  0 20 24213       N0P     F1M28
04376  0 20 24230       N0P     F1M29
                    *
                    *   TEST WA13
                    *
04377  0 43 00430       BRM     0BJECT
04400  0 43 22235       BRM     F1S2            PERFORM TEST
04401    00000002       DATA    2
04402    00000002       DATA    2
04403  0 02 14000       E0M     14000           EXTENDED MODE E0M
04404  0 20 24243       N0P     F1M30
04405  0 20 24251       N0P     F1M31
                    *
                    *   TEST WA12
                    *
04406  0 43 00430       BRM     0BJECT
04407  0 43 22235       BRM     F1S2            PERFORM TEST
04410    00000004       DATA    4
```

```
04411    00000004          DATA    4
04412  0 02 14000         EOM     14000          EXTENDED MODE EOM
04413  0 20 24257         NOP     F1M32
04414  0 20 24265         NOP     F1M33
                    *
                    *      TEST #A11
                    *
04415  0 43 00430         BRM     OBJECT
04416  0 43 22235         BRM     F1S2           PERFORM TEST
04417    00000010         DATA    10
04420    00000010         DATA    10
04421  0 02 14000         EOM     14000          EXTENDED MODE EOM
04422  0 20 24273         NOP     F1M34
04423  0 20 24301         NOP     F1M35
                    *
                    *      TEST #A10
                    *
04424  0 43 00430         BRM     OBJECT
04425  0 43 22235         BRM     F1S2           PERFORM TEST
04426    00000020         DATA    20
04427    00000020         DATA    20
04430  0 02 14000         EOM     14000          EXTENDED MODE EOM
04431  0 20 24307         NOP     F1M36
04432  0 20 24315         NOP     F1M37
                    *
                    *      TEST #A9
                    *
04433  0 43 00430         BRM     OBJECT
04434  0 43 22235         BRM     F1S2           PERFORM TEST
04435    00000040         DATA    40
04436    00000040         DATA    40
04437  0 02 14000         EOM     14000          EXTENDED MODE EOM
04440  0 20 24323         NOP     F1M38
04441  0 20 24331         NOP     F1M39
                    *
                    *      TEST #A8
```



```
                    *
04442  0 43 00430         BRM     OBJECT
04443  0 43 22235         BRM     F1S2           PERFORM TEST
04444    00000100         DATA    100
04445    00000100         DATA    100
04446  0 02 14000         EOM     14000          EXTENDED MODE EOM
04447  0 20 24341         NOP     F1M40
04450  0 20 24347         NOP     F1M41
                    *
                    *      TEST #A7
                    *
04451  0 43 00430         BRM     OBJECT
04452  0 43 22235         BRM     F1S2           PERFORM TEST
04453    00000200         DATA    200
04454    00000200         DATA    200
04455  0 02 14000         EOM     14000          EXTENDED MODE EOM
04456  0 20 24355         NOP     F1M42
04457  0 20 24363         NOP     F1M43
                    *
                    *      TEST #A6
                    *
04460  0 43 00430         BRM     OBJECT
04461  0 43 22235         BRM     F1S2           PERFORM TEST
04462    00000400         DATA    400
04463    00000400         DATA    400
04464  0 02 14000         EOM     14000          EXTENDED MODE EOM
04465  0 20 24371         NOP     F1M44
04466  0 20 24377         NOP     F1M45
                    *
                    *      TEST #A5
                    *
04467  0 43 00430         BRM     OBJECT
04470  0 43 22235         BRM     F1S2           PERFORM TEST
04471    00001000         DATA    1000
04472    00001000         DATA    1000
04473  0 02 14000         EOM     14000          EXTENDED MODE EOM
```

```
04474  0 20 24405          NOP     F1M46
04475  0 20 24413          NOP     F1M47
                    *
                    *       TEST ↑A4
                    *
04476  0 43 00430          BRM     OBJECT
04477  0 43 22235          BRM     F1S2            PERFORM TEST
04500     00002000         DATA    2000
04501     00002000         DATA    2000
04502  0 02 14000          EOM     14000           EXTENDED MODE EOM
04503  0 20 24421          NOP     F1M48
04504  0 20 24427          NOP     F1M49
                    *
                    *       TEST ↑A3
                    *
04505  0 43 00430          BRM     OBJECT
04506  0 43 22235          BRM     F1S2            PERFORM TEST
04507     00004000         DATA    4000
04510     00004000         DATA    4000
04511  0 02 14000          EOM     14000           EXTENDED MODE EOM
04512  0 20 24435          NOP     F1M50
04513  0 20 24443          NOP     F1M51
                    *
                    *       TEST ↑A2
                    *
04514  0 43 00430          BRM     OBJECT
04515  0 43 22235          BRM     F1S2            PERFORM TEST
04516     00010000         DATA    10000
04517     00010000         DATA    10000
04520  0 02 14000          EOM     14000           EXTENDED MODE EOM
04521  0 20 24451          NOP     F1M52
04522  0 20 24457          NOP     F1M53
                    *
                    *       TEST ↑A1
                    *
04523  0 43 00430          BRM     OBJECT
```



```
04524  0 43 22235          BRM     F1S2            PERFORM TEST
04525     00020000         DATA    20000
04526     00020000         DATA    20000
04527  0 02 14000          EOM     14000           EXTENDED MODE EOM
04530  0 20 24465          NOP     F1M54
04531  0 20 24473          NOP     F1M55
                    *
                    *       TEST ↑A0
                    *
04532  0 43 00430          BRM     OBJECT
04533  0 43 22235          BRM     F1S2            PERFORM TEST
04534     00000000         DATA    0
04535     00040000         DATA    40000
04536  0 02 14040          EOM     14040           EXTENDED MODE EOM
04537  0 20 24501          NOP     F1M56
04540  0 20 24511          NOP     F1M57
                    *
                    *       TEST ↑A00
                    *
04541  0 43 00430          BRM     OBJECT
04542  0 43 22235          BRM     F1S2            PERFORM TEST
04543     00000000         DATA    0
04544     00100000         DATA    100000
04545  0 02 14100          EOM     14100           EXTENDED MODE EOM
04546  0 20 24514          NOP     F1M58
04547  0 20 24517          NOP     F1M59
                    *
                    *       TEST INCREMENTING OF ↑A1↓↑A14
                    *
04550  0 76 15447          LDA     BIT9
04551  0 35 23352          STA     PBTARD
04552  0 43 00430  F1BE1   BRM     OBJECT
04553  0 43 00440          BRM     RETURN
04554  0 20 23371          NOP     ENTER
04555  0 02 20004          DIR
04556  0 75 33557          LDB     =177777
```

```
04557  0 02*10000        EOM*    10000           ALERT CHANNEL
04560  0 02 14000        EOM     14000           EXTENDED MODE EOM
04561  0 13 23352        POT     POTWRD          WC=1
04562  0 02 02045        EOM     2045            DUMMY EOM
04563  0 76 23352        LDA     POTWRD
04564  0 14 33560        ETR     =37777          EXTRACT ADDRESS FROM POT WORD
04565  0 55 15465        ADD     BIT23
04566  0 02 00000        EOM     0               DISCONNECT CHANNEL
04567  0 02 12000        EOM     12000           ALERT TO PIN CHANNEL ADDRESS
04570  0 33 23330        PIN     TEMP
04571  0 70 23330        SKM     TEMP            DID ADDRESS REGISTER INCREMENT
04572  0 01 04574        BRU     *+2             NO
04573  0 01 04576        BRU     *+3
04574  0 75 23330        LDB     TEMP            A=CORRECT VALUE, B=INCORRECT VALUE
04575  0 43 00460        BRM     ERROR
04576  2 20 24522        NOP     F1M60,2
04577  0 43 00434        BRM     END
04600  0 61 23352        MIN     POTWRD
04601  0 76 23352        LDA     POTWRD
04602  0 73 33561        SKG     =77777          LAST PASS
04603  0 01 04552        BRU     F19E1           NO
                  *
                  *     TEST INCREMENTING OF WA00
                  *
04604  0 43 00430        BRM     OBJECT
04605  0 43 00440        BRM     RETURN
04606  0 20 23371        NOP     ENTER
04607  0 02 20004        DIR
04610  0 76 33561        LDA     =77777
04611  0 35 23352        STA     POTWRD
04612  0 02*10000        EOM*    10000           ALERT CHANNEL
04613  0 02 14040        EOM     14040           EXTENDED MODE EOM
04614  0 13 23352        POT     POTWRD          WC=1, WA=77777
04615  0 02 02045        EOM     2045            DUMMY EOM
04616  0 75 33557        LDB     =177777
04617  0 76 15446        LDA     BITB
```



```
04620  0 02 00000        EOM     0               DISCONNECT CHANNEL
04621  0 02 12000        EOM     12000           ALERT TO PIN CHANNEL ADDRESS
04622  0 33 23330        PIN     TEMP
04623  0 70 23330        SKM     TEMP            WA=100000
04624  0 01 04626        BRU     *+2             NO
04625  0 01 04630        BRU     *+3
04626  0 75 23330        LDB     TEMP            A=EXPECTED VALUE, B=INCORRECT VALUE
04627  0 43 00460        BRM     ERROR
04630  2 20 24522        NOP     F1M60,2
04631  0 43 00434        BRM     END
                  *
                  *     TEST WRAP-AROUND INCREMENTING
                  *
04632  0 43 00430        BRM     OBJECT
04633  0 43 00440        BRM     RETURN
04634  0 20 23371        NOP     ENTER
04635  0 02 20004        DIR
04636  0 76 33561        LDA     =77777
04637  0 35 23352        STA     POTWRD
04640  0 02*10000        EOM*    10000           ALERT CHANNEL
04641  0 02 14140        EOM     14140           EXTENDED MODE EOM
04642  0 13 23352        POT     POTWRD          WC=1, WA=177777
04643  0 02 02045        EOM     2045            DUMMY EOM
04644  0 75 33557        LDB     =177777
04645  0 76 33550        LDA     =0
04646  0 02 00000        EOM     0               DISCONNECT CHANNEL
04647  0 02 12000        EOM     12000           ALERT TO PIN CHANNEL ADDRESS
04650  0 33 23330        PIN     TEMP
04651  0 70 23330        SKM     TEMP            WA=0
04652  0 01 04654        BRU     *+2             NO
04653  0 01 04656        BRU     *+3
04654  0 75 23330        LDB     TEMP            A=EXPECTED VALUE, B=INCORRECT VALUE
04655  0 43 00460        BRM     ERROR
04656  2 20 24522        NOP     F1M60,2
04657  0 43 00434        BRM     END
                  *
```

```
                    *       TEST ZERO WORD COUNT INTERRUPT
                    *
04660  0 43 00430           BRM     OBJECT
04661  0 43 00440           BRM     RETURN
04662  0 20 04737           NOP     XTI2
04663  0 76 15447           LDA     BIT9
04664  0 35 23352           STA     POTWRD
04665  0 02 20002           EIR
04666  0 02*10000           EOM*    10000           ALERT CHANNEL
04667  0 02 15000           EOM     15000           EXTENDED MODE EOM
04670  0 13 23352           POT     POTWRD
04671  0 02 02045           EOM     2045            DUMMY EOM
04672  0 67 20060           LCY     48D             5 DUMMY CYCLES
04673  0 02 00000           EOM     0               DISCONNECT CHANNEL
04674  0 02 20004           DIR
04675  0 43 00460           BRM     ERROR           NO I1 INTERRUPT
04676  4 20 24542           NOP     F1M65,4
04677  0 20 24551           NOP     F1M66
04700  0 43 00434           BRM     END
                    *
                    *       TEST END OF RECORD INTERRUPT
                    *
04701  0 43 00430           BRM     OBJECT
04702  0 43 00440           BRM     RETURN
04703  0 20 04755           NOP     XTI3
04704  0 76 15447           LDA     BIT9
04705  0 35 23352           STA     POTWRD
04706  0 02 20002           EIR
04707  0 02*10000           EOM*    10000           ALERT CHANNEL
04710  0 02 16000           EOM     16000           EXTENDED MODE EOM
04711  0 13 23352           POT     POTWRD
04712  0 02 00000           EOM     0               DISCONNECT CHANNEL
04713  0 67 20060           LCY     48D             5 DUMMY CYCLES
04714  0 67 20060           LCY     48D             5 DUMMY CYCLES
04715  0 02 20004           DIR
04716  0 43 00460           BRM     ERROR
```



```
04717  4 20 24405           NOP     F1M70,4
04720  0 20 24414           NOP     F1M71
04721  0 43 00434           BRM     END
                    *
                    *       TEST END OF WORD INTERRUPT
                    *
04722  0 43 00430           BRM     OBJECT
04723  0 43 00440           BRM     RETURN
04724  0 20 04737           NOP     XTI2
04725  0 02 20002           EIR
04726  0 02 02045           EOM     2045            DUMMY EOM
04727  0 67 20060           LCY     48D             5 DUMMY CYCLES
04730  0 02 00000           EOM     0               DISCONNECT CHANNEL
04731  0 02 20004           DIR
04732  0 43 00460           BRM     ERROR           NO I1 INTERRUPT RECEIVED
04733  4 20 24542           NOP     F1M65,4
04734  0 20 24565           NOP     F1M67
04735  0 43 00434           BRM     END
04736  0 43 00456           BRM     FDONE           EXIT TO NEXT FUNCTION
                    *
                    *       INTERRUPT ENTRANCES
                    *
04737  0 02 20004  XTI2      DIR
04740  0 02 00000           EOM     0               DISCONNECT CHANNEL
04741  0 76 00450           LDA     DIVERT
04742  0 14 33560           ETR     =37777
04743  0 75 33551           LDB     ==1
04744  0 70 33562           SKM     =IX1            I1 INTERRUPT RECEIVED
04745  0 43 23377           BRM     SPUR            NO = SPURIOUS
04746  0 20 33562           NOP     =IX1
04747  0 76 00242           LDA     INTX1
04750  0 55 33563           ADD     =5
04751  0 35 00242           STA     INTX1
04752  0 53 23350           SKN     NFFLG           IS MACHINE A 940
04753  0 01*00242           BRU*    INTX1           NO
04754  0 11 00242           BRI     INTX1
```

```
04755  0 02 20004  XTI3   DIR
04756  0 02 00000         EOM     0                DISCONNECT CHANNEL
04757  0 76 00450         LDA     DIVERT
04760  0 14 33560         ETR     =37777
04761  0 75 33561         LDB     =1
04762  0 70 33564         SKM     =IX2             I2 INTERRUPT RECIEVED
04763  0 43 23377         BRM     SPUR             NO = SPURIOUS
04764  0 20 33564         NOP     =IX2
04765  0 76 00246         LDA     INTX2
04766  0 55 15463         ADD     BIT21
04767  0 35 00246         STA     INTX2
04770  0 53 23350         SKN     NFFLG            IS MACHINE A 940
04771  0 01=00246         BRU=    INTX2
04772  0 11 00246         BRI     INTX2
```



```
                   *
                   *       UNIT, FUNCTION TABLES
                   *
04773  0 20 05012  UPT     NOP     UIM              UNIT IDENTIFIER MESSAGE
04774  0 20 05022         NOP     UAM              UNIT ABSTRACT MESSAGE
04775  0 20 05341         NOP     UVM              UNIT VARIABLE MESSAGE
04776  0 03 05000         THREE   UVT              UNIT VARIABLE TABLE
04777    00000004         DATA    4                UNIT IDENTIFIER = BIT 21
05000    37020000  UVT     DATA    37020000         INITIALIZE FUNCTIONS 1 THROUGH 5 AND 10
05001  0 00 00000  D00T17  PZE     0                DISCS 0 THROUGH 17 ACTIVATION BITS
05002  0 00 00000  D20T37  PZE     0                DISCS 20 THROUGH 37 ACTIVATION BITS
05003  0 20 05350  FPT1    NOP     FIM1             FUNCTION IDENTIFIER MESSAGE
05004  0 20 05356         NOP     FAM1             FUNCTION ABSTRACT MESSAGE
05005  0 20 05476         NOP     FVM1             FUNCTION VARIABLE MESSAGE
05006  0 01 05011         ONE     FVT1             FUNCTION VARIABLE TABLE
05007  0 00 05504         PZE     FUNC2            POINTER TO NEXT FUNCTION
05010    20000000         DATA    2B7              FUNCTION IDENTIFIER = BIT 1
05011  0 00 00000  FVT1    PZE     0                FUNCTION VARIABLE TABLE (NO VARIABLES)
                   *
                   *       UNIT, FUNCTION MESSAGES
                   *
05012    52641202  UIM     BCD     ' U 21 = W CHANNEL DISC = 3.0''
05013    01124012
05014    66122330
05015    21454525
05016    43122431
05017    62231240
05020    12033300
05021    37121212
05022    52326445  UAM     BCD     '  UNIT 21 = W=CHANNEL DISC DIAGNOSTICS AND EXERCISERS 3.0'
05023    31631202
05024    01124012
05025    66402330
05026    21454525
05027    43122431
05030    62231224
```

```
05031    31212745
05032    46626331
05033    23621221
05034    45241225
05035    67255123
05036    31622551
05037    62120333
05040    00121212
05041    52526330          BCD     ! THIS UNIT CONTAINS DIAGNOSTICS, EXERCISERS, AND SPECIAL FUNCTIONS DEVOTED!
05042    31621264
05043    45316312
05044    23464563
05045    21314562
05046    12243121
05047    27454662
05050    63312362
05051    73122567
05052    25512331
05053    62255162
05054    73122145
05055    24126247
05056    25233121
05057    43122464
05060    45236331
05061    46456212
05062    24256546
05063    63252412
05064    52634412          BCD     ! TO THE 9164-01 AND 9165-01 DISC FILE. THERE ARE THREE UNIT VARIABLES!
05065    63302512
05066    11010604
05067    40000112
05070    21452412
05071    11010605
05072    40000112
05073    24316223
05074    12263143
```



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05075    25331263
05076    30255125
05077    12215125
05100    12633051
05101    25251264
05102    45316312
05103    65215131
05104    21224325
05105    62151212
05106    52522621          BCD     !  FAM = FUNCTION ACTIVATION WORD. LEGAL FUNCTIONS ARE FUNCTIONS 1-5 (DIAG-!
05107    66124012
05110    26644523
05111    63314445
05112    12212363
05113    31652163
05114    31464512
05115    66465124
05116    33124325
05117    27214312
05120    26644523
05121    63314445
05122    62122151
05123    25122664
05124    45236331
05125    46456212
05126    01400512
05127    74243121
05130    27401212
05131    52454662          BCD     ! NOSTICS), FUNCTION 10 (EXERCISER), AND FUNCTIONS 18-23 (SPECIAL FUNCTIONS).!
05132    63312362
05133    34731226
05134    64452363
05135    31464512
05136    01001274
05137    25672551
05140    23316225
```

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05141    51347312
05142    21452412
05143    26644523
05144    63314645
05145    62120110
05146    40020312
05147    74624725
05150    23312143
05151    12266445
05152    23633146
05153    45623433
05154    52240000        BCD     ' D00T17 AND D20T37 = ACTIVATION BITS FOR ARMS 0-37. BITS IN THE MOST SIGNIF-'
05155    63010712
05156    21452412
05157    24020063
05160    03071240
05161    12212363
05162    31652163
05163    31464512
05164    22316362
05165    12264451
05166    12215144
05167    62120040
05170    03073312
05171    22316362
05172    12314512
05173    63302512
05174    44466263
05175    12623127
05176    45312640
05177    52312321        BCD     ' ICANT 16 BITS OF EACH WORD PERMIT THE CORRESPONDING DISC TO BE USED. IF A'
05200    45631201
05201    06122231
05202    63621246
05203    26122521
05204    23301266
```



```
05205    46512412
05206    47255144
05207    31631263
05210    30251223
05211    46515125
05212    62474645
05213    24314527
05214    12243162
05215    23126346
05216    12222512
05217    64622524
05220    33123126
05221    12211212
05222    52001231        BCD     ' 0 IS IN A BIT, THE CORRESPONDING ARM WILL NOT BE USED.'
05223    62123145
05224    12211222
05225    31637312
05226    63302512
05227    23465151
05230    25624746
05231    45243145
05232    27122151
05233    44126631
05234    43431245
05235    46631222
05236    25126462
05237    25243312
05240    52464512        BCD     ' ON THE FIRST PASS, ALL DIAGNOSTICS WILL BE RUN, AND THE DISC WILL BE KEYED.'
05241    63302512
05242    26315162
05243    63124721
05244    62627312
05245    21434312
05246    24312127
05247    45466263
05250    31236212
```

```
05251    66314343
05252    12222512
05253    51644473
05254    12214524
05255    12633025
05256    12243162
05257    23126431
05260    43431222
05261    25124225
05262    70252433
05263    52464512        BCD     ' ON SUBSEQUENT PASSES, ONLY THE DIAGNOSTICS WHICH DO NOT DESTROY THE INTEGRITY,
05264    62642362
05265    25506425
05266    45631247
05267    21626225
05270    62731246
05271    45437012
05272    63302512
05273    24312127
05274    45466263
05275    31236212
05276    66303123
05277    30122446
05300    12454663
05301    12242562
05302    63514470
05303    12633025
05304    12314563
05305    25275131
05306    63701212
05307    52462412        BCD     ' OF THE DISC WILL RUN, AS WELL AS THE EXERCISER. FUNCTIONS 18-23 WILL NOT!
05310    63302512
05311    24316223
05312    12663143
05313    43125164
05314    45731221
```



```
05315    62126625
05316    43431221
05317    62126330
05320    25122567
05321    25512331
05322    62255133
05323    12266445
05324    23633146
05325    45621201
05326    10400203
05327    12663143
05330    43124546
05331    63121212
05332    52516445        BCD     ' RUN UNLESS TRANSFERED TO.!!
05333    12644543
05334    25626212
05335    63512145
05336    62262551
05337    25241263
05340    46333712
05341    52121212  UVM   BCD     '    FAW    DOOT17   D2OT37 !!
05342    26216412
05343    12121224
05344    00006301
05345    07121212
05346    24020063
05347    03075237
                    *
                    *
                    *
05350    52261200  FIM1  BCD     ' F 01 = TMCC DIAGNOSTIC!!
05351    01124412
05352    63442323
05353    12243121
05354    27454662
05355    63312337
```

```
05356    52326344  FAM1   BCD      '  TMCC DIAGNOSTIC '
05357    23231224
05360    31212745
05361    46626331
05362    23521212
05363    52633731          BCD      ' THIS DIAGNOSTIC TESTS AS MANY TMCC FUNCTIONS AS'
05364    62122431
05365    21274546
05366    62633123
05367    12632562
05370    63621221
05371    62124421
05372    45721263
05373    44232312
05374    26644523
05375    63314445
05376    62122162
05377    52474462          BCD      ' POSSIBLE WITHOUT USE OF AN EXTERNAL DEVICE. '
05400    62312243
05401    25126631
05402    63334664
05403    63126462
05404    25124426
05405    12214512
05406    25676325
05407    51452143
05410    12242565
05411    31232533
05412    52121212
05413    52255151          BCD      ' ERRORS ARE REPORTED AS SOURCE LOCATION AND LOGIC'
05414    46516212
05415    21512512
05416    51254746
05417    51632524
05420    12216212
05421    62466451
```



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05422    23251243
05423    46232163
05424    31444512
05425    21452412
05426    43462731
05427    23121212
05430    52472127          BCD      ' PAGE. I.E.  20D25(43) INDICATES THAT THE SUSPECTED'
05431    25331231
05432    33253312
05433    12020024
05434    02057404
05435    03341231
05436    45243123
05437    21632562
05440    12633021
05441    63126330
05442    25126264
05443    62472523
05444    63252412
05445    52635146          BCD      ' TROUBLE IS ON CARD 20D, PIN 25, AND THE LOGIC DRAWING'
05446    64224325
05447    12316212
05450    46451223
05451    21512412
05452    02002473
05453    12473145
05454    12020573
05455    12214524
05456    12633025
05457    12434627
05460    31231224
05461    51216631
05462    45271212
05463    52462612          BCD      ' OF THIS CURCUIT CAN BE FOUND ON PAGE 43.''
05464    63303162
05465    12236451
```

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05466    23643163
05467    12232145
05470    12222512
05471    26466445
05472    24124445
05473    12472127
05474    25120403
05475    33371212
05476    52454412  FVM1   BCD     1 NO FUNCTION VARIABLES !!
05477    26644523
05500    63314445
05501    12652151
05502    31212243
05503    25625237
```



```
                   *
                   *
                   *      FUNCTION 2 = 9164 DISC FILE CONTROLLER DIAGNOSTIC (NO DATA XFER)
                   *
                   *
05504  0 76 00404  FUNC2  LDA     DSCSIZ          GET DISC SIZE
05505  0 72 33565         SKA     =753            IS SIZE > 0
05506  0 01 05510         BRU     **2             YES
05507  0 43 00452         BRM     DONE            NO = EXIT UNIT
05510  0 40 10226         SKS     10226           FILE ON LINE TEST
05511  0 01 05513         BRU     **2             FILE NOT ON LINE
05512  0 01 05516         BRU     FUNC2A
05513  0 43 00454         BRM     REPORT          REPORT FILE NOT ON LINE
05514  0 20 23571         NOP     U21M7
05515  0 43 00452         BRM     DONE            EXIT UNIT
05516  0 43 00424  FUNC2A BRM     FUNCTN          FUNCTION LINK
05517  0 20 06700         NOP     FPT2
05520  0 43 00440         BRM     RETURN          INTERRUPT/TRAP LINK
05521  0 20 23371         NOP     ENTER
05522  0 02 20004         DIR                     DISABLE INTERRUPTS
                   *
                   *      FILE ON-LINE TEST (FILE ON-LINE CONDITION)
                   *
05523  0 43 00430         BRM     OBJECT
05524  0 43 22323         BRM     F2S2            PERFORM TEST
05525  0 40 10226         SKS     10226           FILE ON LINE TEST
05526  0 20 24442         NOP     F2M1
                   *
                   *      TEST 2CAAA
                   *
05527  0 43 00430         BRM     OBJECT
05530  0 43 22304         BRM     F2S1            PERFORM TEST
05531  0 40 10227         SKS     10227
05532  0 20 24730         NOP     F2M2
                   *
                   *      TEST 2CAAA
```

```
                    *
05533  0 43 00430       BRM     8BJECT
05534  0 43 22304       BRM     F2S1          PERFORM TEST
05535  0 40 10224       SKS     10224
05536  0 20 24751       N8P     F2M3
                    *
                    *   TEST 2CAAA
                    *
05537  0 43 00430       BRM     8BJECT
05540  0 43 22304       BRM     F2S1          PERFORM TEST
05541  0 40 10222       SKS     10222
05542  0 20 24763       N8P     F2M4
                    *
                    *   TEST 2CAAA
                    *
05543  0 43 00430       BRM     8BJECT
05544  0 43 22304       BRM     F2S1          PERFORM TEST
05545  0 40 10206       SKS     10206
05546  0 20 24775       N8P     F2M6
                    *
                    *   TEST 2CAAA
                    *
05547  0 43 00430       BRM     8BJECT
05550  0 43 22304       BRM     F2S1          PERFORM TEST
05551  0 40 10326       SKS     10326
05552  0 20 25007       N8P     F2M7
                    *
                    *   TEST 8S19F
                    *
05553  0 43 00430       BRM     8BJECT
05554  0 43 22304       BRM     F2S1          PERFORM TEST
05555  0 40 17026       SKS     17026
05556  0 20 25021       N8P     F2M8
                    *
                    *   TEST 6S19A0
                    *
```



```
05557  0 43 00430       BRM     8BJECT
05560  0 43 22304       BRM     F2S1          PERFORM TEST
05561  0 40 11226       SKS     11226
05562  0 20 25041       N8P     F2M9
                    *
                    *   TEST 60LSA0
                    *
05563  0 43 00430       BRM     8BJECT
05564  0 43 22304       BRM     F2S1          PERFORM TEST
05565  0 40 12226       SKS     12226
05566  0 20 25070       N8P     F2M10
                    *
                    *   TEST 60LSA0
                    *
05567  0 43 00430       BRM     8BJECT
05570  0 43 22304       BRM     F2S1          PERFORM TEST
05571  0 40 13226       SKS     13226
05572  0 20 25106       N8P     F2M11
                    *
                    *   TEST 60LSA0
                    *
05573  0 43 00430       BRM     8BJECT
05574  0 43 22304       BRM     F2S1          PERFORM TEST
05575  0 40 14226       SKS     14226
05576  0 20 25123       N8P     F2M12
                    *
                    *   TEST 60LSA0
                    *
05577  0 43 00430       BRM     8BJECT
05600  0 43 22304       BRM     F2S1          PERFORM TEST
05601  0 40 15226       SKS     15226
05602  0 20 25143       N8P     F2M13
                    *
                    *   TEST 60LSA0
                    *
05603  0 43 00430       BRM     8BJECT
```

```
DISCW  TAP=3.C                    PAGE 51

05604  0 43 22304          BRM     F2S1            PERFORM TEST
05605  0 40 16226          SKS     16226
05606  0 20 25155          NOP     F2M14
                     *
                     *      TEST 60LSA0
                     *
05607  0 43 00430          BRM     OBJECT
05610  0 43 22304          BRM     F2S1            PERFORM TEST
05611  0 40 17226          SKS     17226
05612  0 20 25167          NOP     F2M15
                     *
                     *      WRITE-HEADER SWITCH TEST (SWITCH OFF CONDITION)
                     *
05613  0 43 00430          BRM     OBJECT
05614  0 43 22323          BRM     F2S2            PERFORM TEST
05615  0 40 14026          SKS     14026           WRITE HEADER TEST
05616  0 20 25201          NOP     F2M16
                     *
                     *      TEST 6SI0A0
                     *
05617  0 43 00430          BRM     OBJECT
05620  0 43 22304          BRM     F2S1            PERFORM TEST
05621  0 40 15026          SKS     15026
05622  0 20 25236          NOP     F2M17
                     *
                     *      TEST 6SI0A0
                     *
05623  0 43 00430          BRM     OBJECT
05624  0 43 22304          BRM     F2S1            PERFORM TEST
05625  0 40 16026          SKS     16026
05626  0 20 25247          NOP     F2M18
                     *
                     *      CONTROLLER READY TEST (READY CONDITION)
                     *
05627  0 43 00430          BRM     OBJECT
05630  0 43 22323          BRM     F2S2            PERFORM TEST
```

```
DISCW  TAP=3.C                    PAGE 52

05631  0 40 10026          SKS     10026           DISC FILE READY TEST
05632  0 20 25262          NOP     F2M19
                     *
                     *      TRACK VERIFIED AND PHASE ONE TEST (CONTROLLER IN PHASE 0)
                     *
05633  0 43 00430          BRM     OBJECT
05634  0 43 22304          BRM     F2S1            PERFORM TEST
05635  0 40 12026          SKS     12026           TRACK VERIFIED TEST
05636  0 20 25335          NOP     F2M20
                     *
                     *      CONTROLLER ERROR TEST (NO ERROR CONDITION)
                     *
05637  0 43 00430          BRM     OBJECT
05640  0 43 22323          BRM     F2S2            PERFORM TEST
05641  0 40 11026          SKS     11026           DISC FILE ERROR TEST
05642  0 20 25371          NOP     F2M21
                     *
                     *      WRITE PROTECT SWITCH TEST (NOT WRITE PROTECTED CASE)
                     *
05643  0 43 00430          BRM     OBJECT
05644  0 43 22323          BRM     F2S2            PERFORM TEST
05645  0 40 13026          SKS     13026           DISC WRITE PROTECT TEST
05646  0 20 25423          NOP     F2M22
                     *
                     *      TEST DA23A (SET)
                     *
05647  0 43 00430          BRM     OBJECT
05650  0 43 22341          BRM     F2S3            PERFORM OBJECT TEST
05651    00000001          DATA    1
05652  0 20 25452          NOP     F2M32
                     *
                     *      TEST DA23A (RESET)
                     *
05653  0 43 00430          BRM     OBJECT
05654  0 43 22362          BRM     F2S4            PERFORM OBJECT TEST
05655    00000001          DATA    1
```

```
05656  0 20 25545          NOP     F2M33
                     *
                     *      TEST 0A22A (SET)
                     *
05657  0 43 00430          BRM     OBJECT
05660  0 43 22341          BRM     F2S3            PERFORM OBJECT TEST
05661    00000002          DATA    2
05662  0 20 25571          NOP     F2M34
                     *
                     *      TEST 0A22A (RESET)
                     *
05663  0 43 00430          BRM     OBJECT
05664  0 43 22362          BRM     F2S4            PERFORM OBJECT TEST
05665    00000002          DATA    2
05666  0 20 25602          NOP     F2M35
                     *
                     *      TEST 0A21A (SET)
                     *
05667  0 43 00430          BRM     OBJECT
05670  0 43 22341          BRM     F2S3            PERFORM OBJECT TEST
05671    00000004          DATA    4
05672  0 20 25625          NOP     F2M36
                     *
                     *      TEST 0A21A (RESET)
                     *
05673  0 43 00430          BRM     OBJECT
05674  0 43 22362          BRM     F2S4            PERFORM OBJECT TEST
05675    00000004          DATA    4
05676  0 20 25636          NOP     F2M37
                     *
                     *      TEST 0A20A (SET)
                     *
05677  0 43 00430          BRM     OBJECT
05700  0 43 22341          BRM     F2S3            PERFORM OBJECT TEST
05701    00000010          DATA    10
05702  0 20 25647          NOP     F2M38
```



```
                     *
                     *      TEST 0A20A (RESET)
                     *
05703  0 43 00430          BRM     OBJECT
05704  0 43 22362          BRM     F2S4            PERFORM OBJECT TEST
05705    00000010          DATA    10
05706  0 20 25660          NOP     F2M39
                     *
                     *      TEST 0A19A (SET)
                     *
05707  0 43 00430          BRM     OBJECT
05710  0 43 22341          BRM     F2S3            PERFORM OBJECT TEST
05711    00000020          DATA    20
05712  0 20 25667          NOP     F2M40
                     *
                     *      TEST 0A19A (RESET)
                     *
05713  0 43 00430          BRM     OBJECT
05714  0 43 22362          BRM     F2S4            PERFORM OBJECT TEST
05715    00000020          DATA    20
05716  0 20 25676          NOP     F2M41
                     *
                     *      TEST 0A18A (SET)
                     *
05717  0 43 00430          BRM     OBJECT
05720  0 43 22341          BRM     F2S3            PERFORM OBJECT TEST
05721    00000040          DATA    40
05722  0 20 25705          NOP     F2M42
                     *
                     *      TEST 0A18A (RESET)
                     *
05723  0 43 00430          BRM     OBJECT
05724  0 43 22362          BRM     F2S4            PERFORM OBJECT TEST
05725    00000040          DATA    40
05726  0 20 25716          NOP     F2M43
                     *
```

```
                    *       TEST 0A17A (SET)
                    *
05727  0 43 00430          BRM     0BJECT
05730  0 43 22341          BRM     F2S3            PERFORM 0BJECT TEST
05731    00000100          DATA    100
05732  0 20 25727          NOP     F2M44
                    *
                    *       TEST 0A17A (RESET)
                    *
05733  0 43 00430          BRM     0BJECT
05734  0 43 22362          BRM     F2S4            PERFORM 0BJECT TEST
05735    00000100          DATA    100
05736  0 20 25740          NOP     F2M45
                    *
                    *       TEST 0A16A (SET)
                    *
05737  0 43 00430          BRM     0BJECT
05740  0 43 22341          BRM     F2S3            PERFORM 0BJECT TEST
05741    00000200          DATA    200
05742  0 20 25751          NOP     F2M46
                    *
                    *       TEST 0A16A (RESET)
                    *
05743  0 43 00430          BRM     0BJECT
05744  0 43 22362          BRM     F2S4            PERFORM 0BJECT TEST
05745    00000200          DATA    200
05746  0 20 25760          NOP     F2M47
                    *
                    *       TEST 0A15A (SET)
                    *
05747  0 43 00430          BRM     0BJECT
05750  0 43 22341          BRM     F2S3            PERFORM 0BJECT TEST
05751    00000400          DATA    400
05752  0 20 25767          NOP     F2M48
                    *
                    *       TEST 0A15A (RESET)
```



```
                    *
05753  0 43 00430          BRM     0BJECT
05754  0 43 22362          BRM     F2S4            PERFORM 0BJECT TEST
05755    00000400          DATA    400
05756  0 20 26000          NOP     F2M49
                    *
                    *       TEST 0A14A (SET)
                    *
05757  0 43 00430          BRM     0BJECT
05760  0 43 22341          BRM     F2S3            PERFORM 0BJECT TEST
05761    00001000          DATA    1000
05762  0 20 26011          NOP     F2M50
                    *
                    *       TEST 0A14A (RESET)
                    *
05763  0 43 00430          BRM     0BJECT
05764  0 43 22362          BRM     F2S4            PERFORM 0BJECT TEST
05765    00001000          DATA    1000
05766  0 20 26020          NOP     F2M51
                    *
                    *       TEST 0A13A (SET)
                    *
05767  0 43 00430          BRM     0BJECT
05770  0 43 22341          BRM     F2S3            PERFORM 0BJECT TEST
05771    00002000          DATA    2000
05772  0 20 26027          NOP     F2M52
                    *
                    *       TEST 0A13A (RESET)
                    *
05773  0 43 00430          BRM     0BJECT
05774  0 43 22362          BRM     F2S4            PERFORM 0BJECT TEST
05775    00002000          DATA    2000
05776  0 20 26041          NOP     F2M53
                    *
                    *       TEST 0A12A (SET)
                    *
```

```
05777  0 43 00430        BRM     OBJECT
06000  0 43 22341        BRM     F2S3            PERFORM OBJECT TEST
06001    00004000        DATA    4000
06002  0 20 26053        NOP     F2M54
                  *
                  *     TEST OA12A (RESET)
                  *
06003  0 43 00430        BRM     OBJECT
06004  0 43 22362        BRM     F2S4            PERFORM OBJECT TEST
06005    00004000        DATA    4000
06006  0 20 26065        NOP     F2M55
                  *
                  *     TEST OA11A (SET)
                  *
06007  0 43 00430        BRM     OBJECT
06010  0 43 22341        BRM     F2S3            PERFORM OBJECT TEST
06011    00010000        DATA    10000
06012  0 20 26077        NOP     F2M56
                  *
                  *     TEST OA11A (RESET)
                  *
06013  0 43 00430        BRM     OBJECT
06014  0 43 22362        BRM     F2S4            PERFORM OBJECT TEST
06015    00010000        DATA    10000
06016  0 20 26111        NOP     F2M57
                  *
                  *     TEST OA10A (SET)
                  *
06017  0 43 00430        BRM     OBJECT
06020  0 43 22341        BRM     F2S3            PERFORM OBJECT TEST
06021    00020000        DATA    20000
06022  0 20 26123        NOP     F2M58
                  *
                  *     TEST OA10A (RESET)
                  *
06023  0 43 00430        BRM     OBJECT
```



```
06024  0 43 22362        BRM     F2S4            PERFORM OBJECT TEST
06025    00020000        DATA    20000
06026  0 20 26135        NOP     F2M59
                  *
                  *     TEST OA09A (SET)
                  *
06027  0 43 00430        BRM     OBJECT
06030  0 43 22341        BRM     F2S3            PERFORM OBJECT TEST
06031    00040000        DATA    40000
06032  0 20 26147        NOP     F2M60
                  *
                  *     TEST OA09A (RESET)
                  *
06033  0 43 00430        BRM     OBJECT
06034  0 43 22362        BRM     F2S4            PERFORM OBJECT TEST
06035    00040000        DATA    40000
06036  0 20 26160        NOP     F2M61
                  *
                  *     TEST OA08A (SET)
                  *
06037  0 43 00430        BRM     OBJECT
06040  0 43 22341        BRM     F2S3            PERFORM OBJECT TEST
06041    00100000        DATA    100000
06042  0 20 26171        NOP     F2M62
                  *
                  *     TEST OA08A (RESET)
                  *
06043  0 43 00430        BRM     OBJECT
06044  0 43 22362        BRM     F2S4            PERFORM OBJECT TEST
06045    00100000        DATA    100000
06046  0 20 26202        NOP     F2M63
                  *
                  *     TEST OA07A (SET)
                  *
06047  0 43 00430        BRM     OBJECT
06050  0 43 22341        BRM     F2S3            PERFORM OBJECT TEST
```

```
06051    00200000        DATA    200000
06052  0 20 26213        NOP     F2M64
                  *
                  *     TEST 0A07A (RESET)
                  *
06053  0 43 00430        BRM     OBJECT
06054  0 43 22362        BRM     F2S4            PERFORM OBJECT TEST
06055    00200000        DATA    200000
06056  0 20 26224        NOP     F2M65
                  *
                  *     TEST 0A06A (SET)
                  *
06057  0 43 00430        BRM     OBJECT
06060  0 43 22341        BRM     F2S3            PERFORM OBJECT TEST
06061    00400000        DATA    400000
06062  0 20 26235        NOP     F2M66
                  *
                  *     TEST 0A06A (RESET)
                  *
06063  0 43 00430        BRM     OBJECT
06064  0 43 22362        BRM     F2S4            PERFORM OBJECT TEST
06065    00040000        DATA    40000
06066  0 20 26246        NOP     F2M67
                  *
                  *     TEST FOR 0A05A GROUNDED
                  *
06067  0 43 00430        BRM     OBJECT
06070  0 43 00440        BRM     RETURN          SET INTERRUPT LINKAGE
06071  0 20 23371        NOP     ENTER
06072  0 76 15443        LDA     BIT5            POTWORD
06073  0 43 23263        BRM     POTPIN
06074  0 72 15443        SKA     BIT5            ADDRESS BIT SET
06075  0 43 00460        BRM     ERROR           YES
06076  0 20 26257        NOP     F2M68
06077  0 43 00434        BRM     END
                  *
```



```
                  *     TEST FOR 0A04A GROUNDED
                  *
06100  0 43 00430        BRM     OBJECT
06101  0 43 00440        BRM     RETURN          SET INTERRUPT LINKAGE
06102  0 20 23371        NOP     ENTER
06103  0 76 15442        LDA     BIT4            POTWORD
06104  0 43 23263        BRM     POTPIN
06105  0 72 15442        SKA     BIT4            ADDRESS BIT SET
06106  0 43 00460        BRM     ERROR           YES
06107  0 20 26275        NOP     F2M69
06110  0 43 00434        BRM     END
                  *
                  *     TEST FOR 0A03A GROUNDED
                  *
06111  0 43 00430        BRM     OBJECT
06112  0 43 00440        BRM     RETURN          SET INTERRUPT LINKAGE
06113  0 20 23371        NOP     ENTER
06114  0 76 15441        LDA     BIT3            POTWORD
06115  0 43 23263        BRM     POTPIN
06116  0 72 15441        SKA     BIT3            ADDRESS BIT SET
06117  0 43 00460        BRM     ERROR           YES
06120  0 20 26313        NOP     F2M70
06121  0 43 00434        BRM     END
                  *
                  *     CHECK FOR INTERFERENCE OF CHANNEL POTS WITH CONTROLLER
                  *
06122  0 43 00430        BRM     OBJECT
06123  0 43 22760        BRM     SETUP2
06124  0 02 10026        EOM     10026           ALERT DISC FILE
06125  0 13 33550        POT     *0              CLEAR ADDRESS REGISTER
06126  0 02*10000        EOM*    10000           ALERT CHANNEL
06127  0 13 33566        POT     *777777         POT TO CHANNEL
06130  0 02 10026        EOM     10026           ALERT DISC FILE
06131  0 33 23330        PIN     TEMP            PIN CONTROLLER ADDRESS REGISTER
06132  0 76 23330        LDA     TEMP
06133  0 72 33851        SKA     **1             ANY ADDRESS REGISTER F.F'S SET
```

```
06134  0 43 00460        BRM     ERR0R           YES
06135  0 20 26331        N0P     F2M71
06136  0 43 00434        BRM     END
                  *
                  *     CHECK FOR INTERFERENCE OF CHANNEL PINS WITH CONTROLLER
                  *
06137  0 43 00430        BRM     0BJECT
06140  0 43 22760        BRM     SETUP2
06141  0 02 10026        E0M     10026           ALERT DISC FILE
06142  0 13 33566        P0T     .777777         SET CONTROLLER ADDRESS REGISTER
06143  0 02.10000        E0M.    10000           ALERT CHANNEL
06144  0 02 14000        E0M     14000           EXTENDED MODE E0M
06145  0 13 33550        P0T     .0
06146  0 02 12000        E0M     12000           ALERT TO PIN CHANNEL ADDRESS
06147  0 33 23330        PIN     TEMP            PIN CHANNEL ADDRESS REGISTER
06150  0 76 23330        LDA     TEMP
06151  0 72 33551        SKA     ..1             CHANNEL ADDRESS REGISTER TEST ZER0S
06152  0 43 00460        BRM     ERR0R           N0
06153  0 20 26354        N0P     F2M72
06154  0 43 00434        BRM     END
                  *
                  *     TEST ABILITY TO VERIFY ADDRESS 0 - N0 MOVEMENT, FILE N0T READY
                  *
06155  0 43 23126        BRM     N0RMAL          N0RMALIZE DISC
06156  0 40 10026        SKS     10026           DISC FILE READY TEST
06157  0 01 06156        BRU     ..1             WAIT FOR CONTROLLER READY
06160  0 02 10026        E0M     10026           ALERT DISC FILE
06161  0 13 33550        P0T     .0
06162  0 43 00430        BRM     0BJECT
06163  0 7A 33550        LDA     .0              P0TW0RD
06164  0 43 22767        BRM     SETUP3
06165  0 01 06204        BRU     F2E9            D0 N0T USE THIS DISC
06166  0 02 10026        E0M     10026           ALERT DISC FILE
06167  0 13 23352        P0T     P0T+RD          SELECT PRESENT P0SITION
06170  0 40 12026        SKS     12026           TRACK VERIFIED TEST
06171  0 01 06173        BRU     ..2             ADDRESS N0T VERIFIED
```



```
06172  0 01 06201        BRU     F2E9+3          0K
06173  0 55 15465        ADD     BIT23
06174  0 73 33567        SKG     .85710          120 MILLISEC ELAPSED YET
06175  0 01 06170        BRU     F2L1            N0
06176  0 43 00460        BRM     ERR0R           TIME0UT ERR0R
06177  0 20 26373        N0P     F2M73
06200  0 01 06204        BRU     F2E9
06201  0 73 33570        SKG     .50000          TIME GREATER THAN 70 MILLISEC
06202  0 43 00460        BRM     ERR0R           N0 - TIME T00 SH0RT
06203  0 20 26422        N0P     F2M73A
06204  0 43 00434  F2E9  BRM     END
                  *
                  *     L0GIC FLOW FOR PRECEEDING 0BJECT TEST
                  *
                  *  1  AX01A   = 2CAAA+3C12A+8I9CA+3C16A                  SET X01
                  *  2  AU01A   = 2PTFA+3X04A+2IGDA+0X01A+8PT2A            SET U01
                  *  3  6RARA0  = 200FA+2U01A+1X04A                        RESET A REG
                  *     6RGRA0  = 200FA+2U01A+1X04A                        RESET G REG
                  *     6RERA0  = 200FA+2U01A                              RESET E REG
                  *  4  AX04A   = 200FA+2U01A+8PT2A                        SET X04
                  *  5  YA23A   = 200FA+0X04A+2U01A+8PT2A+8C23A            SET A REG
                  *  6  AU02A   = 200FA+2U01A+4NBSB+3WHRA                  SET U02
                  *  7  BU01A   = 200FA+0X04A+8PT2A                        RESET U01
                  *  8  2RT0A   = 0X04A+3U01A                              P0T RELEASE
                  *  9  AG01A   = 2PTFA+3U01A+3BYPA+8PT2A+0X04A            SET G01
                  *     AG03A   = 2PTFA+3U01A+3BYPA+8PT2A+0X04A            SET G03
                  *               2BYPA+2U02A+2PAVA+2RDYA                  ST 4 BYPASS
                  * 10  BX04A   = 200FA+8PT1A                             RESET X04
                  *     BU02A   = 200FA+8PT1A                             RESET U02
                  *     BX01A   = 200FA+8PT1A                             RESET X01
                  *     AF01A   = 2PTFA+3U01A+3BYPA+8PT2A+0X04A           STATE 4 NEXT
                  * 11  TK01A   = 0K01A+204FA                             RESET K01
                  *     TK02A   = 0K02A+204FA                             RESET K02
                  *     6RBHA0  = 204FA+3U01A                             RESET B01+04
                  *     6RBLA0  = 204FA+3U01A                             RESET B05+08
                  *     BB09A   = 204FA+3U01A+2CK0A                       RESET B09
```

```
                    * 12   AD04A   = 2SC1A                                  D REGISTER =
                    *                2SC1A=SECTOR 1 PULSE                    USED TO
                    *      BD04A   = 2SC0A                                  DECODE SEC-
                    *                2SC0A=SECTOR 0 PULSE                    TOR DATA
                    *      AD03A   = 0D04A.2SC0A                            PULSES
                    *      BD03A   = 1D04A.2SC0A
                    *      AD02A   = 0D03A.4SC0A
                    *      BD02A   = 1D03A.4SC0A
                    *      AD01A   = 4SC0A.(0D02A+0D03A)
                    *      BD01A   = 4SC0A
                    * 13   AX05A   = 0D01A.0D02A.1D03A.4SC0A                INNER ZONE
                    *      BX05A   = 2SC0A                                  SECTOR
                    * 14   2IZSA   = 0X05A
                    * 15   SGBA0   = 2G03A.2CKGA                            SET G02
                    *      RGCA0   = 2CKGA                                  RESET G03
                    *                2CKGA=3U01A.204FA.2IZSA
                    * 16   SGCA0   = 2CKGA                                  SET G03
                    * 17   AU01A   = 204FA.207GA.1U04A.9RDYA.2IZSA          SET U01
                    *                207GA= G01A. G02A. G03A
                    *                9RDYA=FILE NOT READY
                    * 18   AP01A   = 2U01A.204FA.2CK0A                      SET P01
                    *      BP01A   = AF01A                                  RESET P01
                    * 19   AU03A   = 204FA.2U01A.2SC1A.2IZSA.2RDYA          SET U03
                    * 20   BU03A   = 204FA.2U01A.2IZSA                      RESET U03
                    *      BU01A   = 204FA.2U03A.2IZSA                      RESET U01
                    * 21   BF01A   = 204FA.3U02A.3U01A.2BGAA                RESET F01
                    *                2BGAA=2RDYA.2PAVA.2IZSA.207GA           STATE 1 NEXT
                    *      AF03A   = 204FA.3U02A.3U01A.2BGAA                SET F03
                    * 22   AU04A   = 201FA.3U03A.8HLTB.6Q20A                SET U04
                    *                8HLTB=FORCED TRUE IN SINGLE ACCESS
                    * 23   8INLA   = 201FA.2U04A.1X03A                      SEND INT
                    * 24   AU03A   = 201FA.2U04A.8Q20A                      SET U03
                    * 25   BU04A   = 201FA.2U03A.6Q20A                      RESET U04
                    *
                    *      CONTROLLER IS NOW IN WAIT STATE ONE WAITING FOR THE BUFFER TO
                    *      CONNECT FOR DATA TRANSMISSION. VERIFICATION WILL NOW TAKE PLACE.
```



```
                    *
                    *      TIMING FOR SEQUENCE SHOULD BE 116 MILLISEC.
                    *
                    *      TEST ABILITY TO VERIFY ADDRESS 0 . MOVEMENT INVOLVED, FILE READY
                    *
06205  0 43 00430           BRM     OBJECT
06206  0 76 33850           LDA     =0              POTWORD
06207  0 43 22767           BRM     SETUP3
06210  0 01 06231           BRU     F2E10           DO NOT USE THIS DISC
06211  0 02 10026           EOM     10026           ALERT DISC FILE
06212  0 13 15456           POT     BIT16           MOVE TO POSITION 1
06213  0 43 23315           BRM     .500            WAIT 500 MILLISEC
06214  0 02 10026           EOM     10026           ALERT DISC FILE
06215  0 13 23352           POT     POTARD          MOVE TO POSITION 0
06216  0 40 12026           SKS     12026           TRACK VERIFIED TEST
06217  0 01 06221           BRU     *+2             TRACK NOT VERIFIED
06220  0 01 06226           BRU     F2L3
06221  0 55 15465           ADD     BIT23
06222  0 73 33571           SKG     =35714D         500 MILLISEC ELAPSED YET
06223  0 01 06216           BRU     F2L2            NO
06224  0 43 00460           BRM     ERROR           500 MILLISEC TIMEOUT
06225  0 20 26460           NOP     F2M74
06226  0 73 33567  F2L3     SKG     =85710          TIME > 120 MILLISEC
06227  0 43 00460           BRM     ERROR           NO . TIME TOO SHORT
06230  0 20 26507           NOP     F2M74A
06231  0 43 00434  F2E10    BRM     END
                    *
                    *      LOGIC FLOW FOR PRECEEDING OBJECT TEST
                    *
                    *  1   AX01A   = 2CAAA.3C12A.8I8CA.3C16A                 SET X01
                    *  2   AU01A   = 2PTFA.3X04A.2IGDA.0X01A.8PT2A           SET U01
                    *  3   6RARA0  = 200FA.2U01A.1X04A                       RESET A REG
                    *      6RGRA0  = 200FA.2U01A.1X04A                       RESET G REG
                    *      6RERA0  = 200FA.2U01A                             RESET E REG
                    *  4   AX04A   = 200FA.2U01A.8PT2A                       SET X04
                    *  5   YA23A   = 200FA.0X04A.2U01A.8PT2A.8C23A           SET A REG
```

```
*  6   AU02A   = 200FA*2U01A*4NBSB*3WHRA                    SET U02
*  7   BU01A   = 200FA*0X04A*8PT2A                          RESET U01
*  8   2RTCA   = 0X04A*3U01A                                POT RELEASE
*  9   AG01A   = 2PTFA*3U01A*3BYPA*8PT2A*0X04A              SET G01
*      AG03A   = 2PTFA*3U01A*3BYPA*8PT2A*0X04A              SET G03
*                2BYPA=2U02A*2PAVA*2RDYA                    ST 4 BYPASS
*  10  BX04A   = 200FA*8PT1A                                RESET X04
*      BU02A   = 200FA*8PT1A                                RESET U02
*      BX01A   = 200FA*8PT1A                                RESET X01
*      AF01A   = 2PTFA*3U01A*3BYPA*8PT2A*0X04A              STATE 4 NEXT
*  11  TK01A   = 0K01A*204FA                                RESET K01
*      TK02A   = 0K02A*204FA                                RESET K02
*      6RBHA0  = 204FA*3U01A                                RESET B01=04
*      6RBLA0  = 204FA*3U01A                                RESET B05=08
*      BB09A   = 204FA*3U01A*2CK0A                          RESET B09
*  13  SGBA0   = 2G03A*2CKGA                                SET G02
*      RGCA0   = 2CKGA                                      RESET G03
*                2CKGA=3U01A*204FA*2IZSA
*  14  SGCA0   = 2CKGA                                      SET G03
*  15  AU01A   = 204FA*207GA*3PAVA*2IZSA                    SET U01
*  16  AP01A   = 2U01A*204FA*2CK0A                          SET P01
*  17  8SPRA   = 204FA*0P01A                                SEL AND OPER
*  18  AU03A   = 204FA*2U01A*2SC1A*2IZSA*2RDYA              SET U03
*  19  BU03A   = 204FA*2U01A*2IZSA                          RESET U03
*  20  BU01A   = 204FA*2U03A*2IZSA                          RESET U01
*      BF01A   = 204FA*2BUBA*3WHRA*2IZSA                    STATE 2 NEXT
*      AF02A   = 204FA*2BUBA*3WHRA*2IZSA
*                2BUBA=2U01A*2U03A
*  21  AU01A   = 223FA*2SECA                                SET U01
*                2SECA=2IZSA*2IZHA
*  22  2CKBA   = 223FA*2IUBA*2CK0A                          B REG CLOCK
*                7IUBA=2U02A*3U01A
*                2CK0A=FILE WRITE CLOCK
*  23  SB09A   = 2CKBA*1B09A                                SET B09
*      RB09A   = 2CKBA*0B09A                                RESET B09
*      SB08A   = 2CKBA*1B08A*0B09A*1B07A                    SET B08
```



```
*      RB08A   = 2CKBA*0B08A*0B09A*1B07A                    RESET B08
*      SB07A   = 2CKBA*1B07A*2CT3A                          SET B07
*                2CT3A=0B08A*0B09A
*      RB07A   = 2CKBA*0B07A*2CT5A                          RESET B07
*                2CT5A=0B07A*0B09A
*      SB06A   = 2CKBA*1B06A*2CT5A                          SET B06
*      RB06A   = 2CKBA*0B06A*2CT5A                          RESET B06
*      SB05A   = 2CKBA*1B05A*0B06A*2CT5A                    SET B05
*      RB05A   = 2CKBA*0B05A*0B06A*2CT5A                    RESET B05
*      SB04A   = 2CKBA*1B04A*2CT5A*2H03A                    SET B04
*      RB04A   = 2CKBA*0B04A*2CT5A*2H03A                    RESET B04
*                2H03A=0B05A*0B06A
*      SB03A   = CB03A*1B03A                                SET B03
*      RB03A   = CB03A*0B03A                                RESET B03
*                CB03A=2CT5A*2CKBA*2H07A
*                2H07A=0B04A*0B05A*0B06A
*  24  265BA   = 0B03A*0B05A*2CT5A                          COUNT = 65
*  25  BU01A   = 223FA*265BA*2CK0A                          RESET U01
*      AU02A   = 223FA*265BA*2CK0A                          SET U02
*  26  CB03A   = 202FA*3U01A*0B03A*2CK0A                    RESET B03
*      3RBLA   = 202FA*3U01A                                RESET B05=08
*      BB09A   = 202FA*3U01A*2CK0A                          RESET B09
*      AU03A   = 223FA*2IUAA*2RDKA                          SET U03
*                2RDKA=2RD0A*2RD1A
*  27  AU01A   = 223FA*2U02A*2RD1A                          SET U01
*  28  2CKBA   = 223FA*2BUAA*2RDKA                          B REG CLOCK
*                2BUAA=2U01A*2U02A
*  29  AU04A   = 223FA*2U02A*2H00A*2CT1A*2RDKA              SET U04
*                2H00A=1B05A*1B06A
*                2CT1A=1B07A*1B08A*0B09A
*  30  UP02A   = 223FA*3U01A                                SET P02
*      AP02A   = 223FA*2BUAA*2RD1A                          SET P02
*      BP02A   = 223FA*2BUAA*2RD1A                          RESET P02
*  31  2CKGA   = 223FA*2IXDA                                RESET G REG
*                2IXDA=INDEX PULSE
*
*
```

```
                    * 32   IF PARITY ERROR OR INEQUALITY:
                    *
                    *      BU03A   = 223FA.2U02A.2H03A.2CT2A.0P02A.2RD0A        PARITY ERROR
                    *                +223FA.2U02A.2H03A.2CT2A.1P02A.2RD1A
                    *      BU03A   = QUCAO+XUCAO+ZUCAQ+VUCAO                    INEQUALITY
                    *      6RBHAO  = 202FA.2IUEA.2H03A.2CT3A                    RESET B01-04
                    *                7IUEAO=2U03A.3U02A
                    *      TK02A   = 0K02A.202FA.2IUEA.2H03A.2CT3A              RESET K02
                    *      TK01A   = 0K01A.202FA.2IUEA.2H03A.2CT3A              RESET K01
                    *
                    *      IF EQUALITY AND NO PARITY ERROR:
                    *
                    *      CB02A   = 202FA.2IZSA                                TOGGLE B02
                    *      CB01A   = 202FA.0B02A.2IZSA                          TOGGLE B01
                    *      TK02A   = 202FA.2H48A.2IZSA                          TOGGLE K02
                    *                7H48AO=1B01A+1B02A
                    *      TK01A   = 202FA.2H48A.0K02A.2IZSA                    TOGGLE K01
                    * 33   RU04A   = 202FA.2U02A.2H02A.2CT2A.2RDKA              RESET U04
                    *                2H02A=0B05A.1B06A
                    *                2CT2A=0B08A.1B09A
                    * 34   BU01A   = 223FA.2U02A.2H03A.2CT3A.2RDKA              RESET U01
                    *      BU02A   = 223FA.2H03A.2CT3A.2RDKA                    RESET U02
                    * 35   AF03A   = 202FA.2IGCA                               STATE 1 NEXT
                    *      BF02A   = 202FA.3BNCA.2IGCA                          BUFFER CONN.
                    *                7IGCAO=1K01A+1K02A+2SECA+1B01A+1B02A
                    *                2BNCA=2X03A.8FHAF
                    *      BU03A   = 202FA.2IGCA                                RESET U03
                    *      BG01A   = 202FA.2IGCA                                RESET G01
                    *      BG02A   = 202FA.2IGCA                                RESET G02
                    *      BG03A   = 202FA.2IGCA                                RESET G03
                    *
                    *      CONTROLLER IS NOW IN WAIT STATE ONE WAITING FOR THE BUFFER TO
                    *      CONNECT FOR DATA TRANSMISSION. VERIFICATION WILL NOW TAKE PLACE.
                    *
                    *      IF SEVEN DISC REVOLUTIONS HAD TAKEN PLACE WITHOUT VERIFICATION,
                    *      LOGIC FLOW WOULD HAVE BEEN AS FOLLOWS DURING STATE TWO:
```



```
                    *
                    *      AE03A   = 202FA.0G01A.0G02A.2TUGA                    SET E03
                    *                2TUGA=NOT  [1U04A+1G03A]
                    *      8INLA   = 202FA.0G01A.0G02A.2TUGA                    INTERRUPT
                    *      9YHSA   = NOT  [0X06A.2MHAA]
                    *                YX06A=202FA.0G01A.0G02A.2TUGA              SET X06
                    *      BF02A   = 202FA.0G01A.0G02A.2TUGA                    STATE 0 NEXT
                    *
                    *      NOTE: SEEK ERROR INDICATOR WOULD BE ON (1E01.1E02.0E03)
                    *
                    *      TIMING FOR SEQUENCE SHOULD BE APPROXIMATELY 145 TO 220 MILLISEC.
                    *
                    *      TEST ABILITY TO VERIFY ADDRESS 0 + NO MOVEMENT, FILE READY
                    *
06232  0 43 00430           BRM     OBJECT
06233  0 76 33550           LDA     #0              POTWORD
06234  0 43 22767           BRM     SETUP3
06235  0 01 06261           BRU     F2E52           DO NOT USE THIS DISC
06236  0 02 10026           EOM     10026           ALERT DISC FILE
06237  0 13 23352           POT     POTWRD          POT TO CONTROLLER
06240  0 43 23143           BRM     WAIT            WAIT FOR CONTROLLER READY
06241  0 01 06261           BRU     F2E52           ERROR ABORT
06242  0 02 10026           EOM     10026           ALERT DISC FILE
06243  0 13 23352           POT     POTWRD          POT TO CONTROLLER
06244  0 40 12026           SKS     12026           TRACK VERIFIED TEST
06245  0 01 06247           BRU     *+2             TRACK NOT VERIFIED
06246  0 01 06255           BRU     F2L32
06247  0 55 15465           ADD     BIT23
06250  0 73 33571           SKG     #357140         500 MILLISEC ELAPSED YET
06251  0 01 06244           BRU     F2L31           NO - LOOP
06252  0 43 00460           BRM     ERROR           500 MILLISEC TIMEOUT
06253  0 00 27542           NOP     F2M116
06254  0 01 06256           BRU     *+2
06255  0 73 33570  F2L32     SKG     #50000          TIME < 70 MILLISEC
06256  0 01 06260           BRU     *+2             YES - OK
06257  0 43 00460           BRM     ERROR           TIME TOO LONG
```

```
06260  0 20 27871          NOP     F2M117
06261  0 43 00434  F2E52    BRM     END
                   *
                   *       LOGIC FLOW FOR PRECEEDING OBJECT TEST
                   *
                   *  1    AX01A   = 2CAAA.3C12A.8I0CA.3C16A                    SET X01
                   *  2    AU01A   = 2PTFA.3X04A.2IGDA.0X01A.8PT2A              SET U01
                   *  3    6RARA0  = 200FA.2U01A.1X04A                          RESET A REG
                   *       6RGRA0  = 200FA.2U01A.1X04A                          RESET G REG
                   *       6RERA0  = 200FA.2U01A                                RESET E REG
                   *  4    AX04A   = 200FA.2U01A.8PT2A                          SET X04
                   *  5    YA23A   = 200FA.0X04A.2U01A.8PT2A.8C23A              SET A REG
                   *  6    AU02A   = 200FA.2U01A.4NB8B.3WHRA                    SET U02
                   *  7    BU01A   = 200FA.0X04A.8PT2A                          RESET U01
                   *  8    2RTOA   = 0X04A.3U01A                                POT RELEASE
                   *  9    AF02A   = 2PTFA.2BYPA                                STATE 3 NEXT
                   *                 2BYPA.2U02A.2PAVA.2RDYA                   ST. 4 BYPASS
                   *       AF03A   = 2PTFA.2BYPA
                   *       BU02A   = 200FA.8PT1A                                RESET U02
                   *       BX01A   = 200FA.8PT1A                                RESET X01
                   *       BX04A   = 200FA.8PT1A                                RESET X04
                   * 10    6RBHA0  = 0F03A.3U01A                                RESET B01-04
                   *       6RBLA0  = 0F03A.3U01A                                RESET B05-08
                   *       RBIA0   = 0F03A.3U01A.2CK0A                          RESET B09
                   * 11    AU01A   = 223FA.2SECA                                SET U01
                   * 12    2CKBA   = 223FA.2IUBA.2CK0A                          B REG CLOCK
                   * 13    265BA   = 0803A.0805A.2CT3A                          COUNT = 65
                   * 14    BU01A   = 223FA.265BA.2CK0A                          RESET U01
                   *       AU02A   = 223FA.265BA.2CK0A                          SET U02
                   * 15    6RBHA0  = 0F03A.3U01A                                RESET B01-04
                   *       6RBLA0  = 0F03A.3U01A                                RESET B05-08
                   *       RBIA0   = 0F03A.3U01A.2CK0A                          RESET B09
                   * 16    AU03A   = 223FA.2IUAA.2RDKA                          SET U03
                   *       AU01A   = 223FA.2U02A.2RD1A                          SET U01
                   * 17    2CKBA   = 223FA.2U01A.2U02A.2RDKA                    B REG CLOCK
                   * 18    AU04A   = 223FA.2U01A.2H00A.2CT1A.2RDKA              SET U04
```



```
                   *
                   *       IF PARITY ERROR OR INEQUALITY!
                   *
                   *       BU03A   = 223FA.2U02A.2H03A.2CT2A.0P02A.2RD0A        PARITY ERROR
                   *                +223FA.2U02A.2H03A.2CT2A.1P02A.2RD1A
                   *                + QUCA+ XUCA+ VUCA+ ZUCA                    INEQUALITY
                   * 19    RU04A   = 2RDKA.2CT1A.2H03A.2U02A.203FA              RESET U04
                   * 20    BU02A   = 223FA.2RDKA.2CT3A.2H03A                    RESET U02
                   *       BU03A   = 203FA.2IUAA.2RDKA.2CT3A.2H03A              RESET U03
                   *                 2IUAA+ U01+ U02+ U03
                   *       BU01A   = 2U02A.2RDKA.2CT3A.2H03A.223FA              RESET U01
                   *       AG01A   = 203FA.2IUAA.2RDKA.2CT3A.2H03A              SET G REG TO
                   *       BG02A   = 203FA.2IUAA.2RDKA.2CT3A.2H03A                FIVE
                   *       AG03A   = 203FA.2IUAA.2RDKA.2CT3A.2H03A
                   *       AF01A   = 203FA.2IUAA.2RDKA.2CT3A.2H03A              STATE 4 NEXT
                   *       BF02A   = 203FA.2IUAA.2RDKA.2CT3A.2H03A.3Y9CA
                   *       BF03A   = 203FA.2IUAA.2RDKA.2CT3A.2H03A.3BNCA
                   * 21    TK01A   = 0K01A.204FA                                RESET K01
                   *       TK02A   = 0K02A.204FA                                RESET K02
                   *       6RBHA0  = 204FA.3U01A                                RESET B01-04
                   *       6RBLA0  = 204FA.3U01A                                RESET B05-08
                   *       BB09A   = 204FA.3U01A.2CK0A                          RESET B09
                   * 22    2CKGA   = 3U01A.204FA.2IZSA                          G REG CLOCK
                   * 23    AU03A   = 204FA.2IZSA.2U01A.2RDYA.2SC1A              SET U03
                   * 24    BU03A   = 204FA.2U01A.2IZSA                          RESET U03
                   *       BU01A   = 204FA.2U03A.2IZSA                          RESET U01
                   * 25    BF01A   = 204FA.3U02A.3U01A.2BGAA                    STATE 1 NEXT
                   *       AF03A   = 204FA.3U02A.3U01A.2BGAA
                   *
                   *       CONTROLLER IS NOW IN WAIT STATE ONE, TIMING FOR SEQUENCE SHOULD
                   *       BE FROM 16 TO 68 MILLISEC.
                   *
                   *       TEST VERIFICATION LOGIC
                   *
06262  0 43 00430          BRM     OBJECT
06263  0 43 22402          BRM     F255            PERFORM OBJECT TEST
```

```
06264    00777777        DATA    777777
06265  0 20 26551        NOP     F2M75
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06266  0 43 00430        BRM     OBJECT
06267  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06270    00400000        DATA    400000
06271  0 20 26620        NOP     F2M76
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06272  0 43 00430        BRM     OBJECT
06273  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06274    00200000        DATA    200000
06275  0 20 26653        NOP     F2M77
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06276  0 43 00430        BRM     OBJECT
06277  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06300    00100000        DATA    100000
06301  0 20 26700        NOP     F2M78
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06302  0 43 00430        BRM     OBJECT
06303  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06304    00040000        DATA    40000
06305  0 20 26730        NOP     F2M79
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06306  0 43 00430        BRM     OBJECT
06307  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06310    00020000        DATA    20000
```



```
06311  0 20 26756        NOP     F2M80
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06312  0 43 00430        BRM     OBJECT
06313  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06314    00010000        DATA    10000
06315  0 20 27015        NOP     F2M81
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06316  0 43 00430        BRM     OBJECT
06317  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06320    00004000        DATA    4000
06321  0 20 27040        NOP     F2M82
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06322  0 43 00430        BRM     OBJECT
06323  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06324    00002000        DATA    2000
06325  0 20 27063        NOP     F2M83
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06326  0 43 00430        BRM     OBJECT
06327  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06330    00001000        DATA    1000
06331  0 20 27111        NOP     F2M84
                  *
                  *     TEST VERIFICATION LOGIC
                  *
06332  0 43 00430        BRM     OBJECT
06333  0 43 22402        BRM     F2S5            PERFORM OBJECT TEST
06334    00000400        DATA    400
06335  0 20 27135        NOP     F2M85
```

```
                    *
                    *       TEST VERIFICATION LOGIC
                    *
06336  0 43 00430           BRM     OBJECT
06337  0 43 22402           BRM     F285            PERFORM OBJECT TEST
06340    00000200           DATA    200
06341  0 20 27162           NOP     F2M86
                    *
                    *       TEST VERIFICATION LOGIC
                    *
06342  0 43 00430           BRM     OBJECT
06343  0 43 22402           BRM     F285            PERFORM OBJECT TEST
06344    00000100           DATA    100
06345  0 20 27207           NOP     F2M87
                    *
                    *       TEST VERIFICATION LOGIC
                    *
06346  0 43 00430           BRM     OBJECT
06347  0 43 22402           BRM     F285            PERFORM OBJECT TEST
06350    00000040           DATA    40
06351  0 20 27233           NOP     F2M88
                    *
                    *       TEST PAVA LOGIC
                    *
06352  0 43 00430           BRM     OBJECT
06353  0 43 22427           BRM     F2S6            PERFORM OBJECT TEST
06354    00000000           DATA    0
06355    00017400           DATA    17600
06356  0 20 27255           NOP     F2M89
                    *
                    *       TEST PAVA LOGIC
                    *
06357  0 43 00430           BRM     OBJECT
06360  0 43 22427           BRM     F2S6            PERFORM OBJECT TEST
06361    00777777           DATA    777777
06362    00760000           DATA    760000
```



```
06363  0 20 27255           NOP     F2M89
                    *
                    *       TEST PAVA LOGIC
                    *
06364  0 43 00430           BRM     OBJECT
06365  0 43 22427           BRM     F2S6            PERFORM OBJECT TEST
06366    00777777           DATA    777777
06367    00377777           DATA    377777
06370  0 20 27274           NOP     F2M90
                    *
                    *       TEST PAVA LOGIC
                    *
06371  0 43 00430           BRM     OBJECT
06372  0 43 22427           BRM     F2S6            PERFORM OBJECT TEST
06373    00777777           DATA    777777
06374    00577777           DATA    577777
06375  0 20 27301           NOP     F2M91
                    *
                    *       TEST PAVA LOGIC
                    *
06376  0 43 00430           BRM     OBJECT
06377  0 43 22427           BRM     F286            PERFORM OBJECT TEST
06400    00777777           DATA    777777
06401    00677777           DATA    677777
06402  0 20 27306           NOP     F2M92
                    *
                    *       TEST PAVA LOGIC
                    *
06403  0 43 00430           BRM     OBJECT
06404  0 43 22427           BRM     F2S6            PERFORM OBJECT TEST
06405    00777777           DATA    777777
06406    00737777           DATA    737777
06407  0 20 27313           NOP     F2M93
                    *
                    *       TEST PAVA LOGIC
                    *
```

```
06410  0 43 00430        BRM     OBJECT
06411  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06412    00777777        DATA    777777
06413    00757777        DATA    757777
06414  0 20 27320        NOP     F2M94
                  *
                  *      TEST PAVA LOGIC
                  *
06415  0 43 00430        BRM     OBJECT
06416  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06417    00777777        DATA    777777
06420    00767777        DATA    767777
06421  0 20 27325        NOP     F2M95
                  *
                  *      TEST PAVA LOGIC
                  *
06422  0 43 00430        BRM     OBJECT
06423  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06424    00777777        DATA    777777
06425    00773777        DATA    773777
06426  0 20 27332        NOP     F2M96
                  *
                  *      TEST PAVA LOGIC
                  *
06427  0 43 00430        BRM     OBJECT
06430  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06431    00777777        DATA    777777
06432    00775777        DATA    775777
06433  0 20 27337        NOP     F2M97
                  *
                  *      TEST PAVA LOGIC
                  *
06434  0 43 00430        BRM     OBJECT
06435  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06436    00777777        DATA    777777
06437    00776777        DATA    776777
```



```
06440  0 20 27344        NOP     F2M98
                  *
                  *      TEST PAVA LOGIC
                  *
06441  0 43 00430        BRM     OBJECT
06442  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06443    00777777        DATA    777777
06444    00777377        DATA    777377
06445  0 20 27351        NOP     F2M99
                  *
                  *      TEST PAVA LOGIC
                  *
06446  0 43 00430        BRM     OBJECT
06447  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06450    00777777        DATA    777777
06451    00777577        DATA    777577
06452  0 20 27356        NOP     F2M100
                  *
                  *      TEST PAVA LOGIC
                  *
06453  0 43 00430        BRM     OBJECT
06454  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06455    00000000        DATA    0
06456    00400000        DATA    400000
06457  0 20 27363        NOP     F2M101
                  *
                  *      TEST PAVA LOGIC
                  *
06460  0 43 00430        BRM     OBJECT
06461  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06462    00000000        DATA    0
06463    00200000        DATA    200000
06464  0 20 27372        NOP     F2M102
                  *
                  *      TEST PAVA LOGIC
                  *
```

```
06465  0 43 00430        BRM     OBJECT
06466  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06467    00000000        DATA    0
06470    00100000        DATA    100000
06471  0 20 27401        NOP     F2M103
                  *
                  *      TEST PAVA LOGIC
                  *
06472  0 43 00430        BRM     OBJECT
06473  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06474    00000000        DATA    0
06475    00040000        DATA    40000
06476  0 20 27410        NOP     F2M104
                  *
                  *      TEST PAVA LOGIC
                  *
06477  0 43 00430        BRM     OBJECT
06500  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06501    00000000        DATA    0
06502    00020000        DATA    20000
06503  0 20 27417        NOP     F2M105
                  *
                  *      TEST PAVA LOGIC
                  *
06504  0 43 00430        BRM     OBJECT
06505  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06506    00000000        DATA    0
06507    00010000        DATA    10000
06510  0 20 27426        NOP     F2M106
                  *
                  *      TEST PAVA LOGIC
                  *
06511  0 43 00430        BRM     OBJECT
06512  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06513    00000000        DATA    0
06514    00004000        DATA    4000
```



```
06515  0 20 27436        NOP     F2M107
                  *
                  *      TEST PAVA LOGIC
                  *
06516  0 43 00430        BRM     OBJECT
06517  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06520    00000000        DATA    0
06521    00002000        DATA    2000
06522  0 20 27445        NOP     F2M108
                  *
                  *      TEST PAVA LOGIC
                  *
06523  0 43 00430        BRM     OBJECT
06524  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06525    00000000        DATA    0
06526    00001000        DATA    1000
06527  0 20 27454        NOP     F2M109
                  *
                  *      TEST PAVA LOGIC
                  *
06530  0 43 00430        BRM     OBJECT
06531  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06532    00000000        DATA    0
06533    00000400        DATA    400
06534  0 20 27463        NOP     F2M110
                  *
                  *      TEST PAVA LOGIC
                  *
06535  0 43 00430        BRM     OBJECT
06536  0 43 22427        BRM     F2S6            PERFORM OBJECT TEST
06537    00000000        DATA    0
06540    00000200        DATA    200
06541  0 20 27472        NOP     F2M111
                  *
                  *      TEST &SIGAD
                  *
```

```
06542  0 43 00430          BRM     OBJECT
06543  0 76 33550          LDA     =0
06544  0 43 22767          BRM     SETUP3
06545  0 01 06556          BRU     F2E58           DO NOT USE ADDRESSED DISC
06546  0 02 10026          EOM     10026           ALERT DISC FILE
06547  0 13 23352          POT     POTWRD          POSITION ARM
06550  0 71 33572          LDX     =-39970         7 MILLISEC DELAY
06551  0 41 06551          BRX     *
06552  0 40 10026          SKS     10026           DISC FILE READY TEST
06553  0 01 06555          BRU     *+2             CONTROLLER SHOULD NOT BE READY YET
06554  0 43 00460          BRM     ERROR
06555  0 20 27502          NOP     F2M112
06556  0 43 00434  F2E58   BRM     END
                    *
                    *       TEST 6S10A0
                    *
06557  0 43 00430          BRM     OBJECT
06560  0 76 33550          LDA     =0              POTWORD
06561  0 43 22767          BRM     SETUP3
06562  0 01 06572          BRU     F2E49           DO NOT USE ADDRESSED DISC
06563  0 02 10026          EOM     10026           ALERT DISC FILE
06564  0 13 23352          POT     POTWRD          POT TO CONTROLLER
06565  0 40 12026          SKS     12026           TRACK VERIFIED TEST
06566  0 01 06565          BRU     *-1             WAIT FOR VERIFICATION
06567  0 40 10026          SKS     10026           DISC FILE READY TEST
06570  0 43 00460          BRM     ERROR           CONTROLLER NOT READY
06571  0 20 27511          NOP     F2M113
06572  0 43 00434  F2E49   BRM     END
                    *
                    *       TEST 6S10A0
                    *
06573  0 43 00430          BRM     OBJECT
06574  0 76 33550          LDA     =0              POTWORD
06575  0 43 22767          BRM     SETUP3
06576  0 01 06607          BRU     F2E50           DO NOT USE ADDRESSED DISC
06577  0 02 10026          EOM     10026           ALERT DISC FILE
```



```
06600  0 13 23352          POT     POTWRD          POT TO DISC
06601  0 40 12026          SKS     12026           TRACK VERIFIED TEST
06602  0 01 06601          BRU     *-1             WAIT FOR VERIFICATION
06603  0 40 16026          SKS     16026           SHOULD NOT SKIP
06604  0 01 06606          BRU     *+2             OK
06605  0 43 00460          BRM     ERROR
06606  0 20 27516          NOP     F2M114
06607  0 43 00434  F2E50   BRM     END
                    *
                    *       TEST 6S10A0
                    *
06610  0 43 00430          BRM     OBJECT
06611  0 76 33550          LDA     =0              POTWORD
06612  0 43 22767          BRM     SETUP3
06613  0 01 06624          BRU     F2E51           DO NOT USE ADDRESSED DISC
06614  0 02 10026          EOM     10026           ALERT DISC FILE
06615  0 13 23352          POT     POTWRD          POT TO DISC
06616  0 40 12026          SKS     12026           TRACK VERIFIED TEST
06617  0 01 06616          BRU     *-1             WAIT FOR VERIFICATION
06620  0 40 12226          SKS     12226           SHOULD NOT SKIP
06621  0 01 06623          BRU     *+2             OK
06622  0 43 00460          BRM     ERROR
06623  0 20 27530          NOP     F2M115
06624  0 43 00434  F2E51   BRM     END
                    *
                    *       SECTOR VERIFICATION LOGIC CHECK
                    *
06625  0 43 00430          BRM     OBJECT
06626  0 43 22465          BRM     F2S7            PERFORM OBJECT TEST
06627    00777777          DATA    777777
06630  0 20 27432          NOP     F2M118
                    *
                    *       SECTOR VERIFICATION LOGIC CHECK
                    *
06631  0 43 00430          BRM     OBJECT
06632  0 43 22465          BRM     F2S7            PERFORM OBJECT TEST
```

```
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06633     00000002          DATA    2
06634  0 20 27461          NOP     F2M119
                    *
                    *       SECTOR VERIFICATION LOGIC CHECK
                    *
06635  0 43 00430          BRM     OBJECT
06636  0 43 22465          BRM     F2S7            PERFORM OBJECT TEST
06637     00000001          DATA    1
06640  0 20 27710          NOP     F2M120
                    *
                    *       TEST FOR ERRORS DURING VERIFICATION
                    *
06641  0 43 00430          BRM     OBJECT
06642  0 76 33550          LDA     =0              POTWORD
06643  0 43 22767          BRM     SETUP3
06644  0 01 06457          BRU     F2E56           DISC OUT OF BOUNDS
06645  0 02 10026          EOM     10026           ALERT DISC FILE
06646  0 13 23352          POT     POTWRD          POT TO DISC
06647  0 40 12026          SKS     12026           TRACK VERIFIED TEST
06650  0 01 06447          BRU     **1             WAIT FOR VERIFICATION
06651  0 02 10026          EOM     10026           ALERT DISC FILE
06652  0 13 23352          POT     POTWRD          POT TO DISC
06653  0 43 23315          BRM     W500            WAIT 500 MILLISEC
06654  0 40 11026          SKS     11026           DISC FILE ERROR TEST
06655  0 43 00460          BRM     ERROR           CONTROLLER ERROR SET
06656  0 20 27736          NOP     F2M121
06657  0 43 00434  F2E56    BRM     END
                    *
                    *       TEST FOR ERRORS DURING VERIFICATION
                    *
06660  0 43 00430          BRM     OBJECT
06661  0 76 33550          LDA     =0              POTWORD
06662  0 43 22767          BRM     SETUP3
06663  0 01 06476          BRU     F2E57           DISC OUT OF BOUNDS
06664  0 02 10026          EOM     10026           ALERT DISC FILE
06665  0 13 15456          POT     BIT16           MOVE ARM TO POSITION 1
```

```
DISCW  TAP=3.0                          PAGE 82

06666  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
06667  0 01 06476          BRU     F2E57           ERROR ABORT
06670  0 02 10026          EOM     10026           ALERT DISC FILE
06671  0 13 23352          POT     POTWRD          MOVE TO POSITION 0
06672  0 43 23315          BRM     W500            WAIT 500 MILLISEC
06673  0 40 11026          SKS     11026           DISC FILE ERROR TEST
06674  0 43 00460          BRM     ERROR           CONTROLLER ERROR SET
06675  0 20 27762          NOP     F2M122
06676  0 43 00434  F2E57    BRM     END
06677  0 43 00456  ENDF2    BRM     FDONE           EXIT THIS FUNCTION
```

```
                    *
                    *       FUNCTION PARAMETER TABLES
                    *
06700  0 20 06706   FPT2    NOP     FIM2            FUNCTION IDENTIFIER MESSAGE
06701  0 20 06726           NOP     FAM2            FUNCTION ABSTRACT MESSAGE
06702  0 20 05476           NOP     FVM1            FUNCTION VARIABLES MESSAGE
06703  0 01 05011           ONE     FVT1            FUNCTION VARIABLES (NONE)
06704  0 00 07100           PZE     FUNC3           POINTER TO NEXT FUNCTION
06705    10000000           DATA    10000000        FUNCTION IDENTIFIER BIT (BIT 2)
                    *
                    *       FUNCTION MESSAGES
                    *
06706    52261000   FIM2    BCD     ' F 02 . DISC FILE CONTROLLER DIAGNOSTIC WITH NO DATA'
06707    02124212
06710    24316223
06711    12263143
06712    25122346
06713    45635146
06714    43432551
06715    12243121
06716    27454662
06717    63312312
06720    66316330
06721    12454412
06722    24216321
06723    12635121           BCD     ' TRANSFER!!'
06724    45622425
06725    51371212
06726    52322431   FAM2    BCD     '  DISC FILE CONTROLLER DIAGNOSTIC WITH NO DATA TRANSFER'
06727    62231226
06730    31432512
06731    23464563
06732    51464343
06733    25511224
06734    31212745
06735    46626331
```



```
06736    23126431
06737    63301345
06740    46122421
06741    63211263
06742    51214562
06743    26255112
06744    52526330           BCD     '  THIS FUNCTIONS TESTS THE 9164 DISC FILE CONTROLLER AS'
06745    31621226
06746    64452363
06747    31464562
06750    12632562
06751    63621263
06752    30251211
06753    01060412
06754    24316223
06755    12263143
06756    25122346
06757    45635146
06760    43432551
06761    12216212
06762    52446423           BCD     ' MUCH AS POSSIBLE WITHOUT DATA TRANSFER. THE FOLLOWING'
06763    30122162
06764    12474662
06765    62312243
06766    25126431
06767    63304464
06770    63122421
06771    63211263
06772    51214562
06773    26255133
06774    12633225
06775    12264443
06776    43466631
06777    45271212
07000    52216262           BCD     ' ASSUMPTIONS ARE MADE!!'
07001    64444763
```

```
07002    31464562
07003    12215125
07004    12442124
07005    25151212
07006    52665131          BCD     ' WRITE HEADER SWITCH IS OFF'
07007    63251230
07010    25212425
07011    51126266
07012    31632330
07013    12316212
07014    46262412
07015    52454412          BCD     ' NO DISCS WRITE PROTECTED'
07016    24316223
07017    62126651
07020    31632512
07021    47514463
07022    25236325
07023    24121212
07024    52255151          BCD     ' ERROR STOP SWITCH IS IN CONTINUE'
07025    46511262
07026    63464712
07027    62663163
07030    23301231
07031    62123145
07032    12234445
07033    63314564
07034    25121212
07035    52263143          BCD     ' FILE IS ON LINE'
07036    25123162
07037    12464512
07040    43314525
07041    52302521          BCD     ' HEADERS ARE GOOD'
07042    24255162
07043    12215125
07044    12274446
07045    24121212
```



```
07046    52462241          BCD     ' OBJECT TESTS USING DISCS WHICH ARE DELETED FROM THE'
07047    25236312
07050    63256263
07051    62126462
07052    31452712
07053    24316223
07054    62126430
07055    31233212
07056    21512512
07057    24254325
07060    63252412
07061    26514644
07062    12633025
07063    52644531          BCD     ' UNIT VARIABLES D00T17 AND D20T37 WILL BE SKIPPED.''
07064    63126521
07065    51312122
07066    43256212
07067    24000063
07070    01071221
07071    45241224
07072    02036303
07073    07126431
07074    43431222
07075    25126242
07076    31474725
07077    24333712
```

```
                    *
                    *
                    *       FUNCTION 3 = 9164 DISC FILE CONTROLLER DIAGNOSTIC (DATA XFER)
                    *
                    *
07100  0 43 00424  FUNC3  BRM     FUNCTN          FUNCTION LINK
07101  0 20 11514         NOP     FPT3
07102  0 43 00430         BRM     OBJECT
07103  0 43 00440         BRM     RETURN          SET INTERRUPT LINKAGE
07104  0 20 23371         NOP     ENTER
07105  0 02 20004         DIR                     DISABLE INTERRUPTS
07106  0 76 00401         LDA     STATUS          GET SYSTEM STATUS WORD
07107  0 72 15447         SKA     BIT9            IS DISC SOFTWARE WRITE=PROTECTED
07110  0 01 11513         BRU     ENDF3           YES = EXIT FUNCTION
07111  0 76 00332         LDA     FLAGS           CHECK FOR PREVIOUS KEY
07112  0 72 04777         SKA     UPT+4
07113  0 01 11513         BRU     ENDF3           DISC KEYED
                    *
                    *       TEST ABILITY TO CONNECT BUFFER FOR WRITE
                    *
07114  0 43 00430         BRM     OBJECT
07115  0 76 33550         LDA     =0              POTWORD
07116  0 43 22776         BRM     SETUP4          SETUP OBJECT TEST
07117  0 01 07130         BRU     F3E1            ABORT
07120  0 43 23006         BRM     CPST1           POT TO CHANNEL
07121    00074000         DATA    4B4=STADDR
07122  0 77 36706         EAX     =5700           WAIT 1 MILLISEC
07123  0 41 07123         BRX     *
07124  0 40 12026         SKS     12026           TRACK VERIFIED TEST
07125  0 01 07127         BRU     *+2             CONTROLLER LEFT STATE 1 = OK
07126  0 43 00460         BRM     ERROR
07127  0 20 30027         NOP     F3M1
07130  0 43 00434  F3E1   BRM     END
                    *
                    *       TEST 2MHAA
                    *
```



```
07131  0 43 00430         BRM     OBJECT
07132  0 40 12046         SKS     12046           CARD PUNCH BUFFER TEST
07133  0 01 07135         BRU     *+2
07134  0 01 07143         BRU     F3E2            READY = ABORT TEST
07135  0 40 14046         SKS     14046           CARD PUNCH READY TEST
07136  0 01 07140         BRU     *+2
07137  0 01 07143         BRU     F3E2            READY = ABORT TEST
07140  0 43 22510         BRM     F3S1            PERFORM TEST
07141  0 02 03646         EOM     3646
07142  0 20 30124         NOP     F3M2
07143  0 43 00434  F3E2   BRM     END
                    *
                    *       TEST 2MHAA
                    *
07144  0 43 00430         BRM     OBJECT
07145  0 40 10216         SKS     10216           MAGPACK TEST (CHECK FOR MAG TAPE 6)
07146  0 01 07150         BRU     *+2             NO MAG TAPE 6
07147  0 01 07153         BRU     F3E3
07150  0 43 22510         BRM     F3S1            PERFORM TEST
07151  0 02 03676         EOM     3676
07152  0 20 30137         NOP     F3M3
07153  0 43 00434  F3E3   BRM     END
                    *
                    *       TEST 2MHAA
                    *
07154  0 43 00430         BRM     OBJECT
07155  0 43 22510         BRM     F3S1            PERFORM TEST
07156  0 02 03662         EOM     3662
07157  0 20 30137         NOP     F3M3
07160  0 43 00434         BRM     END
                    *
                    *       TEST 2MHAA
                    *
07161  0 43 00430         BRM     OBJECT
07162  0 43 22510         BRM     F3S1            PERFORM TEST
07163  0 02 03664         EOM     3664
```

```
07164  0 20 30137          NOP     F3M3
07165  0 43 00434          BRM     END
                    *
                    *       TEST 2MHAA
                    *
07166  0 43 00430          BRM     OBJECT
07167  0 43 22510          BRM     F3S1            PERFORM TEST
07170  0 02 03667          EOM     3667
07171  0 20 30146          NOP     F3M4
07172  0 43 00434          BRM     END
                    *
                    *       VERIFY ECW RECEIVED
                    *
07173  0 43 00430          BRM     OBJECT
07174  0 76 33550          LDA     =0              POTWORD
07175  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07176  0 01 07207          BRU     F3E8            ERROR ABORT
07177  0 02=10000          EOM=    10000           ALERT CHANNEL
07200  0 02 14200          EOM     14200           EXTENDED MODE EOM
07201  0 13 33573          POT     =4B4=STADDR     WC = 1
07202  0 02 03066          EOM     3066            WRITE SECTOR MODE, 1 CHARACTER
07203  0 43 23305          BRM     X20C            WAIT 200 MILLISEC
07204  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
07205  0 43 00460          BRM     ERROR           COUNT NOT ZERO = ECW NOT RECEIVED
07206  0 20 30155          NOP     F3M6
07207  0 43 00434  F3E8    BRM     END
                    *
                    *       TEST ABILITY TO CYCLE TO STATE 0 FROM STATE 7 (WRITE)
                    *
07210  0 43 00430          BRM     OBJECT
07211  0 76 33550          LDA     =0              POTWORD
07212  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07213  0 01 07236          BRU     F3E9            ERROR ABORT
07214  0 02=10000          EOM=    10000           ALERT CHANNEL
07215  0 02 14200          EOM     14200           EXTENDED MODE EOM
07216  0 13 33574          POT     =2B5=STADDR     WC = 4
```



```
07217  0 02 03066          EOM     3066            1 CHARACTER
07220  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
07221  0 01 07220          BRU     *=1             WAIT FOR ECW TO DISCONNECT
07222  0 77 20754          EAX     =7700D          WAIT 4.4 MILLISEC
07223  0 41 07223          BRX     *
07224  0 40 10026          SKS     10026           DISC FILE READY TEST
07225  0 01 07227          BRU     *+2             CONTROLLER NOT READY
07226  0 01 07232          BRU     *+4
07227  0 43 00460          BRM     ERROR
07230  0 20 30230          NOP     F3M7
07231  0 01 07236          BRU     F3E9
07232  0 40 12026          SKS     12026           TRACK VERIFIED TEST
07233  0 01 07236          BRU     F3E9            NOT IN STATE 1
07234  0 43 00460          BRM     ERROR           RETURNED TO STATE 1
07235  0 20 30246          NOP     F3M8
07236  0 43 00434  F3E9    BRM     END
                    *
                    *       LOGIC FLOW FOR PRECEEDING OBJECT TEST
                    *
                    *       ENTRANCE FROM STATE 3 (SEARCH)
                    *
                    *  1    AF01A   = 2B3EA                                 STATE 7 NEXT
                    *           2B3EA=2F03A=2IUHA=2H03A=2CT3A=2RDKA
                    *  2    6RBHA0  = 2RSTA                                 RESET B01=04
                    *       6RBLA0  = 2RSTA                                 RESET B05=08
                    *       RBIA0   = 2RSTA=2CK0A                           RESET B09
                    *       6RSLX0  = 257FA=2IUCA=3U01A                     RESET L01=06
                    *       TK01A   = 2RSKA=0K01A                           RESET K01
                    *       TK02A   = 2RSKA=0K02A                           RESET K02
                    *           2RSKA=257FA=2IUCA=3U01A
                    *       8ENAA   = 207FA=3CLRA                           WRITE ENABLE
                    *  3    8WD0A   = 207FA=2IUCA=2CK0A                     WRITE DATA 0
                    *       AU01A   = 207FA=2CK0A                           SET U01
                    *  4    2CK8A   = 207FA=2U01A=2CK0A                     B REG CLOCK
                    *  5    AU04A   = 207FA=3U02A=2H07A=2CT1A=2CK0A         SET U04
                    *  6    6ECYA0  = 207FA=2U04A                           ECW
```

```
*  7   BU04A   = 2C7FA*3U02A*246BA*2CK0A                    RESET U04
*      BU01A   = 2C7FA*3U02A*246BA*2CK0A                    RESET U01
*      AU02A   = 2C7FA*246BA*2CK0A                          SET U02
*  8   6RBHA0  = 2RSTA                                      RESET B01-04
*      6RBLA0  = 2RSTA                                      RESET B05-08
*      RBIA0   = 2RSTA*2CK0A                                RESET B09
*      2SGSx   = 2C7FA*2U04A*3U02A*246BA*2CK0A
*      AS01A   = 2SGSx*8R10A                                SET S REG
*      BS01A   = 2SGSx*9R10A                                RESET S REG
*  9   8WD1A   = 2C7FA*2CK0A*2IUAA                          WRITE DATA 1
*      AU01A   = 2C7FA*2CK0A                                SET U01
* 10   2SSRx   = 2C7FA*2BUAA*2IGBA*2CK0A                    SHIFT S REG
* 11   BS06A   = 2C7FA*2SSRx                                RESET S06
*      8WD1A   = 2VFCA*2BUAA*0S01A                          WRITE DATA 1
*      8WD0A   = 2VFCA*2BUAA*1S01A                          WRITE DATA 0
*
*      AT THIS POINT, THE BUFFER SHOULD DISCONNECT (ZERO WORD COUNT)
*
* 12   BX03A   = 2MHAA*8Y90A                                RESET X03
* 13   BU03A   = 3X03A*2CK0A*2C7FA*2U02A                    RESET U03
*
*      NOW, SGSX IS INHIBITED AND ZEROS WILL BE WRITTEN
*
* 14   BU01A   = 2C7FA*2FLBA*2CK0A                          RESET U01
*                2FLBA*2FCHA*2CT5A                         COUNT = 383
*                7FCHA0*1B01A*1B02A*1B03A*1B04A*1B05A*1B06A
* 15   2RSTA   = 0F03A*3U01A                                CLEAR B REG
*      AU01A   = 2C7FA*2CK0A                                SET U01
*
* 16   IF MORE PACKETS:
*
*      8WD1A   = 2C7FA*2IUAA*2CK0A                          WRITE DATA 1
*
*      IF LAST PACKET:
*
* 17   AU03A   = 2C7FA*2U02A*0K01A*0K02A*2FCHA*2CK0A        SET U03
```



```
* 18   BU02A   = 2C7FA*2U03A*2FLBA*2CK0A                    RESET U02
*      BU01A   = 2C7FA*2FLBA*2CK0A                          RESET U01
* 19   8WD0A   = 2VFCA*3U01A*3U02A                          WRITE DATA 0
* 20   AP01A   = 2SGSx*8RP0A                                SET/RESET P01
*      BP01A   = 2SGSx*9RP0A
*      BP01A   = 2C7FA*2U01A*2IGBA*2WD1A                    TOGGLE P01
*      AP01A   = 2C7FA*2U01A*2IGBA*2WD1A
*                2IGBA= NOT [ CT5 ]
*      TL01A   = 2TLRx*8R10A                                TOGGLE L REG
*                2TLRx=2C7FA*2U04A*3U02A*246BA
*                     +2C7FA*3U03A*2U04A*2CT5A*2CK0A
* 21   AS01A   = 2TLSx*0L01A                                SET S FROM L
*      BS01A   = 2TLSx*1L01A
*                2TLSx=2C7FA*3U01A*2U03A*2CK0A
* 22   2SSRx   = 2C7FA*2BUBA*2CK0A                          SHIFT S REG
*      8WD1A   = 2VFCA*2BUBA*306JA*307JA*0S01A              WRITE DATA 1
*      8WD0A   = 2VFCA*2BUBA*306JA*307JA*1S01A              WRITE DATA 0
*                2BUBA=2U01A*2U03A
*                2VFCA=2C7FA*2CK0A
*                306JA=NOT COUNT SIX
*                307JA=NOT COUNT SEVEN
* 23   AP01A   = 2C7FA*2IUFA*2CT5A*2CK0A                    SET P01
* 24   BP01A   = 2C7FA*2U01A*2IGBA*2WD1A                    TOGGLE P01
*      AP01A   = 2C7FA*2U01A*2IGBA*2WD1A
* 25   8WD1A   = 2VFCA*2IUDA*2O6JA*0P01A                    WRITE DATA 1
*      8WD0A   = 2VFCA*3U02A*2O6JA*1P01A                    WRITE DATA 0
* 26   8WD1A   = 2VFCA*2IUDA*2O7JA*0X02A                    CHAIN BIT
*                X02 SET DURING EOM IN STATE 1
* 27   2BGDA   = 2C7FA*2IUDA*2H02A*2CT2A*2CK0A
*      BU01A   = 2BGDA                                      RESET U01
*      BU03A   = 2BGDA                                      RESET U03
*      RG03A   = 2BGDA                                      RESET G03
*      BF01A   = 2BGDA*3X03A                                STATE 0 NEXT
*      BF02A   = 2BGDA*3X03A
*      BF03A   = 2BGDA*3X03A
*
```

```
                    *       THE CONTROLLER IS NOW IN STATE ZERO
                    *
                    *       TEST ECW GENERATION
                    *
07237  0 43 00430           BRM     OBJECT
07240  0 76 33550           LDA     =0
07241  0 43 22775           BRM     SETUP4          SET UP OBJECT TEST
07242  0 01 07275           BRU     F3E10           ERROR ABORT
07243  0 76 33550           LDA     =0              CLEAR 4 WORDS OF OUTPUT BUFFER
07244  0 77 37774           EAX     =4
07245  2 35 34004           STA     STADDR+4,2
07246  0 41 07245           BRX     **1
07247  0 02=10000  EOM=      EOM     10000           ALERT CHANNEL
07250  0 02 14200           EOM     14200           EXTENDED MODE EOM
07251  0 13 33574           PBT     =2B5+STADDR     WC = 4
07252  0 02 03066           EOM     3066            1 CHAR/WORD
07253  0 76 33550           LDA     =0
07254  0 40 10026           SKS     10026           DISC FILE READY TEST
07255  0 01 07257           BRU     **2             CONTROLLER NOT READY
07256  0 01 07272           BRU     F3L2
07257  0 55 15465           ADD     BIT23
07260  0 73 33575           SKG     =80000          112 MILLISEC ELAPSED YET
07261  0 01 07254           BRU     F3L1            NO
07262  0 40 11026           SKS     11026           DISC FILE ERROR TEST
07263  0 01 07267           BRU     **4             CONTROLLER ERROR SET
07264  0 43 00460           BRM     ERRBR
07265  0 20 30254           NOP     F3M9
07266  0 01 07275           BRU     F3E10
07267  0 43 00460           BRM     ERRBR
07270  0 20 30267           NOP     F3M10
07271  0 01 07275           BRU     F3E10
07272  0 40 12000           SKS     12000           CHANNEL ZERO WORD COUNT TEST
07273  0 43 00460           BRM     ERRBR           CHANNEL WORD COUNT NOT ZERO
07274  0 20 30304           NOP     F3M11
07275  0 43 00434  F3E10    BRM     END
                    *
```



```
                    *       TEST PARITY CHECKING DURING WRITE
                    *
07276  0 43 00430           BRM     OBJECT
07277  0 76 33550           LDA     =0              POTWORD
07300  0 43 22775           BRM     SETUP4          SET UP OBJECT TEST
07301  0 01 07312           BRU     F3E11           ABORT
07302  0 76 33550           LDA     =0
07303  0 35 34000           STA     STADDR          DATA WORD
07304  0 43 23006           BRM     CPBT1           PBT TO CHANNEL
07305    00074000           DATA    4B4+STADDR
07306  0 43 23305           BRM     =200            WAIT 200 MILLISEC
07307  0 40 11026           SKS     11026           DISC FILE ERROR TEST
07310  0 43 00460           BRM     ERRBR           CONTROLLER ERROR SET
07311  0 20 30342           NOP     F3M12
07312  0 43 00434  F3E11    BRM     END
                    *
                    *       TEST PARITY CHECKING DURING WRITE
                    *
07313  0 43 00430           BRM     OBJECT
07314  0 43 22535           BRM     F3S2            PERFORM TEST
07315    40000000           DATA    4B7
07316  0 20 30434           NOP     F3M13
                    *
07317  0 43 00430           BRM     OBJECT
07320  0 43 22535           BRM     F3S2            PERFORM TEST
07321    20000000           DATA    2B7
07322  0 20 30457           NOP     F3M14
                    *
07323  0 43 00430           BRM     OBJECT
07324  0 43 22535           BRM     F3S2            PERFORM TEST
07325    10000000           DATA    1B7
07326  0 20 30475           NOP     F3M15
                    *
07327  0 43 00430           BRM     OBJECT
07330  0 43 22535           BRM     F3S2            PERFORM TEST
07331    04000000           DATA    4B6
```

```
07332  0 20 30514          NOP     F3M16
                   *
07333  0 43 00430          BRM     OBJECT
07334  0 43 22935          BRM     F3S2            PERFORM TEST
07335    02000000          DATA    2B6
07336  0 20 30532          NOP     F3M17
                   *
07337  0 43 00430          BRM     OBJECT
07340  0 43 22535          BRM     F3S2            PERFORM TEST
07341    01000000          DATA    1B6
07342  0 20 30550          NOP     F3M18
                   *
                   *       TEST ABILITY TO DISCONNECT CONTROLLER AT END OF SECTOR
                   *
07343  0 43 00430          BRM     OBJECT
07344  0 76 33550          LDA     =0              PDTWORD
07345  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07346  0 01 07421          BRU     F3E18           ERROR ABORT
07347  0 77 37600          EAX     =128D           CLEAR 128 WORDS OF OUTPUT BUFFER
07350  0 76 33550          LDA     =0
07351  2 35 34200          STA     STADDR+128D,2
07352  0 41 07351          BRX     **1
07353  0 43 23006          BRM     CPDT1           PDT TO CHANNEL
07354    10034000          DATA    1B7+STADDR
07355  0 40 14000          SKS     14000           CHANNEL ACTIVE TEST
07356  0 01 07360          BRU     **2             CHANNEL ACTIVE
07357  0 01 07366          BRU     F3L4
07360  0 55 15465          ADD     BIT23
07361  0 73 33571          SKG     =357140         500 MILLISEC ELAPSED YET
07362  0 01 07355          BRU     F3L3            NO
07363  0 43 00460          BRM     ERROR
07364  0 20 30567          NOP     F3M19
07365  0 01 07421          BRU     F3E18
07366  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
07367  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
07370  0 76 23330          LDA     TEMP
```



```
07371  0 75 33551          LDB     **1             MASK
07372  0 70 33576          SKM     *STADDR+128D    CHANNEL ADDRESS CORRECT
07373  0 01 07375          BRU     **2             NO
07374  0 01 07403          BRU     F3L5            YES
07375  0 54 33577          SUB     *STADDR         A = WORD COUNT
07376  0 75 15456          LDB     BIT16           B = CORRECT WORD COUNT
07377  0 71 33577          LDX     *STADDR         X = STARTING CORE ADDRESS
07400  0 43 00460          BRM     ERROR
07401  2 20 30400          NOP     F3M20,2
07402  0 01 07421          BRU     F3E18
07403  0 40 11026          SKS     11026           DISC FILE ERROR TEST
07404  0 01 07406          BRU     **2             CONTROLLER ERROR SET
07405  0 01 07411          BRU     F3L6
07406  0 43 00460          BRM     ERROR
07407  0 20 30640          NOP     F3M21
07410  0 01 07421          BRU     F3E18
07411  0 43 23073  F3L6    BRM     CHECK           CHECK FOR CHANNEL READY
07412  0 01 07421          BRU     F3E18           ERROR ABORT
07413  0 02 10026          EOM     10026           ALERT DISC FILE
07414  0 13 15465          PDT     BIT23           VERIFY SECTOR 1
07415  0 43 23315          BRM     .500            WAIT 500 MILLISEC
07416  0 40 12026          SKS     12026           TRACK VERIFIED TEST
07417  0 43 00460          BRM     ERROR           TRACK NOT VERIFIED
07420  0 20 30655          NOP     F3M22
07421  0 43 00434  F3E18    BRM     END
                   *
                   *       TEST FOR ECC ON READ
                   *
07422  0 43 00430          BRM     OBJECT
07423  0 76 33550          LDA     =0              PDTWORD
07424  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07425  0 01 07436          BRU     F3E19           ERROR ABORT
07426  0 02*10000          EOM*    10000           ALERT CHANNEL
07427  0 02 14000          EOM     14000           EXTENDED MODE EOM
07430  0 13 33573          PDT     =484+STADDR     WC = 1
07431  0 02 03026          EOM     3026            1 CHAR/WORD
```

```
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07432  0 43 23305          BRM     W200            WAIT 200 MILLISEC
07433  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
07434  0 43 00460          BRM     ERROR           COUNT NOT ZERO = ECW NOT RECEIVED
07435  0 20 30735          NOP     F3M23
07436  0 43 00434  F3E19    BRM     END
                   *
                   *       TEST ABILITY TO RETURN TO STATE 0 FROM STATE 5 (READ)
                   *
07437  0 43 00430          BRM     OBJECT
07440  0 76 33550          LDA     =0              POTWORD
07441  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07442  0 01 07461          BRU     F3E20           ERROR ABORT
07443  0 02*10000          EOM*    10000           ALERT CHANNEL
07444  0 02 14000          EOM     14000           EXTENDED MODE EOM
07445  0 13 33573          POT     *4B4+STADDR     WC = 1
07446  0 02 03026          EOM     3026            READ 1 CHAR
07447  0 43 23305          BRM     W200            WAIT 200 MILLISEC
07450  0 40 10026          SKS     10026           DISC FILE READY TEST
07451  0 01 07457          BRU     F3L7            CONTROLLER NOT READY
07452  0 40 12026          SKS     12026           TRACK VERIFIED TEST
07453  0 01 07461          BRU     F3E20           IN STATE 0
07454  0 43 00460          BRM     ERROR
07455  0 20 31132          NOP     F3M24
07456  0 01 07461          BRU     F3E20
07457  0 43 00460  F3L7     BRM     ERROR
07460  0 20 31150          NOP     F3M25
07461  0 43 00434  F3E20    BRM     END
                   *
                   *       TEST ABILITY TO WRITE/READ ONES
                   *
07462  0 43 00430          BRM     OBJECT
07463  0 76 33550          LDA     =0              POTWORD
07464  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07465  0 01 07530          BRU     F3E21           ERROR ABORT
07466  0 76 33551          LDA     =-1             OUTPUT WORD
07467  0 35 34000          STA     STADDR
```

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07470  0 43 23006          BRM     CPOT1           POT TO CHANNEL
07471     00074000         DATA    4B4+STADDR
07472  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
07473  0 01 07530          BRU     F3E21           ERROR ABORT
07474  0 43 23173          BRM     POTOUT          POT TO DISC
07475  0 01 07530          BRU     F3E21           ERROR ABORT
07476  0 43 23173          BRM     CHECK           CHECK FOR CHANNEL READY
07477  0 01 07530          BRU     F3E21           ERROR ABORT
07500  0 76 33550          LDA     =0              CLEAR INPUT LOCATION
07501  0 35 34000          STA     STADDR
07502  0 43 23015          BRM     CPOT2           POT TO CHANNEL
07503     00074000         DATA    4B4+STADDR
07504  0 43 23305          BRM     W200            WAIT 200 MILLISEC
07505  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
07506  0 01 07510          BRU     *+2             WORD COUNT NOT ZERO
07507  0 01 07516          BRU     F3L8
07510  0 76 33550          LDA     =0
07511  0 75 15465          LDB     BIT23
07512  0 71 33577          LDX     =STADDR
07513  0 43 00460          BRM     ERROR
07514  2 20 30600          NOP     F3M20,2
07515  0 01 07530          BRU     F3E21
07516  0 76 34000  F3L8     LDA     STADDR          GET INPUT WORD
07517  0 75 33551          LDB     =-1             MASK
07520  0 70 33551          SKM     =-1             INPUT DATA CORRECT
07521  0 01 07523          BRU     *+2             NO
07522  0 01 07530          BRU     F3E21
07523  0 71 33577          LDX     =STADDR
07524  0 43 00454          BRM     REPORT
07525  2 20 31133          NOP     F3M26,2
07526  0 43 00460          BRM     ERROR
07527  0 20 31154          NOP     F3M27
07530  0 43 00434  F3E21    BRM     END
                   *
                   *       TEST ABILITY TO WRITE/READ ZEROS
                   *
```

```
07531  0 43 00430          BRM     OBJECT
07532  0 76 33550          LDA     =0              POTWORD
07533  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07534  0 01 07577          BRU     F3E22           ERROR ABORT
07535  0 76 33550          LDA     =0              OUTPUT WORD
07536  0 35 34000          STA     STADDR
07537  0 43 23006          BRM     CPOT1           POT TO CHANNEL
07540    00074000          DATA    4B4+STADDR
07541  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
07542  0 01 07577          BRU     F3E22           ERROR ABORT
07543  0 43 23173          BRM     POTOUT          POT TO DISC
07544  0 01 07577          BRU     F3E22
07545  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
07546  0 01 07577          BRU     F3E22
07547  0 76 33551          LDA     ==1             ALTER INPUT LOCATION
07550  0 35 34000          STA     STADDR
07551  0 43 23015          BRM     CPOT2           POT TO CHANNEL
07552    00074000          DATA    4B4+STADDR
07553  0 43 23305          BRM     W200            WAIT 200 MILLISEC
07554  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
07555  0 01 07557          BRU     *+2             WORD COUNT NOT ZERO
07556  0 01 07565          BRU     F3L9
07557  0 76 33550          LDA     =0
07560  0 75 15465          LDB     BIT23
07561  0 71 33577          LDX     =STADDR
07562  0 43 00460          BRM     ERROR
07563  2 20 31600          NOP     F3M20,2
07564  0 01 07577          BRU     F3E22
07565  0 76 34000  F3L9    LDA     STADDR          GET INPUT WORD
07566  0 72 33551          SKA     ==1             WERE ZEROS READ
07567  0 01 07571          BRU     *+2             NO
07570  0 01 07577          BRU     F3E22
07571  0 75 33550          LDB     =0
07572  0 71 33577          LDX     =STADDR
07573  0 43 00454          BRM     REPORT
07574  2 20 31133          NOP     F3M26,2
```



```
07575  0 43 00460          BRM     ERROR
07576  0 20 31205          NOP     F3M28
07577  0 43 00434  F3E22    BRM     END
                    *
                    *       TEST READ/WRITE PARITY
                    *
07600  0 43 00430          BRM     OBJECT
07601  0 76 33550          LDA     =0              POTWORD
07602  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07603  0 01 07624          BRU     F3E23
07604  0 76 33550          LDA     =0              DATA WORD
07605  0 35 34000          STA     STADDR
07606  0 43 23006          BRM     CPOT1           POT TO CHANNEL
07607    00074000          DATA    4B4+STADDR
07610  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
07611  0 01 07624          BRU     F3E23
07612  0 43 23173          BRM     POTOUT          POT TO DISC
07613  0 01 07624          BRU     F3E23
07614  0 43 23073          BRM     CHECK           CHECK CHANNEL FOR READY
07615  0 01 07624          BRU     F3E23
07616  0 43 23015          BRM     CPOT2           POT TO CHANNEL
07617    00074000          DATA    4B4+STADDR
07620  0 43 23305          BRM     W200            WAIT 200 MILLISEC
07621  0 40 11000          SKS     11000           CHANNEL ERROR TEST
07622  0 43 00460          BRM     ERROR           CHANNEL ERROR SET
07623  0 20 31213          NOP     F3M29
07624  0 43 00434  F3E23    BRM     END
                    *
                    *       TEST READ/WRITE PARITY
                    *
07625  0 43 00430          BRM     OBJECT
07626  0 76 33550          LDA     =0              POTWORD
07627  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07630  0 01 07451          BRU     F3E24
07631  0 76 33600          LDA     =77             DATA WORD
07632  0 35 34000          STA     STADDR
```

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07633  0 43 23006          BRM     CPBT1           PBT TB CHANNEL
07634    00074000          DATA    484.STADDR
07635  0 43 23143          BRM     WAIT            WAIT FBR CBNTRBLLER READY
07636  0 01 07451          BRU     F3E24
07637  0 43 23173          BRM     PBTBUT          PBT TB DISC
07640  0 01 07451          BRU     F3E24
07641  0 43 23073          BRM     CHECK           CHECK FBR CHANNEL READY
07642  0 01 07451          BRU     F3E24
07643  0 43 23015          BRM     CPBT2           PBT TB CHANNEL
07644    00074000          DATA    484.STADDR
07645  0 43 23305          BRM     W200            WAIT 200 MILLISEC
07646  0 40 11000          SKS     11000           CHANNEL ERRBR TEST
07647  0 43 00460          BRM     ERRBR           CHANNEL ERRBR SET
07650  0 20 31266          NBP     F3M30
07651  0 43 00434  F3E24    BRM     END
                    *
                    *       TEST TERMINATION BF STATE 7 TB STATE 3
                    *
07652  0 43 00430          BRM     BBJECT
07653  0 76 33550          LDA     =0              PBTWBRD
07654  0 43 22775          BRM     SETUP4          SET UP BBJECT TEST
07655  0 01 07705          BRU     F3E62
07656  0 43 23006          BRM     CPBT1           PBT TB CHANNEL
07657    04134000          DATA    4185.STADDR
07660  0 76 33401          LDA     =STADDR.63D     CHECK ADDRESS
07661  0 75 33551          LDB     =.1             MASK
07662  0 02 12000          EBM     12000           ALERT TB PIN CHANNEL ADDRESS
07663  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
07664  0 70 23330          SKM     TEMP            64 WBRDS WRITTEN YET
07665  0 01 07662          BRU     F3L45           NB
07666  0 77 37343          EAX     =285D           WAIT 1 MILLISEC
07667  0 41 07667          BRX     .
07670  0 40 10026          SKS     10026           DISC FILE READY TEST
07671  0 01 07702          BRU     F3L47           NBT READY = BK
07672  0 40 12026          SKS     12026           TRACK VERIFIED TEST
07673  0 01 07477          BRU     F3L46           IN STATE 0
```

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07674  0 43 00460          BRM     ERRBR           IN STATE 1
07675  0 20 31571          NBP     F3M54
07676  0 01 07705          BRU     F3E62
07677  0 43 00460  F3L46    BRM     ERRBR
07700  0 20 31611          NBP     F3M55
07701  0 01 07705          BRU     F3E62
07702  0 40 12000          SKS     12000           CHANNEL ZERB WBRD CBUNT TEST
07703  0 43 00460          BRM     ERRBR           CBUNT SHBULD BE ZERB
07704  0 20 31642          NBP     F3M56
07705  0 43 00434  F3E62    BRM     END
                    *
                    *       CHECK FBR WHS FRBM CBNTRBLLER
                    *
07706  0 43 00430          BRM     BBJECT
07707  0 76 33550          LDA     =0              PBTWBRD
07710  0 43 22775          BRM     SETUP4          SET UP BBJECT TEST
07711  0 01 07743          BRU     F3E25
07712  0 43 00440          BRM     RETURN          SET INTERRUPT LINKAGE
07713  0 20 23353          NBP     PI2
07714  0 77 37477          EAX     =65D            CLEAR 65 WBRDS BF BUTPUT TABLE
07715  0 76 33550          LDA     =0
07716  2 35 34101          STA     STADDR.65D.2
07717  0 41 07716          BRX     .-1
07720  0 43 23006          BRM     CPBT1           PBT TB CHANNEL
07721    04074000          DATA    404B4.STADDR
07722  0 43 23143          BRM     WAIT            WAIT FBR CBNTRBLLER READY
07723  0 01 07743          BRU     F3E25
07724  0 43 23073          BRM     CHECK           WAIT FBR CHANNEL READY
07725  0 01 07743          BRU     F3E25
07726  0 43 23173          BRM     PBTBUT          PBT TB DISC
07727  0 01 07743          BRU     F3E25
07730  0 02*10000          EBM.    10000           ALERT CHANNEL
07731  0 02 16000          EBM     16000           EXTENDED MBDE EBM
07732  0 13 33602          PBT     =404B4.STADDR   WC = 65
07733  0 02 03626          EBM     3626            READ DISC FILE . SECTBR
07734  0 43 23305          BRM     W200            WAIT 200 MILLISEC
```

```
07735  0 02 20002          EIR                     ENABLE INTERRUPTS
07736  0 67 20060          LCY     48D             DUMMY CYCLES
07737  0 02 20004          DIR                     DISABLE INTERRUPTS
07740  0 53 15476          SKN     I2FLAG          I2 RECEIVED
07741  0 43 00460          BRM     ERR0R           NO
07742  0 20 31323          NOP     F3M31
07743  0 43 00434  F3E25    BRM     END
                   *
                   *       TEST TERMINATION OF STATE 7 TO STATE 4
                   *
07744  0 43 00430          BRM     OBJECT
07745  0 76 33603          LDA     =177            POTWORD
07746  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
07747  0 01 10017          BRU     F3E63
07750  0 43 23006          BRM     CPOT1           POT TO CHANNEL
07751     40740000         DATA    40484+STADDR
07752  0 76 33404          LDA     +STADDR+64D     COMPARE ADDRESS
07753  0 75 33551          LDB     ==1             MASK
07754  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
07755  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
07756  0 70 23330          SKM     TEMP            DO ADDRESSES COMPARE
07757  0 01 07754          BRU     F3L48           NO
07760  0 76 33550          LDA     =0
07761  0 40 10026          SKS     10026           DISC FILE READY TEST
07762  0 01 07764          BRU     *+2             CONTROLLER NOT READY
07763  0 01 07777          BRU     F3L51
07764  0 40 11026          SKS     11026           DISC FILE ERROR TEST
07765  0 01 07774          BRU     F3L50           CONTROLLER ERROR SET
07766  0 55 15465          ADD     BIT23
07767  0 73 33605          SKG     =259740         TIMED OUT YET
07770  0 01 07761          BRU     F3L49           NO
07771  0 43 00460          BRM     ERR0R
07772  0 20 31775          NOP     F3M59
07773  0 01 10017          BRU     F3E63
07774  0 43 00460  F3L50    BRM     ERR0R
07775  0 20 31713          NOP     F3M57
```



```
07776  0 01 10017          BRU     F3E63
07777  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
10000  0 01 10002          BRU     *+2             COUNT NOT ZERO
10001  0 01 10005          BRU     F3L52
10002  0 43 00460          BRM     ERR0R
10003  0 20 31755          NOP     F3M58
10004  0 01 10017          BRU     F3E63
10005  0 02 10026          EOM     10026           ALERT DISC FILE
10006  0 13 15456          POT     BIT16           WILL VERIFY SECTOR 0 IN STATE 3
10007  0 40 12026          SKS     12026           TRACK VERIFIED TEST
10010  0 01 10012          BRU     *+2             TRACK NOT VERIFIED
10011  0 01 10017          BRU     F3E63
10012  0 40 11026          SKS     11026           DISC FILE ERROR TEST
10013  0 01 10015          BRU     *+2             CONTROLLER ERROR SET
10014  0 01 10007          BRU     F3L53
10015  0 43 00460          BRM     ERR0R
10016  0 20 32715          NOP     F3M60
10017  0 43 00434  F3E63    BRM     END
                   *
                   *       TEST INCREMENTING OF ADDRESS REGISTER
                   *
10020  0 43 00430          BRM     OBJECT
10021  0 43 22557          BRM     F3S3            PERFORM TEST
10022     00000000         DATA    0
10023  0 20 31412          NOP     F3M33
                   *
10024  0 43 00430          BRM     OBJECT
10025  0 43 22557          BRM     F3S3            PERFORM TEST
10026     00000001         DATA    1
10027  0 20 31430          NOP     F3M34
                   *
10030  0 43 00430          BRM     OBJECT
10031  0 43 22557          BRM     F3S3            PERFORM TEST
10032     00000002         DATA    2
10033  0 20 31436          NOP     F3M35
                   *
```

```
10034  0 43 00430        BRM     OBJECT
10035  0 43 22557        BRM     F3S3            PERFORM TEST
10036    00000003        DATA    3
10037  0 20 31441        NOP     F3M36
                *
10040  0 43 00430        BRM     OBJECT
10041  0 43 22557        BRM     F3S3            PERFORM TEST
10042    00000007        DATA    7
10043  0 20 31451        NOP     F3M37
                *
10044  0 43 00430        BRM     OBJECT
10045  0 43 22557        BRM     F3S3            PERFORM TEST
10046    00000017        DATA    17
10047  0 20 31451        NOP     F3M37
                *
10050  0 43 00430        BRM     OBJECT
10051  0 43 22557        BRM     F3S3            PERFORM TEST
10052    00000037        DATA    37
10053  0 20 31454        NOP     F3M38
                *
10054  0 43 00430        BRM     OBJECT
10055  0 43 22557        BRM     F3S3            PERFORM TEST
10056    00000077        DATA    77
10057  0 20 31463        NOP     F3M39
                *
10060  0 43 00430        BRM     OBJECT
10061  0 43 22557        BRM     F3S3            PERFORM TEST
10062    00000057        DATA    57
10063  0 20 31474        NOP     F3M40
                *
10064  0 43 00430        BRM     OBJECT
10065  0 43 22557        BRM     F3S3            PERFORM TEST
10066    00000067        DATA    67
10067  0 20 31474        NOP     F3M40
                *
10070  0 43 00430        BRM     OBJECT
```



```
10071  0 43 22557        BRM     F3S3            PERFORM TEST
10072    00000073        DATA    73
10073  0 20 31474        NOP     F3M40
                *
10074  0 43 00430        BRM     OBJECT
10075  0 43 22557        BRM     F3S3            PERFORM TEST
10076    00000074        DATA    74
10077  0 20 31477        NOP     F3M41
                *
10100  0 43 00430        BRM     OBJECT
10101  0 43 22557        BRM     F3S3            PERFORM TEST
10102    00000177        DATA    177
10103  0 20 31502        NOP     F3M42
                *
10104  0 43 00430        BRM     OBJECT
10105  0 43 22557        BRM     F3S3            PERFORM TEST
10106    00000377        DATA    377
10107  0 20 31502        NOP     F3M42
                *
10110  0 43 00430        BRM     OBJECT
10111  0 43 22557        BRM     F3S3            PERFORM TEST
10112    00000777        DATA    777
10113  0 20 31505        NOP     F3M43
                *
10114  0 43 00430        BRM     OBJECT
10115  0 43 22557        BRM     F3S3            PERFORM TEST
10116    00001777        DATA    1777
10117  0 20 31513        NOP     F3M44
                *
10120  0 43 00430        BRM     OBJECT
10121  0 43 22557        BRM     F3S3            PERFORM TEST
10122    00001477        DATA    1677
10123  0 20 31523        NOP     F3M45
                *
10124  0 43 00430        BRM     OBJECT
10125  0 43 22557        BRM     F3S3            PERFORM TEST
```

```
10126    00001577          DATA    1577
10127  0 20 31523          NOP     F3M45
                *
10130  0 43 00430          BRM     OBJECT
10131  0 43 22557          BRM     F3S3            PERFORM TEST
10132    00001377          DATA    1377
10133  0 20 31523          NOP     F3M45
                *
10134  0 43 00430          BRM     OBJECT
10135  0 43 22557          BRM     F3S3            PERFORM TEST
10136    00001703          DATA    1703
10137  0 20 31477          NOP     F3M41
                *
10140  0 43 00430          BRM     OBJECT
10141  0 43 22557          BRM     F3S3            PERFORM TEST
10142    00001774          DATA    1774
10143  0 20 31477          NOP     F3M41
                *
10144  0 43 00430          BRM     OBJECT
10145  0 43 22557          BRM     F3S3            PERFORM TEST
10146    00003777          DATA    3777
10147  0 20 31526          NOP     F3M46
                *
10150  0 43 00430          BRM     OBJECT
10151  0 43 22557          BRM     F3S3            PERFORM TEST
10152    00007777          DATA    7777
10153  0 20 31526          NOP     F3M46
                *
10154  0 43 00430          BRM     OBJECT
10155  0 43 22557          BRM     F3S3            PERFORM TEST
10156    00017777          DATA    17777
10157  0 20 31531          NOP     F3M47
                *
10160  0 43 00430          BRM     OBJECT
10161  0 43 22557          BRM     F3S3            PERFORM TEST
10162    00037777          DATA    37777
```



```
10163  0 20 31537          NOP     F3M48
                *
10164  0 43 00430          BRM     OBJECT
10165  0 43 22557          BRM     F3S3            PERFORM TEST
10166    00035777          DATA    35777
10167  0 20 31523          NOP     F3M45
                *
10170  0 43 00430          BRM     OBJECT
10171  0 43 22557          BRM     F3S3            PERFORM TEST
10172    00033777          DATA    33777
10173  0 20 31523          NOP     F3M45
                *
10174  0 43 00430          BRM     OBJECT
10175  0 43 22557          BRM     F3S3            PERFORM TEST
10176    00027777          DATA    27777
10177  0 20 31523          NOP     F3M45
                *
10200  0 43 00430          BRM     OBJECT
10201  0 43 22557          BRM     F3S3            PERFORM TEST
10202    00036077          DATA    36077
10203  0 20 31547          NOP     F3M49
                *
10204  0 43 00430          BRM     OBJECT
10205  0 43 22557          BRM     F3S3            PERFORM TEST
10206    00037703          DATA    37703
10207  0 20 31477          NOP     F3M41
                *
10210  0 43 00430          BRM     OBJECT
10211  0 43 22557          BRM     F3S3            PERFORM TEST
10212    00037774          DATA    37774
10213  0 20 31477          NOP     F3M41
                *
10214  0 43 00430          BRM     OBJECT
10215  0 43 22557          BRM     F3S3            PERFORM TEST
10216    00077777          DATA    77777
10217  0 20 31552          NOP     F3M50
```

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                    *
10220  0 43 00430           BRM     OBJECT
10221  0 43 22557           BRM     F3S3            PERFORM TEST
10222    00177777           DATA    177777
10223  0 20 31552           NOP     F3M50
                    *
10224  0 43 00430           BRM     OBJECT
10225  0 43 22557           BRM     F3S3            PERFORM TEST
10226    00377777           DATA    377777
10227  0 20 31555           NOP     F3M51
                    *
                    *       TEST INCREMENTING OF ADDRESS REGISTER
                    *
10230  0 43 00430           BRM     OBJECT
10231  0 76 33550           LDA     =0              POTWORD
10232  0 43 23042           BRM     DISCCK          USE THIS DISC
10233  0 01 10273           BRU     F3E60           NO
10234  0 76 33566           LDA     =777777         POTWORD
10235  0 43 22775           BRM     SETUP4          SET UP OBJECT TEST
10236  0 01 10273           BRU     F3E60
10237  0 43 23006           BRM     CPOT1           POT TO CHANNEL
10240    04074000           DATA    40484+STADDR
10241  0 43 23143           BRM     WAIT            WAIT FOR CONTROLLER READY
10242  0 01 10273           BRU     F3E60
10243  0 40 12000           SKS     12000           CHANNEL ZERO WORD COUNT TEST
10244  0 01 10246           BRU     *+2             WORD COUNT NOT ZERO
10245  0 01 10357           BRU     F3L44
10246  0 02 12000           EOM     12000           ALERT TO PIN CHANNEL ADDRESS
10247  0 33 23330           PIN     TEMP            PIN CHANNEL ADDRESS
10250  0 76 23330           LDA     TEMP
10251  0 54 33577           SUB     =STADDR         A = WORD COUNT
10252  0 75 33606           LDB     =101
10253  0 71 33577           LDX     =STADDR
10254  0 43 00460           BRM     ERROR
10255  2 20 30600           NOP     F3M20,2
10256  0 01 10273           BRU     F3E60
```



```
10257  0 02 10026           EOM     10026           ALERT DISC FILE
10260  0 33 23330           PIN     TEMP            PIN CONTROLLER ADDRESS
10261  0 76 23330           LDA     TEMP
10262  0 72 33551           SKA     A=1             ADDRESS CORRECT
10263  0 01 10265           BRU     *+2             NO
10264  0 01 10273           BRU     F3E60
10265  0 75 33550           LDB     =0
10266  0 71 33566           LDX     =777777
10267  0 43 00454           BRM     REPORT
10270  2 20 31360           NOP     F3M32,2
10271  0 43 00460           BRM     ERROR
10272  0 20 31561           NOP     F3M52
10273  0 43 00434  F3E60     BRM     END
                    *
                    *       VERIFY ADDRESS REGISTER NOT INCREMENTED IF CHANNEL DISCONNECTED
                    *
10274  0 43 00430           BRM     OBJECT
10275  0 76 33550           LDA     =0              POTWORD
10276  0 43 22775           BRM     SETUP4          SET UP OBJECT TEST
10277  0 01 10312           BRU     F3E61
10300  0 43 23006           BRM     CPOT1           POT TO CHANNEL
10301    04034000           DATA    4864+STADDR
10302  0 43 23143           BRM     WAIT            WAIT FOR CONTROLLER READY
10303  0 01 10312           BRU     F3E61
10304  0 02 10026           EOM     10026           ALERT DISC FILE
10305  0 33 23330           PIN     TEMP            PIN CONTROLLER ADDRESS
10306  0 76 23330           LDA     TEMP
10307  0 72 33551           SKA     A=1             DID ADDRESS INCREMENT
10310  0 43 00460           BRM     ERROR           YES = ERROR
10311  0 20 31564           NOP     F3M53
10312  0 43 00434  F3E61     BRM     END
                    *
                    *       TEST ABILITY TO READ CHAIN MODE
                    *
10313  0 43 00430           BRM     OBJECT
10314  0 76 33550           LDA     =0              POTWORD
```

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10315  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
10316  0 01 10361          BRU     F3E64
10317  0 43 23006          BRM     CPOT1           POT TO CHANNEL
10320    10034000          DATA    187+STADDR
10321  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10322  0 01 10361          BRU     F3E64
10323  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
10324  0 01 10361          BRU     F3E64
10325  0 43 23173          BRM     POTOUT          POT TO DISC
10326  0 01 10361          BRU     F3E64
10327  0 43 23033          BRM     CPOT4           POT TO CHANNEL
10330    10034000          DATA    187+STADDR
10331  0 76 33604          LDA     *STADDR+64D     COMPARE ADDRESS
10332  0 75 33551          LDB     *+1
10333  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
10334  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
10335  0 70 23330          SKM     TEMP            DO ADDRESSES COMPARE
10336  0 01 10333          BRU     F3L54           NO
10337  0 77 36706          EAX     =5700           WAIT 1 MILLISEC
10340  0 41 10340          BRX     *
10341  0 40 10026          SKS     10026           DISC FILE READY TEST
10342  0 01 10353          BRU     F3L56           NOT READY = OK
10343  0 40 12026          SKS     12026           TRACK VERIFIED TEST
10344  0 01 10350          BRU     F3L55           IN STATE 0
10345  0 43 00460          BRM     ERROR           IN STATE 1
10346  0 20 32032          NOP     F3M61
10347  0 01 10361          BRU     F3E64
10350  0 43 00460  F3L55   BRM     ERROR
10351  0 20 32054          NOP     F3M62
10352  0 01 10361          BRU     F3E64
10353  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
10354  0 33 23330          PIN     TEMP
10355  0 70 23330          SKM     TEMP            IS CHANNEL ADD REG COUNTING AGAIN
10356  0 01 10361          BRU     F3E64           YES
10357  0 43 00460          BRM     ERROR
10360  0 20 32112          NOP     F3M63
```

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10361  0 43 00434  F3E64  BRM     END
                   *
                   *      TEST 2IGAA
                   *
10362  0 43 00430          BRM     OBJECT
10363  0 76 33550          LDA     =0              POTWORD
10364  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
10365  0 01 10411          BRU     F3E65
10366  0 43 23006          BRM     CPOT1           POT TO CHANNEL
10367    04034000          DATA    486+STADDR
10370  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10371  0 01 10411          BRU     F3E65
10372  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
10373  0 01 10411          BRU     F3E65
10374  0 43 23173          BRM     POTOUT          POT TO DISC
10375  0 01 10411          BRU     F3E65
10376  0 43 23033          BRM     CPOT4           POT TO CHANNEL
10377    04034000          DATA    486+STADDR
10400  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
10401  0 01 10400          BRU     *-1             WAIT FOR ZERO WORD COUNT
10402  0 77 36706          EAX     =5700
10403  0 41 10403          BRX     *               WAIT 1 MILLISEC
10404  0 40 10026          SKS     10026           DISC FILE READY TEST
10405  0 01 10407          BRU     *+2             CONTROLLER NOT READY
10406  0 01 10411          BRU     F3E65
10407  0 43 00460          BRM     ERROR
10410  0 20 32154          NOP     F3M64
10411  0 43 00434  F3E65  BRM     END
                   *
                   *      TEST 2IGAA
                   *
10412  0 43 00430          BRM     OBJECT
10413  0 76 33550          LDA     =0              POTWORD
10414  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
10415  0 01 10444          BRU     F3E66
10416  0 43 23006          BRM     CPOT1           POT TO CHANNEL
```

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10417     10034000          DATA    1B7+STADDR
10420   0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10421   0 20 10444          NOP     F3E66
10422   0 43 23173          BRM     PUTOUT          PUT TO DISC
10423   0 01 10444          BRU     F3E66
10424   0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
10425   0 01 10444          BRU     F3E66
10426   0 43 23033          BRM     CPUT4           PUT TO CHANNEL
10427     10034000          DATA    1B7+STADDR
10430   0 76 33604          LDA     +64D+STADDR     COMPARE ADDRESS
10431   0 75 33551          LDB     =+1             MASK
10432   0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
10433   0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
10434   0 70 23330          SKM     TEMP            DO ADDRESSES COMPARE
10435   0 01 10432          BRU     F3L57           NO
10436   0 77 36706          EAX     +57CD           WAIT 1 MILLISEC
10437   0 41 10437          BRX     *
10440   0 40 10026          SKS     10026           DISC FILE READY TEST
10441   0 01 10444          BRU     F3E66           CONTROLLER NOT READY = OK
10442   0 43 00460          BRM     ERROR
10443   0 20 32163          NOP     F3M65
10444   0 43 00434  F3E66    BRM     END
                    *
                    *       TEST ABILITY TO WRITE/READ IN CHAIN MODE
                    *
10445   0 43 00430          BRM     OBJECT
10446   0 76 33550          LDA     =0              POTWORD
10447   0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
10450   0 01 10476          BRU     F3E67
10451   0 43 23024          BRM     CPUT3           PUT TO CHANNEL
10452     04034000          DATA    4B6+STADDR
10453   0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10454   0 01 10476          BRU     F3E67
10455   0 43 23173          BRM     PUTOUT          PUT TO DISC
10456   0 01 10476          BRU     F3E67
10457   0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
```

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DISCW  TAP=3.0                          PAGE 114

10460   0 01 10476          BRU     F3E67
10461   0 43 23033          BRM     CPUT4           PUT TO CHANNEL
10462     10034000          DATA    1B7+STADDR
10463   0 76 33604          LDA     =STADDR+64D     COMPARE ADDRESS
10464   0 75 33551          LDB     =+1             MASK
10465   0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
10466   0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
10467   0 70 23330          SKM     TEMP            DO ADDRESSES COMPARE
10470   0 01 10465          BRU     F3L58           NO
10471   0 77 36706          EAX     +57CD           WAIT 1 MILLISEC
10472   0 41 10472          BRX     *
10473   0 40 10026          SKS     10026           DISC FILE READY TEST
10474   0 43 00460          BRM     ERROR           SHOULD BE IN STATE 0
10475   0 20 32170          NOP     F3M66
10476   0 43 00434  F3E67    BRM     END
                    *
                    *       TEST PACKET COUNTER
                    *
10477   0 43 00430          BRM     OBJECT
10500   0 76 33550          LDA     =0              POTWORD
10501   0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
10502   0 01 10545          BRU     F3E83
10503   0 77 37700          EAX     +64D            SET UP OUTPUT BUFFER
10504   0 76 33551          LDA     =+1
10505   2 35 34100          STA     STADDR+64D/2
10506   0 41 10505          BRX     =+1
10507   0 43 23006          BRM     CPUT1           PUT TO CHANNEL
10510     02034000          DATA    2B6+STADDR
10511   0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10512   0 01 10545          BRU     F3E83
10513   0 43 23173          BRM     PUTOUT          PUT TO DISC
10514   0 01 10545          BRU     F3E83
10515   0 77 37700          EAX     +64D            CLEAR INPUT BUFFER
10516   0 76 33550          LDA     =0
10517   2 35 34100          STA     STADDR+64D/2
10520   0 41 10517          BRX     =+1
```

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DISCW  TAP=3.C                          PAGE 115

10521  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
10522  0 01 10545          BRU     F3E83
10523  0 43 23015          BRM     CPOT2           POT TO CHANNEL
10524    040340000         DATA    486+STADDR
10525  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10526  0 01 10545          BRU     F3E83
10527  0 75 33551          LDB     **1             MASK
10530  0 76 34020          LDA     STADDR+16D      CHECK WORD 17
10531  0 70 33551          SKM     **1             IS DATA CORRECT
10532  0 01 10534          BRU     **2             NO
10533  0 01 10537          BRU     F3L78
10534  0 43 00460          BRM     ERROR
10535  0 20 32553          NOP     F3M84
10536  0 01 10545          BRU     F3E83
10537  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
10540  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
10541  0 76 33407          LDA     *STADDR+32D     COMPARE ADDRESS
10542  0 70 23330          SKM     TEMP            CONTROLLER DISCONNECT AFTER TWO PACKETS
10543  0 43 00460          BRM     ERROR           NO
10544  0 20 32560          NOP     F3M85
10545  0 43 00434  F3E83    BRM     END
                   *
                   *       TEST TERMINATION OF STATE 5 TO STATE 4
                   *
10546  0 43 00430          BRM     OBJECT
10547  0 76 33403          LDA     *177            POTWORD
10550  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
10551  0 01 10622          BRU     F3E68
10552  0 43 23006          BRM     CPOT1           POT TO CHANNEL
10553    100340000         DATA    187+STADDR
10554  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10555  0 01 10622          BRU     F3E68
10556  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
10557  0 01 10622          BRU     F3E68
10560  0 43 23173          BRM     POTOUT          POT TO DISC
10561  0 01 10622          BRU     F3E68
```

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DISCW  TAP=3.C                          PAGE 116

10562  0 43 23033          BRM     CPOT4           POT TO CHANNEL
10563    100340000         DATA    187+STADDR
10564  0 76 33404          LDA     *STADDR+64D     COMPARE ADDRESS
10565  0 75 33551          LDB     **1             MASK
10566  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
10567  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
10570  0 70 23330          SKM     TEMP            DO ADDRESSES COMPARE
10571  0 01 10566          BRU     F3L59           NO
10572  0 77 36706          EAX     *5700           WAIT 1 MILLISEC
10573  0 41 10573          BRX     *
10574  0 70 23330          SKM     TEMP            IS CONTROLLER STILL READING
10575  0 01 10577          BRU     **2             YES = ERROR
10576  0 01 10602          BRU     F3L60
10577  0 43 00460          BRM     ERROR
10600  0 20 32215          NOP     F3M67
10601  0 01 10622          BRU     F3E68
10602  0 40 10026          SKS     10026           DISC FILE READY TEST
10603  0 01 10607          BRU     F3L61           CONTROLLER NOT READY = OK
10604  0 43 00460          BRM     ERROR
10605  0 20 32225          NOP     F3M68
10606  0 01 10622          BRU     F3E68
10607  0 76 33550  F3L61    LDA     *0              WAIT 140 MILLISEC
10610  0 55 15465          ADD     BIT23
10611  0 73 33610          SKG     *160000
10612  0 01 10610          BRU     **2
10613  0 40 11026          SKS     11026           DISC FILE ERROR TEST
10614  0 01 10616          BRU     **2             CONTROLLER ERROR SET
10615  0 01 10621          BRU     F3L62
10616  0 43 00460          BRM     ERROR
10617  0 20 32244          NOP     F3M69
10620  0 01 10622          BRU     F3E68
10621  0 43 23143  F3L62    BRM     WAIT            WAIT FOR CONTROLLER TO FINISH
10622  0 43 00434  F3E68    BRM     END
                   *
                   *       TEST SYNTAX
                   *
```

```
10623  0 43 00430          BRM     OBJECT
10624  0 76 33550          LDA     =0              POTWORD
10625  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
10626  0 01 10667          BRU     F3E69
10627  0 43 00440          BRM     RETURN          SET INTERRUPT LINKAGE
10630  0 20 23353          NOP     PI2
10631  0 76 33550          LDA     =0              CLEAR I2 FLAG
10632  0 35 15476          STA     I2FLAG
10633  0 43 23006          BRM     CPOT1           POT TO CHANNEL
10634    10034000          DATA    1B7+STADDR
10635  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10636  0 01 10667          BRU     F3E69
10637  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
10640  0 01 10667          BRU     F3E69
10641  0 43 23173          BRM     POTOUT          POT TO DISC
10642  0 01 10667          BRU     F3E69
10643  0 02+10000          EOM+    10000           ALERT CHANNEL
10644  0 02 16000          EOM     16000           EXTENDED MODE EOM
10645  0 13 33611          POT     =1B7+STADDR     WC = 128
10646  0 02 02626          EOM     2626            READ DISC FILE + CHAIN
10647  0 02 20002          EIR                     ENABLE INTERRUPTS
10650  0 76 33A04          LDA     =STADDR+64D     COMPARE ADDRESS
10651  0 75 33551          LDB     =+1             MASK
10652  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
10653  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
10654  0 70 23330          SKM     TEMP            DO ADDRESSES COMPARE
10655  0 01 10652          BRU     F3L63           NO
10656  0 77 36706          EAX     =570D           WAIT 1 MILLISEC
10657  0 41 10657          BRX     *
10660  0 02 20004          DIR                     DISABLE INTERRUPTS
10661  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10662  0 01 10667          BRU     F3E69
10663  0 53 15476          SKM     I2FLAG          WAS I2 RECEIVED
10664  0 01 10666          BRU     *+2             NO = OK
10665  0 43 00460          BRM     ERROR
10666  0 20 32262          NOP     F3M70
```



```
10667  0 43 23255  F3E69   BRM     CLINT           CLEAR INTERRUPT
10670  0 43 00434          BRM     END
                    *
                    *       TEST ADDRESS INCREMENTING IN STATE 5
                    *
10671  0 43 00430          BRM     OBJECT
10672  0 76 33550          LDA     =0              POTWORD
10673  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
10674  0 01 10720          BRU     F3E70
10675  0 43 23006          BRM     CPOT1           POT TO CHANNEL
10676    04074000          DATA    404B4+STADDR
10677  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10700  0 01 10720          BRU     F3E70
10701  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
10702  0 01 10720          BRU     F3E70
10703  0 43 23173          BRM     POTOUT          POT TO DISC
10704  0 01 10720          BRU     F3E70
10705  0 43 23033          BRM     CPOT4           POT TO CHANNEL
10706    04074000          DATA    404B4+STADDR
10707  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
10710  0 01 10720          BRU     F3E70
10711  0 02 10026          EOM     10026           ALERT DISC FILE
10712  0 33 23330          PIN     TEMP            PIN CONTROLLER ADDRESS
10713  0 76 23330          LDA     TEMP
10714  0 75 33551          LDB     =+1             MASK
10715  0 70 15465          SKM     BIT23           DID ADDRESS REGISTER INCREMENT
10716  0 43 00460          BRM     ERROR           NO
10717  0 20 32267          NOP     F3M71
10720  0 43 00434  F3E70   BRM     END
                    *
                    *       TEST CKRAO (STATE 5)
                    *
10721  0 43 00430          BRM     OBJECT
10722  0 76 33550          LDA     =0              POTWORD
10723  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
10724  0 01 10747          BRU     F3E71
```

```
10725  0 43 23024          BRM     CPBT3           PBT TB CHANNEL
10726    040340000         DATA    4B6+STADDR
10727  0 43 23143          BRM     WAIT            WAIT FBR CBNTRBLLER READY
10730  0 01 10747          BRU     F3E71
10731  0 43 23173          BRM     PBTBUT          PBT TB DISC
10732  0 01 10747          BRU     F3E71
10733  0 43 23073          BRM     CHECK           CHECK FBR CHANNEL READY
10734  0 01 10747          BRU     F3E71
10735  0 43 23033          BRM     CPBT4           PBT TB CHANNEL
10736    040340000         DATA    4B6+STADDR
10737  0 43 23143          BRM     WAIT            WAIT FBR CBNTRBLLER READY
10740  0 01 10747          BRU     F3E71
10741  0 02 10026          EBM     10026           ALERT DISC FILE
10742  0 33 23330          PIN     TEMP            PIN CBNTRBLLER ADDRESS
10743  0 76 23330          LDA     TEMP
10744  0 72 33551          SKA     +-1             DID ADDRESS REGISTER INCREMENT
10745  0 43 00460          BRM     ERRBR           YES
10746  0 20 32267          NBP     F3M71
10747  0 43 00434  F3E71    BRM     END
                    *
                    *       TEST READ PARITY GENERATION
                    *
10750  0 43 00430          BRM     BBJECT
10751  0 76 33550          LDA     +0              PBTWBRD
10752  0 43 22775          BRM     SETUP4          SET UP BBJECT TEST
10753  0 01 11021          BRU     F3F72           ABBRT
10754  0 76 33551          LDA     +-1             DATA WBRD
10755  0 35 34000          STA     STADDR
10756  0 43 23006          BRM     CPBT1           PBT TB CHANNEL
10757    000740000         DATA    4B4+STADDR
10760  0 43 23143          BRM     WAIT            WAIT FBR CBNTRBLLER READY
10761  0 01 11021          BRU     F3E72
10762  0 76 33550          LDA     +0              CLEAR INPUT BUFFER CELL
10763  0 35 34000          STA     STADDR
10764  0 43 23173          BRM     PBTBUT          PBT TB DISC
10765  0 01 11021          BRU     F3E72
```



```
10766  0 43 23073          BRM     CHECK           CHECK FBR CHANNEL READY
10767  0 01 11021          BRU     F3E72
10770  0 43 23015          BRM     CPBT2           PBT TB CHANNEL
10771    000740000         DATA    4B4+STADDR
10772  0 43 23143          BRM     WAIT            WAIT FBR CBNTRBLLER READY
10773  0 01 11021          BRU     F3E72
10774  0 40 12000          SKS     12000           CHANNEL ZERB WBRD CBUNT TEST
10775  0 01 10777          BRU     +-2             WBRD CBUNT NBT ZERB
10776  0 01 11005          BRU     F3L64
10777  0 76 33550          LDA     +0
11000  0 75 15465          LDB     BIT23
11001  0 71 33577          LDX     +STADDR
11002  0 43 00460          BRM     ERRBR
11003  2 20 30600          NBP     F3M20,2
11004  0 01 11021          BRU     F3E72
11005  0 76 34000  F3L64    LDA     STADDR          CHECK INPUT WBRD
11006  0 75 33551          LDB     +-1             MASK
11007  0 70 33551          SKM     +-1             DATA CBRRECT
11010  0 01 11012          BRU     +-2             NB
11011  0 01 11016          BRU     F3L65
11012  0 71 33577          LDX     +STADDR
11013  0 43 00460          BRM     ERRBR
11014  2 20 31133          NBP     F3M26,2
11015  0 01 11021          BRU     F3E72
11016  0 40 11000          SKS     11000           CHANNEL ERRBR TEST
11017  0 43 00460          BRM     ERRBR           CHANNEL ERRBR SET
11020  0 20 32274          NBP     F3M72
11021  0 43 00434  F3E72    BRM     END
                    *
                    *       TEST READ PARITY GENERATION
                    *
11022  0 43 00430          BRM     BBJECT
11023  0 76 33550          LDA     +0              PBTWBRD
11024  0 43 22775          BRM     SETUP4          SET UP BBJECT TEST
11025  0 01 11073          BRU     F3E73           ABBRT
11026  0 76 33550          LDA     +0              DATA WBRD
```

```
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11027  0 35 34000          STA     STADDR
11030  0 43 23006          BRM     CPOT1           POT TO CHANNEL
11031    00074000          DATA    4B4+STADDR
11032  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
11033  0 01 11073          BRU     F3E73
11034  0 76 33551          LDA     *+1             ALTER INPUT LOCATION
11035  0 35 34000          STA     STADDR
11036  0 43 23173          BRM     POTOUT          POT TO DISC
11037  0 01 11073          BRU     F3E73
11040  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
11041  0 01 11073          BRU     F3E73
11042  0 43 23015          BRM     CPOT2           POT TO CHANNEL
11043    00074000          DATA    4B4+STADDR
11044  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
11045  0 01 11073          BRU     F3E73
11046  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
11047  0 01 11051          BRU     *+2             WORD COUNT NOT ZERO
11050  0 01 11057          BRU     F3L66
11051  0 76 33550          LDA     *0
11052  0 75 15465          LDB     BIT23
11053  0 71 33577          LDX     *STADDR
11054  0 43 00460          BRM     ERROR
11055  2 20 30400          NOP     F3M20,2
11056  0 01 11073          BRU     F3E73
11057  0 74 34000  F3L66   LDA     STADDR          CHECK INPUT WORD
11060  0 72 33551          SKA     *+1             DATA CORRECT
11061  0 01 11063          BRU     *+2             NO
11062  0 01 11070          BRU     F3L67
11063  0 75 33550          LDB     *0
11064  0 71 33577          LDX     *STADDR
11065  0 43 00460          BRM     ERROR
11066  2 20 31133          NOP     F3M26,2
11067  0 01 11073          BRU     F3E73
11070  0 40 11000          SKS     11000           CHANNEL ERROR TEST
11071  0 43 00460          BRM     ERROR           CHANNEL ERROR SET
11072  0 20 32324          NOP     F3M73
```

```
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11073  0 43 00434  F3E73   BRM     END
                   *
                   *       TEST PARITY GENERATION CIRCUIT
                   *
11074  0 43 00430          BRM     OBJECT
11075  0 76 33550          LDA     *0              POTWORD
11076  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
11077  0 01 11146          BRU     F3E74           ABORT
11100  0 76 33612          LDA     *25522552       DATA WORD
11101  0 35 34000          STA     STADDR
11102  0 43 23006          BRM     CPOT1           POT TO CHANNEL
11103    00074000          DATA    4B4+STADDR
11104  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
11105  0 01 11146          BRU     F3E74
11106  0 76 33550          LDA     *0              CLEAR INPUT LOCATION
11107  0 35 34000          STA     STADDR
11110  0 43 23173          BRM     POTOUT          POT TO DISC
11111  0 01 11146          BRU     F3E74
11112  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
11113  0 01 11146          BRU     F3E74
11114  0 43 23015          BRM     CPOT2           POT TO CHANNEL
11115    00074000          DATA    4B4+STADDR
11116  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
11117  0 01 11146          BRU     F3E74
11120  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
11121  0 01 11123          BRU     *+2             WORD COUNT NOT ZERO
11122  0 01 11131          BRU     F3L68
11123  0 76 33550          LDA     *0
11124  0 75 15465          LDB     BIT23
11125  0 71 33577          LDX     *STADDR
11126  0 43 00460          BRM     ERROR
11127  2 20 30400          NOP     F3M20,2
11130  0 01 11146          BRU     F3E74
11131  0 76 34000  F3L68   LDA     STADDR          CHECK INPUT WORD
11132  0 75 33551          LDB     *+1             MASK
11133  0 70 33612          SKM     *25522552       IS THE DATA CORRECT
```

```
11134  0 01 11136          BRU     *+2             NO
11135  0 01 11143          BRU     F3L69
11136  0 75 33612          LDB     =25522552
11137  0 71 33577          LDX     =STADDR
11140  0 43 00460          BRM     ERROR
11141  2 20 31133          NOP     F3M26,2
11142  0 01 11146          BRU     F3E74
11143  0 40 11000          SKS     11000           CHANNEL ERROR TEST
11144  0 43 00460          BRM     ERROR           CHANNEL ERROR SET
11145  0 20 32346          NOP     F3M74
11146  0 43 00434  F3E74    BRM     END
                   *
                   *       VERIFY ZEROS WRITTEN AFTER CHANNEL DISCONNECTS
                   *
11147  0 43 00430          BRM     OBJECT
11150  0 76 33550          LDA     =0              POTWORD
11151  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
11152  0 01 11253          BRU     F3E75
11153  0 76 33551          LDA     =+1             DATA WORDS
11154  0 77 37700          EAX     =64D
11155  2 35 34100          STA     STADDR+64D,2
11156  0 41 11155          BRX     *+1
11157  0 43 23006          BRM     CPOT1           POT TO CHANNEL
11160     04034000         DATA    4B6+STADDR
11161  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
11162  0 01 11253          BRU     F3E75
11163  0 76 33550          LDA     =0              CLEAR FIRST WORD
11164  0 35 34000          STA     STADDR
11165  0 43 23173          BRM     POTOUT          POT TO DISC
11166  0 01 11253          BRU     F3E75
11167  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
11170  0 01 11253          BRU     F3E75
11171  0 43 23006          BRM     CPOT1           POT TO CHANNEL
11172     00074000         DATA    4B4+STADDR
11173  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
11174  0 01 11253          BRU     F3E75
```



```
11175  0 76 33551          LDA     =+1
11176  0 35 34000          STA     STADDR
11177  0 43 23173          BRM     POTOUT          POT TO DISC
11200  0 01 11253          BRU     F3E75
11201  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
11202  0 01 11253          BRU     F3E75
11203  0 43 23015          BRM     CPOT2           POT TO CHANNEL
11204     01034000         DATA    1B6+STADDR
11205  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
11206  0 01 11253          BRU     F3E75
11207  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
11210  0 01 11212          BRU     *+2             WORD COUNT NOT ZERO
11211  0 01 11223          BRU     F3L70
11212  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
11213  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS REGISTER
11214  0 76 23330          LDA     TEMP
11215  0 54 33577          SUB     =STADDR         A = WORD COUNT
11216  0 75 15461          LDB     BIT19
11217  0 71 33577          LDX     =STADDR
11220  0 43 00460          BRM     ERROR
11221  2 20 30400          NOP     F3M20,2
11222  0 01 11253          BRU     F3E75
11223  0 76 33550  F3L70    LDA     =0              CHECK DATA
11224  0 35 23330          STA     TEMP
11225  0 77 37700          EAX     =64D
11226  0 55 15465  F3L71    ADD     BIT23           INCREMENT COUNT
11227  0 46 00014          XAB
11230  2 76 34100          LDA     STADDR+64D,2
11231  0 72 33551          SKA     =+1             IS DATA CORRECT
11232  0 43 11242          BRM     F3L72           NO
11233  0 46 00014          XAB
11234  0 41 11226          BRX     F3L71           LOOP
11235  0 53 23330          SKN     TEMP            HAS AN ERROR OCCURED
11236  0 01 11253          BRU     F3E75           NO
11237  0 43 00460          BRM     ERROR
11240  0 20 32425          NOP     F3M77
```

```
11241  0 01 11253          BRU     F3E75
11242  0 00 00000  F3L72   PZE     0
11243  0 53 23330          SKN     TEMP            FIRST ERROR
11244  0 43 00454          BRM     REPORT          YES = OUTPUT HEADING
11245  0 20 32366          NOP     F3M75
11246  0 43 00454          BRM     REPORT          OUTPUT DATA
11247  2 20 32424          NOP     F3M76,2
11250  0 76 33551          LDA     =+1
11251  0 35 23330          STA     TEMP
11252  0 51 11242          BRR     F3L72
11253  0 43 00434  F3E75   BRM     END
                    *
                    *       TEST 3Z6FA
                    *
11254  0 43 00430          BRM     OBJECT
11255  0 76 33550          LDA     =0              POTWORD
11256  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
11257  0 01 11302          BRU     F3E76
11260  0 43 23006          BRM     CPOT1           POT TO CHANNEL
11261    10034000          DATA    1B7+STADDR
11262  0 76 33613          LDA     =STADDR+3       COMPARE ADDRESS
11263  0 75 33551          LDB     =+1             MASK
11264  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
11265  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
11266  0 70 23330          SKM     TEMP            DO ADDRESSES COMPARE
11267  0 01 11264          BRU     F3L73           NO = LOOP
11270  0 02 10226          EOM     10226           CLEAR FILE
11271  0 40 10026          SKS     10026           DISC FILE READY TEST
11272  0 01 11300          BRU     F3L74           NOT IN STATE 0
11273  0 40 12026          SKS     12026           TRACK VERIFIED TEST
11274  0 01 11302          BRU     F3E76           IN STATE 0
11275  0 43 00460          BRM     ERROR           IN STATE 1
11276  0 20 32502          NOP     F3M79
11277  0 01 11302          BRU     F3E76
11300  0 43 00460  F3L74   BRM     ERROR
11301  0 20 32446          NOP     F3M78
```



```
11302  0 02 00000          EOM     0               DISCONNECT CHANNEL
11303  0 43 00434          BRM     END
                    *
                    *       TEST 2CLMA
                    *
11304  0 43 00430          BRM     OBJECT
11305  0 76 33550          LDA     =0              POTWORD
11306  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
11307  0 01 11325          BRU     F3E77
11310  0 43 23006          BRM     CPOT1           POT TO CHANNEL
11311    10034000          DATA    1B7+STADDR
11312  0 76 33613          LDA     =STADDR+3       COMPARE ADDRESS
11313  0 75 33551          LDB     =+1             MASK
11314  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
11315  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
11316  0 70 23330          SKM     TEMP            DATA BEING TRANSMITTED YET
11317  0 01 11314          BRU     F3L75           NO = LOOP
11320  0 02 10227          EOM     10227           ILLEGAL EOM
11321  0 40 10026          SKS     10026           DISC FILE READY TEST
11322  0 01 11324          BRU     *+2             NOT READY = OK
11323  0 43 00460          BRM     ERROR
11324  0 20 32514          NOP     F3M80
11325  0 02 00000          EOM     0               DISCONNECT CHANNEL
11326  0 43 00434          BRM     END
                    *
                    *       TEST 2CLMA
                    *
11327  0 43 00430          BRM     OBJECT
11330  0 76 33550          LDA     =0              POTWORD
11331  0 43 22775          BRM     SETUP4          SET UP OBJECT TEST
11332  0 01 11350          BRU     F3E78
11333  0 43 23006          BRM     CPOT1           POT TO CHANNEL
11334    10034000          DATA    1B7+STADDR
11335  0 76 33613          LDA     =STADDR+3       COMPARE ADDRESS
11336  0 75 33551          LDB     =+1             MASK
11337  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
```

```
11340  0 33 23330        PIN     TEMP            PIN CHANNEL ADDRESS
11341  0 70 23330        SKM     TEMP            DATA BEING TRANSMITTED YET
11342  0 01 11337        BRU     F3L76           NO
11343  0 02 30226        EOM     30226           ILLEGAL EOM
11344  0 40 10026        SKS     10026           DISC FILE READY TEST
11345  0 01 11347        BRU     *+2             CONTROLLER NOT READY = OK
11346  0 43 00460        BRM     ERROR
11347  0 20 32521        NOP     F3M81
11350  0 02 00000        EOM     0               DISCONNECT CHANNEL
11351  0 43 00434        BRM     END
                  *
                  *      TEST 2CLMA
                  *
11352  0 43 00430        BRM     OBJECT
11353  0 76 33550        LDA     =0              PATWORD
11354  0 43 22775        BRM     SETUP4          SET UP OBJECT TEST
11355  0 01 11374        BRU     F3E79
11356  0 43 23006        BRM     CPOT1           POT TO CHANNEL
11357    10034000        DATA    1B7+STADDR
11360  0 76 33413        LDA     *STADDR+3       COMPARE ADDRESS
11361  0 75 33451        LDB     *+1             MASK
11362  0 02 12000        EOM     12000           ALERT TO PIN CHANNEL ADDRESS
11363  0 33 23330        PIN     TEMP            PIN CHANNEL ADDRESS
11364  0 70 23330        SKM     TEMP            DATA BEING TRANSMITTED YET
11365  0 01 11362        BRU     F3L77           NO
11366  0 02 10026        EOM     10026           ALERT DISC FILE
11367  0 33 23330        PIN     TEMP            DUMMY - EOM SHOULD NOT INTERFERE
11370  0 40 10026        SKS     10026           DISC FILE READY TEST
11371  0 01 11373        BRU     *+2             CONTROLLER NOT READY = OK
11372  0 43 00460        BRM     ERROR
11373  0 20 32514        NOP     F3M80
11374  0 02 00000        EOM     0               DISCONNECT CHANNEL
11375  0 43 00434        BRM     END
                  *
                  *      TEST 0X02A
                  *
```



```
11376  0 43 00430        BRM     OBJECT
11377  0 76 33550        LDA     =0              PATWORD
11400  0 43 22775        BRM     SETUP4          SET UP OBJECT TEST
11401  0 01 11423        BRU     F3E81
11402  0 43 23006        BRM     CPOT1           POT TO CHANNEL
11403    10034000        DATA    1B7+STADDR
11404  0 02 32666        EOM     32666           SYSTEMS EOM - SHOULD HAVE NO EFFECT
11405  0 43 23143        BRM     WAIT            WAIT FOR CONTROLLER READY
11406  0 01 11423        BRU     F3E81
11407  0 43 23173        BRM     POTOUT          POT TO DISC
11410  0 01 11423        BRU     F3E81
11411  0 43 23073        BRM     CHECK           CHECK FOR CHANNEL READY
11412  0 01 11423        BRU     F3E81
11413  0 43 23015        BRM     CPOT2           POT TO CHANNEL
11414    10034000        DATA    1B7+STADDR
11415  0 43 23143        BRM     WAIT            WAIT FOR CONTROLLER READY
11416  0 01 11423        BRU     F3E81
11417  0 40 12000        SKS     12000           CHANNEL ZERO WORD COUNT TEST
11420  0 01 11422        BRU     *+2             WORD COUNT NOT 0 = OK
11421  0 43 00460        BRM     ERROR
11422  0 20 32546        NOP     F3M83
11423  0 02 00000        EOM     0               DISCONNECT CHANNEL
11424  0 43 00434        BRM     END
                  *
                  *      TEST 0X02A
                  *
11425  0 43 00430        BRM     OBJECT
11426  0 76 33550        LDA     =0              PATWORD
11427  0 43 22775        BRM     SETUP4          SET UP OBJECT TEST
11430  0 01 11451        BRU     F3E82
11431  0 43 23024        BRM     CPOT3           POT TO CHANNEL
11432    10034000        DATA    1B7+STADDR
11433  0 02 33666        EOM     33666           SYSTEMS EOM - SHOULD HAVE NO EFFECT
11434  0 43 23143        BRM     WAIT            WAIT FOR CONTROLLER READY
11435  0 01 11451        BRU     F3E82
11436  0 43 23173        BRM     POTOUT          POT TO DISC
```

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11437  0 01 11451          BRU     F3E82
11440  0 43 23073          BRM     CHECK           CHECK FOR CHANNEL READY
11441  0 01 11451          BRU     F3E82
11442  0 43 23033          BRM     CPOT4           POT TO CHANNEL
11443     10034000         DATA    1B7+STADDR
11444  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
11445  0 01 11451          BRU     F3E82
11446  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
11447  0 43 00460          BRM     ERROR           WORD COUNT NOT ZERO
11450  0 20 32533          NOP     F3M82
11451  0 02 00000          EOM     0               DISCONNECT CHANNEL
11452  0 43 00434          BRM     END
                    *
                    *       TEST 9YESA
                    *
11453  0 43 00430          BRM     OBJECT
11454  0 43 22634          BRM     F3S4            GENERATE ERROR
11455  0 01 11462          BRU     F3E85           ABORT
11456  0 40 11000          SKS     11000           CHANNEL ERROR TEST
11457  0 01 11461          BRU     *+2             CHANNEL ERROR OK
11460  0 43 00460          BRM     ERROR
11461  0 20 32565          NOP     F3M94
11462  0 43 00434  F3E85    BRM     END
                    *
                    *       TEST 9YHSA
                    *
11463  0 43 00430          BRM     OBJECT
11464  0 43 22634          BRM     F3S4            GENERATE ERROR
11465  0 01 11512          BRU     F3E86           ABORT
11466  0 02 10226          EOM     10226           CLEAR FILE
11467  0 02 00000          EOM     0               DISCONNECT CHANNEL
11470  0 76 33550          LDA     =0              CLEAR I2 FLAG
11471  0 35 15476          STA     I2FLAG
11472  0 43 00440          BRM     RETURN          SET SPIT LINKAGE
11473  0 20 23353          NOP     PI2
11474  0 43 23173          BRM     POTOUT          POT TO DISC
```

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DISCW  TAP=3.0                          PAGE 130

11475  0 01 11512          BRU     F3E86
11476  0 02*10000          EOM*    10000           ALERT CHANNEL
11477  0 02 16000          EOM     16000           EXTENDED MODE EOM
11500  0 13 33611          POT     =1B7+STADDR
11501  0 02 02626          EOM     2626            READ DISC FILE + CHAIN
11502  0 43 23305          BRM     =200            WAIT 200 MILLISEC
11503  0 02 20002          EIR                     ENABLE INTERRUPTS
11504  0 20 00000          NOP     0               DUMMY - INTERRUPT SHOULD BE PENDING
11505  0 20 00000          NOP     0
11506  0 02 20004          DIR                     DISABLE INTERRUPTS
11507  0 53 15476          SKN     I2FLAG          WAS I2 INTERRUPT RECEIVED
11510  0 43 00460          BRM     ERROR           NO
11511  0 20 32575          NOP     F3M95
11512  0 43 00434  F3E86    BRM     END
11513  0 43 00456  ENDF3    BRM     FDONE           EXIT FUNCTION
```

```
                    *
                    *       FUNCTION PARAMETER TABLES
                    *
11514  0 20 11522   FPT3    NOP     FIM3            FUNCTION IDENTIFIER MESSAGE
11515  0 20 11541           NOP     FAM3            FUNCTION ABSTRACT MESSAGE
11516  0 20 05476           NOP     FVM1            FUNCTION VARIABLES MESSAGE
11517  0 01 05511           ONE     FVT1            FUNCTION VARIABLES (NONE)
11520  0 00 11742           PZE     FUNC4           POINTER TO NEXT FUNCTION
11521    04000000           DATA    4000000         FUNCTION IDENTIFIER BIT (BIT 3)
                    *
                    *       FUNCTION MESSAGES
                    *
11522    52261200   FIM3    BCD     ' F 03 - DISC FILE CONTROLLER DIAGNOSTIC WITH DATA TRANSFER''
11523    03124012
11524    24316223
11525    12263143
11526    25122346
11527    45635146
11530    43432551
11531    12243121
11532    27454462
11533    63312312
11534    66316330
11535    12242163
11536    21126351
11537    21456226
11540    25513712
11541    52322431   FAM3    BCD     '  DISC FILE CONTROLLER DIAGNOSTIC WITH DATA TRANSFER'
11542    62231226
11543    31432512
11544    23464563
11545    51464343
11546    25511224
11547    31212745
11550    46626331
11551    23126431
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11552    63301224
11553    21632112
11554    63512145
11555    62262551
11556    52526330           BCD     '  THIS FUNCTION TESTS THE 9164 DISC FILE CONTROLLER AS'
11557    31621226
11560    64452363
11561    31464512
11562    63256263
11563    62126330
11564    25121101
11565    06041224
11566    31622312
11567    26314325
11570    12234445
11571    63514443
11572    43255112
11573    21621212
11574    52446423           BCD     ' MUCH AS POSSIBLE WITH DATA TRANSFER. THE FOLLOWING'
11575    30122162
11576    12474662
11577    62312243
11600    25126631
11601    63301224
11602    21632112
11603    63512145
11604    62262551
11605    33126330
11606    25122646
11607    43434666
11610    31452712
11611    52216262           BCD     ' ASSUMPTIONS ARE MADE''
11612    64444763
11613    31464562
11614    12215125
11615    12442124
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11616    25151212
11617    52665131          BCD     ' WRITE HEADER SWITCH IS OFF'
11620    63251230
11621    25212425
11622    51126266
11623    31632330
11624    12316212
11625    46262412
11626    52454412          BCD     ' NO DISCS WRITE PROTECTED'
11627    24316223
11630    62126651
11631    31632512
11632    47514663
11633    25236325
11634    24121212
11635    52255151          BCD     ' ERROR STOP SWITCH IS IN CONTINUE'
11636    46511262
11637    63464712
11640    62663163
11641    23301231
11642    62123145
11643    12234645
11644    63314564
11645    25121212
11646    52263143          BCD     ' FILE IS ON LINE'
11647    25123162
11650    12464512
11651    43314525
11652    52302521          BCD     ' HEADERS ARE GOOD'
11653    24255162
11654    12215125
11655    12274646
11656    24121212
11657    52312612          BCD     ' IF THE DISC IS SOFTWARE WRITE PROTECTED OR PREVIOUSLY'
11660    63302512
11661    24316223
```



```
11662    12316212
11663    62462663
11664    66215125
11665    12665131
11666    63251247
11667    51466325
11670    23632524
11671    12465112
11672    47512565
11673    31466462
11674    43701212
11675    52422570          BCD     ' KEYED, THIS FUNCTION WILL BE SKIPPED. OBJECT TESTS USING'
11676    25247312
11677    63303162
11700    12266445
11701    23633146
11702    45126431
11703    43431222
11704    25126242
11705    31474725
11706    24331246
11707    22412523
11710    63126325
11711    62636212
11712    64623145
11713    27121212
11714    52243162          BCD     ' DISCS WHICH ARE DELEATED FROM THE UNIT VARIABLES D00717'
11715    23621266
11716    30312330
11717    12215125
11720    12242543
11721    25216325
11722    24122651
11723    46441263
11724    30251264
11725    45316312
```

```
DISCW  TAP=3.0                    PAGE 135

11726    65215131
11727    21224325
11730    62122400
11731    00630107
11732    52214524          BCD     ! AND D20T37 WILL BE SKIPPED.!!
11733    12240200
11734    63030712
11735    66314343
11736    12222512
11737    62423147
11740    47252433
11741    37121212
```

```
DISCW  TAP=3.0                    PAGE 136

                         *
                         *
                         *        FUNCTION 4 = HEADER AND ADDRESSING VERIFICATION
                         *
                         *
11742  0 43 00424  FUNC4  BRM      FUNCTN           FUNCTION LINK
11743  0 20 12230         NOP      FPT4
11744  0 43 00430         BRM      OBJECT
11745  0 02 20004         DIR
11746  0 43 00440         BRM      RETURN           SET INTERRUPT LINKAGE
11747  0 20 23371         NOP      ENTER
11750  0 76 00401         LDA      STATUS           CHECK FOR SOFTWARE WRITE-PROTECT
11751  0 72 15447         SKA      BIT9
11752  0 01 12210         BRU      ENDF4            WRITE PROTECTED
11753  0 76 00332         LDA      FLAGS            CHECK FOR PREVIOUS KEY
11754  0 72 04777         SKA      UPT+4
11755  0 01 12210         BRU      ENDF4            DISC KEYED
                         *
                         *        CLEAR OUTPUT BUFFER
                         *
11756  0 76 33550         LDA      =0
11757  0 71 33614         LDX      =-2048D
11760  2 35 00000         STA      STADDR+2048D,2
11761  0 41 11760         BRX      *-1
                         *
                         *        PRESET
                         *
11762  0 76 33415         LDA      =-20000          PRESET POTWORD
11763  0 35 23352         STA      POTWRD
                         *
                         *        DISC DRIVER
                         *
11764  0 76 23352  F4L1   LDA      POTWRD
11765  0 55 15450         ADD      BIT10            INCREMENT DISC NUMBER
11766  0 73 33566         SKG      =777777          FINISHED
11767  0 01 11771         BRU      *+2              NO
```

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DISCW   TAP.3.C                         PAGE 137

11770   0 01 12072          BRU     F4E1
11771   0 43 23042          BRM     DISCCK          USE THIS DISC
11772   0 01 11764          BRU     F4L1            NO
11773   0 43 00430          BRM     OBJECT
11774   0 43 23173          BRM     POTOUT          POT TO DISC
11775   0 01 12034          BRU     F4L4            ERROR ABORT
11776   0 43 23173  F4L2    BRM     CHECK           CHECK FOR CHANNEL READY
11777   0 01 12034          BRU     F4L4            ERROR ABORT
12000   0 76 23352          LDA     POTWRD
12001   0 71 33414          LDX     #-2048D
12002   2 35 00000          STA     STADDR-2048D,2  STORE DATA IN FIRST WORD
12003   0 02*10000          EOM*    10000           ALERT CHANNEL
12004   0 02 14202          EOM     14202           EXTENDED MODE EOM
12005   0 13 33577          POT     #STADDR
12006   0 02 03466          EOM     3666            WRITE DISC FILE . SECTOR
                    *
                    *       BUILD OUTPUT TABLE
                    *
12007   2 35 00000  F4L3    STA     STADDR-2048D,2
12010   0 55 15465          ADD     BIT23
12011   2 77 00077          EAX     77,2
12012   0 41 12007          BRX     F4L3            LOOP
12013   0 43 23143          BRM     WAIT            WAIT FOR DISC TO FINISH
12014   0 01 12034          BRU     F4L4            ERROR ABORT
12015   0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
12016   0 01 12034          BRU     F4L4            ERROR . COUNT NOT ZERO
12017   0 40 11000          SKS     11000           CHANNEL ERROR TEST
12020   0 01 12034          BRU     F4L4            CHANNEL ERROR SET
12021   0 43 01434          BRM     END
12022   0 76 23352  F4L5    LDA     POTWRD
12023   0 75 33416          LDB     #760000         MASK
12024   0 55 15460          ADD     BIT18           INCREMENT POTWORD
12025   0 70 23352          SKM     POTWRD          NEW ADDRESS ON SAME DISC
12026   0 01 11766          BRU     F4L1+2          NO
12027   0 35 23352          STA     POTWRD
12030   0 43 00430          BRM     OBJECT
```

```
DISCW   TAP.3.C                         PAGE 138

12031   0 02 10026          EOM     10026           ALERT DISC FILE
12032   0 13 23352          POT     POTWRD          POT TO DISC
12033   0 01 11776          BRU     F4L2
                    *
                    *       ERROR ROUTINE
                    *
12034   0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
12035   0 33 23330          PIN     TEMP            COMPUTE WORD COUNT
12036   0 76 23330          LDA     TEMP
12037   0 54 33577          SUB     #STADDR
12040   0 35 15513          STA     ERRTBL
12041   0 76 15452          LDA     BIT12           CORRECT WORD COUNT
12042   0 35 15514          STA     ERRTBL+1
12043   0 76 23352          LDA     POTWRD          STARTING DISC ADDRESS
12044   0 35 15515          STA     ERRTBL+2
12045   0 02 10026          EOM     10026           ALERT DISC FILE
12046   0 33 15516          PIN     ERRTBL+3        PINNED DISC ADDRESS
12047   0 76 33550          LDA     #0              CHANNEL ERROR FLAG
12050   0 40 11000          SKS     11000           CHANNEL ERROR TEST
12051   0 76 33551          LDA     #-1
12052   0 35 15517          STA     ERRTBL+4
12053   0 76 33550          LDA     #0              CONTROLLER ERROR FLAG
12054   0 40 11026          SKS     11026           DISC FILE ERROR TEST
12055   0 76 33551          LDA     #-1
12056   0 35 15520          STA     ERRTBL+5
12057   0 76 23351          LDA     TIMOUT          TIMEOUT ERROR FLAG
12060   0 35 15521          STA     ERRTBL+6
12061   0 02 10226          EOM     10226           CLEAR FILE
12062   0 02 00000          EOM     0               DISCONNECT CHANNEL
12063   0 43 00454          BRM     REPORT          REPORT ERROR
12064   4 20 32602          NOP     F4M1,4          MESSAGE
12065   0 07 15513          SEVEN   ERRTBL          DATA
12066   0 43 00460          BRM     ERROR           GO TO CONTROL
12067   0 20 32627          NOP     F4M2
12070   0 43 00434          BRM     END
12071   0 01 12022          BRU     F4L5
```

```
12072  0 43 00434  F4E1   BRM     END
12073  0 01 12074         BRU     F481
                   *
                   *      ADDRESSING VERIFICATION
                   *
12074  0 76 33615  F481   LDA     =#20000          PRESET POT WORD
12075  0 35 23352         STA     POTWRD
12076  0 76 23352  F4L6   LDA     POTWRD           INCREMENT DISC NUMBER
12077  0 55 15450         ADD     BIT10
12100  0 73 33566         SKG     =#777777         FINISHED
12101  0 01 12103         BRU     *+2              NO
12102  0 01 12207         BRU     F4E2
12103  0 43 23042         BRM     DISCCK           USE THIS DISC
12104  0 01 12076         BRU     F4L6             NO
12105  0 43 00430         BRM     OBJECT
12106  0 43 23173         BRM     POTOUT           POT TO DISC
12107  0 01 12151         BRU     F4L10            ERROR ABORT
12110  0 43 23073  F4L7   BRM     CHECK            CHECK FOR CHANNEL READY
12111  0 01 12151         BRU     F4L10            ERROR ABORT
12112  0 02#10000         EOM#    10000            ALERT CHANNEL
12113  0 02 14002         EOM     14002            EXTENDED MODE EOM
12114  0 13 33577         POT     =STADDR
12115  0 02 02626         EOM     2626             READ DISC FILE + CHAIN
12116  0 43 23143         BRM     WAIT             WAIT FOR CONTROLLER TO FINISH
12117  0 01 12151         BRU     F4L10            ERROR ABORT
12120  0 40 12000         SKS     12000            CHANNEL ZERO WORD COUNT TEST
12121  0 01 12151         BRU     F4L10            WORD COUNT NOT ZERO
12122  0 40 11000         SKS     11000            CHANNEL ERROR TEST
12123  0 01 12151         BRU     F4L10            CHANNEL ERROR SET
12124  0 76 33550         LDA     =0
12125  0 35 12227         STA     F4L11A
12126  0 76 23352         LDA     POTWRD           TEST FIRST WORD OF EACH SECTOR INPUT
12127  0 71 33614         LDX     =-2048D
12130  0 75 33551         LDB     =-1              MASK
12131  2 70 00000  F4L8   SKM     STADDR+2048D,2   ADDRESS CORRECT
12132  0 43 12211         BRM     F4L11            NO
```



```
12133  0 55 15465         ADD     BIT23
12134  2 77 00077         EAX     77,2
12135  0 41 12131         BRX     F4L8             LOOP
12136  0 43 00434         BRM     END
12137  0 76 23352  F4L9   LDA     POTWRD
12140  0 75 33616         LDB     =760000          MASK
12141  0 55 15460         ADD     BIT16            INCREMENT TRACK PAIR
12142  0 70 23352         SKM     POTWRD           ADDRESS ON SAME DISC
12143  0 01 12100         BRU     F4L6+2           NO
12144  0 35 23352         STA     POTWRD
12145  0 43 00430         BRM     OBJECT
12146  0 02 10026         EOM     10026            ALERT DISC FILE
12147  0 13 23352         POT     POTWRD           POT TO DISC
12150  0 01 12110         BRU     F4L7
                   *
                   *      ERROR ROUTINE
                   *
12151  0 02 12000         EOM     12000            ALERT TO PIN CHANNEL ADDRESS
12152  0 33 23330         PIN     TEMP             COMPUTE WORD COUNT
12153  0 76 23330         LDA     TEMP
12154  0 54 33577         SUB     =STADDR
12155  0 35 15513         STA     ERRTBL
12156  0 76 15452         LDA     BIT12            CORRECT WORD COUNT
12157  0 35 15514         STA     ERRTBL+1
12160  0 76 23352         LDA     POTWRD           STARTING DISC ADDRESS
12161  0 35 15515         STA     ERRTBL+2
12162  0 02 10026         EOM     10026            ALERT DISC FILE
12163  0 33 15516         PIN     ERRTBL+3         PINNED DISC ADDRESS
12164  0 76 33550         LDA     =0               CHANNEL ERROR FLAG
12165  0 40 11000         SKS     11000            CHANNEL ERROR TEST
12166  0 76 33551         LDA     =-1
12167  0 35 15517         STA     ERRTBL+4
12170  0 76 33550         LDA     =0               CONTROLLER ERROR FLAG
12171  0 40 11026         SKS     11026            DISC FILE ERROR TEST
12172  0 76 33551         LDA     =-1
12173  0 35 15520         STA     ERRTBL+5
```

```
12174  0 76 23351          LDA     TIMOUT          TIMEOUT ERROR FLAG
12175  0 35 15521          STA     ERRTBL+6
12176  0 02 10226          EOM     10226           CLEAR FILE
12177  0 02 00000          EOM     0               DISCONNECT CHANNEL
12200  0 43 00454          BRM     REPORT          REPORT ERROR
12201  4 20 32630          NOP     F4M3,4          MESSAGE
12202  0 07 15513          SEVEN   ERRTBL          DATA
12203  0 43 00460          BRM     ERROR           GO TO CONTROL
12204  0 20 32627          NOP     F4M2
12205  0 43 00434          BRM     END
12206  0 01 12137          BRU     F4L9
12207  0 43 00434  F4E2    BRM     END
12210  0 43 00456  ENDF4   BRM     FDONE           EXIT FUNCTION
                   *
                   *       DATA ERROR SUBROUTINE
                   *
12211  0 00 00000  F4L11   PZE     0
12212  0 35 15513          STA     ERRTBL          CORRECT ADDRESS
12213  2 76 00000          LDA     STADDR+2048D,2
12214  0 35 15514          STA     ERRTBL+1        INCORRECT ADDRESS
12215  0 53 12227          SKN     F4L11A          PRINT HEADING
12216  0 43 00454          BRM     REPORT          YES
12217  0 20 32660          NOP     F4M4
12220  0 43 00454          BRM     REPORT          OUTPUT DATA
12221  4 20 32627          NOP     F4M2,4          CARRIAGE RETURN
12222  0 02 15513          TWO     ERRTBL          DATA
12223  0 76 33551          LDA     *+1
12224  0 35 12227          STA     F4L11A
12225  0 76 15513          LDA     ERRTBL          RESTORE A
12226  0 51 12211          BRR     F4L11
12227  0 00 00000  F4L11A  PZE     0               PRINT HEADING FLAG
```



```
                   *
                   *       FUNCTION PARAMETER TABLES
                   *
12230  0 20 12236  FPT4    NOP     FIM4            FUNCTION IDENTIFIER MESSAGE
12231  0 20 12251          NOP     FAM4            FUNCTION ABSTRACT MESSAGE
12232  0 20 05476          NOP     FVM1            FUNCTION VARIABLES MESSAGE
12233  0 01 05011          ONE     FVT1            FUNCTION VARIABLES (NONE)
12234  0 00 12445          PZE     FUNC5           POINTER TO NEXT FUNCTION
12235    02000000          DATA    2000000         FUNCTION IDENTIFIER BIT (BIT 4)
                   *
                   *       FUNCTION MESSAGES
                   *
12236    52261200  FIM4    BCD     ' F 04 - HEADER AND ADDRESSING VERIFICATION'
12237    04124012
12240    30252124
12241    25511221
12242    45241221
12243    24245125
12244    62623145
12245    27126525
12246    51312631
12247    23216331
12250    46453712
12251    52323025  FAM4    BCD     '  HEADER AND ADDRESSING VERIFICATION'
12252    21242551
12253    12214524
12254    12212424
12255    51256262
12256    31452712
12257    65255131
12260    26312721
12261    63314445
12262    52526330          BCD     '  THIS FUNCTION VERIFIES HEADERS AND ADDRESSING BY'
12263    31621226
12264    64452363
12265    31464412
```

```
12266    65255131
12267    26312562
12270    12302521
12271    24255162
12272    12214524
12273    12212424
12274    51256262
12275    31452712
12276    22701212
12277    52665131          BCD     ' WRITING THE SECTOR ADDRESS IN THE FIRST WORD OF EACH'
12300    63314527
12301    12633025
12302    12622523
12303    63465112
12304    21242451
12305    25626212
12306    31451263
12307    30251226
12310    31516263
12311    12664651
12312    24124426
12313    12252123
12314    30121212
12315    52622523          BCD     ' SECTOR ON THE DISC. WHEN THE ENTIRE DISC HAS BEEN TAGGED'
12316    63465112
12317    46451263
12320    30251224
12321    31622333
12322    12663025
12323    45126330
12324    25122545
12325    63315125
12326    12243162
12327    23123021
12330    62122225
12331    25451263
```



```
12332    21272725
12333    24121212
12334    52633025          BCD     ' THE ENTIRE DISC IS THEN READ AND THE FIRST WORD IN EACH'
12335    12254563
12336    31512512
12337    24316223
12340    12316212
12341    63302545
12342    12512521
12343    24122145
12344    24126330
12345    25122631
12346    51626312
12347    66465124
12350    12314512
12351    25212330
12352    52622523          BCD     ' SECTOR IS CHECKED FOR THE CORRECT ADDRESS. DISCS WHICH'
12353    63465112
12354    31621223
12355    30252342
12356    25241226
12357    46511263
12360    30251223
12361    46515125
12362    23631221
12363    24245125
12364    62623312
12365    24316223
12366    62126630
12367    31233012
12370    52302165          BCD     ' HAVE BEEN DELETED FROM THE UNIT VARIABLES D00T17 AND'
12371    25122225
12372    25451224
12373    25432563
12374    25241226
12375    51464412
```

```
12376    63302512
12377    64453163
12400    12652151
12401    31212243
12402    25621224
12403    00006301
12404    07122145
12405    24121212
12406    52240200          BCD     ' D20T37 WILL NOT BE DRIVEN, IF THE DISC IS SOFTWARE'
12407    63030712
12410    66314343
12411    12454663
12412    12222512
12413    24513165
12414    25453312
12415    31261263
12416    30251224
12417    31622312
12420    31621262
12421    46266366
12422    21512512
12423    52665131          BCD     ' WRITE PROTECTED OR PREVIOUSLY KEYED, THIS FUNCTION'
12424    63251247
12425    51466325
12426    23632524
12427    12465112
12430    47512565
12431    31466462
12432    43701242
12433    25702524
12434    73126330
12435    31621226
12436    64452363
12437    31464512
12440    52663143          BCD     ' WILL BE SKIPPED.''
12441    43122225
```



```
12442    12624231
12443    47472524
12444    33371212
```

```
                    *
                    *
                    *       FUNCTION 5 = DATA PRODUCTS 5045 DISC FILE DIAGNOSTIC
                    *
                    *
12445  0 43 00424   FUNC5   BRM     FUNCTN          FUNCTION LINK
12446  0 20 12651           NOP     FPT5
12447  0 43 00440           BRM     RETURN          SET INTERRUPT LINKAGE
12450  0 20 23371           NOP     ENTER
12451  0 CP 20004           DIR                     DISABLE INTERRUPTS
                    *
                    *       TEST PDBA LOGIC IN 5045 FILE (POSITION DECODER)
                    *
12452  0 43 00430           BRM     OBJECT
12453  0 43 22700           BRM     F5S1            PERFORM TEST
12454     00000000          DATA    0
12455     00000600          DATA    600
12456  0 20 32716           NOP     F5M2
12457  0 20 32721           NOP     F5M3
12460  0 20 32724           NOP     F5M4
12461  0 20 32727           NOP     F5M5
                    *
12462  0 43 00430           BRM     OBJECT
12463  0 43 22700           BRM     F5S1            PERFORM TEST
12464     00020000          DATA    20000
12465     00020200          DATA    20200
12466  0 20 32732           NOP     F5M6
12467  0 20 32735           NOP     F5M7
12470  0 20 32740           NOP     F5M8
12471  0 20 32743           NOP     F5M9
                    *
12472  0 43 00430           BRM     OBJECT
12473  0 43 22700           BRM     F5S1            PERFORM TEST
12474     00040200          DATA    40200
12475     00040400          DATA    40400
12476  0 20 32746           NOP     F5M10
```



```
12477  0 20 32751           NOP     F5M11
12500  0 20 32754           NOP     F5M12
12501  0 20 32757           NOP     F5M13
                    *
12502  0 43 00430           BRM     OBJECT
12503  0 43 22700           BRM     F5S1            PERFORM TEST
12504     00060400          DATA    60400
12505     00060600          DATA    60600
12506  0 20 32762           NOP     F5M14
12507  0 20 32765           NOP     F5M15
12510  0 20 32770           NOP     F5M16
12511  0 20 32773           NOP     F5M17
                    *
12512  0 43 00430           BRM     OBJECT
12513  0 43 22700           BRM     F5S1            PERFORM TEST
12514     00001000          DATA    1000
12515     00001600          DATA    1600
12516  0 20 32776           NOP     F5M18
12517  0 20 33002           NOP     F5M19
12520  0 20 33005           NOP     F5M20
12521  0 20 33011           NOP     F5M21
                    *
12522  0 43 00430           BRM     OBJECT
12523  0 43 22700           BRM     F5S1            PERFORM TEST
12524     00021000          DATA    21000
12525     00021200          DATA    21200
12526  0 20 33014           NOP     F5M22
12527  0 20 33017           NOP     F5M23
12530  0 20 33022           NOP     F5M24
12531  0 20 33025           NOP     F5M25
                    *
12532  0 43 00430           BRM     OBJECT
12533  0 43 22700           BRM     F5S1            PERFORM TEST
12534     00041200          DATA    41200
12535     00041400          DATA    41400
12536  0 20 33030           NOP     F5M26
```

```
12537  0 20 33033          NOP     F5M27
12540  0 20 33036          NOP     F5M28
12541  0 20 33041          NOP     F5M29
                    *
12542  0 43 00430          BRM     OBJECT
12543  0 43 22700          BRM     F5S1            PERFORM TEST
12544    00061400          DATA    61400
12545    00061600          DATA    61600
12546  0 20 33044          NOP     F5M30
12547  0 20 33047          NOP     F5M31
12550  0 20 33052          NOP     F5M32
12551  0 20 33055          NOP     F5M33
                    *
                    *       CHECK FOR FC0=6121 (CLR FLIP=FLOP IN FILE)
                    *
12552  0 43 00430          BRM     OBJECT
12553  0 76 33550          LDA     =0              PATWORD
12554  0 43 23042          BRM     DISCCK          USE THIS DISC
12555  0 01 12607          BRU     F5E9            NO
12556  0 43 00440          BRM     RETURN          SET INTERRUPT LINKAGE
12557  0 20 23371          NOP     ENTER
12560  0 02 20004          DIR
12561  0 71 33417          LDX     =-3             LOOP COUNT
12562  0 43 23143  F5L49    BRM     WAIT            WAIT FOR CONTROLLER READY
12563  0 01 12607          BRU     F5E9            ERROR ABORT
12564  0 02 10026          EOM     10026           ALERT DISC FILE
12565  0 13 33550          PUT     =0              PUT A
12566  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
12567  0 01 12607          BRU     F5E9            ERROR ABORT
12570  0 02 10026          EOM     10026           ALERT DISC FILE
12571  0 13 15456          PUT     BIT16           PUT B
12572  0 41 12562          BRX     F5L49           LOOP
12573  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
12574  0 01 12607          BRU     F5E9            ERROR ABORT
12575  0 02 10226          EOM     10226           CLEAR FILE
12576  0 40 10026          SKS     10026           DISC FILE READY TEST
```



```
12577  0 01 12576          BRU     *-1             WAIT FOR CONTROLLER READY
12600  0 02 10026          EOM     10026           ALERT DISC FILE
12601  0 13 33550          PUT     =0              PUT A
12602  0 43 23315          BRM     W500            WAIT 500 MILLISEC
12603  0 40 10026          SKS     10026           DISC FILE READY TEST
12604  0 43 00460          BRM     ERROR           CONTROLLER NOT READY
12605  0 20 33060          NOP     F5M34
12606  0 02 10226          EOM     10226           CLEAR FILE
12607  0 43 00434  F5E9     BRM     END
                    *
                    *       TEST TIMING LOGIC
                    *
12610  0 43 00430          BRM     OBJECT
12611  0 76 33550          LDA     =0              PATWORD
12612  0 43 23042          BRM     DISCCK          USE THIS DISC
12613  0 01 12647          BRU     F5E10           NO
12614  0 43 00440          BRM     RETURN          SET INTERRUPT LINKAGE
12615  0 20 23371          NOP     ENTER
12616  0 02 20004          DIR
12617  0 43 23173          BRM     PUTOUT          PUT TO DISC
12620  0 01 12647          BRU     F5E10
12621  0 02 10226          EOM     10226           CLEAR FILE
12622  0 40 10026          SKS     10026           DISC FILE READY TEST
12623  0 01 12622          BRU     *-1             WAIT FOR CONTROLLER READY
12624  0 76 33550          LDA     =0
12625  0 02 10026          EOM     10026           ALERT DISC FILE
12626  0 13 23352          PUT     PUTWRD          PUT TO DISC
12627  0 71 33420  F5L50    LDX     =-560D          TIME UNTIL VERIFICATION (1 MS/LOOP)
12630  0 41 12630          BRX     *
12631  0 55 15465          ADD     BIT23
12632  0 73 33421          SKG     =5000           TIMED OUT
12633  0 01 12635          BRU     *+2             NO
12634  0 01 12644          BRU     F5L51
12635  0 40 12026          SKS     12026           TRACK VERIFIED TEST
12636  0 01 12627          BRU     F5L50           NOT VERIFIED = LOOP
12637  0 73 33422          SKG     =118D           TIME GREATER THAN 118 MILLISEC
```

```
12640  0 01 12642          BRU     *+2             NO = OK
12641  0 43 00460          BRM     ERROR           REPORT ERROR
12642  0 20 33117          NOP     F5M35
12643  0 01 12647          BRU     F5E10
12644  0 02 10226          EOM     10226           CLEAR FILE
12645  0 43 00460          BRM     ERROR           REPORT TIMEOUT ERROR
12646  0 20 33206          NOP     F5M36
12647  0 43 00434  F5E10    BRM     END
12650  0 43 00456  ENDF5    BRM     FDONE           EXIT FUNCTION
```



```
                    *
                    *       FUNCTION PARAMETER TABLES
                    *
12651  0 20 12457   FPT5    NOP     FIM5            FUNCTION IDENTIFIER MESSAGE
12652  0 20 12670           NOP     FAM5            FUNCTION ABSTRACT MESSAGE
12653  0 20 05476           NOP     FVM1            FUNCTION VARIABLES MESSAGE
12654  0 01 05011           ONE     FVT1            FUNCTION VARIABLES (NONE)
12655  0 00 12773           PZE     FUNC10          POINTER TO NEXT FUNCTION
12656    01000000           DATA    1000000         FUNCTION IDENTIFIER BIT (BIT 5)
                    *
                    *       FUNCTION MESSAGES
                    *
12657    52261200   FIM5    BCD     ' F 05 = 5045 DISC FILE DIAGNOSTIC!!
12660    05124012
12661    05000405
12662    12243162
12663    23122631
12664    43251224
12665    31712745
12666    46626331
12667    23371212
12670    52320500   FAM5    BCD     '  5045 DISC FILE DIAGNOSTICS!
12671    04051224
12672    31622312
12673    26314325
12674    12243121
12675    27454462
12676    63312362
12677    52526330           BCD     '  THIS FUNCTION CONTAINS OBJECT TESTS WHICH ARE DESIGNED!
12700    31621226
12701    64452363
12702    31464512
12703    23464563
12704    21314562
12705    12462241
12706    25236312
```

```
12707    63256263
12710    62126430
12711    31233012
12712    21512512
12713    24256231
12714    27452524
12715    52624725          BCD     ' SPECIFICALLY TO LOCATE PROBLEMS IN THE DATA PRODUCTS'
12716    23312631
12717    23214343
12720    70126346
12721    12434423
12722    21632512
12723    47514622
12724    43254462
12725    12314512
12726    63302512
12727    24216721
12730    12475146
12731    24642263
12732    62121212
12733    52050004          BCD     ' 5045 DISC FILE. OBJECT TESTS WHICH USE DISCS WHICH ARE'
12734    05122431
12735    62231226
12736    31432533
12737    12462241
12740    25236312
12741    63256263
12742    62126430
12743    31233012
12744    64622512
12745    24316223
12746    62126430
12747    31233012
12750    21512512
12751    52242543          BCD     ' DELETED FROM THE UNIT VARIABLES D00T17 AND D20T37 WILL'
12752    25632524
```



```
12753    12265146
12754    44126330
12755    25126445
12756    31631265
12757    21513121
12760    22432562
12761    12240000
12762    63010712
12763    21452412
12764    24020063
12765    03071266
12766    31434312
12767    52222512          BCD     ' BE SKIPPED.''
12770    62423147
12771    47252433
12772    37121212
```

```
                    *
                    *
                    *       FUNCTION 10 = DISC EXERCISER
                    *
                    *
12773  0 76 00401   FUNC10  LDA     STATUS          PRESET RUNMODE
12774  0 72 15447           SKA     BIT9            WRITE PROTECT BIT SET
12775  0 01 13006           BRU     PRE1            YES
12776  0 76 00332           LDA     FLAGS
12777  0 72 04777           SKA     UPT+4           DISC PREVIOUSLY KEYED
13000  0 01 13013           BRU     PRE2            YES
13001  0 76 15466           LDA     RMODE           SET UP KEY MODE
13002  0 14 33423           ETR     =785
13003  0 16 33624           MRG     =22026610
13004  0 35 15721           STA     OPMODE
13005  0 01 13015           BRU     PRE3
13006  0 76 15466   PRE1    LDA     RMODE           FORCE R-R-C-W=R-C MODE
13007  0 14 33625           ETR     =77770007
13010  0 16 33626           MRG     =5520
13011  0 35 15721           STA     OPMODE
13012  0 01 13015           BRU     PRE3
13013  0 76 15466   PRE2    LDA     RMODE           RANDOM OPERATION
13014  0 35 15721           STA     OPMODE
13015  0 76 33577   PRE3    LDA     =STADDR         PRESET VARIABLES
13016  0 35 15722           STA     LOCORE          LOCORE
13017  0 76 00405           LDA     SYSIZE          HICORE
13020  0 71 33617           LDX     =-3
13021  0 67 00001           LSH     1
13022  0 66 00001           RSH     1
13023  0 72 15465           SKA     BIT23
13024  0 41 13022           BRX     *-2
13025  0 37 23330           STX     TEMP
13026  0 76 33555           LDA     =3
13027  0 55 23330           ADD     TEMP
13030  0 67 00016           LSH     14D
13031  0 16 33560           MRG     =37777
```



```
13032  0 35 15723           STA     HICORE
13033  0 76 33550           LDA     =0
13034  0 35 15724           STA     LODISC          LO DISC
13035  0 76 33566           LDA     =777777
13036  0 35 15725           STA     HIDISC          HI DISC
13037  0 76 15721           LDA     OPMODE          SET XFER LENGTH
13040  0 72 15462           SKA     BIT20           KEY MODE
13041  0 01 13046           BRU     PRE4            YES
13042  0 75 33551           LDB     =-1             LENGTH RANDOM
13043  0 72 15461           SKA     BIT19           IN COMPARE MODE
13044  0 75 15461           LDB     BIT19           YES = LENGTH = 20B SECTORS
13045  0 01 13052           BRU     PRE5
13046  0 75 15461   PRE4    LDB     BIT19           LENGTH = 20B SECTORS
13047  0 76 15723           LDA     HICORE
13050  0 72 15447           SKA     BIT9            SECOND MEMORY DOOR IN
13051  0 75 15456           LDB     BIT16           YES = LENGTH = 200B SECTORS
13052  0 36 15726   PRE5    STB     LENGTH
13053  0 76 15722           LDA     LOCORE
13054  0 35 23337           STA     VAR3            POINTER TO CORE ADDRESS FOR SEQ CORE
13055  0 76 15724           LDA     LODISC
13056  0 35 23340           STA     VAR4            POINTER TO DISC ADDRESS FOR SEQ DISC
```

```
                    *
                    *       INITIALIZE STARTING POSITIONS OF SELECTED DISCS TO 630
                    *
13057  0 76 33627           LDA     =17777
13060  0 43 23042  INPOS1   BRM     DISCCK          CHECK FOR OUT OF BOUNDS
13061  0 01 13076           BRU     INPOS4          OUT OF BOUNDS
13062  0 46 20005           ABC
13063  0 40 10226           SKS     10026           DISC FILE READY TEST
13064  0 01 13066           BRU     *+2
13065  0 01 13071           BRU     INPOS3          CONTROLLER READY
13066  0 55 15465           ADD     BIT23           ADD 1
13067  0 73 33571           SKG     =357140
13070  0 01 13063           BRU     INPOS2          500 MS NOT UP YET
13071  0 02 10226           EOM     10226           CLEAR FILE
13072  0 02 10026           EOM     10026           ALERT DISC FILE
13073  0 13 23352           POT     POTARD          POT TO DISC
13074  0 46 10012           BAC
13075  0 43 15276           BRM     ENDPOS          ENTER ENDING POSITION IN TABLE
13076  0 55 15450  INPOS4   ADD     BIT10           INCREMENT DISC NO.
13077  0 73 15443           SKG     BIT5            FINISHED
13100  0 01 13060           BRU     INPOS1          NO
```



```
13101  0 43 00424  FSTART  BRM     FUNCTN          FUNCTION LINK
13102  0 20 15713          NOP     FPT10
13103  0 43 00440          BRM     RETURN          SET SPIT LINKAGE
13104  0 20 23371          NOP     ENTER
13105  0 02 20002          EIR                     ENABLE INTERRUPTS
13106  0 76 15721          LDA     OPMODE          CHECK OPMODE
13107  0 72 33430          SKA     =7B7
13110  0 01 13112          BRU     *+2
13111  0 43 13341          BRM     PERR1           DISC ADDRESSING NOT SPECIFIED
13112  0 72 33431          SKA     =7B6
13113  0 01 13115          BRU     *+2
13114  0 43 13341          BRM     PERR1           CORE ADDRESSING NOT SPECIFIED
13115  0 72 33423          SKA     =7B5
13116  0 01 13120          BRU     *+2
13117  0 43 13341          BRM     PERR1           DATA NOT SPECIFIED
13120  0 72 15441          SKA     BIT3
13121  0 01 13123          BRU     *+2
13122  0 01 13125          BRU     *+3
13123  0 72 15450          SKA     BIT10
13124  0 43 13341          BRM     PERR1           FIXED CORE, FAST MODE (ILLEGAL)
13125  0 75 33465          LDB     =7B3
13126  0 70 33551          SKM     *=1
13127  0 01 13131          BRU     *+2
13130  0 43 13341          BRM     PERR1           FIXED WRITE AND READ (B=1)
13131  0 75 33632          LDB     =700
13132  0 70 33551          SKM     *=1
13133  0 01 13135          BRU     *+2
13134  0 43 13341          BRM     PERR1           FIXED WRITE AND READ (B=2)
13135  0 72 15462          SKA     BIT20
13136  0 01 13140          BRU     *+2
13137  0 01 13143          BRU     CKO
13140  0 75 33433          LDB     =70005500
13141  0 70 33434          SKM     =20004400
13142  0 43 13341          BRM     PERR1           KEY, DISC ADD NOT SEQ, B=1 OR =2 READ
13143  0 72 33435  CKO     SKA     =3300
13144  0 01 13146          BRU     *+2
```

```
DISCW  TAP=3.0                          PAGE 159

13145  0 43 13341          BRM     PERR1           NO BUFFER SELECTED
13146  0 72 15461          SKA     BIT19
13147  0 01 13151          BRU     **2
13150  0 01 13165          BRU     CK1
13151  0 72 15452          SKA     BIT12
13152  0 01 13154          BRU     **2
13153  0 43 13341          BRM     PERR1           COMPARE MODE, B=1 OPER, NOT FIXED
13154  0 72 15455          SKA     BIT15
13155  0 01 13157          BRU     **2
13156  0 43 13341          BRM     PERR1           COMPARE MODE, B=2 OPER, NOT FIXED
13157  0 72 15457          SKA     BIT17
13160  0 01 13162          BRU     **2
13161  0 43 13341          BRM     PERR1           COMPARE MODE, B=2 NOT READ
13162  0 53 15726          SKN     LENGTH
13163  0 01 13165          BRU     CK1
13164  0 43 13346          BRM     PERR2           COMPARE MODE, LENGTH RANDOM
13165  0 72 33636  CK1     SKA     =2200
13166  0 01 13170          BRU     **2
13167  0 01 13173          BRU     CK2
13170  0 76 00401          LDA     STATUS
13171  0 72 15447          SKA     BIT9
13172  0 43 13341          BRM     PERR1
13173  0 53 15726  CK2     SKN     LENGTH          CHECK LENGTH
13174  0 01 13176          BRU     **2             YES
13175  0 01 13221          BRU     CK4
13176  0 76 15723          LDA     HICORE
13177  0 54 15722          SUB     LOCORE
13200  0 55 15465          ADD     BIT23
13201  0 66 00006          RSH     6
13202  0 73 15726          SKG     LENGTH
13203  0 43 13346          BRM     PERR2           FIXED LENGTH TOO LARGE
13204  0 76 33637          LDA     =341
13205  0 73 15726          SKG     LENGTH
13206  0 43 13346          BRM     PERR2           FIXED LENGTH > 14K (340B SECTORS)
13207  0 76 15721          LDA     OPMODE
13210  0 72 15461          SKA     BIT19
```

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DISCW  TAP=3.0                          PAGE 160

13211  0 01 13213          BRU     **2
13212  0 01 13216          BRU     CK3
13213  0 76 33640          LDA     =161
13214  0 73 15726          SKG     LENGTH
13215  0 43 13346          BRM     PERR2           COMPARE MODE, LENGTH > 7K (160B SECTORS)
13216  0 76 15726  CK3     LDA     LENGTH
13217  0 73 33550          SKG     =0
13220  0 43 13346          BRM     PERR2           FIXED LENGTH = 0
13221  0 76 15722  CK4     LDA     LOCORE          CHECK LOCORE
13222  0 55 15465          ADD     BIT23           ADD 1
13223  0 73 33577          SKG     =STADDR
13224  0 43 00460          BRM     ERROR           LOCORE < 340008
13225  4 20 33224          NOP     F10M1,4
13226  0 20 33235          NOP     F10M3
13227  0 76 15723          LDA     HICORE          CHECK HICORE
13230  0 73 33557          SKG     =177777
13231  0 01 13233          BRU     **2
13232  0 43 00460          BRM     ERROR           HICORE > 177777B
13233  4 20 33224          NOP     F10M1,4
13234  0 20 33273          NOP     F10M10
13235  0 53 23350          SKN     NFFLG
13236  0 73 33560          SKG     =37777
13237  0 01 13241          BRU     **2
13240  0 43 00460          BRM     ERROR           HICORE > 37777, NOT 940
13241  4 20 33224          NOP     F10M1,4
13242  0 20 33273          NOP     F10M10
13243  0 54 33600          SUB     =63D
13244  0 73 15722          SKG     LOCORE
13245  0 43 00460          BRM     ERROR           HICORE + LOCORE < 64D
13246  4 20 33224          NOP     F10M1,4
13247  0 20 33273          NOP     F10M10
13250  0 76 15725          LDA     HIDISC          CHECK HIDISC
13251  0 55 15465          ADD     BIT23           ADD 1
13252  0 73 15724          SKG     LODISC
13253  0 43 00460          BRM     ERROR           HIDISC < LODISC
13254  4 20 33224          NOP     F10M1,4
```

```
DISCW  TAP=3,0                          PAGE 161

13255  0 20 33243        NOP     F10M6
13256  0 73 15443        SKG     BIT5
13257  0 01 13261        BRU     **2
13260  0 43 00460        BRM     ERROR           HIDISC > 777777
13261  4 20 33224        NOP     F10M1,4
13262  0 20 33243        NOP     F10M6
13263  0 75 33851        LDB     #=1             RESET SEQ DISC POINTER IF LODISC CHANGED
13264  0 76 23335        LDA     VAR1
13265  0 55 15465        ADD     BIT23
13266  0 70 15724        SKM     LODISC
13267  0 01 13271        BRU     **2
13270  0 01 13273        BRU     **3
13271  0 76 15724        LDA     LODISC
13272  0 35 23340        STA     VAR4
13273  0 76 15721        LDA     BPMODE          INITIALIZE
13274  0 75 33850        LDB     #0              SET FLAGS
13275  0 72 15451        SKA     BIT11
13276  0 75 33851        LDB     #=1
13277  0 36 15474        STB     INTRPT
13300  0 75 33850        LDB     #0
13301  0 72 15462        SKA     BIT20
13302  0 75 33851        LDB     #=1
13303  0 36 15500        STB     KEY
13304  0 76 33851        LDA     #=1             SET HEADER FLAGS
13305  0 35 15472        STA     DHEAD
13306  0 35 15473        STA     IOHEAD
13307  0 76 15724        LDA     LODISC
13310  0 54 15465        SUB     BIT23           SET LODISC PRIME
13311  0 35 23335        STA     VAR1
13312  0 53 15474        SKN     INTRPT          SET INTERRUPT RETURN
13313  0 01 13315        BRU     **2
13314  0 43 00440        BRM     RETURN
13315  0 20 15403        NOP     INTER
13316  0 76 15723        LDA     HICORE          SET MAX BLOCK LENGTH
13317  0 54 15722        SUB     LOCORE
13320  0 55 15465        ADD     BIT23
```

```
DISCW  TAP=3,0                          PAGE 162

13321  0 73 33641        SKG     #70000
13322  0 01 13324        BRU     **2
13323  0 76 33641        LDA     #70000
13324  0 66 00007        RSH     7
13325  0 35 15505        STA     BLKMAX
13326  0 76 33642        LDA     #199D           SET PASS COUNT
13327  0 35 23341        STA     VAR5
13330  0 76 15721        LDA     BPMODE
13331  0 72 15461        SKA     BIT19
13332  0 01 13334        BRU     **2
13333  0 01 13353        BRU     START
13334  0 76 33643        LDA     #160
13335  0 73 15505        SKG     BLKMAX
13336  0 01 13353        BRU     START
13337  0 35 15505        STA     BLKMAX
13340  0 01 13353        BRU     START
                  *
                  *     PARAMETER ERROR OUTPUT ROUTINES
                  *
13341  0 00 00000  PERR1 PZE     0
13342  0 43 00460        BRM     ERROR
13343  4 20 33224        NOP     F10M1,4
13344  0 20 33241        NOP     F10M5
13345  0 51 13341        BRR     PERR1
13346  0 00 00000  PERR2 PZE
13347  0 43 00460        BRM     ERROR
13350  4 20 33224        NOP     F10M1,4
13351  0 20 33237        NOP     F10M4
13352  0 51 13346        BRR     PERR2
```

```
                    *
                    *       START OPERATION
                    *
13353  0 76 15721  START  LDA     OPMODE
13354  0 72 15461         SKA     BIT19
13355  0 01 13501         BRU     COMPAR          COMPARE MODE HANDLER
13356  0 72 33644         SKA     *3000
13357  0 01 13361         BRU     **2
13360  0 01 13366         BRU     B2ONLY          HANDLE BUFFER 2 ONLY
13361  0 72 33645         SKA     *300
13362  0 01 13416         BRU     B1AND2          HANDLE BUFFERS 1 AND 2
13363  0 01 13364         BRU     B1ONLY          HANDLE BUFFER 1 ONLY
```



```
                    *
                    *       HANDLE BUFFER 1 ONLY
                    *
13364  0 77 15563  B1ONLY EAX     TABLE1          SET BUFFER BIAS
13365  0 01 13367         BRU     B2ONLY+1
                    *
                    *       HANDLE BUFFER 2 ONLY
                    *
13366  0 77 15573  B2ONLY EAX     TABLE2          SET BUFFER BIAS
13367  0 43 13604         BRM     SETDAD          GET STARTING DISC ADDRESS AND LENGTH
13370  2 35 00003         STA     3,2             LENGTH
13371  2 36 00000         STB     0,2             START DISC
13372  0 75 33550         LDB     *0
13373  0 43 13743         BRM     SETCAD          GET STARTING CORE ADDRESS
13374  2 35 00002         STA     2,2             START CORE
13375  0 43 14032         BRM     SETDVR          SET UP CHANNEL DRIVER
13376  0 43 14117         BRM     SPREAD          SPREAD DATA IF WRITE
13377  0 43 00430         BRM     OBJECT
13400  0 02 20002         EIR                     ENABLE INTERRUPTS
13401  0 43 14245         BRM     DRIVER          DRIVE I/O
13402  0 43 14543         BRM     WFIO            WAIT FOR I/O TO FINISH
13403  0 43 14560         BRM     CHNCK           CHECK FOR I/O ERRORS
13404  0 43 14745         BRM     DATACK          CHECK FOR DATA ERRORS IF READ
13405  0 43 00434  F1OEND  BRM     END
13406  0 53 15500         SKN     KEY             IN KEY MODE
13407  0 01 13411         BRU     **2             NO
13410  0 01 13560         BRU     CONKEY          CONTINUE OPERATION IF NOT COMPLETED
13411  0 60 23341         SKR     VAR5
13412  0 20 00000         NOP     0
13413  0 53 23341         SKN     VAR5            FINISHED
13414  0 01 13353         BRU     START           NO
13415  0 43 00456  ENDF1O BRM     FDONE           EXIT FUNCTION
```

```
                        *
                        *       HANDLE BUFFERS 1 AND 2
                        *
13416  0 77 15563  B1AND2 EAX     TABLE1          BIAS
13417  0 43 13404         BRM     SETDAD          GET STARTING DISC AND LENGTH (B=1)
13420  2 35 00003         STA     3,2             LENGTH
13421  2 36 00000         STB     0,2             START DISC
13422  0 77 15573         EAX     TABLE2          BIAS
13423  0 43 13404         BRM     SETDAD          GET STARTING DISC AND LENGTH (B=2)
13424  2 35 00003         STA     3,2             LENGTH
13425  2 36 00000         STB     0,2             START DISC
13426  0 46 20005         ABC
13427  0 77 15563         EAX     TABLE1
13430  2 76 00003         LDA     3,2             B=1 LENGTH
13431  0 43 13743         BRM     SETCAD          GET STARTING CORE ADDRESSES (B=102)
13432  2 35 00002         STA     2,2             START CORE (B=1)
13433  0 77 15573         EAX     TABLE2
13434  2 36 00002         STB     2,2             START CORE (B=2)
13435  0 43 14032         BRM     SETDVR          SET UP CHANNEL DRIVER (B=2)
13436  0 77 15563         EAX     TABLE1
13437  0 43 14032         BRM     SETDVR          SET UP CHANNEL DRIVER (B=1)
13440  0 43 14117         BRM     SPREAD          SPREAD DATA IF WRITE (B=1)
13441  0 76 00406         LDA     SEED            SAVE RANDOM SEED
13442  0 35 23336         STA     VAR2
13443  0 43 00430         BRM     OBJECT
13444  0 02 20002         EIR                     ENABLE INTERRUPTS
13445  0 76 23336         LDA     VAR2            GET ORIGINAL SEED (FOR LOOPING ON BPI)
13446  0 35 00406         STA     SEED
13447  0 77 15563         EAX     TABLE1
13450  0 43 14245         BRM     DRIVER          DRIVE I/O (B=1)
13451  0 76 15721         LDA     OPMODE
13452  0 72 15450         SKA     BIT10           IN FAST MODE
13453  0 01 13466         BRU     B1A2B           YES
13454  0 43 14543         BRM     WFIO            WAIT FOR I/O TO FINISH
13455  0 43 14560         BRM     CHNCK           CHECK FOR I/O ERRORS
13456  0 43 14745         BRM     DATACK          CHECK FOR DATA ERRORS IF READ
```



```
13457  0 77 15573         EAX     TABLE2
13460  0 43 14117         BRM     SPREAD          SPREAD DATA IF WRITE (B=2)
13461  0 43 14245         BRM     DRIVER          DRIVE I/O (B=2)
13462  0 43 14543  B1A2A   BRM     WFIO            WAIT FOR I/O TO FINISH
13463  0 43 14560         BRM     CHNCK           CHECK FOR I/O ERRORS
13464  0 43 14745         BRM     DATACK          CHECK FOR DATA ERRORS IF READ
13465  0 01 13405         BRU     F10END
13466  0 77 15573  B1A2B   EAX     TABLE2
13467  0 43 14117         BRM     SPREAD          SPREAD DATA B=2 IF WRITE
13470  0 77 15563         EAX     TABLE1
13471  0 43 14543         BRM     WFIO            WAIT FOR I/O TO FINISH
13472  0 43 14560         BRM     CHNCK           CHECK FOR I/O ERRORS
13473  0 77 15573         EAX     TABLE2
13474  0 43 14245         BRM     DRIVER          DRIVE I/O (B=2)
13475  0 77 15563         EAX     TABLE1
13476  0 43 14745         BRM     DATACK          CHECK DATA IF READ (B=1)
13477  0 77 15573         EAX     TABLE2
13500  0 01 13462         BRU     B1A2A
```

```
                    *
                    *       COMPARE MODE HANDELER
                    *
13501  0 76 15721   COMPAR  LDA     OPMODE
13502  0 75 33551           LDB     =1
13503  0 72 15453           SKA     BIT13           WRITE B=1
13504  0 75 33550           LDB     =0              YES
13505  0 36 15501           STB     RRSW            SET UP READ/READ SWITCH
13506  0 77 15563           EAX     TABLE1          B=1 BIAS
13507  0 43 13604           BRM     SETDAD          GET STARTING LENGTH AND DISC ADDRESS (B=1)
13510  2 35 00003           STA     3,2             LENGTH
13511  2 36 00000           STB     0,2             DISC ADDRESS
13512  0 77 15573           EAX     TABLE2
13513  2 35 00003           STA     3,2             LENGTH (B=2)
13514  2 36 00000           STB     0,2             DISC ADDRESS (B=2)
13515  2 75 00003           LDB     3,2
13516  0 43 13743           BRM     SETCAD          GET STARTING CORE ADDRESS
13517  2 36 00002           STB     2,2             START CORE (B=2)
13520  0 77 15563           EAX     TABLE1
13521  2 35 00002           STA     2,2             START CORE (B=1)
13522  0 43 14032           BRM     SETDVR          SET UP CHANNEL DRIVER (B=1)
13523  0 77 15573           EAX     TABLE2
13524  0 43 14032           BRM     SETDVR          SET UP CHANNEL DRIVER (B=2)
13525  0 77 15563           EAX     TABLE1
13526  0 43 14117           BRM     SPREAD          SPREAD DATA IF WRITE (B=1)
13527  0 43 00430           BRM     OBJECT
13530  0 02 20002           EIR                     ENABLE INTERRUPTS
13531  0 43 14245   COMP1   BRM     DRIVER          DRIVE I/O (B=1)
13532  0 43 14543           BRM     WFIO            WAIT FOR I/O TO FINISH
13533  0 43 14560           BRM     CHNCK           CHECK FOR CHANNEL ERRORS
13534  0 77 15573           EAX     TABLE2
13535  0 43 14245           BRM     DRIVER          DRIVE I/O (B=2)
13536  0 43 14543           BRM     WFIO            WAIT FOR I/O TO FINISH
13537  0 43 14560           BRM     CHNCK           CHECK FOR I/O ERRORS
13540  0 77 15563           EAX     TABLE1
13541  0 43 15102           BRM     C1AND2          COMPARE BUFFER 1 WITH BUFFER 2
```



```
13542  0 43 00434           BRM     END
13543  0 53 15501           SKN     RRSW            LAST OPERATION A READ/READ
13544  0 01 13406           BRU     F10END+1        NO
13545  0 76 33550           LDA     =0              RESET READ/READ SWITCH
13546  0 35 15501           STA     RRSW
13547  0 77 15563           EAX     TABLE1
13550  0 76 33555           LDA     =3              FORCE WRITE BUFFER 1
13551  2 35 00004           STA     4,2             SET MODE
13552  2 76 00005           LDA     5,2
13553  0 17 15456           EOR     BIT16
13554  2 35 00005           STA     5,2             CONVERT XMODE EOM TO IOSD
13555  0 76 15470           LDA     WRITE
13556  2 35 00006           STA     6,2             CHANGE BUFFER EOM TO WRITE
13557  0 01 13531           BRU     COMP1
```

```
                    *
                    *       CONTINUE IF KEYING DISC
                    *
13560  0 76 23340   CONKEY  LDA     VAR4
13561  0 73 15725           SKG     HIDISC          FINISHED
13562  0 01 13353           BRU     START           NO
13563  0 76 04777           LDA     UPT++           SET UP KEYED FLAGS
13564  0 16 00332           MRG     FLAGS
13565  0 35 00332           STA     FLAGS
13566  0 76 33550           LDA     =0              RESET KEY SWITCH
13567  0 35 15500           STA     KEY
13570  0 76 15721           LDA     OPMODE          SET UP OPERATING MODE
13571  0 14 33623           ETR     =785
13572  0 35 15721           STA     OPMODE
13573  0 76 15466           LDA     RMODE
13574  0 14 33646           ETR     =77077777
13575  0 16 15721           MRG     OPMODE
13576  0 35 15721           STA     OPMODE
13577  0 76 33551           LDA     =+1             SET LENGTH TO BE RANDOM
13600  0 35 15726           STA     LENGTH
13601  0 76 15724           LDA     LODISC          RESET SEQUENTIAL DISC POINTER
13602  0 35 23340           STA     VAR4
13603  0 01 13415           BRU     ENDF10          EXIT
```



```
                    *
                    *       CALCULATE STARTING DISC ADDRESS AND TRANSMIT LENGTH
                    *
13604  0 00 00000   SETDAD  PZE     0
13605  0 37 23334           STX     TEMPD           SAVE X
13606  0 76 15721           LDA     OPMODE
13607  0 72 15436           SKA     BIT0            IS ADDRESSING FIXED
13610  0 01 13652           BRU     FIXD            YES
13611  0 72 15437           SKA     BIT1            IS ADDRESSING SEQUENTIAL
13612  0 01 13625           BRU     SEQD            YES
13613  0 76 00406   RAND    LDA     SEED            RANDOM ADDRESSING
13614  0 43 15372           BRM     RANDOM          GENERATE RANDOM ADDRESS
13615  0 35 00406           STA     SEED
13616  0 14 33566           ETR     =777777
13617  0 73 15725           SKG     HIDISC          CHECK GENERATED ADDRESS
13620  0 73 23335           SKG     VAR1
13621  0 01 13613           BRU     RAND            NOT WITHIN HIDISC-LODISC LIMITS
13622  0 43 23042           BRM     DISCCK
13623  0 01 13613           BRU     RAND            ADDRESSED DISC OUT OF BOUNDS
13624  0 01 13662           BRU     SAVDPW
13625  0 76 23340   SEQD    LDA     VAR4            GET INCREMENTED DISC ADDRESS
13626  0 73 15725           SKG     HIDISC          CHECK ADDRESS
13627  0 01 13634           BRU     SEQD1
13630  0 53 15500           SKN     KEY             ADDRESS TOO LARGE - IS KEY IN PROCESS
13631  0 01 13633           BRU     *+2             NO
13632  0 01 13560           BRU     CONKEY
13633  0 76 15724           LDA     LODISC          START OVER
13634  0 35 23340   SEQD1   STA     VAR4
13635  0 43 23042           BRM     DISCCK
13636  0 01 13640           BRU     *+2             DISC OUT OF BOUNDS
13637  0 01 13662           BRU     SAVDPW
13640  0 55 15450           ADD     BIT10           INCREMENT DISC ADDRESS
13641  0 14 33647           ETR     =1760000
13642  0 73 15725           SKG     HIDISC          CHECK NEW ADDRESS FOR DONE
13643  0 01 13634           BRU     SEQD1           ADDRESS OK
13644  0 53 15500           SKN     KEY             ADDRESS TOO LARGE, IS KEY IN PROCESS
```

```
13645  0 01 13450          BRU     *+3             NO
13646  0 35 23340          STA     VAR4            KEY FINISHED
13647  0 01 13560          BRU     CONKEY
13650  0 76 15724          LDA     LODISC          RESET SEQUENTIAL DISC POINTER
13651  0 01 13626          BRU     SEQD+1
13652  0 76 15724  FIXD    LDA     LODISC          FIXED DISC ADDRESS
13653  0 43 23042          BRM     DISCCK
13654  0 01 13656          BRU     *+2             DISC OUT OF BOUNDS
13655  0 01 13662          BRU     SAVDPW
13656  0 43 00460          BRM     ERROR           REPORT PARAMETER ERROR
13657  4 20 33224          NOP     F10M1,4
13660  0 20 33233          NOP     F10M2
13661  0 01 13652          BRU     FIXD            LOOP
13662  0 35 23332  SAVDPW  STA     TEMPB           SAVE DISC ADDRESS
13663  0 53 15726  SLEN    SKN     LENGTH          IS LENGTH FIXED
13664  0 01 13734          BRU     SLEN5           YES
13665  0 76 00406          LDA     SEED            GENERATE RANDOM LENGTH
13666  0 43 15372          BRM     RANDOM
13667  0 35 00406          STA     SEED
13670  0 14 33650          ETR     =377
13671  0 73 15505  SLEN0   SKG     BLKMAX          LEN > BLKMAX
13672  0 01 13675          BRU     SLEN1           NO
13673  0 54 15505          SUB     BLKMAX          LEN = LEN - BLKMAX
13674  0 01 13671          BRU     SLEN0           LOOP
13675  0 72 33551  SLEN1   SKA     *+1             DOES LEN = 0
13676  0 01 13700          BRU     *+2             NO
13677  0 76 15465          LDA     BIT23           A = 1
13700  0 35 23331  SLEN2   STA     TEMPA           SAVE TRANSMIT LENGTH
13701  0 55 23332          ADD     TEMPB           ADD STARTING DISC ADDRESS
13702  0 54 15465          SUB     BIT23           SUBTRACT 1
13703  0 73 15725          SKG     HIDISC          LEN + ADDR - 1 > HIDISC
13704  0 01 13711          BRU     SLEN3           NO
13705  0 76 15725          LDA     HIDISC          LEN = HIDISC - ADDR + 1
13706  0 54 23332          SUB     TEMPB
13707  0 55 15465          ADD     BIT23           ADD 1
13710  0 01 13700          BRU     SLEN2
```



```
13711  0 43 23042  SLEN3   BRM     DISCCK
13712  0 01 13714          BRU     *+2             FINAL DISC ADDRESS OUT OF BOUNDS
13713  0 01 13721          BRU     SLEN4
13714  0 76 23332          LDA     TEMPB           LEN = REMAINING SECTORS ON THIS DISC
13715  0 16 33627          MRG     =17777
13716  0 54 23332          SUB     TEMPB
13717  0 55 15465          ADD     BIT23           ADD 1
13720  0 35 23331          STA     TEMPA
13721  0 76 15721  SLEN4   LDA     OPMODE          CHECK OPMODE FOR SEQUENTIAL DISC OPERATION
13722  0 72 15437          SKA     BIT1
13723  0 01 13725          BRU     *+2             SEQUENTIAL
13724  0 01 13730          BRU     SLEN6           NOT SEQUENTIAL
13725  0 76 23340          LDA     VAR4            UPDATE DISC INCREMENT
13726  0 55 23331          ADD     TEMPA
13727  0 35 23340          STA     VAR4
13730  0 76 23331  SLEN6   LDA     TEMPA           GET REGISTERS
13731  0 75 23332          LDB     TEMPB
13732  0 71 23334          LDX     TEMPD
13733  0 51 13604          BRR     SETDAD          RETURN
13734  0 76 15726  SLEN5   LDA     LENGTH
13735  0 73 15505          SKG     BLKMAX          FIXED LENGTH > BLKMAX
13736  0 01 13700          BRU     SLEN2           NO
13737  0 43 00460          BRM     ERROR           REPORT PARAMETER ERROR
13740  4 20 33224          NOP     F10M1,4
13741  0 20 33237          NOP     F10M4
13742  0 01 13663          BRU     SLEN            LOOP
```

```
                    *
                    *       CALCULATE STARTING CORE ADDRESS
                    *
13743  0 00 00000   SETCAD  PZE     0
13744  0 37 23327           STX     X               SAVE X
13745  0 67 00006           LGH     6               MULTIPLY LENGTHS BY 64D
13746  0 35 23331           STA     TEMPA
13747  0 36 23332           STB     TEMPB
13750  0 76 15721           LDA     OPMODE          FIND CORE ADDRESSING MODE
13751  0 72 15441           SKA     BIT3            IS ADDRESSING FIXED
13752  0 01 14025           BRU     FIXC            YES
13753  0 72 15442           SKA     BIT4            IS ADDRESSING SEQUENTIAL
13754  0 01 14002           BRU     SEQC            YES
13755  0 76 15723           LDA     HICORE          RANDOM ADDRESSING
13756  0 54 15722           SUB     LOCORE
13757  0 54 23331           SUB     TEMPA
13760  0 54 23332           SUB     TEMPB
13761  0 35 23333           STA     TEMPC           RANGE OF NUMBERS FOR START CORE (B-1)
13762  0 73 33550           SKG     =0              DOES RANGE = 0
13763  0 01 13774           BRU     RANC2           YES
13764  0 76 00406           LDA     SEED            GENERATE RANDOM BIAS
13765  0 43 15372           BRM     RANDOM
13766  0 35 00406           STA     SEED
13767  0 14 33560           ETR     =37777
13770  0 73 23333   RANC1   SKG     TEMPC           IS BIAS > RANGE
13771  0 01 13775           BRU     RANC3           NO
13772  0 54 23333           SUB     TEMPC           BIAS = BIAS - RANGE
13773  0 01 13770           BRU     RANC1
13774  0 76 33550   RANC2   LDA     =0              BIAS = 0
13775  0 55 15722   RANC3   ADD     LOCORE          LOCORE + BIAS = CORE1
13776  0 35 23325           STA     A
13777  0 55 23331           ADD     TEMPA           CORE1 + LEN1 = CORE2
14000  0 35 23326           STA     B
14001  0 01 14030           BRU     SCARET          SET UP RETURN
14002  0 76 15723   SEQC    LDA     HICORE          CALCULATE RANGE
14003  0 54 23331           SUB     TEMPA
```



```
14004  0 54 23332           SUB     TEMPB
14005  0 55 15465           ADD     BIT23
14006  0 75 23337           LDB     VAR3
14007  0 73 23337           SKG     VAR3            IS RANGE > VAR3
14010  0 46 00014           XAB                     NO
14011  0 46 00014           XAB
14012  0 35 23325           STA     A               CORE 1
14013  0 55 23331           ADD     TEMPA
14014  0 35 23326           STA     B               CORE 2
14015  0 55 23332           ADD     TEMPB           UPDATE VAR3
14016  0 35 23337           STA     VAR3
14017  0 54 15723           SUB     HICORE
14020  0 72 15436           SKA     BIT0            IS VAR3 < HICORE
14021  0 01 14030           BRU     SCARET          YES
14022  0 76 15722           LDA     LOCORE          SET VAR3 = LOCORE
14023  0 35 23337           STA     VAR3
14024  0 01 14030           BRU     SCARET          SET UP RETURN
14025  0 76 15722   FIXC    LDA     LOCORE          FIXED ADDRESSING
14026  0 35 23325           STA     A               CORE1
14027  0 35 23326           STA     B               CORE2
14030  0 43 15264   SCARET  BRM     GET             SET REGISTERS
14031  0 61 13743           BRR     SETCAD          RETURN
```

```
                    *
                    *       SET UP I/O BUFFER
                    *
14032  0 00 00000 SETDVR PZE     0
14033  2 76 00003         LDA     3,2             BUILD PBT WORD
14034  0 75 33550         LDB     =0
14035  0 67 20024         LCY     20D
14036  0 35 23330         STA     TEMP
14037  2 76 00002         LDA     2,2
14040  0 14 33560         ETR     =37777
14041  0 55 23330         ADD     TEMP
14042  2 35 00001         STA     1,2
14043  0 36 23330         STB     TEMP            HI ORDER WORD COUNT
14044  2 76 00002         LDA     2,2             BUILD EXTENDED MODE EOM
14045  0 66 00011         RSH     9D
14046  0 14 33651         ETR     =140
14047  0 55 23330         ADD     TEMP
14050  0 53 15474         SKN     INTRPT
14051  0 01 14053         BRU     *+2
14052  0 16 33644         MRG     =3000
14053  0 55 15471         ADD     XMODE
14054  2 35 00005         STA     5,2
14055  2 76 00007         LDA     7,2             BUFFER NUMBER
14056  0 75 15721         LDB     OPMODE
14057  0 72 15465         SKA     BIT23           BUFFER 1
14060  0 66 00003         RSH     3               YES = CORRECT
14061  0 46 10012         BAC
14062  0 72 15455         SKA     BIT15           OPERATION FIXED
14063  0 01 14065         BRU     *+2
14064  0 01 14113         BRU     SDVR3           NO
14065  0 72 15456 SDVR0   SKA     BIT16           IS OPERATION A WRITE
14066  0 01 14070         BRU     *+2
14067  0 01 14077         BRU     SDVR2           NO
14070  0 76 15470         LDA     WRITE           BUFFER EOM
14071  2 35 00006         STA     6,2
14072  2 76 00005         LDA     5,2             XMODE = IOSD
```



```
14073  0 16 15456         MRG     BIT16
14074  2 35 00005         STA     5,2
14075  0 75 33555         LDB     =3              SET MODE
14076  0 01 14102         BRU     SDVR4
14077  0 76 15467 SDVR2   LDA     READ            BUFFER EOM
14100  2 35 00006         STA     6,2
14101  0 75 15463         LDB     BIT21           B = 4
14102  2 76 00007 SDVR4   LDA     7,2             BUFFER NO
14103  0 72 15465         SKA     BIT23           BUFFER 1
14104  0 01 14111         BRU     SDVR5           YES
14105  0 46 10012         BAC
14106  0 55 15464         ADD     BIT22           ADD 2
14107  2 35 00004 SDVR6   STA     4,2             MODE
14110  0 51 14032         BRR     SETDVR          RETURN
14111  0 46 10012 SDVR5   BAC
14112  0 01 14107         BRU     SDVR6
14113  0 76 00406 SDVR3   LDA     SEED            GEN RANDOM NO, = IF BIT16, WRITE
14114  0 43 15372         BRM     RANDOM
14115  0 35 00406         STA     SEED
14116  0 01 14065         BRU     SDVR0
```

```
                        *
                        *       GENERATE AND SPREAD DATA
                        *
14117  0 00 00000 SPREAD PZE     0
14120  0 37 23334        STX     TEMPD           SAVE X
14121  2 76 00006        LDA     6,2             EOM
14122  0 72 15460        SKA     BIT15           IS OPERATION A WRITE
14123  0 01 14125        BRU     *+2             YES
14124  0 51 14117        BRR     SPREAD          RETURN
14125  0 53 23350        SKN     NFFLG           IS MACHINE A 940
14126  0 01 14146        BRU     SPR2            NO
14127  2 76 00002        LDA     2,2             START CORE
14130  0 66 00013        RSH     11D             SET UP RELABELING
14131  0 35 23330        STA     TEMP
14132  0 75 33550        LDB     =0
14133  0 71 33652        LDX     =-7
14134  0 61 23330 SPR1   MIN     TEMP
14135  0 67 20006        LCY     6
14136  0 55 23330        ADD     TEMP
14137  0 41 14134        BRX     SPR1
14140  0 36 00415        STB     RL1
14141  0 35 00416        STA     RL2
14142  0 02 20400        EOM     20400           SET UP RL1
14143  0 13 00415        POT     RL1
14144  0 02 21000        EOM     21000           SET UP RL2
14145  0 13 00416        POT     RL2
14146  0 71 23334 SPR2   LDX     TEMPD
14147  2 76 00003        LDA     3,2             SECTOR COUNT
14150  0 54 15465        SUB     BIT23           SUBTRACT 1
14151  0 35 15506        STA     COUNT
14152  2 76 00000        LDA     0,2             START DISC
14153  0 35 23344        STA     VAR8
14154  2 76 00002        LDA     2,2             START CORE
14155  0 53 23350        SKN     NFFLG           MACHINE A 940
14156  0 01 14160        BRU     *+2             NO
14157  0 14 33653        ETR     =3777
```



```
14160  0 16 15436        MRG     BIT0            USER MAP BIT
14161  0 35 23345        STA     VAR9
14162  0 76 15721        LDA     OPMODE
14163  0 72 15444        SKA     BIT6            IS DATA FIXED
14164  0 01 14226        BRU     SPR5            YES
14165  0 72 15445        SKA     BIT7            IS DATA SEQUENTIAL
14166  0 01 14210        BRU     SPR4            YES
14167  0 71 33654 SPR3   LDX     =-63D           RANDOM DATA
14170  0 76 00406        LDA     SEED            GEN RANDOM DATA
14171  0 43 15372        BRM     RANDOM
14172  0 35*23345        STA*    VAR9            STORE DATA
14173  0 61 23345        MIN     VAR9            INCREMENT POINTER
14174  0 41 14171        BRX     *-3             LOOP
14175  0 43 15372        BRM     RANDOM          GEN DATA FOR LAST WORD
14176  0 35 00406        STA     SEED
14177  0 55 23344        ADD     VAR8            ADD DISC ADDRESS
14200  0 35*23345        STA*    VAR9            STORE LAST WORD
14201  0 61 23345        MIN     VAR9            INCREMENT POINTER
14202  0 61 23344        MIN     VAR8            INCREMENT DISC POINTER
14203  0 60 15506        SKR     COUNT           DECREMENT COUNT
14204  0 20 00000        NOP     0
14205  0 53 15506        SKN     COUNT           FINISHED
14206  0 01 14167        BRU     SPR3            NO - LOOP
14207  0 01 14243        BRU     SPR6            RETURN
14210  0 71 33655 SPR4   LDX     =-64D           COUNT
14211  0 76 23344        LDA     VAR8
14212  0 75 33550        LDB     =0
14213  0 67 00006        LCH     6
14214  0 35*23345        STA*    VAR9            STORE DATA
14215  0 55 15465        ADD     BIT23           ADD 1
14216  0 61 23345        MIN     VAR9            INCREMENT POINTER
14217  0 41 14214        BRX     *-3             LOOP
14220  0 61 23344        MIN     VAR8            INCREMENT DISC ADDRESS
14221  0 60 15506        SKR     COUNT           DECREMENT COUNT
14222  0 20 00000        NOP     0
14223  0 53 15506        SKN     COUNT           FINISHED
```

```
14224  0 01 14210         BRU     $PR4          NO = LOOP
14225  0 01 14243         BRU     $PR6          RETURN
14226  0 71 33654  $PR5   LDX     =-63D         COUNT
14227  0 76 15727         LDA     PATERN        FIXED PATTERN
14230  0 35=23345         STA=    VAR9          STORE DATA
14231  0 61 23345         MIN     VAR9          INCREMENT POINTER
14232  0 41 14230         BRX     *-2
14233  0 55 23344         ADD     VAR8          TAG LAST WORD
14234  0 35=23345         STA=    VAR9
14235  0 61 23345         MIN     VAR9          INCREMENT POINTERS
14236  0 61 23344         MIN     VAR8
14237  0 60 15506         SKR     COUNT         DECREMENT COUNT
14240  0 20 00000         NOP     0
14241  0 53 15506         SKN     COUNT         FINISHED
14242  0 01 14226         BRU     $PR5          NO
14243  0 71 23334  $PR6   LDX     TEMPD         GET X
14244  0 51 14117         BRR     $READ         RETURN
```



```
                   *
                   *     I/O DRIVER
                   *
14245  0 00 00000  DRIVER PZE     0
14246  0 37 23334         STX     TEMPD
14247  0 76 15730         LDA     CNTRS         GET RETRY COUNT
14250  0 66 00014         RSH     12D
14251  0 14 33552         ETR     =7
14252  0 54 15465         SUB     BIT23         SUBTRACT 1
14253  0 35 23343         STA     VAR7          CHANNEL DRIVER RETRY COUNT
14254  0 76 15721         LDA     OPMODE
14255  0 72 15463         SKA     BIT21         DO A DUMMY SEEK
14256  0 01 14260         BRU     *+2           YES
14257  0 01 14274         BRU     DRIVE1
14260  0 76 00406         LDA     SEED          GENERATE RANDOM SEEK ADDRESS
14261  0 43 15372         BRM     RANDOM
14262  0 35 00406         STA     SEED
14263  0 14 33627         ETR     =17777
14264  0 35 23330         STA     TEMP
14265  2 76 00000         LDA     0,2           DISC STARTING POT WORD
14266  0 14 33616         ETR     =760000
14267  0 16 23330         MRG     TEMP
14270  0 35 15603         STA     TABLE3
14271  0 77 15603         EAX     TABLE3
14272  0 43 14277         BRM     DSCDVR        DRIVE DISC
14273  0 71 23334         LDX     TEMPD
14274  0 43 14277  DRIVE1 BRM     DSCDVR        DRIVE DISC
14275  0 43 14452         BRM     CHNDVR        DRIVE CHANNEL
14276  0 51 14245         BRR     DRIVER        RETURN
```

```
                    *
                    *       DISC DRIVER
                    *
14277  0 00 00000 DSCDVR PZE     0
14300  0 76 15730        LDA     CNTRS           SET UP RETRY COUNTER FOR DISC DRIVER
14301  0 66 00014        RSH     12D
14302  0 14 33552        ETR     *7
14303  0 54 15465        SUB     BIT23           SUBTRACT 1
14304  0 35 23342        STA     VAR6
14305  0 76 33551        LDA     **1             PRESET RETRY COUNTER
14306  0 35 15507        STA     RETRY
14307  0 76 15465 DDVR0  LDA     BIT23           SET PHASE
14310  0 35 15512        STA     PHASE
14311  0 40 10226        SKS     10226           FILE ON LINE TEST
14312  0 43 14732        BRM     ABORT           FILE NOT ON LINE
14313  0 20 15436        NOP     BIT0
14314  0 40 14026        SKS     14026           WRITE HEADER TEST
14315  0 43 14732        BRM     ABORT           WRITE HEADER SWITCH ON
14316  0 20 15443        NOP     BIT5
14317  0 76 33550        LDA     *0
14320  0 40 10026        SKS     10026           DISC FILE READY TEST
14321  0 01 14323        BRU     **2             CONTROLLER NOT READY
14322  0 01 14330        BRU     DDVR2
14323  0 55 15465        ADD     BIT23           ADD 1
14324  0 73 33571        SKG     *357140
14325  0 01 14320        BRU     DDVR1           LOOP
14326  0 43 14732        BRM     ABORT           500 MS TIMEOUT
14327  0 20 15437        NOP     BIT1
14330  0 02 10026        EOM     10026           ALERT DISC FILE
14331  2 13 00000        POT     0,2             POT TO DISC
14332  2 76 00000        LDA     0,2             GET POT WORD
14333  0 43 15310        BRM     GETCAP          GET STARTING ARM POSITION
14334  0 35 23332        STA     TEMPB
14335  0 67 00007        LSH     7
14336  0 14 33456        ETR     *17600
14337  0 35 23330        STA     TEMP
```



```
14340  2 76 00000        LDA     0,2             POTWORD
14341  0 14 33616        ETR     *760000
14342  0 16 23330        MRG     TEMP
14343  0 35 23331        STA     TEMPA
14344  2 76 00000        LDA     0,2             ENTER ENDING POSITION IN TABLE
14345  0 43 15276        BRM     ENDPOS
14346  0 76 33550        LDA     *0              PRESET MOVTIM AND BADTIM
14347  0 35 15504        STA     MOVTIM
14350  0 35 15503        STA     BADTIM
14351  2 76 00006        LDA     6,2             TEST FOR WRITE PROTECT
14352  0 72 15460        SKA     BIT18           IS OPERATION A READ
14353  0 01 14355        BRU     **2             NO = TEST FOR WRITE PROTECT
14354  0 01 14357        BRU     **3             YES = DO NOT TEST FOR WRITE PROTECT
14355  0 40 13026        SKS     13026           DISC WRITE PROTECT TEST
14356  0 43 14653        BRM     REPERR          DISC WRITE PROTECTED
14357  0 20 15442        NOP     BIT4
14360  0 76 15721        LDA     OPMODE          TEST FOR POSITION TIMING
14361  0 72 15464        SKA     BIT22
14362  0 01 14364        BRU     **2             TIME IT
14363  0 51 14277        BRR     DSCDVR          RETURN
14364  2 76 00000        LDA     0,2
14365  0 66 00007        RSH     7               GET NEW ARM POSITION
14366  0 14 33600        ETR     *77
14367  0 75 23332        LDB     TEMPB           GET STARTING ARM POSITION
14370  0 43 15321        BRM     GETIME          GET MAXIMUM POSITIONING TIME
14371  0 36 15504        STB     MOVTIM          SAVE TIME
14372  2 76 00000        LDA     0,2             DISC POT WORD
14373  0 14 33456        ETR     *17600
14374  0 66 00037        RSH     31D             END POSITION TO B
14375  0 71 33657        LDX     *-375D
14376  0 41 14376        BRX     *               WAIT REMAINDER OF 1 MS
14377  0 76 15465        LDA     BIT23           PRESET A REGISTER
14400  0 40 12026        SKS     12026           TRACK VERIFIED TEST
14401  0 01 14403        BRU     **2             TRACK NOT VERIFIED
14402  0 01 14412        BRU     DDVR4
14403  0 55 15465        ADD     BIT23           ADD 1
```

```
14404  0 73 33421        SKG     =500D
14405  0 01 14407        BRU     *+2
14406  0 01 14412        BRU     DDVR4           500 MS TIMEOUT
14407  0 71 33660        LDX     *-559D
14410  0 41 14410        BRX     *
14411  0 01 14400        BRU     DDVR3
14412  0 71 23334 DDVR4  LDX     TEMPD           GET BUFFER BIAS
14413  0 73 15504        SKG     MOVTIM          IS POSITIONING TIME OK
14414  0 51 14477        BRR     DSCDVR          YES - RETURN
14415  0 35 15503        STA     BADTIM          SAVE TRUE POSITIONING TIME
14416  0 60 23342        SKR     VAR6            DECREMENT RETRY COUNTER
14417  0 20 00000        NOP     0
14420  0 53 23342        SKN     VAR6            RETRY
14421  0 01 14423        BRU     *+2             YES
14422  0 43 14732        BRM     ABORT
14423  0 20 15445        NOP     BIT7
14424  0 43 14653        BRM     REPERR          REPORT ERROR
14425  0 20 15445        NOP     BIT7
14426  0 02 10026        EOM     10026           ALERT DISC FILE
14427  0 13 23331        PUT     TEMPA           MOVE TO ORIGINAL POSITION
14430  0 76 15464        LDA     BIT22           SET PHASE
14431  0 35 15512        STA     PHASE
14432  0 76 23331        LDA     TEMPA           SET UP END DISC POSITION
14433  0 35 23332        STA     TEMPB
14434  0 43 15276        BRM     ENDPOS          ENTER ENDING POSITION IN TABLE
14435  2 76 00000        LDA     0,2             SET UP START DISC
14436  0 35 23331        STA     TEMPA
14437  0 76 33550        LDA     =0
14440  0 40 12026        SKS     12026           TRACK VERIFIED TEST
14441  0 01 14443        BRU     *+2             TRACK NOT VERIFIED
14442  0 01 14307        BRU     DDVR0           TRY AGAIN
14443  0 55 15465        ADD     BIT23           ADD 1
14444  0 73 33571        SKG     =357140
14445  0 01 14440        BRU     DDVR5
14446  0 76 33621        LDA     =500D
14447  0 35 15503        STA     BADTIM
```



```
14450  0 43 14732        BRM     ABORT           500 MS TIMEOUT
14451  0 20 15445        NOP     BIT7
```

```
                    *
                    *       CHANNEL DRIVER
                    *
14452  0 00 00000 CHNDVR PZE     0
14453  0 37 23334        STX     TEMPD           SAVE X
14454  2 76 00005        LDA     5,2             EXTENDED MODE E@M
14455  0 35 14472        STA     CDVR3
14456  2 76 00006        LDA     6,2             BUFFER CONTROLE@M
14457  0 35 14474        STA     CDVR4
14460  0 76 33550        LDA     =0
14461  0 40 14000        SKS     14000           CHANNEL ACTIVE TEST
14462  0 01 14464        BRU     **2             CHANNEL ACTIVE
14463  0 01 14471        BRU     CDVR2
14464  0 55 15465        ADD     BIT23           ADD 1
14465  0 73 33571        SKG     =357140
14466  0 01 14461        BRU     CDVR1
14467  0 43 14732        BRM     AB@RT           CHANNEL ACTIVE AFTER 500 MS
14470  0 20 15453        N@P     BIT13
14471  0 02=10000        E@M=    10000           ALERT CHANNEL
14472  0 00 00000 CDVR3  PZE     0               EXTENDED MODE E@M
14473  2 13 00001        P@T     1,2
14474  0 00 00000 CDVR4  PZE     0               BUFFER CONTROL E@M
14475  2 76 00004        LDA     4,2             SET PHASE
14476  0 35 15512        STA     PHASE
14477  0 76 33550        LDA     =0
14500  0 35 15477        STA     STFLAG          CLEAR SEARCH TIME FLAG
14501  0 35 15475        STA     I1FLAG          CLEAR I1 FLAG
14502  0 35 15476        STA     I2FLAG          CLEAR I2 FLAG
14503  0 76 15721        LDA     BPM@DE
14504  0 72 15465        SKA     BIT23           TIME SEARCH
14505  0 01 14507        BRU     **2             YES
14506  0 51 14452        BRR     CHNDVR          RETURN
14507  2 76 00002        LDA     2,2             GET COMPARE ADDRESS
14510  0 55 15464        ADD     BIT22           ADD 2
14511  0 71 33661        LDX     ==3300D         COUNT
14512  0 75 33551        LDB     ==1             MASK
```



```
14513  0 02 12000        E@M     12000           ALERT TO PIN CHANNEL ADDRESS
14514  0 33 23330        PIN     TEMP            PIN CHANNEL ADDRESS
14515  0 73 23330        SKG     TEMP            CHANNEL COUNTING YET
14516  0 01 14541        BRU     CDVR7           YES
14517  0 41 14513        BRX     CDVR5           L@@P
14520  0 36 15477        ST8     STFLAG          SET SEARCH TIME ERR@R FLAG
14521  0 71 33662        LDX     ==3303D         COUNT
14522  0 02 12000        E@M     12000           ALERT TO PIN CHANNEL ADDRESS
14523  0 33 23330        PIN     TEMP            PIN CHANNEL ADDRESS
14524  0 73 23330        SKG     TEMP            IS INTERLACE COUNTING YET
14525  0 01 14541        BRU     CDVR7           YES
14526  0 41 14522        BRX     CDVR6           L@@P
14527  0 71 23334        LDX     TEMPD           GET X
14530  0 60 23343        SKR     VAR7            DECREMENT RETRY COUNTER
14531  0 20 00000        N@P     0
14532  0 53 23343        SKN     VAR7            RETRY
14533  0 01 14535        BRU     **2             YES
14534  0 43 14732        BRM     AB@RT
14535  0 20 15447        N@P     BIT9
14536  0 43 14453        BRM     REPERR
14537  0 20 15447        N@P     BIT9
14540  0 01 14307        BRU     DDVR0           TRY AGAIN
14541  0 71 23334 CDVR7  LDX     TEMPD           GET X
14542  0 51 14452        BRR     CHNDVR          RETURN
```

```
                    *
                    *       ROUTINE TO WAIT UP TO 2.8 SECONDS FOR DISC READY
                    *
14543  0 00 00000   WFI0    PZE     0
14544  0 35 23325           STA     A               SAVE A
14545  0 76 33663           LDA     =99999D         COUNT = 100,000
14546  0 35 23330           STA     TEMP
14547  0 60 23330   WFI01   SKR     TEMP
14550  0 66 20060           RCY     48D
14551  0 53 23330           SKN     TEMP
14552  0 01 14554           BRU     **2
14553  0 01 14556           BRU     WFI02           2.8 SEC UP
14554  0 40 10026           SKS     10026           DISC FILE READY TEST
14555  0 01 14547           BRU     WFI01           FILE NOT READY
14556  0 76 23325   WFI02   LDA     A               GET A REGISTER
14557  0 51 14543           BRR     WFI0            RETURN
```



```
                    *
                    *       CHECK FOR I/O ERRORS
                    *
14560  0 00 00000   CHNCK   PZE     0
14561  0 02 10026           EOM     10026           ALERT DISC FILE
14562  0 33 23330           PIN     TEMP            UPDATE CURRENT ARM POSITION TABLE
14563  0 76 23330           LDA     TEMP
14564  0 43 15276           BRM     ENDPOS          INSERT ENDING ADDRESS
14565  0 75 33616           LDB     =760000         MASK
14566  2 70 00000           SKM     0,2             STARTING AND ENDING ADDRESS ON SAME DISC
14567  0 01 14571           BRU     **2             NO
14570  0 01 14574           BRU     **4
14571  2 76 00000           LDA     0,2             START DISC
14572  0 16 33627           MRG     =17777
14573  0 43 15276           BRM     ENDPOS          INSERT POSITION 77 FOR STARTING DISC
14574  0 43 15340           BRM     IOSTAT          GET CURRENT I/O STATUS
14575  0 72 33664           SKA     =71007000       DOES ERROR CONDITION EXIST
14576  0 01 14637           BRU     CHNCK2          YES
14577  0 46 20005           ABC
14600  0 53 15474           SKN     INTRPT          INTERRUPT MODE
14601  0 01 14621           BRU     CHNCK0          NO
14602  2 76 00006           LDA     6,2             BUFFER EOM
14603  0 72 15460           SKA     BIT18           IN WRITE MODE
14604  0 01 14613           BRU     CHNCK4          YES
14605  0 46 10012           BAC
14606  0 72 33665           SKA     =600            INTERRUPT ERROR
14607  0 01 14611           BRU     **2             YES
14610  0 01 14621           BRU     CHNCK0
14611  0 14 33665           ETR     =600
14612  0 01 14440           BRU     CHNCK2+1
14613  0 46 10012   CHNCK4  BAC
14614  0 72 15455           SKA     BIT15           INTERRUPT ERROR IN WRITE MODE
14615  0 01 14617           BRU     **2             YES
14616  0 01 14621           BRU     CHNCK0
14617  0 14 15455           ETR     BIT15
14620  0 01 14440           BRU     CHNCK2+1
```

```
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14621  0 53 15477  CHNCK0 SKN     STFLAG          SEARCH TIME FLAG SET
14622  0 51 14560            BRR     CHNCK           NO . RETURN
14623  0 76 33551            LDA     *.1             RESET HEADING SWITCHES
14624  0 35 15472            STA     DHEAD
14625  0 35 15473            STA     IOHEAD
14626  0 37 23330            STX     TEMP            SET UP MESSAGE POINTER
14627  0 76 23330            LDA     TEMP
14630  0 14 33560            ETR     *37777
14631  0 16 15446            MRG     BITR
14632  0 35 14635            STA     CHNCK1
14633  0 43 00454            BRM     REPORT
14634  4 20 33270            NOP     F10M9,4
14635  0 00 00000  CHNCK1 PZE     0               POINTER
14636  0 51 14560            BRR     CHNCK           RETURN
14637  0 14 33664  CHNCK2 ETR     *71007000       FORMAT
14640  0 35 14652            STA     CHNCK3
14641  0 60 23343            SKR     VAR7            DECREMENT CHANNEL RETRY COUNTER
14642  0 20 00000            NOP     0
14643  0 53 23343            SKN     VAR7            RETRY
14644  0 01 14646            BRU     *+2             YES
14645  0 43 14732            BRM     ABORT
14646  0 20 14652            NOP     CHNCK3
14647  0 43 14653            BRM     REPERR
14650  0 20 14652            NOP     CHNCK3
14651  0 01 14307            BRU     DDVRO           TRY AGAIN
14652  0 00 00000  CHNCK3 PZE     0
```

```
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                    *
                    *       REPORT I/O ERROR
                    *
14653  0 00 00000  REPERR PZE     0
14654  0 37 23334            STX     TEMPD           SAVE X
14655  0 61 14653            MIN     REPERR          INCREMENT RETURN
14656  0 61 15507            MIN     RETRY           INCREMENT RETRY COUNTER
14657  0 77*14653            EAX*    REPERR
14660  2 76*00000            LDA*    0,2             ERROR FLAG
14661  0 35 15513            STA     ERRTBL
14662  0 43 15340            BRM     IOSTAT          GET CURRENT I/O STATUS
14663  0 35 23330            STA     TEMP
14664  0 76 15507            LDA     RETRY
14665  0 67 00003            LSH     3
14666  0 14 33666            ETR     *170
14667  0 55 23330            ADD     TEMP
14670  0 16 15513            MRG     ERRTBL          MERGE ERROR FLAG
14671  0 35 15514            STA     ERRTBL+1
14672  0 76 15503            LDA     BADTIM          TIMES
14673  0 75 33550            LDB     *0
14674  0 67 00014            LSH     12D
14675  0 55 15504            ADD     MOVTIM
14676  0 35 15515            STA     ERRTBL+2
14677  0 71 23334            LDX     TEMPD           BIAS
14700  2 76 00000            LDA     0,2             STARTING DISC ADDRESS
14701  0 35 15516            STA     ERRTBL+3
14702  2 76 00002            LDA     2,2             STARTING CORE ADDRESS
14703  0 35 15520            STA     ERRTBL+5
14704  2 76 00003            LDA     3,2             BLOCK LENGTH
14705  0 35 15522            STA     ERRTBL+7
14706  0 02 10026            EOM     10026           ALERT DISC FILE
14707  0 33 15517            PIN     ERRTBL+4        ENDING DISC ADDRESS
14710  0 02 12000            EOM     12000           ALERT TO PIN CHANNEL ADDRESS
14711  0 33 15521            PIN     ERRTBL+6        ENDING CHANNEL ADDRESS
14712  0 43 14743            BRM     WFIO            WAIT FOR I/O TO FINISH
14713  0 53 15473            SKN     IOHEAD          PRINT HEADING
```

```
14714  0 01 14723          BRU     REP1            NO
14715  0 76 33350          LDA     =0              SET UP HEADING SWITCHES
14716  0 35 15473          STA     IOHEAD
14717  0 76 33351          LDA     ==1
14720  0 35 15472          STA     DHEAD
14721  0 43 00454          BRM     REPORT          OUTPUT HEADING
14722  0 20 33275          NOP     F10M11
14723  0 43 00454  REP1    BRM     REPORT
14724  4 20 33245          NOP     F10M7,4         (CR)
14725  0 10 15513          EIGHT   ERRTBL          DATA
14726  0 43 00460          BRM     ERROR           GO TO CONTROL
14727  0 20 23460          NOP     J21M12
14730  0 02 10226          EOM     10226           CLEAR FILE
14731  0 51 14453          BRR     REPERR          RETURN
                    *
                    *       REPORT I/O ERROR AND ABORT
                    *
14732  0 00 00000  ABORT   PZE     0
14733  0 61 14732          MIN     ABORT           INCREMENT MARK
14734  0 37 23334          STX     TEMPD           SAVE X
14735  0 77=14732          EAX=    ABORT
14736  2 76=00000          LDA=    0,2             GET DATA POINTER
14737  0 71 23334          LDX     TEMPD           GET X
14740  0 35 14742          STA     ABORT1
14741  0 43 14653          BRM     REPERR          REPORT ERROR
14742  0 00 00000  ABORT1  PZE     0
14743  0 43 00434          BRM     END             LOOP IF BP1 SET
14744  0 01 13353          BRU     START           RESTART FUNCTION
```



```
                    *
                    *       CHECK DATA
                    *
14745  0 00 00000  DATACK  PZE     0
14746  0 37 23334          STX     TEMPD           SAVE X
14747  2 76 00006          LDA     6,2             BUFFER CONTROL EOM
14750  0 72 15460          SKA     BIT18           WAS LAST OPERATION THIS BUFFER A READ
14751  0 51 14745          BRR     DATACK          NO = RETURN
14752  0 53 23350          SKN     NFFLG           IS MACHINE A 940
14753  0 01 14773          BRU     DATA2           NO
14754  2 76 00002          LDA     2,2             STARTING CORE ADDRESS
14755  0 66 00013          RSH     11B             SET UP RELABELING
14756  0 35 23330          STA     TEMP
14757  0 75 33350          LDB     =0
14760  0 71 33652          LDX     ==7
14761  0 61 23330  DATA1   MIN     TEMP
14762  0 67 20006          LCY     6
14763  0 55 23330          ADD     TEMP
14764  0 41 14761          BRX     DATA1
14765  0 36 00415          STB     RL1
14766  0 35 00416          STA     RL2
14767  0 02 20400          EOM     20400           SET UP RL1
14770  0 13 00415          PBT     RL1
14771  0 02 21000          EOM     21000           SET UP RL2
14772  0 13 00416          PBT     RL2
14773  0 71 23334  DATA2   LDX     TEMPD
14774  2 76 00003          LDA     3,2             SECTOR COUNT
14775  0 54 15465          SUB     BIT23           SUBTRACT 1
14776  0 35 15506          STA     COUNT
14777  2 76 00000          LDA     0,2             STARTING DISC ADDRESS
15000  0 35 23344          STA     VAR8
15001  2 76 00002          LDA     2,2             STARTING CORE ADDRESS
15002  0 53 23350          SKN     NFFLG           IS MACHINE A 940
15003  0 01 15005          BRU     ==2             NO
15004  0 14 33653          ETR     =3777
15005  0 16 15436          MRG     BIT0            USER MAP BIT
```

```
15006  0 35 23345          STA     VAR9
15007  0 75 33551          LDB     =-1             MASK
15010  0 76 15721          LDA     OPMODE
15011  0 72 15444          SKA     BIT6            IS DATA FIXED
15012  0 01 15060          BRU     DATA7           YES
15013  0 72 15445          SKA     BIT7            IS DATA SEQUENTIAL
15014  0 01 15037          BRU     DATA5           YES
15015  0 36 15502  DATA3   STB     NEWSEC          SET NEW SECTOR SWITCH
15016  0 71 33454          LDX     =-63D           RANDOM DATA
15017  0 76*23345          LDA*    VAR9            GET FIRST WORD
15020  0 70*23345  DATA4   SKM*    VAR9            IS DATA CORRECT
15021  0 43 15170          BRM     DATERR          NO
15022  0 43 15372          BRM     RANDOM          GENERATE NEXT RANDOM WORD
15023  0 61 23345          MIN     VAR9            INCREMENT POINTER
15024  0 41 15020          BRX     DATA4
15025  0 55 23344          ADD     VAR8            ADD DISC ADDRESS + LAST WORD
15026  0 70*23345          SKM*    VAR9            IS LAST WORD CORRECT
15027  0 43 15170          BRM     DATERR          NO
15030  0 61 23345          MIN     VAR9            INCREMENT POINTERS
15031  0 61 23344          MIN     VAR8
15032  0 60 15506          SKR     COUNT           DECREMENT COUNT
15033  0 20 00000          NOP     0
15034  0 53 15506          SKN     COUNT           FINISHED
15035  0 01 15015          BRU     DATA3           NO
15036  0 01 15100          BRU     DATA8
15037  0 36 15502  DATA5   STB     NEWSEC          SET NEW SECTOR SWITCH
15040  0 75 33550          LDB     =0
15041  0 76 23344          LDA     VAR8            SET UP FIRST SEQUENTIAL DATA WORD
15042  0 67 00006          LSH     6
15043  0 75 33551          LDB     =-1             MASK
15044  0 71 33655          LDX     =-64D           COUNT
15045  0 70*23345  DATA6   SKM*    VAR9            IS DATA CORRECT
15046  0 43 15170          BRM     DATERR          NO
15047  0 55 15465          ADD     BIT23           ADD 1
15050  0 61 23345          MIN     VAR9            INCREMENT POINTER
15051  0 41 15045          BRX     DATA6           LOOP
```



```
15052  0 61 23344          MIN     VAR8            UPDATE DISC ADDRESS
15053  0 60 15506          SKR     COUNT           DECREMENT COUNT
15054  0 20 00000          NOP     0
15055  0 53 15506          SKN     COUNT           FINISHED
15056  0 01 15037          BRU     DATA5           NO
15057  0 01 15100          BRU     DATA8
15060  0 36 15502  DATA7   STB     NEWSEC          SET NEW SECTOR SWITCH
15061  0 71 33654          LDX     =-63D           COUNT
15062  0 76 15727          LDA     PATERN          FIXED PATTERN
15063  0 70*23345          SKM*    VAR9            IS DATA CORRECT
15064  0 43 15170          BRM     DATERR          NO
15065  0 61 23345          MIN     VAR9            INCREMENT POINTER
15066  0 41 15063          BRX     *-3             LOOP
15067  0 55 23344          ADD     VAR8
15070  0 70*23345          SKM*    VAR9            IS LAST WORD CORRECT
15071  0 43 15170          BRM     DATERR          NO
15072  0 61 23345          MIN     VAR9            INCREMENT POINTERS
15073  0 61 23344          MIN     VAR8
15074  0 60 15506          SKR     COUNT           DECREMENT COUNT
15075  0 20 00000          NOP     0
15076  0 53 15506          SKN     COUNT           FINISHED
15077  0 01 15060          BRU     DATA7           NO
15100  0 71 23334  DATA8   LDX     TEMPD           GET X
15101  0 51 14745          BRR     DATACK          RETURN
```

```
                    *
                    *       COMPARE BUFFERS 1 AND 2
                    *
15102  0 00 00000   C1AND2  PZE     0
15103  0 37 23334           STX     TEMPD           SAVE X
15104  0 77 15563           EAX     TABLE1
15105  2 76 00002           LDA     2,2             START CORE (B=1)
15106  0 53 23350           SKN     NFFLG           IS MACHINE A 940
15107  0 01 15131           BRU     C1A2B           NO
15110  0 66 00013           RSH     11D             SET UP RELABELING
15111  0 35 23330           STA     TEMP
15112  0 75 33550           LDB     =0
15113  0 71 33652           LDX     ==7
15114  0 61 23330   C1A2A   MIN     TEMP
15115  0 67 20006           LCY     6
15116  0 55 23330           ADD     TEMP
15117  0 41 15114           BRX     C1A2A
15120  0 36 00415           STB     RL1
15121  0 35 00416           STA     RL2
15122  0 02 20400           EOM     20400           SET UP RL1
15123  0 13 00415           POT     RL1
15124  0 02 21000           EOM     21000           SET UP RL2
15125  0 13 00416           POT     RL2
15126  0 77 15563           EAX     TABLE1
15127  2 76 00002           LDA     2,2             START CORE (B=1)
15130  0 14 33453           ETR     =3777
15131  0 35 23331   C1A2B   STA     TEMPA           BUFFER 1 POINTER
15132  2 76 00003           LDA     3,2             LENGTH
15133  0 75 33550           LDB     =0
15134  0 67 00006           LSH     6
15135  0 55 23331           ADD     TEMPA
15136  0 16 15436           MRG     BIT0            USER MAP BIT
15137  0 35 23345           STA     VAR9            BUFFER 2 POINTER
15140  0 76 23331           LDA     TEMPA
15141  0 16 15436           MRG     BIT0            USER MAP BIT
15142  0 35 23331           STA     TEMPA
```



```
15143  2 76 00003           LDA     3,2             LENGTH
15144  0 54 15465           SUB     BIT23           SUBTRACT 1
15145  0 35 15506           STA     COUNT
15146  2 76 00000           LDA     0,2             START DISC
15147  0 35 23344           STA     VAR8
15150  0 75 33551           LDB     ==1             MASK
15151  0 36 15502   C1A2C   STB     NEWSEC          SET NEW SECTOR SWITCH
15152  0 71 33655           LDX     ==640           COUNT
15153  0 76=23331   C1A2D   LDA=    TEMPA           B=1 WORD
15154  0 70=23345           SKM=    VAR9            B=2 WORD
15155  0 43 15170           BRM     DATERR          MISCOMPARE
15156  0 61 23331           MIN     TEMPA           INCREMENT POINTERS
15157  0 61 23345           MIN     VAR9
15160  0 41 15153           BRX     C1A2D           LOOP
15161  0 61 23344           MIN     VAR8            INCREMENT DISC POINTER
15162  0 60 15506           SKR     COUNT           DECREMENT COUNT
15163  0 20 00000           NOP     0
15164  0 53 15506           SKN     COUNT           FINISHED
15165  0 01 15151           BRU     C1A2C           NO
15166  0 71 23334           LDX     TEMPD           GET X
15167  0 51 15102           BRR     C1AND2          RETURN
```

```
                    *
                    *       DATA ERROR ROUTINE
                    *
15170  0 00 00000 DATERR PZE     0
15171  0 43 15257        BRM     SAV             SAVE REGISTERS
15172  0 35 15514        STA     ERRTBL+1        GOOD WORD
15173  0 76*23345        LDA*    VAR9            BAD WORD
15174  0 35 15513        STA     ERRTBL
15175  0 76 23344        LDA     VAR8            DISC ADDRESS
15176  0 35 15515        STA     ERRTBL+2
15177  0 37 23330        STX     TEMP
15200  0 76 15457        LDA     BIT17           A = 64D
15201  0 55 23330        ADD     TEMP
15202  0 35 15521        STA     ERRTBL+6        WORD NUMBER
15203  0 71 23334        LDX     TEMPD           GET BUFFER BIAS
15204  2 76 00002        LDA     2,2             START CORE
15205  0 14 33667        ETR     #174000         EXTRACT RELABELING
15206  0 35 23330        STA     TEMP
15207  0 76 23345        LDA     VAR9
15210  0 53 23350        SKN     NFFLG           IS MACHINE A 940
15211  0 01 15213        BRU     *+2             NO
15212  0 55 23330        ADD     TEMP
15213  0 35 15516        STA     ERRTBL+3        CORE ADDRESS
15214  2 76 00000        LDA     0,2
15215  0 35 15517        STA     ERRTBL+4        STARTING DISC ADDRESS
15216  2 76 00003        LDA     3,2
15217  0 35 15520        STA     ERRTBL+5        BLOCK SIZE IN SECTORS
15220  0 61 15522        MIN     ERRTBL+7        INCREMENT ERROR COUNT
15221  0 43 14543        BRM     WFIO            WAIT FOR DISC TO FINISH IF BUSY
15222  0 53 15502        SKN     NEWSEC          NEW SECTOR
15223  0 01 15247        BRU     DERR2           NO
15224  0 76 15465        LDA     BIT23           A = 1
15225  0 35 15522        STA     ERRTBL+7        RESET ERROR COUNT
15226  0 35 15502        STA     NEWSEC          RESET NEW SECTOR SWITCH
15227  0 43 00454        BRM     REPORT
15230  0 20 33245        NOP     F10M7           (CR)
```



```
15231  0 53 15472        SKN     DHEAD           DATA ERROR HEADER LAST HEADER
15232  0 01 15240        BRU     DERR1           YES
15233  0 35 15472        STA     DHEAD           RESET DATA ERROR HEADER SWITCH
15234  0 76 33551        LDA     #-1             SET I/O HEADER SWITCH
15235  0 35 15473        STA     IOHEAD
15236  0 43 00454        BRM     REPORT
15237  0 20 33246        NOP     F10M8           HEADING
15240  0 43 00454 DERR1  BRM     REPORT
15241  4 20 33245        NOP     F10M7,4         (CR)
15242  0 10 15513        EIGHT   ERRTBL          DATA
15243  0 43 15264        BRM     GET             GET REGISTERS
15244  0 43 00460        BRM     ERROR           GO TO CONTROL
15245  0 20 23660        NOP     U21M12
15246  0 51 15170        BRR     DATERR          RETURN
15247  0 76 15730 DERR2  LDA     CNTRS
15250  0 14 33600        ETR     #77             EXTRACT DISPLAY COUNT
15251  0 55 15465        ADD     BIT23           ADD 1
15252  0 73 15522        SKG     ERRTBL+7        REPORT THIS ERROR
15253  0 01 15255        BRU     *+2             NO
15254  0 01 15240        BRU     DERR1
15255  0 43 15264        BRM     GET             GET REGISTERS
15256  0 51 15170        BRR     DATERR          RETURN
```

```
                    *
                    *       SAVE REGISTERS
                    *
15257  0 00 00000   SAV     PZE     0
15260  0 35 23325           STA     A
15261  0 36 23326           STB     B
15262  0 37 23327           STX     X
15263  0 51 15257           BRR     SAV
                    *
                    *       RESTORE REGISTERS
                    *
15264  0 00 00000   GET     PZE     0
15265  0 76 23325           LDA     A
15266  0 75 23326           LDB     B
15267  0 71 23327           LDX     X
15270  0 51 15264           BRR     GET
                    *
                    *       RESET SEQUENTIAL DISC POINTER
                    *
15271  0 43 00430   RESET   BRM     OBJECT
15272  0 76 15724           LDA     LODISC          GET STARTING DISC ADDRESS
15273  0 35 23340           STA     VAR4            RESET POINTER
15274  0 43 23065           BRM     TERM            GO TO CONTROL
15275  0 01 13101           BRU     FSTART          RESTART FUNCTION
```



```
                    *
                    *       ENTER POSITION INTO TABLE
                    *
15276  0 00 00000   ENDPOS  PZE     0
15277  0 43 15257           BRM     SAV
15300  0 66 00015           RSH     13D             GET DISC
15301  0 35 23330           STA     TEMP            A TO X
15302  0 71 23330           LDX     TEMP
15303  0 76 33650           LDA     =0
15304  0 67 00006           LSH     6
15305  2 35 15523           STA     CAPTBL,2
15306  0 43 15264           BRM     GET
15307  0 51 15276           BRR     ENDPOS          RETURN
                    *
                    *       GET CURRENT ARM POSITION
                    *
15310  0 00 00000   GETCAP  PZE     0
15311  0 43 15257           BRM     SAV             SAVE REGISTERS
15312  0 66 00015           RSH     13D             GET DISC
15313  0 35 23330           STA     TEMP            A TO X
15314  0 71 23330           LDX     TEMP
15315  2 76 15523           LDA     CAPTBL,2        CURRENT POSITION
15316  0 75 23326           LDB     B
15317  0 71 23327           LDX     X
15320  0 51 15310           BRR     GETCAP          RETURN
```

```
                    *
                    *       GET MAXIMUM POSITIONING TIME
                    *
15321  0 00 00000   GETIME  PZE     0
15322  0 43 15287           BRM     SAV             SAVE REGISTERS
15323  0 54 23326           SUB     B
15324  0 35 23330           STA     TEMP            A = END POS - START POS
15325  0 72 15436           SKA     BIT0            IS A NEGATIVE
15326  0 01 15330           BRU     **2             YES
15327  0 01 15333           BRU     ***4
15330  0 76 33550           LDA     =0
15331  0 54 23330           SUB     TEMP            -A TO A
15332  0 35 23330           STA     TEMP
15333  0 71 23330           LDX     TEMP
15334  2 75 15613           LDB     TIMTBL,2        MAX TIME
15335  0 76 23325           LDA     A
15336  0 71 23327           LDX     X
15337  0 51 15321           BRR     GETIME          RETURN
```



```
                    *
                    *       GENERATE STATUS WORD
                    *
15340  0 00 00000   IOSTAT  PZE     0
15341  0 76 33550           LDA     =0
15342  0 40 10226           SKS     10226           FILE ON LINE TEST
15343  0 16 15436           MRG     BIT0            FILE NOT ON LINE
15344  0 40 10026           SKS     10026           DISC FILE READY TEST
15345  0 16 15437           MRG     BIT1            CONTROLLER NOT READY
15346  0 40 11026           SKS     11026           DISC FILE ERROR TEST
15347  0 16 15440           MRG     BIT2            CONTROLLER ERROR
15350  0 40 12026           SKS     12026           TRACK VERIFIED TEST
15351  0 16 15441           MRG     BIT3            TRACK NOT VERIFIED
15352  0 40 13026           SKS     13026           DISC WRITE PROTECT TEST
15353  0 16 15442           MRG     BIT4            DISC WRITE PROTECTED
15354  0 40 14026           SKS     14026           WRITE HEADER TEST
15355  0 16 15443           MRG     BIT5            WRITE HEADER SWITCH ON
15356  0 40 11000           SKS     11000           CHANNEL ERROR TEST
15357  0 16 15452           MRG     BIT12           CHANNEL ERROR
15360  0 40 14000           SKS     14000           CHANNEL ACTIVE TEST
15361  0 16 15453           MRG     BIT13           CHANNEL ACTIVE
15362  0 40 12000           SKS     12000           CHANNEL ZERO WORD COUNT TEST
15363  0 16 15454           MRG     BIT14           CHANNEL WORD COUNT NOT ZERO
15364  0 53 15475           SKN     I1FLAG
15365  0 16 15455           MRG     BIT15           I1 NOT RECEIVED
15366  0 53 15476           SKN     I2FLAG
15367  0 16 15456           MRG     BIT16           I2 NOT RECEIVED
15370  0 16 15512           MRG     PHASE           GET PHASE COUNTER
15371  0 51 15340           BRR     IOSTAT          RETURN
```

```
                    *
                    *       RANDOM NUMBER GENERATOR
                    *
15372  0 00 00000   RANDOM  PZE     0
15373  0 43 15257           BRM     SAV             SAVE REGISTERS
15374  0 66 00015           RSH     13D
15375  0 14 33670           ETR     =1777
15376  0 55 23325           ADD     A
15377  0 55 33471           ADD     =53577045
15400  0 75 23326           LDB     B
15401  0 71 23327           LDX     X
15402  0 51 15372           BRR     RANDOM          RETURN
```



```
                    *
                    *       INTERRUPT PROCESSOR
                    *
15403  0 02 20004   INTER   DIR                     DISABLE INTERRUPTS
15404  0 35 15510           STA     A1              SAVE REGISTERS
15405  0 36 15511           STB     B1
15406  0 76 00450           LDA     DIVERT          GET INTERRUPT MARK ADDRESS
15407  0 75 33551           LDB     =-1             MASK
15410  0 14 33560           ETR     =37777
15411  0 70 33562           SKM     =IX1            WAS INTERRUPT AN I1
15412  0 01 15414           BRU     *+2             NO
15413  0 01 15421           BRU     INTER1
15414  0 70 33564           SKM     =IX2            WAS INTERRUPT AN I2
15415  0 43 23377           BRM     SPUR            NO = SPURIOUS
15416  0 20 33672           NOP     =310033         POINTER
15417  0 36 15476           STB     I2FLAG
15420  0 01 15422           BRU     *+2
15421  0 36 15475   INTER1  STB     I1FLAG
15422  0 54 15465           SUB     BIT23
15423  0 35 00450           STA     DIVERT
15424  0 76*00450           LDA*    DIVERT
15425  0 35 00450           STA     DIVERT
15426  0 76 15510           LDA     A1              RESTORE REGISTERS
15427  0 75 15511           LDB     B1
15430  0 53 23350           SKN     NFFLG           IS MACHINE A 940
15431  0 01 15434           BRU     *+3             NO
15432  0 02 20002           EIR                     ENABLE INTERRUPTS
15433  0 11 00450           BRI     DIVERT          RETURN
15434  0 02 20002           EIR
15435  0 01*00450           BRU*    DIVERT          RETURN
```

```
                    *
                    *       CONSTANTS
                    *
15436    40000000   BIT0    DATA    40000000
15437    20000000   BIT1    DATA    20000000
15440    10000000   BIT2    DATA    10000000
15441    04000000   BIT3    DATA    04000000
15442    02000000   BIT4    DATA    02000000
15443    01000000   BIT5    DATA    01000000
15444    00400000   BIT6    DATA    00400000
15445    00200000   BIT7    DATA    00200000
15446    00100000   BIT8    DATA    00100000
15447    00040000   BIT9    DATA    00040000
15450    00020000   BIT10   DATA    00020000
15451    00010000   BIT11   DATA    00010000
15452    00004000   BIT12   DATA    00004000
15453    00002000   BIT13   DATA    00002000
15454    00001000   BIT14   DATA    00001000
15455    00000400   BIT15   DATA    00000400
15456    00000200   BIT16   DATA    00000200
15457    00000100   BIT17   DATA    00000100
15460    00000040   BIT18   DATA    00000040
15461    00000020   BIT19   DATA    00000020
15462    00000010   BIT20   DATA    00000010
15463    00000004   BIT21   DATA    00000004
15464    00000002   BIT22   DATA    00000002
15465    00000001   BIT23   DATA    00000001
15466    11133307   RMODE   DATA    11133307        AUTOMATIC RUNNING MODE
15467  0 02 02626           EOM     2626            READ DISC FILE . CHAIN
15470  0 02 03666           EOM     3666            WRITE DISC FILE . SECTOR
15471  0 02 14000           EOM     14000           EXTENDED MODE EOM
```



```
                    *
                    *       FLAGS
                    *
15472  0 00 00000   DHEAD   PZE     0               DATA ERROR HEADING FLAG
15473  0 00 00000   I0HEAD  PZE     0               I0 ERROR HEADING FLAG
15474  0 00 00000   INTRPT  PZE     0               INTERRUPT MODE FLAG
15475  0 00 00000   I1FLAG  PZE     0               I1 RECEIVED FLAG
15476  0 00 00000   I2FLAG  PZE     0               I2 RECEIVED FLAG
15477  0 00 00000   STFLAG  PZE     0               SEARCH TIME ERROR FLAG
15500  0 00 00000   KEY     PZE     0               KEY SWITCH (KEY IN PROCESS)
15501  0 00 00000   RR&W    PZE     0               READ/READ SWITCH (USED IN COMPARE MODE)
15502  0 00 00000   NEWSEC  PZE     0               NEW SECTOR SWITCH
                    *
                    *       STORAGE CELLS
                    *
15503  0 00 00000   BADTIM  PZE     0               SEEK TIME ERROR (INCORRECT TIME)
15504  0 00 00000   MOVTIM  PZE     0               SEEK TIME ERROR (MAX CORRECT TIME)
15505  0 00 00000   BLKMAX  PZE     0               MAXIMUM TRANSFER BLOCK LENGTH
15506  0 00 00000   COUNT   PZE     0               INTERNAL COUNTER
15507  0 00 00000   RETRY   PZE     0               CURRENT RETRY COUNT
15510  0 00 00000   A1      PZE     0
15511  0 00 00000   B1      PZE     0
15512  0 00 00000   PHASE   PZE     0               CURRENT PHASE
```

```
                        *
                        *       TABLES
                        *
15513          00010    ERRTBL  BSS     8D              ERROR OUTPUT TABLE
15523          00040    CAPTBL  BSS     32D             CURRENT ARM POSITION TABLE
15563  0 00 00000       TABLE1  PZE     0               DISC POT WORD (B.1)
15564  0 00 00000               PZE     0               CHANNEL POT WORD
15565  0 00 00000               PZE     0               CHANNEL STARTING ADDRESS
15566  0 00 00000               PZE     0               BLOCK LENGTH IN SECTORS
15567  0 00 00000               PZE     0               OPERATING MODE
15570  0 00 00000               PZE     0               EXTENDED MODE EOM
15571  0 00 00000               PZE     0               BUFFER CONTROL EOM
15572     00000001              DATA    1               BUFFER NUMBER (FIXED)
15573  0 00 00000       TABLE2  PZE     0               DISC POT WORD (B.2)
15574  0 00 00000               PZE     0               CHANNEL POT WORD
15575  0 00 00000               PZE     0               CHANNEL STARTING ADDRESS
15576  0 00 00000               PZE     0               BLOCK LENGTH IN SECTORS
15577  0 00 00000               PZE     0               OPERATING MODE
15600  0 00 00000               PZE     0               EXTENDED MODE EOM
15601  0 00 00000               PZE     0               BUFFER CONTROL EOM
15602     00000002              DATA    2               BUFFER NUMBER (FIXED)
15603  0 00 00000       TABLE3  PZE     0               DUMMY SEEK POT WORD
15604  0 00 00000               PZE     0               DUMMY TABLE
15605  0 00 00000               PZE     0
15606  0 00 00000               PZE     0
15607  0 00 00000               PZE     0
15610  0 00 00000               PZE     0
15611  0 00 00000               PZE     0
15612     00000003              DATA    3               BUFFER IDENTIFIER
```



```
                        *
                        *       MAXIMUM POSITIONING TIMES
                        *
15613     00000207      TIMTBL  DATA    135D,250D,217D,217D,233D,233D,250D,250D,250D,250D
15614     00000372
15615     00000331
15616     00000331
15617     00000351
15620     00000351
15621     00000372
15622     00000372
15623     00000372
15624     00000372
15625     00000413              DATA    267D,267D,267D,267D,283D,283D,300D,300D,300D,300D
15626     00000413
15627     00000413
15630     00000413
15631     00000433
15632     00000433
15633     00000454
15634     00000454
15635     00000454
15636     00000454
15637     00000475              DATA    317D,317D,317D,317D,317D,317D,333D,333D,350D,350D
15640     00000475
15641     00000475
15642     00000475
15643     00000475
15644     00000475
15645     00000515
15646     00000515
15647     00000536
15650     00000536
15651     00000536              DATA    350D,350D,350D,350D,350D,350D,367D,367D,367D,367D
15652     00000536
15653     00000536
```

```
15654    00000536
15655    00000536
15656    00000536
15657    00000557
15660    00000557
15661    00000557
15662    00000557
15663    00000557          DATA    367D,367D,367D,367D,383D,383D,383D,383D,383D,383D
15664    00000557
15665    00000557
15666    00000557
15667    00000577
15670    00000577
15671    00000577
15672    00000577
15673    00000577
15674    00000577
15675    00000577          DATA    383D,383D,400D,400D,400D,400D,400D,400D,400D,400D
15676    00000577
15677    00000A20
15700    00000A20
15701    00000A20
15702    00000A20
15703    00000A20
15704    00000A20
15705    00000A20
15706    00000A20
15707    00000620          DATA    400D,400D,400D,400D
15710    00000A20
15711    00000A20
15712    00000620
```



```
                         *
                         *
                         *       FUNCTION PARAMETER TABLE
                         *
15713  0 20 15731  FPT10  NOP     FIM10           FUNCTION IDENTIFIER MESSAGE
15714  0 20 15763         NOP     FAM10           FUNCTION ABSTRACT MESSAGE
15715  0 20 15740         NOP     FVM10           FUNCTION VARIABLE MESSAGE
15716  0 10 15721         EIGHT   OPMODE          FUNCTION VARIABLES POINTER
15717  0 00 17013         PZE     FUNC18          POINTER TO NEXT FUNCTION
15720    00020000         DATA    20000           FUNCTION IDENTIFIER BIT (BIT 10)
15721  0 00 00000  OPMODE PZE     0               OPERATING MODE
15722  0 00 00000  LOCORE PZE     0               FIRST CORE ADDRESS
15723  0 00 00000  HICORE PZE     0               LAST CORE ADDRESS
15724  0 00 00000  LODISC PZE     0               FIRST DISC ADDRESS
15725  0 00 00000  HIDISC PZE     0               LAST DISC ADDRESS
15726  0 00 00000  LENGTH PZE     0               FIXED LENGTH OR RANDOM SWITCH
15727  0 00 00000  PATERN PZE     0               FIXED PATTERN
15730    00070077  CNTRS  DATA    70077           RETRY AND DATA ERROR DISPLAY COUNTERS
                         *
                         *       FUNCTION MESSAGES
                         *
15731    52261201  FIM10  BCD     ' F 10 = DISC EXERCISER 3.0!!
15732    00124012
15733    24316223
15734    12256725
15735    51233162
15736    25511203
15737    33003712
15740    52124647  FVM10  BCD     '  OPMODE   LOCORE   HICORE   LODISC   HIDISC   LENGTH  PATTERN  COUNTERS !!
15741    44462425
15742    12121243
15743    46234651
15744    25121212
15745    30312346
15746    51251212
15747    12434624
```

```
15750    31622312
15751    12123031
15752    24316223
15753    12121243
15754    25452763
15755    30121247
15756    21636325
15757    51451212
15760    23466445
15761    63255162
15762    52371212
15763    52322431  FAM10  BCD     ' DISC EXERCISER = 3.0'
15764    62231225
15765    67255123
15766    31622551
15767    12401203
15770    33001212
15771    52526346         BCD     ' TO RESET THE SEQUENTIAL DISC POINTER, TYPE =0 15271T. THIS POINTER'
15772    12512562
15773    25631263
15774    30251262
15775    25506425
15776    45633121
15777    43122431
16000    62231247
16001    46314563
16002    25517312
16003    63704725
16004    12404612
16005    01050207
16006    01633312
16007    63303162
16010    12474631
16011    45632551
16012    52316212         BCD     ' IS NOT RESET BY A =F 10T.'
16013    45466312
```



```
16014    51256225
16015    63122270
16016    12211240
16017    26120100
16020    63331212
16021    52526330         BCD     '  THE MODE OF OPERATION OF THE EXERCISER IS CONTROLLED BY ONE BITS IN THE'
16022    25124446
16023    24251246
16024    26124647
16025    25512163
16026    31464512
16027    46261263
16030    30251225
16031    67255123
16032    31622551
16033    12316212
16034    23464563
16035    51464343
16036    25241222
16037    70124445
16040    25122231
16041    63621231
16042    45126330
16043    25121212
16044    52652151         BCD     ' VARIABLE =OPMODE= AS FOLLOWS:'
16045    31212243
16046    25124046
16047    47444624
16050    25401221
16051    62122446
16052    43434466
16053    62151212
16054    52006212         BCD     ' 00 = FIXED DISC 01 = SEQUENTIAL DISC 02 = RANDOM DISC'
16055    40122631
16056    67252412
16057    24316223
```

```
16060    52000112
16061    40126225
16062    50642545
16063    63312143
16064    12243162
16065    23520002
16066    12401251
16067    21452446
16070    44122431
16071    62231212
16072    52000312          BCD     ' 03 = FIXED CORE 04 = SEQUENTIAL CORE 05 = RANDOM CORE'
16073    40122431
16074    67252412
16075    23465125
16076    52000412
16077    40126225
16100    50642545
16101    63312143
16102    12234451
16103    25520005
16104    12401251
16105    21452446
16106    44122346
16107    51251212
16110    52000412          BCD     ' 06 = FIXED DATA 07 = SEQUENTIAL DATA 08 = RANDOM DATA'
16111    40122431
16112    67252412
16113    24216321
16114    52000712
16115    40126225
16116    50642545
16117    63312143
16120    12242163
16121    21520010
16122    12401251
16123    21452446
```



```
16124    44122421
16125    63211212
16126    52001112          BCD     ' 09 = N/A 10 = COMPUTE WHILE TRANSFERING DATA 11 = USE INTERRUPTS'
16127    40124561
16130    21520100
16131    12401223
16132    46444764
16133    63251266
16134    30314325
16135    12635121
16136    45622625
16137    51314527
16140    12242163
16141    21520101
16142    12401264
16143    62251231
16144    45632551
16145    51644763
16146    62121212
16147    52010212          BCD     ' 12 = BUFFER 1 FIXED OPERATION 13 = WRITE BUFFER 1 14 = READ BUFFER 1'
16150    40122264
16151    26262551
16152    12011226
16153    31672524
16154    12464725
16155    51216331
16156    46455201
16157    03124012
16160    66513163
16161    25122264
16162    26262551
16163    12015201
16164    04124012
16165    51252124
16166    12226426
16167    26255112
```

```
16170    01121212
16171    52010512          BCD     ' 15 • BUFFER 2 FIXED OPERATION 16 • WRITE BUFFER 2 17 • READ BUFFER 2'
16172    40122264
16173    26262551
16174    12021226
16175    31672524
16176    12464725
16177    51216331
16200    46455201
16201    06124012
16202    66513163
16203    25122264
16204    26262551
16205    12025201
16206    07124012
16207    51232124
16210    12226426
16211    26255112
16212    02121212
16213    52011012          BCD     ' 18 • N/A 19 • COMPARE BUFFERS 1 AND 2 20 • KEY DISC'
16214    40124561
16215    21520111
16216    12401223
16217    46444721
16220    51251222
16221    64262425
16222    51621201
16223    12214824
16224    12025202
16225    06124012
16226    42257012
16227    24316223
16230    52020112          BCD     ' 21 • USE DUMMY SEEK 22 • TIME SEEK 23 • TIME SEARCH'
16231    40126462
16232    25122464
16233    44447012
```



```
16234    62252543
16235    52020912
16236    40126331
16237    44251262
16240    25254252
16241    02031240
16242    12633144
16243    25126225
16244    21512330
16245    52526630          BCD     '  WHEN IN THE COMPARE MODE, BUFFER 2 MUST BE SET FOR FIXED READ. IF'
16246    25451231
16247    45126330
16250    25122346
16251    44472151
16252    25124446
16253    24257312
16254    22642426
16255    25511202
16256    12446462
16257    63122225
16260    12622563
16261    12264651
16262    12263167
16263    25241251
16264    25212433
16265    12312612
16266    52226426          BCD     ' BUFFER 1 IS SET FOR FIXED WRITE, THE PROGRAM WILL EXECUTE A WRITE•READ•'
16267    26255112
16270    01123162
16271    12622563
16272    12264651
16273    12263167
16274    25241266
16275    51316325
16276    73126330
16277    25124751
```

```
16300    46275121
16301    44126631
16302    43431225
16303    67252364
16304    63251221
16305    12665131
16306    63254051
16307    25212440
16310    52234644          BCD     ' COMPARE, IF BUFFER 1 IS SET FOR FIXED READ, THE PROGRAM WILL EXECUTE A'
16311    47215125
16312    33123126
16313    12226426
16314    26255112
16315    01123162
16316    12622563
16317    12264451
16320    12263167
16321    25241251
16322    25212473
16323    12633025
16324    12475146
16325    27512144
16326    12663143
16327    43122567
16330    25236463
16331    25122112
16332    52512521          BCD     ' READ=READ=COMPARE=WRITE=READ=COMPARE (THIS WILL NOT DESTROY THE INTEGRITY'
16333    24405125
16334    21244023
16335    44444721
16336    51254066
16337    51316325
16340    40512521
16341    24402346
16342    44472151
16343    25127463
```



```
16344    30316212
16345    66314343
16346    12454463
16347    12242562
16350    63514470
16351    12633025
16352    12314563
16353    25275131
16354    63701212
16355    52462612          BCD     ' OF THE DISC).  WHEN IN THE KEY MODE, THE DISC WILL BE KEYED WITH THE'
16356    63302512
16357    24316223
16360    34335252
16361    66302545
16362    12314512
16363    63302512
16364    42257212
16365    44462425
16366    73126330
16367    25122431
16370    62231266
16371    31434312
16372    22251242
16373    25702524
16374    12663163
16375    30126330
16376    25121212
16377    52622543          BCD     ' SELECTED DATA AND THE FUNCTION DISMISSED.'
16400    25236325
16401    24122421
16402    63211221
16403    45241263
16404    30251226
16405    64452363
16406    31464512
16407    24316244
```

```
16410    31626225
16411    24331212
16412    52523126          BCD     1  IF THE VARIABLE .LENGTH. IS NEGATIVE, RANDOM BLOCK LENGTHS WILL BE USED.1
16413    12633025
16414    12652151
16415    31212243
16416    25124043
16417    25452763
16420    30401231
16421    62124525
16422    27216331
16423    65257312
16424    51214524
16425    44441222
16426    43462342
16427    12432545
16430    27633062
16431    12663143
16432    43122225
16433    12646225
16434    24331212
16435    52312612          BCD     1 IF .LENGTH. IS POSITIVE, IT REPRESENTS THE FIXED BLOCK LENGTH TO BE USED.1
16436    40432545
16437    27633040
16440    12316212
16441    47466231
16442    63316525
16443    73123163
16444    12512547
16445    51256225
16446    45636212
16447    63302512
16450    26316725
16451    24122243
16452    46234212
16453    43254527
```



```
16454    63301263
16455    46122225
16456    12646225
16457    24331212
16460    52526330          BCD     1  THE VARIABLE .COUNTERS. CONTAINS TWO COUNTERS. BITS 9-11 IS THE NUMBER OF1
16461    25126521
16462    51312122
16463    43251240
16464    23466445
16465    63255162
16466    40122346
16467    45632131
16470    45621263
16471    66461223
16472    46644563
16473    25516233
16474    12223163
16475    62121140
16476    01011231
16477    62126330
16500    25124564
16501    44222551
16502    12462412
16503    52512563          BCD     1 RETRY ATTEMPTS TO BE MADE IF AN I/O ERROR OCCURES, AND BITS 18-23 THE1
16504    51701221
16505    63632544
16506    47636212
16507    63461222
16510    25124421
16511    24251231
16512    26122145
16513    12316146
16514    12255151
16515    46511246
16516    23236451
16517    25627312
```

```
16520    21452412
16521    22316362
16522    12011040
16523    02031263
16524    30251212
16525    52456444          BCD     ! NUMBER OF DATA ERRORS TO BE DISPLAYED AFTER THE FIRST ERROR IN A GIVEN!
16526    22255112
16527    44261224
16530    21632112
16531    25515146
16532    51621263
16533    46122025
16534    12243162
16535    47432170
16536    25241221
16537    26632551
16540    12633025
16541    12263151
16542    62631225
16543    51514451
16544    12314512
16545    21122731
16546    65254512
16547    52622523          BCD     ! SECTOR.  IF AN I/O ERROR OCCURES, INFORMATION DISPLAYED INCLUDES THE FOLLOWING:!
16550    63465133
16551    52523126
16552    12214512
16553    31614612
16554    25515146
16555    51124623
16556    23645125
16557    62731231
16560    45264451
16561    44216331
16562    46451224
16563    31624743
```



```
16564    21702524
16565    12314523
16566    43642425
16567    62126330
16570    25122646
16571    43434666
16572    31452715
16573    52314662          BCD     ! ISSTATUS! AN INDICATION OF THE STATE OF THE SYSTEM AT THE TIME OF FAILURE.!
16574    63216364
16575    62151221
16576    45123145
16577    24312321
16600    63314445
16601    12462612
16602    63302512
16603    62632163
16604    25124626
16605    12633025
16606    12627062
16607    63254412
16610    21631263
16611    30251263
16612    31442512
16613    46261226
16614    21314364
16615    51253312
16616    52000012          BCD     ! 00 = FILE NOT ON LINE 01 = CONTROLLER NOT READY 02 = CONTROLLER ERROR!
16617    40122631
16620    43251245
16621    46631246
16622    45124331
16623    45255200
16624    01124212
16625    23464563
16626    51464343
16627    25511245
```

```
16630    46631251
16631    25212470
16632    52000212
16633    40122346
16634    45635146
16635    43432551
16636    12255151
16637    46511212
16640    52000312          BCD     ' 03 = TRACK NOT VERIFIED 04 = DISC WRITE PROTECTED 05 = WRITE HEADER SWITCH ON'
16641    40126351
16642    21234212
16643    45466312
16644    65255131
16645    26312524
16646    52000412
16647    40122431
16650    62231266
16651    51316325
16652    12475146
16653    63252363
16654    25245200
16655    05124012
16656    66513163
16657    25123025
16660    21242551
16661    12626631
16662    63233012
16663    46451212
16664    52000612          BCD     ' 06 = N/A 07 = SEEK TIME ERROR 08 = N/A'
16665    40124561
16666    21520007
16667    12401262
16670    25254212
16671    63314425
16672    12255151
16673    46515200
```



```
16674    10124012
16675    45612112
16676    52001112          BCD     ' 09 = SEARCH TIME ERROR 10 = N/A 11 = N/A'
16677    40126225
16700    21512330
16701    12633144
16702    25122551
16703    51465152
16704    01001240
16705    12456121
16706    52010112
16707    40124561
16710    21121212
16711    52010212          BCD     ' 12 = CHANNEL ERROR 13 = CHANNEL ACTIVE 14 = WORD COUNT NOT ZERO'
16712    40122330
16713    21454525
16714    43122551
16715    51465152
16716    01031240
16717    12233021
16720    45452543
16721    12212363
16722    31652552
16723    01041240
16724    12664451
16725    24122346
16726    64456312
16727    45466312
16730    71255146
16731    52010340          BCD     ' 15-17 = N/A'
16732    01071240
16733    12456121
16734    52011040          BCD     ' 18-20 = CURRENT RETRY NUMBER 21-23 = CURRENT PHASE'
16735    02001240
16736    12236451
16737    51254563
```

```
16740    12512563
16741    51701245
16742    64442225
16743    51520201
16744    40020312
16745    40122364
16746    51512545
16747    63124730
16750    21622512
16751    52524025          BCD     '  =ERR FLAG= IS A MASK FOR IOSTATUS TO INDICATE THE ERROR DETECTED'
16752    51511224
16753    43212740
16754    12316212
16755    21124421
16756    62421226
16757    46511231
16760    46626321
16761    63646212
16762    63461231
16763    45243123
16764    21632512
16765    63302512
16766    25515146
16767    51122425
16770    63252363
16771    25241212
16772    52406331          BCD     ' =TIS==TSB= TIME IS AND TIME SB FOR SEEK TIME ERROR (IN HALFWORDS)''
16773    62404063
16774    62224012
16775    63314425
16776    12316212
16777    21452412
17000    63314425
17001    12622212
17002    26465112
17003    62252542
```



```
17004    12633144
17005    25122551
17006    51445112
17007    74314512
17010    30214326
17011    66465124
17012    62343712
```

```
                    *
                    *
                    *       FUNCTION 18 = WRITE PROTECT SWITCH TEST
                    *
                    *
17013  0 76 00404   FUNC18  LDA     DSCSIZ          PRESET VARIABLES
17014  0 66 00006           RSH     6
17015  0 14 33673           ETR     =70
17016  0 54 15465           SUB     BIT23
17017  0 35 23347           STA     ENDISC
17020  0 35 23335           STA     VAR1
17021  0 75 33550           LDB     =0
17022  0 36 23346           STB     STDISC
17023  0 43 00424           BRM     FUNCTN          FUNCTION LINK TO CONTROL
17024  0 20 17112           NOP     FPT18
17025  0 43 00454           BRM     REPORT          OUTPUT FUNCTION ID
17026  0 20 17120           NOP     FIN18
17027  0 43 23065           BRM     TERM            GO TO CONTROL
17030  0 43 00440           BRM     RETURN
17031  0 20 23371           NOP     ENTER
17032  0 43 00430           BRM     OBJECT
17033  0 76 23347           LDA     ENDISC          CHECK VARIABLES
17034  0 73 23335           SKG     VAR1            HIGH ARM TOO LARGE
17035  0 01 17037           BRU     **2             NO
17036  0 43 00460           BRM     ERROR
17037  0 20 33320           NOP     F18M1
17040  0 55 15465           ADD     BIT23
17041  0 73 23346           SKG     STDISC          LOW ARM < HIGH ARM
17042  0 43 00460           BRM     ERROR           NO
17043  0 20 33325           NOP     F18M2
17044  0 43 00434           BRM     END
17045  0 76 23346   BEGN18  LDA     STDISC          SET STARTING ARM NUMBER
17046  0 35 23336           STA     VAR2
17047  0 43 00430   STRT18  BRM     OBJECT
17050  0 76 23336           LDA     VAR2            FORM DISC POT WORD
17051  0 67 00015           LSH     13D
```



```
17052  0 43 23042           BRM     DISCCK          USE THIS DISC
17053  0 01 17065           BRU     F18E1           NO
17054  0 40 10026           SKS     10026           DISC FILE READY TEST
17055  0 01 17054           BRU     **1             NO
17056  0 02 10026           EOM     10026           ALERT DISC FILE
17057  0 13 23352           POT     POTWRD
17060  0 40 12026           SKS     12026           TRACK VERIFIED TEST
17061  0 01 17060           BRU     **1             NO
17062  0 40 13026           SKS     13026           DISC WRITE PROTECT TEST
17063  0 43 17073           BRM     OUT18           YES = OUTPUT MESSAGE
17064  0 02 10226           EOM     10226           CLEAR FILE
17065  0 43 00434   F18E1   BRM     END
17066  0 61 23336           MIN     VAR2
17067  0 76 23336           LDA     VAR2
17070  0 73 23347           SKG     ENDISC          LAST DISC TESTED
17071  0 01 17047           BRU     STRT18          NO
17072  0 01 17045           BRU     BEGN18
                    *
                    *
                    *
17073  0 00 000000  OUT18   PZE     0               OUTPUT MESSAGE
17074  0 76 23336           LDA     VAR2            FORM ARM NUMBER INTO BCD
17075  0 67 00003           LSH     3
17076  0 14 33632           ETR     =700
17077  0 55 23336           ADD     VAR2
17100  0 14 33674           ETR     =707
17101  0 67 00014           LSH     12D
17102  0 16 33675           MRG     =3737
17103  0 35 33342           STA     F18M4
17104  0 40 20040           SKS     20040           GO TO CONTROL IF BPT4
17105  0 43 23065           BRM     TERM
17106  0 43 00454           BRM     REPORT          OUTPUT THROUGH CONTROL
17107  0 20 33334           NOP     F18M3
17110  0 20 33342           NOP     F18M4
17111  0 51 17073           BRR     OUT18
```

```
                    *
                    *       FUNCTION PARAMETER TABLE
                    *
17112  0 20 17120   FPT18   NOP     FIM18
17113  0 20 17136           NOP     FAM18
17114  0 20 17131           NOP     FVM18
17115  0 02 23346           TWO     STDISC
17116  0 00 17247           PZE     FUNC19
17117    00000040           DATA    40
                    *
                    *       FUNCTION MESSAGES
                    *
17120    52261201   FIM18   BCD     ' F 18 . WRITE PROTECT SWITCH TEST!'
17121    10124212
17122    66513163
17123    25124751
17124    46632523
17125    63126266
17126    31632330
17127    12632562
17130    63371212
17131    52121262   FVM18   BCD     '   START     END !'
17132    63215163
17133    12121212
17134    12254524
17135    52371212
17136    52326451   FAM18   BCD     '  WRITE PROTECT SWITCH TEST '
17137    31632512
17140    47514463
17141    25236312
17142    62663163
17143    23301263
17144    25626352
17145    52633031           BCD     ' THIS ROUTINE TESTS THE WRITE PROTECT STATUS OF SEQUENTIAL'
17146    62125146
17147    64633145
```



```
17150    25126325
17151    62636212
17152    63302512
17153    66513163
17154    25124751
17155    46632523
17156    63126263
17157    21636462
17160    12462412
17161    62255064
17162    25456331
17163    21431212
17164    52243162           BCD     ' DISCS AND PRINTS THE OCTAL NUMBER OF WRITE PROTECTED DISCS'
17165    23621221
17166    45241247
17167    51314563
17170    62126330
17171    25124423
17172    63214312
17173    45644422
17174    25511246
17175    26126651
17176    31632512
17177    47514463
17200    25236325
17201    24122431
17202    62236212
17203    52216212           BCD     ' AS IT ENCOUNTERS THEM. THE FUNCTION VARIABLES ARE START AND'
17204    31631225
17205    45234464
17206    45632551
17207    62126330
17210    25443312
17211    63302512
17212    26644523
17213    63314645
```

```
17214    12652151
17215    31212243
17216    25621221
17217    51251262
17220    63215163
17221    12214524
17222    52254524          BCD     ' END, WHICH ARE THE STARTING AND ENDING DISC NUMBERS.'
17223    73126630
17224    31233712
17225    21512512
17226    63302512
17227    62632151
17230    63314527
17231    12214524
17232    12254524
17233    31452712
17234    24316223
17235    12456444
17236    22255162
17237    33121212
17240    52740036          BCD     ' (0<NUMBER<37  .  OCTAL)''
17241    45644422
17242    25513603
17243    07121240
17244    12124623
17245    63214334
17246    37121212
```



```
                         *
                         *
                         *      FUNCTION 19 . SINGLE INCREMENT VS. TIME PLOTTER
                         *
                         *
17247  0 76 00404   FUNC19 LDA     DSCSIZ
17250  0 66 00006          RSH     6
17251  0 14 33673          ETR     .70
17252  0 54 15465          SUB     BIT23
17253  0 35 23347          STA     ENDISC
17254  0 35 23335          STA     VAR1
17255  0 43 00424   F19I15 BRM     FUNCTN          FUNCTION LINK TO CONTROL
17256  0 20 17656          NOP     FPT19
17257  0 43 00454          BRM     REPORT          OUTPUT FUNCTION ID
17260  0 20 17664          NOP     FIM19
17261  0 43 23065          BRM     TERM            GO TO CONTROL
17262  0 43 00440          BRM     RETURN
17263  0 20 23371          NOP     ENTER
17264  0 76 23347          LDA     ENDISC          CHECK VARIABLES
17265  0 73 23347          SKG     ENDISC
17266  0 01 17270          BRU     ..2
17267  0 43 00460          BRM     ERROR           HIGH ARM TOO LARGE
17270  0 20 33343          NOP     F19M1
17271  0 55 15465          ADD     BIT23
17272  0 73 23346          SKG     STDISC
17273  0 43 00460          BRM     ERROR           LOW ARM > HIGH ARM
17274  0 20 33350          NOP     F19M2
17275  0 76 23346          LDA     STDISC          SET STARTING ARM
17276  0 35 23336          STA     VAR2
17277  0 43 00430   F19I1  BRM     OBJECT          CLEAR CHART
17300  0 71 33676          LDX     ..562D
17301  0 76 33677          LDA     .60606060
17302  2 35 35062          STA     TABLE.562D,2
17303  0 41 17302          BRX     ..1
17304  0 76 33700          LDA     .140            GENERATE NEW CHART
17305  0 35 15506          STA     COUNT
```

```
17306  0 71 33577          LDX     =TABLE
17307  0 76 33701          LDA     =52020500
17310  0 75 33702          LDB     =52606054
17311  2 35 00000  F1912   STA     0,2          GENERATE VERTICLE AXIS
17312  2 77 00021          EAX     17D,2
17313  2 36 00000          STB     0,2
17314  2 77 00021          EAX     17D,2
17315  0 54 15457          SUB     BIT17
17316  0 72 33703          SKA     =6000
17317  0 54 33704          SUB     =6600
17320  0 60 15506          SKR     COUNT
17321  0 01 17322          BRU     **1
17322  0 53 15506          SKN     COUNT        FINISHED AXIS
17323  0 01 17311          BRU     F1912        NO
17324  2 35 00000          STA     0,2
17325  0 76 33705          LDA     =15D
17326  0 35 15506          STA     COUNT
17327  0 76 33706          LDA     =54545454    GENERATE HORIZONTAL AXIS
17330  2 77 00001  F1913   EAX     1,2
17331  2 35 00000          STA     0,2
17332  0 60 15506          SKR     COUNT
17333  0 01 17334          BRU     **1
17334  0 53 15506          SKN     COUNT        FINISHED AXIS
17335  0 01 17330          BRU     F1913
17336  2 77 00001          EAX     1,2          YES
17337  0 76 33707          LDA     =52606060    GENERATE HORIZONTAL SCALE
17340  2 35 00000          STA     0,2
17341  0 76 33652          LDA     =7
17342  0 35 15506          STA     COUNT
17343  0 76 33710          LDA     =00606060
17344  0 75 33677          LDB     =60606060
17345  2 77 00001          EAX     1,2
17346  2 35 00000  F19112  STA     0,2
17347  2 36 00001          STB     1,2
17350  0 55 15443          ADD     BIT5
17351  2 77 00002          EAX     2,2
```



```
17352  0 60 15506          SKR     COUNT
17353  0 01 17354          BRU     **1
17354  0 53 15506          SKN     COUNT
17355  0 01 17346          BRU     F19112
17356  2 77 37777          EAX     -1,2
17357  0 76 33707          LDA     =52606060
17360  2 35 00000          STA     0,2
17361  0 76 33652          LDA     =7
17362  0 35 15506          STA     COUNT
17363  2 77 00001          EAX     1,2
17364  0 76 33711          LDA     =00010203
17365  0 75 33712          LDB     =04050607
17366  2 35 00000  F1914   STA     0,2
17367  2 36 00001          STB     1,2
17370  2 77 00002          EAX     2,2
17371  0 60 15506          SKR     COUNT
17372  0 01 17373          BRU     **1
17373  0 53 15506          SKN     COUNT
17374  0 01 17366          BRU     F1914
17375  0 76 33713          LDA     =37373737    TERMINATING CHARACTER
17376  2 35 00000          STA     0,2
17377  0 40 10026          SKS     10026        DISC FILE READY TEST
17400  0 01 17377          BRU     **1          NO
17401  0 76 23336          LDA     VAR2
17402  0 75 33550          LDB     =0
17403  0 67 00015          LSH     13D          FORM POT WORD
17404  0 35 23352          STA     POTWRD
17405  0 71 15447          LDX     BIT9
17406  0 43 23342          BRM     DISCCK       USE THIS DISC
17407  0 01 17560          BRU     F19113       NO
17410  0 02 10026          EOM     10026        ALERT DISC FILE
17411  0 13 23352          POT     POTWRD
17412  0 40 12026          SKS     12026        TRACK VERIFIED TEST
17413  0 01 17415          BRU     **2
17414  0 01 17422          BRU     **6
17415  0 67 20060          LCY     48D
```

```
17416  0 67 20060          LCY     48D
17417  0 67 20060          LCY     48D
17420  0 41 17412          BRX     F19I5
17421  0 01 17636          BRU     F19I14          TIMEOUT ERROR
17422  0 76 23352          LDA     P0TWRD
17423  0 55 33656          ADD     .17600
17424  0 35 23337          STA     VAR3
17425  0 76 23352  F19I6    LDA     P0TWRD
17426  0 55 15456          ADD     BIT16           UPDATE P0T W0RD BY 0NE INCREMENT
17427  0 73 23337          SKG     VAR3            FINISHED F0REWARD INCREMENTS
17430  0 01 17432          BRU     *+2             N0
17431  0 01 17472          BRU     F19I7A
17432  0 35 23352          STA     P0TWRD
17433  0 02 10226          E0M     10226           CLEAR FILE
17434  0 40 10026          SKS     10026           DISC FILE READY TEST
17435  0 01 17434          BRU     *-1             N0
17436  0 02 10026          E0M     10026           ALERT DISC FILE
17437  0 13 23352          P0T     P0TWRD
17440  0 76 33650          LDA     .0
17441  0 67 20060  F19I7    LCY     48D
17442  0 71 33714          LDX     .-45D
17443  0 67 20060          LCY     48D
17444  0 41 17443          BRX     *-1
17445  0 55 15465          ADD     BIT23
17446  0 73 33715          SKG     .1000D
17447  0 01 17451          BRU     *+2
17450  0 01 17636          BRU     F19I14
17451  0 40 12026          SKS     12026           TRACK VERIFIED TEST
17452  0 01 17441          BRU     F19I7           N0
17453  0 55 33563          ADD     .5              R0UND 0FF T0 NEAREST 5MILLISEC
17454  0 66 00001          RSH     1               DIVIDE BY 2 . A . NUM 0F 1MS C0UNTS
17455  0 75 33550          LDB     .0
17456  0 36 15506          STB     C0UNT
17457  0 54 33563          SUB     .5              SIMULATE DIVIDE BY 5
17460  0 72 15436          SKA     BIT0
17461  0 01 17464          BRU     *+3
```



```
17462  0 61 15506          MIN     C0UNT
17463  0 01 17467          BRU     *+4
17464  0 76 15506          LDA     C0UNT           A . NUM/5
17465  0 75 33550          LDB     .0
17466  0 43 17567          BRM     F19I11          ENTER TIME INT0 CHART
17467  0 40 20040          SKS     20040           BREAKP0INT 4 TEST
17470  0 43 23065          BRM     TERM            G0 T0 C0NTR0L
17471  0 01 17425          BRU     F19I6
17472  0 76 23336  F19I7A  LDA     VAR2
17473  0 67 00015          LSH     13D
17474  0 54 15456          SUB     BIT16
17475  0 35 23337          STA     VAR3
17476  0 75 33651  F19I8    LDB     .-1
17477  0 76 23352          LDA     P0TWRD
17500  0 54 15456          SUB     BIT16
17501  0 70 23337          SKM     VAR3            FINISHED
17502  0 01 17504          BRU     *+2             N0
17503  0 01 17544          BRU     F19I10          FINISHED
17504  0 35 23352          STA     P0TWRD
17505  0 02 10226          E0M     10226           CLEAR FILE
17506  0 40 10026          SKS     10026           DISC FILE READY TEST
17507  0 01 17506          BRU     *-1             N0
17510  0 02 10026          E0M     10026           ALERT DISC FILE
17511  0 13 23352          P0T     P0TWRD
17512  0 76 33650          LDA     .0
17513  0 67 20060  F19I9    LCY     48D
17514  0 71 33714          LDX     .-45D
17515  0 67 20060          LCY     48D
17516  0 41 17515          BRX     *-1
17517  0 55 15465          ADD     BIT23
17520  0 73 33715          SKG     .1000D
17521  0 01 17523          BRU     *+2
17522  0 01 17636          BRU     F19I14          TIMEOUT ERR0R
17523  0 40 12026          SKS     12026           TRACK VERIFIED TEST
17524  0 01 17513          BRU     F19I9           N0
17525  0 55 33563          ADD     .5              R0UND 0FF T0 NEAREST 5MILLISEC
```

```
17526  0 66 00001          RSH    1              DIVIDE BY 2 . A = NUM OF 1MS COUNTS
17527  0 75 33550          LDB    #0             SIMULATE DIVIDE BY 5
17530  0 36 15506          STB    COUNT
17531  0 54 33563          SUB    #5
17532  0 72 15436          SKA    BITC           DONE
17533  0 01 17536          BRU    **3            YES
17534  0 61 15506          MIN    COUNT
17535  0 01 17531          BRU    **4
17536  0 76 15506          LDA    COUNT          A = NUM/5
17537  0 75 33551          LDB    #*1
17540  0 43 17567          BRM    F19I11
17541  0 40 20040          SKS    20040          BREAKPOINT 4 TEST
17542  0 43 23065          BRM    TERM           GO TO CONTROL
17543  0 01 17476          BRU    F1918
17544  0 75 33550 F19I10   LDB    #0             PUT ARM NUMBER INTO BCD
17545  0 76 23336          LDA    VAR2
17546  0 67 00003          LSH    3
17547  0 14 33632          ETR    #700
17550  0 16 23336          MRG    VAR2
17551  0 14 33674          ETR    #707
17552  0 67 00014          LSH    12D
17553  0 16 33675          MRG    #3737
17554  0 35 33364          STA    F19M4
17555  0 43 00454          BRM    REPORT         OUTPUT MESSAGE
17556  4 20 33355          NOP    F19M3,4
17557  0 20 34000          NOP    TABLE
17560  0 43 00434 F19I13   BRM    END
17561  0 61 23336          MIN    VAR2           INCREMENT ARM NUMBER
17562  0 76 23336          LDA    VAR2
17563  0 73 23347          SKG    ENDISC         FINISHED
17564  0 01 17277          BRU    F19I1          NO
17565  0 02 10226          EOM    10226          CLEAR FILE
17566  0 01 17255 END19    BRU    F19I15
17567  0 00 00000 F19I11   PZE    0              ENTER TIMES INTO CHART
17570  0 73 33716          SKG    #50D           IS TIME > 250MS
17571  0 01 17573          BRU    **2
```



```
17572  0 76 33716          LDA    #50D           YES . ENTER 250MS INTO CHART
17573  0 73 33717          SKG    #20D           IS TIME < 100MS
17574  0 76 33717          LDA    #20D           YES . ENTER 100MS INTO CHART
17575  0 35 23331          STA    TEMPA
17576  0 76 33716          LDA    #50D
17577  0 54 23331          SUB    TEMPA
17600  0 35 23331          STA    TEMPA
17601  0 36 23332          STB    TEMPB
17602  0 75 33550          LDB    #0
17603  0 67 00004          LSH    4
17604  0 55 23331          ADD    TEMPA
17605  0 35 23331          STA    TEMPA
17606  0 76 23352          LDA    POTWRD
17607  0 14 33656          ETR    #17600
17610  0 66 00011          RSH    9D
17611  0 55 23331          ADD    TEMPA
17612  0 55 33677          ADD    #TABLE
17613  0 55 15465          ADD    BIT23
17614  0 35 23333          STA    TEMPC
17615  0 76 33550          LDA    #0
17616  0 67 00002          LSH    2
17617  0 35 23331          STA    TEMPA
17620  0 71 23331          LDX    TEMPA
17621  0 76*23333          LDA*   TEMPC
17622  2 72 17646          SKA    MASK,2         WORD ALTERED YET
17623  0 01 17630          BRU    **5            NO
17624  2 76 17642          LDA    DELTA,2
17625  0 17*23333          EOR*   TEMPC
17626  0 35*23333          STA*   TEMPC
17627  0 51 17567          BRR    F19I11
17630  2 76 17652          LDA    MINUS,2
17631  0 53 23332          SKN    TEMPB          IS DIRECTION REVERSE
17632  2 76 17646          LDA    MASK,2         NO
17633  0 17*23333          EOR*   TEMPC
17634  0 35*23333          STA*   TEMPC
17635  0 51 17567          BRR    F19I11
```

```
17636  0 43 00460  F19114 BRM     ERR0R
17637  0 20 33365         N0P     F19M5
17640  0 02 10226         EBM     10226          CLEAR FILE
17641  0 01 17560         BRU     F19113
17642    77000000  DELTA  DATA    77000000,770000,7700,77
17643    00770000
17644    00007700
17645    00000077
17646    40000000  MASK   DATA    487,485,483,481
17647    00400000
17650    00004000
17651    00000040
17652    20000000  MINUS  DATA    287,285,283,281
17653    00200000
17654    00002000
17655    00000020
```



```
                   *
                   *      FUNCTION PARAMETER TABLE
                   *
17656  0 20 17664  FPT19  N0P     FIM19
17657  0 20 17677         N0P     FAM19
17660  0 20 17131         N0P     FVM18
17661  0 02 23346         TW0     STDISC
17662  0 00 20136         PZE     FUNC20
17663    00000020         DATA    20
                   *
                   *      FUNCTION MESSAGES
                   *
17664    52261201  FIM19  BCD     ' F 19 = SINGLE INCREMENT VS. TIME PLOTTER!'
17665    11124012
17666    62314527
17667    43251231
17670    45235125
17671    44254563
17672    12656233
17673    12633144
17674    25124743
17675    46636325
17676    51371212
17677    52623145  FAM19  BCD     ' SINGLE INCREMENT VS. TIME PLOTTER'
17700    27432512
17701    31452351
17702    25442545
17703    63126562
17704    33126331
17705    44251247
17706    43466363
17707    25511212
17710    52633031          BCD     ' THIS ROUTINE MEASURES AND CHARTS THE AMOUNT OF TIME'
17711    62125146
17712    64633145
17713    25124425
```

```
17714    21626451
17715    25621221
17716    45241223
17717    30215163
17720    62126330
17721    25122144
17722    46644563
17723    12462612
17724    63314425
17725    52314565        BCD     ' INVOLVED IN MOVING AN ARM IN ALL COMBINATIONS OF ONE'
17726    46436525
17727    24123145
17730    12444665
17731    31452712
17732    21451221
17733    51441231
17734    45122143
17735    43122346
17736    44223145
17737    21633146
17740    45621246
17741    26124445
17742    25121212
17743    52314523        BCD     ' INCREMENT, THE HORIZONTAL SCALE IS FINAL POSITION,THE'
17744    51254425
17745    45633312
17746    63302512
17747    30465131
17750    71464563
17751    21431262
17752    23214325
17753    12316212
17754    26314521
17755    43124746
17756    62316331
17757    46457363
```



```
17760    30251212
17761    52652551        BCD     ' VERTICAL SCALE IS TIME IN MILLISEC, FOREWARD DIRECTION'
17762    63312321
17763    43126223
17764    21432512
17765    31621263
17766    31442512
17767    31451244
17770    31434331
17771    62252373
17772    12264651
17773    25662151
17774    24122431
17775    51252363
17776    31464512
17777    52633144        BCD     ' TIMES ARE INDICATED BY A PLUS, IN THE REVERSE DIRECTION'
20000    25621221
20001    51251231
20002    45243123
20003    21632524
20004    12227212
20005    21124743
20006    64627312
20007    31451263
20010    30251251
20011    25652551
20012    62251224
20013    31512523
20014    63314645
20015    52227212        BCD     ' BY A MINUS, AND IF THE FOREWARD AND REVERSE DIRECTION'
20016    21124431
20017    45646273
20020    12214524
20021    12312612
20022    63302512
20023    26465125
```

```
20024    66215124
20025    12214524
20026    12512565
20027    25516225
20030    12243151
20031    25236331
20032    46451212
20033    52633144          BCD     ' TIMES ARE THE SAME, BY A DELTA, THE CHART WILL BE PRINTED'
20034    25621221
20035    51251263
20036    30251262
20037    21442573
20040    12227212
20041    21122425
20042    43632133
20043    12633225
20044    12233221
20045    51631266
20046    31434312
20047    22251247
20050    51314563
20051    25241212
20052    52464512          BCD     ' ON THE ERROR DEVISE, AND WHEN THE PRINTER IS USED, TIMING'
20053    63332512
20054    25515146
20055    51122425
20056    65316225
20057    73122145
20060    24126630
20061    25451263
20062    30251247
20063    51314563
20064    25511231
20065    62126462
20066    25247312
20067    63314431
```



```
20070    45271212
20071    52316212          BCD     ' IS APPROXIMATELY ONE MIN/ARM. FUNCTION VARIABLES ARE'
20072    21474751
20073    46673144
20074    21632543
20075    70124445
20076    25124431
20077    45612151
20100    44331226
20101    64452363
20102    31464512
20103    65215131
20104    21224725
20105    62122151
20106    25121212
20107    52626321          BCD     ' START AND END, WHICH ARE STARTING AND ENDING DISCS'
20110    51631221
20111    45241225
20112    45247312
20113    66303123
20114    30122151
20115    25126263
20116    21516331
20117    45271221
20120    45241225
20121    45243145
20122    27122431
20123    62236212
20124    52512562          BCD     ' RESPECTIVELY (0<NUMBER<37 . OCTAL).''
20125    47252363
20126    31652543
20127    70127400
20130    36456444
20131    22255136
20132    03071240
20133    12462363
```

```
20134    21433433
20135    37121212
```



```
          00000055  UTIME   EQU     45D
          00000012  LTIME   EQU     10D
          00000046  LINES   EQU     UTIME+LTIME+3
          00001206  WORDS   EQU     LINES*17D
          00034000  TABLE   EQU     34000
          00035207  ETBLE   EQU     TABLE+WORDS+1
          00000004  TENS    EQU     UTIME/10D
          00000005  UNITS   EQU     UTIME-TENS*10D
          52040800  HILBL   EQU     UNITS*100B+TENS*10000B+520000008
```

```
                    *
                    *
                    *       FUNCTION 20 - MULTIPLE INCREMENT VS. TIME PLOTTER
                    *
                    *
20136  0 76 00404   FUNC20  LDA     DSCSIZ
20137  0 66 00006           RSH     6
20140  0 14 33673           ETR     =70
20141  0 54 15465           SUB     BIT23
20142  0 35 23347           STA     ENDISC
20143  0 35 23335           STA     VAR1
20144  0 43 00424   F20L1   BRM     FUNCTN
20145  0 20 20576           NOP     FPT20
20146  0 43 00454           BRM     REPORT          OUTPUT FUNCTION ID
20147  0 20 20610           NOP     FIM20
20150  0 43 23065           BRM     TERM            GO TO CONTROL
20151  0 43 00440           BRM     RETURN
20152  0 20 23371           NOP     ENTER
20153  0 76 23347           LDA     ENDISC
20154  0 73 23335           SKG     VAR1
20155  0 01 20157           BRU     **2
20156  0 43 00460           BRM     ERROR           HIGH ARM TOO LARGE
20157  0 20 33372           NOP     F20M1
20160  0 55 15465           ADD     BIT23
20161  0 73 23344           SKG     STDISC
20162  0 43 00460           BRM     ERROR           LOW ARM > HIGH ARM
20163  0 20 33400           NOP     F20M2
20164  0 76 23346           LDA     STDISC          ARM = FIRST ARM
20165  0 35 23336           STA     VAR2
20166  0 43 00430   STRTIT  BRM     OBJECT
20167  0 43 20410           BRM     CLCHT           CLEAR CHART
20170  0 43 20445           BRM     CHART           MAKE NEW CHART
20171  0 43 20204           BRM     PLOT            TIME MOVEMENTS, ENTER TIMES INTO CHART
20172  0 43 20563           BRM     FORT            FORM TITLE
20173  0 43 00454           BRM     REPORT          OUTPUT CHART
20174  4 20 33424           NOP     TITLE,4
```



```
20175  0 20 34000           NOP     TABLE
20176  0 43 00434   FNDIT   BRM     END
20177  0 61 23336           MIN     VAR2
20200  0 76 23336           LDA     VAR2
20201  0 73 23347           SKG     ENDISC
20202  0 01 20166           BRU     STRTIT
20203  0 01 20144           BRU     F20L1
```

```
DISCW  TAP=3.0                          PAGE 249

20204  0 00 00000  PLOT   PZE
20205  0 75 33550         LDB     =0           POTWRD = CURRENT ARM TO POS 0
20206  0 76 23336         LDA     VAR2
20207  0 67 00015         LSH     13D
20210  0 43 23342         BRM     DISCCK       USE THIS DISC
20211  0 01 20176         BRU     ENDIT        NO
20212  0 40 10026         SKS     10026        DISC FILE READY TEST
20213  0 01 20212         BRU     **1
20214  0 02 10026         EOM     10026        ALERT DISC FILE
20215  0 13 23352         POT     POTWRD
20216  0 35 23337         STA     VAR3         VAR3 = POT WORD FOR POS 0
20217  0 76 33550         LDA     =0
20220  0 35 23340         STA     VAR4
20221  0 76 15465         LDA     BIT23
20222  0 35 23341         STA     VAR5
20223  0 76 33550  PLOT1  LDA     =0
20224  0 35 23342         STA     VAR6
20225  0 35 23340         STA     VAR4
20226  0 76 33551         LDA     **1
20227  0 35 23343         STA     VAR7         PRESET VAR7 AND VAR8
20230  0 76 33621         LDA     =500D
20231  0 35 23344         STA     VAR8
20232  0 40 10026         SKS     10026        DISC FILE READY TEST
20233  0 01 20232         BRU     **1
20234  0 75 33550         LDB     =0
20235  0 76 23342         LDA     VAR6
20236  0 67 00007         LSH     7
20237  0 16 23337         MRG     VAR3
20240  0 35 23352         STA     POTWRD
20241  0 02 10026         EOM     10026        ALERT DISC FILE
20242  0 13 23352         POT     POTWRD
20243  0 76 23340  PLOT2  LDA     VAR4
20244  0 55 23341         ADD     VAR5
20245  0 73 33600         SKG     =77          ROOM TO MOVE ANOTHER INCREMENT
20246  0 01 20250         BRU     **2          YES
20247  0 01 20330         BRU     PLOT3
```

```
DISCW  TAP=3.0                          PAGE 250

20250  0 35 23340         STA     VAR4
20251  0 75 33550         LDB     =0
20252  0 67 00007         LSH     7
20253  0 16 23337         MRG     VAR3
20254  0 35 23352         STA     POTWRD
20255  0 71 15447         LDX     BIT9
20256  0 40 12026         SKS     12026        TRACK VERIFIED TEST
20257  0 01 20261         BRU     *+2
20260  0 01 20366         BRU     PLOT2B
20261  0 67 20360         LCY     48D
20262  0 67 20360         LCY     48D
20263  0 67 20360         LCY     48D
20264  0 41 20254         BRX     PLOT2A
20265  0 01 20355         BRU     VERERR
20266  0 02 10226         EOM     10226        CLEAR FILE
20267  0 40 10026         SKS     10026        DISC FILE READY TEST
20270  0 01 20267         BRU     **1
20271  0 02 10026         EOM     10026        ALERT DISC FILE
20272  0 13 23352         POT     POTWRD
20273  0 76 33550         LDA     =0
20274  0 67 20360  TMIT   LCY     48D          TIME MOVEMENT
20275  0 71 33714         LDX     **45D        TIMING = 500 US. PER LOOP
20276  0 67 20360         LCY     48D
20277  0 41 20276         BRX     **1
20300  0 55 15465         ADD     BIT23
20301  0 73 33715         SKG     =10000D      HAS 500 MS ELAPSED YET
20302  0 01 20304         BRU     **2          NO
20303  0 01 20355         BRU     VERERR
20304  0 40 12026         SKS     12026        TRACK VERIFIED TEST
20305  0 01 20274         BRU     TMIT
20306  0 55 33720         ADD     =100         ROUND OFF TO NEAREST 10 MS.
20307  0 66 00002         RSH     2            DIVIDE BY 2
20310  0 75 33551         LDB     **1          INITIALIZE COUNTER
20311  0 36 23330         STB     TEMP
20312  0 61 23330  TMIT1  MIN     TEMP         SIMULATE DIVIDE BY 2
20313  0 54 33563         SUB     =5
```

```
20314  0 72 15436          SKA     BIT0
20315  0 01 20317          BRU     *+2
20316  0 01 20312          BRU     TMIT1
20317  0 76 23330          LDA     TEMP            GET QUOTIENT
20320  0 73 23343          SKG     VAR7            CHANGE VAR7 OR VAR8 IF APPROPRIATE
20321  0 01 20323          BRU     *+2
20322  0 35 23343          STA     VAR7
20323  0 73 23344          SKG     VAR8
20324  0 35 23344          STA     VAR8
20325  0 40 20040          SKS     20040           BREAKPOINT 4 TEST
20326  0 43 23065          BRM     TERM            GO TO CONTROL
20327  0 01 20243          BRU     PLOT2
20330  0 61 23342  PLOT3   MIN     VAR6
20331  0 76 23342          LDA     VAR6
20332  0 75 33551          LDB     =77777777
20333  0 70 23341          SKM     VAR5            LAST PASS THIS INCREMENT VALUE
20334  0 01 20336          BRU     *+2             NO
20335  0 01 20345          BRU     PLOT4
20336  0 55 23341          ADD     VAR5
20337  0 73 33600          SKG     =77
20340  0 01 20342          BRU     *+2
20341  0 01 20345          BRU     PLOT4
20342  0 76 23342          LDA     VAR6
20343  0 35 23340          STA     VAR4
20344  0 01 20232          BRU     PLOT1A
20345  0 43 20373  PLOT4   BRM     ENTIM           ENTER VAR7 AND VAR8 INTO CHART
20346  0 61 23341          MIN     VAR5
20347  0 76 23341          LDA     VAR5
20350  0 73 33600          SKG     =77             LAST INCREMENT VALUE
20351  0 01 20223          BRU     PLOT1           NO
20352  0 40 10026          SKS     10026           DISC FILE READY TEST
20353  0 01 20352          BRU     *-1
20354  0 76 23337          LDA     VAR3
20355  0 35 23352          STA     POTWRD
20356  0 02 10026          EOM     10026           ALERT DISC FILE
20357  0 13 23352          POT     POTWRD
```



```
20360  0 71 33721          LDX     =40000
20361  0 40 12026          SKS     12026           TRACK VERIFIED TEST
20362  0 01 20364          BRU     *+2
20363  0 01 20371          BRU     PLOT4B
20364  0 67 20060          LCY     48D
20365  0 67 20060          LCY     48D
20366  0 67 20060          LCY     48D
20367  0 41 20361          BRX     PLOT4A
20370  0 01 20555          BRU     VERERR
20371  0 02 10226          EOM     10226           CLEAR FILE
20372  0 51 20204          BRR     PLOT
```

```
20373  0 00 00000  ENTIM  PZE
20374  0 76 23343         LDA     VAR7
20375  0 73 33722         SKG     #UTIME          VAR7 > 450MS
20376  0 01 20400         BRU     **2
20377  0 76 33722         LDA     #UTIME          YES = ENTER 450MS INTO CHART
20400  0 43 20416         BRM     PUT
20401  0 76 23344         LDA     VAR8
20402  0 73 33720         SKG     #LTIME          VAR8 < 100MS
20403  0 76 33720         LDA     #LTIME          YES
20404  0 75 33551         LDB     #=1
20405  0 70 23343         SKM     VAR7            VAR7 = VAR8
20406  0 43 20416         BRM     PUT             NO = ENTER VAR8 INTO CHART
20407  0 51 20373         BRR     ENTIM
                    *
                    *
                    *
20410  0 00 00000  CLCHT  PZE     0               CLEAR CHART
20411  0 71 33723         LDX     #=WORDS=1
20412  0 76 33677         LDA     #60606060
20413  2 35 35207         STA     ETBLE,2
20414  0 41 20413         BRX     **1
20415  0 51 20410         BRR     CLCHT
```



```
20416  0 00 00000  PUT    PZE     0               A = NO OF 5MS COUNTS
20417  0 35 23331         STA     TEMPA
20420  0 76 33722         LDA     #UTIME
20421  0 54 23331         SUB     TEMPA
20422  0 35 23331         STA     TEMPA           TEMPA = NO OF LINES FROM TOP
20423  0 75 33550         LDB     #0
20424  0 67 00004         LSH     4
20425  0 55 23331         ADD     TEMPA
20426  0 35 23331         STA     TEMPA           TEMPA = FIRST WORD OF CORRECT LINE
                    *                          = EQUALS LINES * 17D
20427  0 76 23341         LDA     VAR5
20430  0 66 00002         RSH     2               A = HORIZONTAL DEFLECTION
20431  0 55 23331         ADD     TEMPA           ADD VERTICAL COMPONENT
20432  0 55 33677         ADD     #TABLE          ADD ADDRESS BIAS
20433  0 55 15465         ADD     BIT23           ADD 1 WORD TO CLEAR Y=AXIS WORD
20434  0 35 23345         STA     VAR9
20435  0 76 33550         LDA     #0
20436  0 67 00002         LSH     2               A = CHARACTER IN WORD TO BE CHANGED
20437  0 35 23331         STA     TEMPA
20440  0 71 23331         LDX     TEMPA
20441  2 76 20604         LDA     WORD,2
20442  0 17=23345         EBR=    VAR9            ALTER WORD
20443  0 35=23345         STA=    VAR9            STORE WORD IN TABLE
20444  0 51 20416         BRR     PUT
```

```
20445  0 00 00000  CHART  PZE
20446  0 71 33550         LDX    =0
20447  0 75 33724         LDB    =1700
20450  0 76 33725         LDA    =LINES=4
20451  0 35 15506         STA    COUNT
20452  0 76 33726         LDA    =HILBL
20453  0 35 23331  CHART1 STA    TEMPA          MAKE UP VERTICAL AXIS
20454  0 76 33702         LDA    =052606054
20455  2 35 34000         STA    TABLE,2
20456  0 76 23331         LDA    TEMPA
20457  0 70 33550         SKM    =0
20460  0 01 20462         BRU    **2
20461  2 35 34000         STA    TABLE,2
20462  0 70 33727         SKM    =500
20463  0 01 20465         BRU    **2
20464  2 35 34000         STA    TABLE,2
20465  0 54 15457         SUB    BIT17
20466  0 72 33703         SKA    =6000
20467  0 54 33704         SUB    =6600
20470  2 77 00021         EAX    17D,2
20471  0 60 15506         SKR    COUNT
20472  0 01 20473         BRU    **1
20473  0 53 15506         SKN    COUNT
20474  0 01 20453         BRU    CHART1
20475  0 76 33730         LDA    =52010000      MAKE UP HORIZONTAL AXIS
20476  2 35 34000         STA    TABLE,2
20477  0 76 33552         LDA    =7
20500  0 35 15506         STA    COUNT
20501  2 77 00001  CHART2 EAX    1,2
20502  0 76 33706         LDA    =54545454
20503  2 35 34000         STA    TABLE,2
20504  2 77 00001         EAX    1,2
20505  2 35 34000         STA    TABLE,2
20506  0 60 15506         SKR    COUNT
20507  0 01 20510         BRU    **1
20510  0 53 15506         SKN    COUNT
```



```
20511  0 01 20501         BRU    CHART2
20512  2 77 00001         EAX    1,2
20513  0 76 33707         LDA    =52606060      MAKE UP HORIZONTAL SCALE
20514  2 35 34000         STA    TABLE,2
20515  0 76 33552         LDA    =7
20516  0 35 15506         STA    COUNT
20517  0 76 33710         LDA    =00606060
20520  0 75 33677         LDB    =60606060
20521  2 77 00001  CHART3 EAX    1,2
20522  2 35 34000         STA    TABLE,2
20523  2 77 00001         EAX    1,2
20524  2 36 34000         STB    TABLE,2
20525  0 55 15443         ADD    BIT5
20526  0 60 15506         SKR    COUNT
20527  0 01 20530         BRU    **1
20530  0 53 15506         SKN    COUNT
20531  0 01 20521         BRU    CHART3
20532  2 77 00001         EAX    1,2
20533  0 76 33707         LDA    =52606060
20534  2 35 34000         STA    TABLE,2
20535  0 76 33552         LDA    =7
20536  0 35 15506         STA    COUNT
20537  2 77 00001  CHART4 EAX    1,2
20540  0 76 33711         LDA    =10203
20541  2 35 34000         STA    TABLE,2
20542  2 77 00001         EAX    1,2
20543  0 55 33731         ADD    =04040404
20544  2 35 34000         STA    TABLE,2
20545  0 60 15506         SKR    COUNT
20546  0 01 20547         BRU    **1
20547  0 53 15506         SKN    COUNT
20550  0 01 20537         BRU    CHART4
20551  2 77 00001         EAX    1,2
20552  0 76 33732         LDA    =37121212      ADD TERMINAL CHARACTER
20553  2 35 34000         STA    TABLE,2
20554  0 51 20445         BRR    CHART
```

```
20555  0 43 20563  VERERR BRM     FORT
20556  0 43 00460         BRM     ERROR
20557  4 20 33405         NOP     F20M3,4
20560  0 20 33431         NOP     TITLE1
20561  0 02 10226         EOM     10226           CLEAR FILE
20562  0 01 20176         BRU     ENDIT
20563  0 00 00000  FORT    PZE     0               PUT ARM NUMBER INTO BCD
20564  0 75 33550         LDB     *0
20565  0 76 23336         LDA     VAR2
20566  0 67 00003         LSH     3
20567  0 14 33432         ETR     *700
20570  0 16 23336         MRG     VAR2
20571  0 14 33674         ETR     *707
20572  0 67 00014         LSH     12D
20573  0 16 33675         MRG     *3737
20574  0 35 33431         STA     TITLE1
20575  0 51 20563         BRR     FART
```



```
                   *
                   *       FUNCTION PARAMETER TABLES
                   *
20576  0 20 20610  FPT20   NOP     FIM20           FUNCTION IDENTIFIER MESSAGE
20577  0 20 20622         NOP     FAM20           FUNCTION ABSTRACT MESSAGE
20600  0 20 17131         NOP     FVM18           FUNCTION VARIABLES MESSAGE
20601  0 02 23346         TWO     STDISC          FUNCTION VARIABLES POINTER
20602  0 00 21122         PZE     FUNC21          POINTER TO NEXT FUNCTION
20603    00000010         DATA    10              FUNCTION IDENTIFIER BIT (BIT 20)
                   *
20604    34000000  WORD    DATA    3486,3484,3482,34
20605    00340000
20606    00003400
20607    00000034
                   *
                   *       FUNCTION MESSAGES
                   *
20610    52261202  FIM20   BCD     ' F 20 - ARM MOVEMENT VS. TIME PLOTTER'
20611    00124212
20612    21514412
20613    44466525
20614    44254563
20615    12656233
20616    12633144
20617    25124743
20620    46636325
20621    51371212
20622    52322151  FAM20   BCD     '  ARM MOVEMENT VS. TIME PLOTTER. '
20623    44124446
20624    65254425
20625    45631265
20626    62331263
20627    31442512
20630    47434463
20631    63255133
20632    52121212
```

```
20633    52633031          BCD     ' THIS ROUTINE TIMES ARM MOVEMENTS IN MILLISEC AND PLOTS'
20634    62125146
20635    64633145
20636    25126331
20637    44256212
20640    21514412
20641    44466525
20642    44254563
20643    62123145
20644    12443143
20645    43316225
20646    23122145
20647    24124743
20650    46636212
20651    52633025          BCD     ' THE HIGH AND LOW TIMES VERSES INCREMENTS MOVED ON A'
20652    12303127
20653    30122145
20654    24124346
20655    66126331
20656    44256212
20657    65255162
20660    25621231
20661    45235125
20662    44254563
20663    62124446
20664    65252412
20665    46451221
20666    52233021          BCD     ' CHART. THE HORIZONTAL SCALE OF THE CHART IS NUMBER OF'
20667    51633312
20670    63302512
20671    30465131
20672    71464563
20673    21431262
20674    23214325
20675    12462612
20676    63302512
```



```
20677    23302151
20700    63123162
20701    12456444
20702    22255112
20703    46261212
20704    52314523          BCD     ' INCREMENTS MOVED, AND THE VERTICLE SCALE IS MILLISEC. '
20705    51254425
20706    45636212
20707    44466525
20710    24731221
20711    45241263
20712    30251265
20713    25516331
20714    23432512
20715    62232143
20716    25123162
20717    12443143
20720    43316225
20721    23335212
20722    52312612          BCD     ' IF A SEEK OR SEARCH TIME ERROR OCCURES (500 MILLISEC'
20723    21126225
20724    25421246
20725    51126225
20726    21512330
20727    12633144
20730    25122551
20731    51465112
20732    46232364
20733    51256212
20734    74050000
20735    12443143
20736    43316225
20737    23121212
20740    52316212          BCD     ' IS ALLOWED), THE OPERATION IS ABORTED AND AN ERROR MSG'
20741    21434346
20742    66252434
```

```
20743    73126330
20744    25124647
20745    25512163
20746    31464512
20747    31621221
20750    22445163
20751    25241221
20752    45241221
20753    45122551
20754    51465112
20755    44622712
20756    52316212          BCD     ' IS PRINTED. '
20757    47513145
20760    63252437
20761    52121212
20762    52633225          BCD     ' THERE ARE TWO FUNCTION VARIABLES, START AND END.'
20763    51251221
20764    51251263
20765    66461226
20766    64452363
20767    31464512
20770    65215131
20771    21224325
20772    62731262
20773    63215163
20774    12214524
20775    12254524
20776    33121212
20777    52626321          BCD     ' START IS PRESET TO 000 AND END IS PRESET BY THE'
21000    51631231
21001    62124751
21002    25622563
21003    12634412
21004    00000012
21005    21452412
21006    25452412
```



```
21007    31621247
21010    51256225
21011    63122270
21012    12633025
21013    52627062          BCD     ' SYSTEM VARIABLE =DSCSIZ=. THESE VARIABLES MAY BE SET'
21014    63254412
21015    65215131
21016    21224325
21017    12402462
21020    23623171
21021    40331263
21022    30256225
21023    12652151
21024    31212243
21025    25621244
21026    21701222
21027    25126225
21030    63121212
21031    52634412          BCD     ' TO SELECT ANY COMBINATION OF CONSECUTIVE ARMS, THE'
21032    62254325
21033    23631221
21034    45701223
21035    46442231
21036    45216331
21037    46451246
21040    26122344
21041    45622523
21042    64633165
21043    25122151
21044    44623312
21045    63302512
21046    52512145          BCD     ' RANGE FOR START AND END IS 0<NUMBER<37. '
21047    27231226
21050    46511262
21051    63215163
21052    12214524
```

```
21053    12254524
21054    12316212
21055    00364564
21056    44222551
21057    36030733
21060    52121212
21061    52633144        BCD     ' TIMING FOR EACH DISC IS APPROXIMATELY 20 MINUTES.'
21062    31452712
21063    26465112
21064    25212330
21065    12243162
21066    23123162
21067    12214747
21070    51466731
21071    44216325
21072    43701202
21073    00124431
21074    45646325
21075    62331212
21076    52216312        BCD     ' AT THE COMPLETION OF THE LAST ARM, CONTROL WILL BE'
21077    63302512
21100    23464447
21101    43256331
21102    46451246
21103    26126330
21104    25124321
21105    62631221
21106    51447312
21107    23464563
21110    51464312
21111    66314343
21112    12222512
21113    52512563        BCD     ' RETURNED TO THE EXECUTIVE.''
21114    64514525
21115    24126346
21116    12633025
```



```
21117    12256725
21120    23646331
21121    65253337
```

```
                    *
                    *
                    *       FUNCTION 21 = WRITE HEADERS
                    *
                    *
21122  0 76 33550   FUNC21  LDA     =0              PRESET STDISC AND ENDISC
21123  0 35 23346           STA     STDISC
21124  0 76 00404           LDA     DSCSIZ
21125  0 66 00006           RSH     6
21126  0 14 33673           ETR     =70
21127  0 54 15465           SUB     BIT23
21130  0 67 00015           LSH     13D
21131  0 16 33627           MRG     =17777
21132  0 35 23347           STA     ENDISC
21133  0 43 00424   F21E2   BRM     FUNCTN          SET FUNCTION LINKS
21134  0 20 21255           NOP     FPT21
21135  0 43 00454           BRM     REPORT          OUTPUT FUNCTION ID
21136  0 20 21263           NOP     FIM21
21137  0 43 23065           BRM     TERM            GO TO CONTROL
21140  0 43 00440           BRM     RETURN          SET INTERRUPT AND TRAP LINKAGES
21141  0 20 23371           NOP     ENTER
21142  0 76 23346           LDA     STDISC
21143  0 14 33733           ETR     =777600         START AT HEAD=PAIR AND SECTOR ZERO
21144  0 35 23346           STA     STDISC
21145  0 76 23347           LDA     ENDISC
21146  0 14 33566           ETR     =777777
21147  0 35 23347           STA     ENDISC
21150  0 73 23346           SKG     STDISC          ENDISC > STDISC
21151  0 43 00460           BRM     ERROR           NO
21152  0 20 33432           NOP     F21M1
21153  0 76 23346           LDA     STDISC
21154  0 35 23332           STA     TEMPB           SET STARTING DISC ADDRESS
                    *
                    *       BUILD INTERLACE POT WORD
                    *
21155  0 76 23332   F21E0   LDA     TEMPB           CHECK FOR LAST TRACK
```



```
21156  0 16 33603           MRG     =177
21157  0 55 15465           ADD     BIT23
21160  0 73 23347           SKG     ENDISC          LAST TRACK
21161  0 01 21172           BRU     F21E1           NO
21162  0 76 23347           LDA     ENDISC          YES = PICK UP SECTOR COUNT
21163  0 54 23332           SUB     TEMPB
21164  0 55 15465           ADD     BIT23           A = SECTOR COUNT
21165  0 75 33550           LDB     =0              BUILD INTERLACE POT WORD
21166  0 67 00016           LSH     14D
21167  0 16 33577           MRG     =STADDR
21170  0 35 23331           STA     TEMPA
21171  0 01 21174           BRU     F21E1+2
21172  0 76 33611   F21E1   LDA     =187+STADDR     WC = 128D, ADDR = STADDR
21173  0 35 23331           STA     TEMPA
                    *
                    *       BUILD HEADER TABLE
                    *
21174  0 76 23332           LDA     TEMPB
21175  0 75 33550           LDB     =0
21176  0 67 00006           LSH     6
21177  0 71 33734           LDX     =-128D
21200  2 35 34200           STA     STADDR+128D,2
21201  0 55 15457           ADD     BIT17
21202  0 41 21200           BRX     *-2
                    *
                    *       DISC DRIVER
                    *
21203  0 43 00430           BRM     OBJECT
21204  0 02 20004           DIR                     DISABLE INTERRUPTS
21205  0 40 10226           SKS     10226           FILE ON LINE TEST
21206  0 43 00460           BRM     ERROR           FILE NOT ON LINE
21207  0 20 33437           NOP     F21M2
21210  0 40 10026           SKS     10026           DISC FILE READY TEST
21211  0 01 21210           BRU     *-1             FILE NOT READY
21212  0 40 14026           SKS     14026           WRITE HEADER TEST
21213  0 01 21215           BRU     *-2
```

```
21214  0 43 00460          BRM     ERR0R           HEADER SWITCH N0T UP
21215  0 20 33444          N0P     F21M3
21216  0 40 14000          SKS     14000           CHANNEL ACTIVE TEST
21217  0 01 21216          BRU     *-1             CHANNEL ACTIVE
21220  0 02 10026          E0M     10026           ALERT DISC FILE
21221  0 13 23332          P0T     TEMPB
21222  0 02*10000          E0M*    10000           ALERT CHANNEL
21223  0 02 14200          E0M     14200           EXTENDED MODE E0M
21224  0 13 23331          P0T     TEMPA
21225  0 02 02666          E0M     2666            WRITE DISC FILE + CHAIN
21226  0 40 14000          SKS     14000           CHANNEL ACTIVE TEST
21227  0 01 21226          BRU     *-1             WAIT F0R CHANNEL INACTIVE
21230  0 40 12000          SKS     12000           CHANNEL ZER0 W0RD C0UNT TEST
21231  0 43 00460          BRM     ERR0R           W0RD C0UNT N0T ZERO
21232  0 20 33453          N0P     F21M4
21233  0 40 13026          SKS     13026           DISC WRITE PR0TECT TEST
21234  0 43 00460          BRM     ERR0R           DISC WRITE PROTECTED
21235  0 20 33463          N0P     F21M5
21236  0 40 11000          SKS     11000           CHANNEL ERR0R TEST
21237  0 43 00460          BRM     ERR0R           CHANNEL ERR0R SET
21240  0 20 33471          N0P     F21M6
21241  0 40 11026          SKS     11026           DISC FILE ERR0R TEST
21242  0 43 00460          BRM     ERR0R           C0NTR0LLER ERR0R SET
21243  0 20 33475          N0P     F21M7
21244  0 43 00434          BRM     END
21245  0 76 23332          LDA     TEMPB           UPDATE DISC ADDRESS
21246  0 55 15456          ADD     BIT16
21247  0 35 23332          STA     TEMPB
21250  0 76 23347          LDA     ENDISC
21251  0 73 23332          SKG     TEMPB           ENDISC > TEMPB
21252  0 01 21254          BRU     *+2             N0 + EXIT
21253  0 01 21155          BRU     F21E0
21254  0 01 21133  FND21    BRU     F21F2
```



```
                    *
                    *       FUNCTION TABLES
                    *
21255  0 20 21263   FPT21   N0P     FIM21           FUNCTION IDENTIFIER MESSAGE
21256  0 20 21273           N0P     FAM21           FUNCTION ABSTRACT MESSAGE
21257  0 20 17131           N0P     FVM18           FUNCTION VARIABLE MESSAGE
21260  0 02 23346           TW0     STDISC          FUNCTION VARIABLE TABLE
21261  0 00 21415           PZE     FUNC22          LINK T0 FUNCTION 22
21262    00000004           DATA    4               FUNCTION IDENTIFIER = BIT 21
                    *
                    *       FUNCTION MESSAGES
                    *
21263    52261202   FIM21   BCD     ' F 21 = WRITE HEADER R0UTINE''
21264    01124012
21265    66513163
21266    25123025
21267    21242551
21270    12514664
21271    63314525
21272    37121212
21273    52326651   FAM21   BCD     '  ARITE HEADER R0UTINE '
21274    31632512
21275    30252124
21276    25511251
21277    46646331
21300    45255212
21301    52633031           BCD     ' THIS SPECIAL FUNCTION WILL WRITE THE HEADERS 0N'
21302    62126247
21303    25233121
21304    43122664
21305    45236331
21306    46451266
21307    31434312
21310    66513163
21311    25126330
21312    25123025
```

```
21313    21242551
21314    62124445
21315    52622550          BCD     ' SEQUENTIAL TRACKS ACCORDING TO THE FUNCTION VARIABLES'
21316    64254563
21317    31214312
21320    63512123
21321    42621221
21322    23234451
21323    24314527
21324    12634412
21325    63302512
21326    26644523
21327    63314645
21330    12652151
21331    31212243
21332    25621212
21333    52626321          BCD     ' START AND END. THESE VARIABLES ARE IN THE FORM OF THE'
21334    51631221
21335    45241225
21336    45243312
21337    63302562
21340    25126521
21341    51312122
21342    43256212
21343    21512512
21344    31451263
21345    30251226
21346    46514412
21347    46261263
21350    30251212
21351    52243162          BCD     ' DISC PAT WORDS.'
21352    23124746
21353    63126446
21354    51246233
21355    52626321          BCD     ' START SHOULD HAVE AN ADDRESS WITH SECTOR 0, HEAD'
21356    51631262
```



```
21357    30466443
21360    24123021
21361    65251221
21362    45122124
21363    24512562
21364    62126431
21365    63301262
21366    25236346
21367    51120073
21370    12302521
21371    24121212
21372    52472131          BCD     ' PAIR 0. I.E. 777600 WOULD BE DISC 37, POSITION'
21373    51120033
21374    12313325
21375    33120707
21376    07060000
21377    12664664
21400    43241222
21401    25122431
21402    62231203
21403    07731247
21404    46623163
21405    31464512
21406    52070773          BCD     ' 77, HEAD PAIR 0, SECTOR 0.''
21407    12302521
21410    24124721
21411    31511200
21412    73126225
21413    23634451
21414    12003337
```

```
                    *
                    *
                    *       FUNCTION 22 = WRITE HEADER TEST
                    *
                    *
21415  0 43 00424   FUNC22  BRM     FUNCTN
21416  0 20 21513           NOP     FPT22
21417  0 43 00454           BRM     REPORT          OUTPUT FUNCTION ID
21420  0 20 21521           NOP     FIN22
21421  0 43 23065           BRM     TERM            GO TO CONTROL
21422  0 43 00440           BRM     RETURN          SET INTERRUPT AND TRAP LINKS
21423  0 20 23371           NOP     ENTER
21424  0 76 23346           LDA     STDISC          SET STDISC TO START AT SECTOR 0
21425  0 14 33735           ETR     =777740
21426  0 35 23346           STA     STDISC
21427  0 76 23347           LDA     ENDISC
21430  0 73 23346           SKG     STDISC          ENDISC > STDISC
21431  0 43 00460           BRM     ERROR           NO
21432  0 20 33503           NOP     F22M1
21433  0 54 23346           SUB     STDISC          A = SECTOR COUNT - 1
21434  0 73 33603           SKG     =127D           IS SECTOR COUNT > 128D
21435  0 73 33551           SKG     *=1             IS SECTOR COUNT < 1
21436  0 43 00460           BRM     ERROR           YES = SECTOR COUNT ERROR
21437  0 20 33510           NOP     F22M2
21440  0 55 15465           ADD     BIT23           WORD COUNT
21441  0 75 33550           LDB     =0              BUILD INTERLACE POT WORD
21442  0 67 00016           LSH     14D
21443  0 16 33577           MRG     =STADDR
21444  0 35 23331           STA     TEMPA
21445  0 76 23346           LDA     STDISC          BUILD HEADER TABLE
21446  0 67 00006           LSH     6
21447  0 71 33734           LDX     *-128D
21450  2 35 34200           STA     STADDR+128D,2
21451  0 55 15457           ADD     BIT17
21452  0 41 21450           BRX     *-2
```



```
                    *
                    *       DISC DRIVER
                    *
21453  0 43 00430           BRM     OBJECT
21454  0 02 20004           DIR                     DISABLE INTERRUPTS
21455  0 40 10226           SKS     10226           FILE ON LINE TEST
21456  0 43 00460           BRM     ERROR           FILE NOT ON LINE
21457  0 20 33515           NOP     F22M3
21460  0 40 14026           SKS     14026           WRITE HEADER TEST
21461  0 01 21463           BRU     *-2
21462  0 43 00460           BRM     ERROR           HEADER SWITCH DOWN
21463  0 20 33522           NOP     F22M4
21464  0 40 14000           SKS     14000           CHANNEL ACTIVE TEST
21465  0 01 21464           BRU     *-1             CHANNEL ACTIVE
21466  0 40 10026           SKS     10026           DISC FILE READY TEST
21467  0 01 21466           BRU     *-1             CONTROLLER NOT READY
21470  0 02 10026           EOM     10026           ALERT DISC FILE
21471  0 13 23346           POT     STDISC
21472  0 02+10000           EOM+    10000           ALERT CHANNEL
21473  0 02 14200           EOM     14200           EXTENDED MODE EOM
21474  0 13 23331           POT     TEMPA
21475  0 02 02666           EOM     2666            WRITE DISC FILE + CHAIN
21476  0 40 14000           SKS     14000           CHANNEL ACTIVE TEST
21477  0 01 21476           BRU     *-1             WAIT FOR CHANNEL DISCONNECT
21500  0 40 13026           SKS     13026           DISC WRITE PROTECT TEST
21501  0 43 00460           BRM     ERROR           DISC WRITE PROTECTED
21502  0 20 33531           NOP     F22M5
21503  0 40 11000           SKS     11000           CHANNEL ERROR TEST
21504  0 43 00460           BRM     ERROR           CHANNEL ERROR SET
21505  0 20 33537           NOP     F22M6
21506  0 40 11026           SKS     11026           DISC FILE ERROR TEST
21507  0 43 00460           BRM     ERROR           CONTROLLER ERROR SET
21510  0 20 33543           NOP     F22M7
21511  0 43 00434           BRM     END
21512  0 01 21415           BRU     FUNC22
```

```
                    *
                    *       FUNCTION TABLES
                    *
21513  0 20 21521   FPT22   NOP     FIM22           FUNCTION IDENTIFIER MESSAGE
21514  0 20 21530           NOP     FAM22           FUNCTION ABSTRACT MESSAGE
21515  0 20 17131           NOP     FVM18           FUNCTION VARIABLE MESSAGE
21516  0 02 23346           TWO     STDISC          FUNCTION VARIABLE TABLE
21517  0 00 21772           PZE     FUNC23          LINK TO NEXT FUNCTION
21520    00000002           DATA    2               FUNCTION IDENTIFIER • BIT 22
                    *
                    *       FUNCTION MESSAGES
                    *
21521    52261202   FIM22   BCD     ' F 22 • WRITE HEADER TEST''
21522    02124012
21523    66513163
21524    25123025
21525    21242551
21526    12632562
21527    63371212
21530    52326651   FAM22   BCD     '  WRITE HEADER TEST '
21531    31632512
21532    30252124
21533    25511263
21534    25626352
21535    52633025           BCD     ' THE PURPOSE OF THIS SPECIAL FUNCTION IS TO PROVIDE'
21536    12476451
21537    47466225
21540    12462612
21541    63303162
21542    12624725
21543    23312143
21544    12266445
21545    23633146
21546    45123162
21547    12634612
21550    47514465
```



```
21551    31242512
21552    52633025           BCD     ' THE OPERATOR WITH A TOOL FOR USE IN LOCATING PROB•'
21553    12464725
21554    51216946
21555    51126631
21556    63301221
21557    12634646
21560    43122646
21561    51126462
21562    25123145
21563    12434623
21564    21633145
21565    27124751
21566    46224012
21567    52432544           BCD     ' LEMS ENCOUNTERED DURING HEADER WRITING• NO ATTEMPT'
21570    62122545
21571    23466445
21572    63255125
21573    24122464
21574    51314527
21575    12302521
21576    24255112
21577    66513163
21600    31452733
21601    12454612
21602    21636325
21603    44476312
21604    52316212           BCD     ' IS MADE TO DIAGNOSE ERRORS• HOWEVER• THE FOLLOWING'
21605    44212425
21606    12634612
21607    24312127
21610    45466225
21611    12255151
21612    46516233
21613    12304466
21614    25652551
```

```
21615    73126330
21616    25122646
21617    43434466
21620    31452712
21621    52255151          BCD     ' ERROR CONDITIONS WILL BE TYPED;'
21622    46511223
21623    46452431
21624    63314445
21625    62126631
21626    43431222
21627    25126170
21630    47252415
21631    52263143          BCD     ' FILE NOT ON LINE'
21632    25124544
21633    63134445
21634    12433145
21635    25121212
21636    52302521          BCD     ' HEADER SWITCH DOWN'
21637    24255112
21640    62663163
21641    23301224
21642    46664512
21643    52243162          BCD     ' DISC WRITE PROTECTED'
21644    23126651
21645    31632512
21646    47514663
21647    25236325
21650    24121212
21651    52233221          BCD     ' CHANNEL ERROR'
21652    45452543
21653    12255151
21654    46511212
21655    52234445          BCD     ' CONTROLLER ERROR.'
21656    63514443
21657    43255112
21660    25515146
```



```
21661    51331212
21662    52266445          BCD     ' FUNCTION VARIABLES ARE START AND END, (STARTING'
21663    23633146
21664    45126521
21665    51312122
21666    43256212
21667    21512512
21670    62632151
21671    63122145
21672    24122545
21673    24731274
21674    62632151
21675    63314527
21676    52214524          BCD     ' AND ENDING DISC ADDRESSES, RESPECTIVELY). THE SAME'
21677    12254524
21700    31452712
21701    24316223
21702    12212424
21703    51256262
21704    25627312
21705    51256247
21706    25236331
21707    65254370
21710    34331263
21711    30251262
21712    21442512
21713    52652151          BCD     ' VARIABLES WILL BE USED UNTIL BREAKPOINT ONE IS RE.'
21714    31212243
21715    25621266
21716    31434312
21717    22251264
21720    62252412
21721    64456331
21722    43122251
21723    25214247
21724    46314563
```

```
21725    12464525
21726    12316212
21727    51254012
21730    52622563          BCD     ' SET, AT WHICH POINT AN END MESSAGE IS TYPED. FUNC•'
21731    73122163
21732    12663031
21733    23301247
21734    46314563
21735    12214512
21736    25452412
21737    44256262
21740    21272512
21741    31621263
21742    70472524
21743    33122464
21744    45234012
21745    52633146          BCD     ' TION VARIABLES MAY NOW BE CHANGED OR ANOTHER FUNC•'
21746    45126521
21747    51312122
21750    43256212
21751    44217012
21752    45466612
21753    22251223
21754    30214527
21755    25241246
21756    51122145
21757    46633025
21760    51132664
21761    45234012
21762    52633146          BCD     ' TION OR UNIT MAY BE ACCESSED.''
21763    45124651
21764    12644531
21765    63124421
21766    70122225
21767    12212323
21770    25626225
```



```
21771    24333712
```

```
                    *
                    *
                    *       FUNCTION 23 = SECTOR DUMP
                    *
                    *
21772  0 43 00424   FUNC23  BRM     FUNCTN          FUNCTION LINK
21773  0 20 22061           NOP     FPT23
21774  0 43 00440           BRM     RETURN          SET INTERRUPT LINKAGE
21775  0 20 23371           NOP     ENTER
21776  0 02 20004           DIR                     DISABLE INTERRUPTS
21777  0 43 00430           BRM     OBJECT          OBJECT LINK
22000  0 43 00454           BRM     REPORT          OUTPUT FUNCTION IDENTIFIER
22001  0 20 22067           NOP     FIN23
22002  0 43 23065           BRM     TERM            GO TO CONTROL
                    *
                    *       DRIVE DISC
                    *
22003  0 43 00430           BRM     OBJECT
22004  0 43 00440           BRM     RETURN          SET INTERRUPT LINKAGE
22005  0 20 23371           NOP     ENTER
22006  0 76 23346           LDA     STDISC          GET DISC ADDRESS
22007  0 35 23352           STA     POTARD
22010  0 43 23173           BRM     POTOUT          POT TO DISC
22011  0 01 22056           BRU     F23E1           ERROR ABORT
22012  0 02 00000           EOM     0               DISCONNECT CHANNEL
22013  0 02*10000           EOM*    10000           ALERT CHANNEL
22014  0 02 14000           EOM     14000           EXTENDED MODE EOM
22015  0 13 33736           POT     *4B64+STADDR    WC = 64
22016  0 02 03626           EOM     3626            READ DISC FILE = SECTOR
22017  0 43 23143           BRM     WAIT            WAIT FOR CONTROLLER READY
22020  0 01 22056           BRU     F23E1           ERROR ABORT
22021  0 40 11000           SKS     11000           CHANNEL ERROR TEST
22022  0 01 22024           BRU     *+2             CHANNEL ERROR SET
22023  0 01 22027           BRU     *+4
22024  0 43 00460           BRM     ERROR
22025  0 20 23607           NOP     U21M8
```



```
22026  0 01 22056           BRU     F23E1
22027  0 40 12000           SKS     12000           CHANNEL ZERO WORD COUNT TEST
22030  0 01 22032           BRU     *+2             WORD COUNT NOT ZERO
22031  0 01 22035           BRU     *+4
22032  0 43 00460           BRM     ERROR
22033  0 20 23661           NOP     U21M13
22034  0 01 22056           BRU     F23E1
22035  0 43 23073           BRM     CHECK           CHECK FOR CHANNEL INACTIVE
22036  0 01 22056           BRU     F23E1           ERROR ABORT
22037  0 76 33577           LDA     =STADDR         SET UP POINTER
22040  0 16 15443           MRG     BIT5
22041  0 35 22045           STA     F23L1
22042  0 76 15462           LDA     BIT20
22043  0 43 00454   F23L2    BRM     REPORT          DUMP 8 WORDS
22044  4 20 23674           NOP     U21M14,4        CARRIAGE RETURN
22045  0 10 34000   F23L1    EIGHT   STADDR          DATA
22046  0 46 00014           XAB
22047  0 76 22045           LDA     F23L1           UPDATE ADDRESS
22050  0 55 15462           ADD     BIT20
22051  0 35 22045           STA     F23L1
22052  0 46 00014           XAB
22053  0 54 15465           SUB     BIT23
22054  0 72 33551           SKA     *+1             FINISHED
22055  0 01 22043           BRU     F23L2           NO
22056  0 43 00434   F23E1   BRM     END
22057  0 01 21772           BRU     FUNC23
22060  0 43 00452   LAST    BRM     DONE
```

```
                    *
                    *       FUNCTION PARAMETER TABLE
                    *
22061  0 20 22067   FPT23   NBP     FIM23           FUNCTION IDENTIFIER MESSAGE
22062  0 20 22077           NBP     FAM23           FUNCTION ABSTRACT MESSAGE
22063  0 20 22074           NBP     FVM23           FUNCTION VARIABLES MESSAGE
22064  0 01 23346           ONE     STDISC          FUNCTION VARIABLE
22065  0 00 22060           PZE     LAST            LINK TO CONTROL
22066    00000001           DATA    1               FUNCTION IDENTIFIER - BIT 23
                    *
                    *       FUNCTION MESSAGES
                    *
22067    52261202   FIM23   BCD     ' F 23 - SECTOR DUMP!!
22070    03124012
22071    62252363
22072    46511224
22073    64444737
22074    52126225   FVM23   BCD     '  SECTOR !!
22075    23634651
22076    52371212
22077    52326330   FAM23   BCD     '  THIS SPECIAL FUNCTION DUMPS THE CONTENTS OF ANY!
22100    31621262
22101    47252331
22102    21431226
22103    64452363
22104    31464512
22105    24644447
22106    62126330
22107    25122346
22110    45632545
22111    63621246
22112    26122145
22113    70121212
22114    52243162           BCD     ' DISC SECTOR TO THE ERROR DEVICE. WHEN COMPLETED,!
22115    23120225
22116    23634651
```



```
22117    12634612
22120    63302512
22121    25515146
22122    51122425
22123    65312325
22124    33126630
22125    25451223
22126    46444743
22127    25632524
22130    73121212
22131    52234645           BCD     ' CONTROL WILL BE RETURNED TO THE KEYBOARD. THE ONLY!
22132    63514443
22133    12663143
22134    43120225
22135    12512563
22136    64514525
22137    24126346
22140    12633225
22141    12422570
22142    22462151
22143    24331263
22144    30251246
22145    45437212
22146    52266445           BCD     ' FUNCTION VARIABLE IS .SECTOR., WHICH IS THE ADDRESS!
22147    23633146
22150    45126521
22151    51312122
22152    43251231
22153    62124262
22154    25236346
22155    51407312
22156    66303123
22157    30123162
22160    12633225
22161    12212424
22162    51256262
```

```
22163    52462612          BCD     ' OF THE SECTOR WHICH WILL BE DUMPED. AFTER CHANGING!
22164    63302512
22165    62252363
22166    46511266
22167    30312330
22170    12663543
22171    43122225
22172    12246444
22173    47252433
22174    12212663
22175    25511223
22176    30214527
22177    31452712
22200    52633531          BCD     ' THIS VARIABLE, TYPE .T TO CONTINUE.''
22201    62126521
22202    51312122
22203    43257312
22204    63704725
22205    12406312
22206    63461223
22207    46456331
22210    45642533
22211    37121212
```



```
                         *
                         *
                         *       SUBROUTINES
                         *
                         *
                         *
                         *       TEST WORD COUNT REGISTER
                         *
22212  0 00 00000  F1S1  PZE     0
22213  0 77*22212        EAX*    F1S1            BIAS
22214  2 76 00001        LDA     1,2             POTWORD
22215  0 35 23352        STA     POTWRD
22216  2 76 00002        LDA     2,2             EXTENDED MODE EOM
22217  0 35 22225        STA     F1S1A
22220  2 76 00003        LDA     3,2             MESSAGE
22221  0 35 22232        STA     F1S1B
22222  0 43 00440        BRM     RETURN          SET INTERRUPT LINKAGE
22223  0 20 23371        NOP     ENTER
22224  0 02*10000        EOM*    10000           ALERT CHANNEL
22225  0 00 00000  F1S1A  PZE     0               EXTENDED MODE EOM
22226  0 13 23352        POT     POTWRD
22227  0 40 12000        SKS     12000           CHANNEL ZERO WORD COUNT TEST
22230  0 01 22232        BRU     **2             WC NOT ZERO . OK
22231  0 43 00460        BRM     ERROR
22232  0 00 00000  F1S1B  PZE     0               MESSAGE POINTER
22233  0 43 00434        BRM     END
22234  2 01 00004        BRU     4,2             RETURN
                         *
                         *       TEST ADDRESS REGISTER
                         *
22235  0 00 00000  F1S2  PZE     0
22236  0 43 00440        BRM     RETURN          SET INTERRUPT LINKAGE
22237  0 20 23371        NOP     ENTER
22240  0 77*22235        EAX*    F1S2            BIAS
22241  2 76 00001        LDA     1,2             POTWORD
22242  0 35 23352        STA     POTWRD
```

```
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22243  2 76 00003          LDA     3,2         EXTENDED MODE EOM
22244  0 35 22253          STA     F1S2A
22245  0 35 22267          STA     F1S2C
22246  2 76 00004          LDA     4,2         MESSAGE 1
22247  0 35 22263          STA     F1S2B
22250  2 76 00005          LDA     5,2         MESSAGE 2
22251  0 35 22301          STA     F1S2D
22252  0 02*10000          EOM*    10000       ALERT CHANNEL
22253  0 00 00000  F1S2A   PZE     0
22254  0 13 23352          POT     POT*RD
22255  0 02 12000          EOM     12000       ALERT TO PIN CHANNEL ADDRESS
22256  0 33 23330          PIN     TEMP        PIN CHANNEL ADDRESS
22257  0 76 23330          LDA     TEMP
22260  2 72 00002          SKA     2,2         IS ADDRESS CORRECT
22261  0 01 22263          BRU     *+2         YES
22262  0 43 00460          BRM     ERROR
22263  0 00 00000  F1S2B   PZE     0
22264  0 43 00434          BRM     END
22265  0 43 00430          BRM     OBJECT
22266  0 02*10000          EOM*    10000       ALERT CHANNEL
22267  0 00 00000  F1S2C   PZE     0
22270  0 13 23352          POT     POT*RD
22271  0 02*10000          EOM*    10000       ALERT CHANNEL
22272  0 02 14000          EOM     14000       EXTENDED MODE EOM
22273  0 13 33550          POT     *0
22274  0 02 12000          EOM     12000       ALERT TO PIN CHANNEL ADDRESS
22275  0 33 23330          PIN     TEMP        PIN CHANNEL ADDRESS
22276  0 76 23330          LDA     TEMP
22277  2 72 00002          SKA     2,2         IS ADDRESS CORRECT
22300  0 43 00460          BRM     ERROR       NO
22301  0 00 00000  F1S2D   PZE     0
22302  0 43 00434          BRM     END
22303  2 01 00006          BRU     6,2         RETURN
                    *
                    *       TEST SKS FOR NO SKIP
                    *
```

```
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22304  0 00 00000  F2S1    PZE     0
22305  0 77*22304          EAX*    *-1
22306  2 76 00001          LDA     1,2         GET SKS
22307  0 35 22315          STA     F2S1A
22310  2 76 00002          LDA     2,2         GET MESSAGE
22311  0 35 22320          STA     F2S1B
22312  0 43 00440          BRM     RETURN      SET INTERRUPT LINKAGE
22313  0 20 23371          NOP     ENTER
22314  0 02 10226          EOM     10226       CLEAR FILE
22315  0 00 00000  F2S1A   PZE     0           SHOULD NOT SKIP
22316  0 01 22320          BRU     *+2
22317  0 43 00460          BRM     ERROR
22320  0 00 00000  F2S1B   PZE     0
22321  0 43 00434          BRM     END
22322  0 51 22304          BRR     F2S1        RETURN
                    *
                    *       TEST SKS FOR SKIP
                    *
22323  0 00 00000  F2S2    PZE     0
22324  0 77*22323          EAX*    *-1
22325  2 76 00001          LDA     1,2         GET SKS
22326  0 35 22334          STA     F2S2A
22327  2 76 00002          LDA     2,2         GET MESSAGE
22330  0 35 22336          STA     F2S2B
22331  0 43 00440          BRM     RETURN      SET INTERRUPT LINKAGE
22332  0 20 23371          NOP     ENTER
22333  0 02 10226          EOM     10226       CLEAR FILE
22334  0 00 00000  F2S2A   PZE     0           SHOULD SKIP
22335  0 43 00460          BRM     ERROR
22336  0 00 00000  F2S2B   PZE     0
22337  0 43 00434          BRM     END
22340  0 51 22323          BRR     F2S2        RETURN
                    *
                    *       TEST ADDRESS REGISTER IN CONTROLLER
                    *
22341  0 00 00000  F2S3    PZE     0
```

```
22342  0 61 22341          MIN     F2S3            INCREMENT RETURN
22343  0 77*22341          EAX.    F2S3
22344  2 76 00001          LDA     1,2             MESSAGE
22345  0 35 22357          STA     F2S3A
22346  0 43 00440          BRM     RETURN          SET INTERRUPT LINKAGE
22347  0 20 23371          NOP     ENTER
22350  0 76 33550          LDA     .0              POT A
22351  0 43 23263          BRM     POTPIN
22352  0 76*22341          LDA.    F2S3            POT B
22353  0 43 23263          BRM     POTPIN
22354  0 72*22341          SKA.    F2S3            IS ADDRESS BIT SET
22355  0 01 22357          BRU     .+2             YES
22356  0 43 00460          BRM     ERROR
22357  0 00 00000  F2S3A   PZE     0
22360  0 43 00434          BRM     END
22361  0 51 22341          BRR     F2S3            RETURN
                    *
                    *       TEST ADDRESS REGISTER IN CONTROLLER
                    *
22362  0 00 00000  F2S4    PZE     0
22363  0 61 22362          MIN     F2S4            INCREMENT RETURN
22364  0 77*22362          EAX.    F2S4
22365  2 76 00001          LDA     1,2             MESSAGE
22366  0 35 22377          STA     F2S4A
22367  0 43 00440          BRM     RETURN          SET INTERRUPT LINKAGE
22370  0 20 23371          NOP     ENTER
22371  0 76 33566          LDA     .777777         POT A
22372  0 43 23263          BRM     POTPIN
22373  0 76 33550          LDA     .0              POT B
22374  0 43 23263          BRM     POTPIN
22375  0 72*22362          SKA.    F2S4            ADDRESS BIT RESET
22376  0 43 00460          BRM     ERROR           NO
22377  0 00 00000  F2S4A   PZE     0
22400  0 43 00434          BRM     END
22401  0 51 22362          BRR     F2S4            RETURN
                    *
```



```
                    *       TEST VERIFICATION LOGIC
                    *
22402  0 00 00000  F2S5    PZE     0
22403  0 61 22402          MIN     F2S5            INCREMENT RETURN
22404  0 77*22402          EAX.    F2S5
22405  2 76 00001          LDA     1,2             MESSAGE
22406  0 35 22424          STA     F2S5A
22407  2 76 00000          LDA     0,2             POT A
22410  0 43 22767          BRM     SETUP3
22411  0 01 22425          BRU     F2S5B           DO NOT USE ADDRESSED DISC
22412  0 17 15456          EOR     BIT16           BUILD POT B
22413  0 35 23330          STA     TEMP
22414  0 02 10026          EOM     10026           ALERT DISC FILE
22415  0 13 23330          POT     TEMP            POT B
22416  0 43 23126          BRM     NORMAL          NORMALIZE DISC
22417  0 02 10026          EOM     10026           ALERT DISC FILE
22420  0 13 23352          POT     POTWRD          POT A
22421  0 43 23315          BRM     .500            WAIT 500 MILLISEC
22422  0 40 12026          SKS     12026           TRACK VERIFIED TEST
22423  0 43 00460          BRM     ERROR           TRACK NOT VERIFIED
22424  0 00 00000  F2S5A   PZE     0
22425  0 43 00434  F2S5B   BRM     END
22426  0 51 22402          BRR     F2S5            RETURN
                    *
                    *       TEST RAVA LOGIC
                    *
22427  0 00 00000  F2S6    PZE     0
22430  0 77*22427          EAX.    F2S6
22431  2 76 00003          LDA     3,2             MESSAGE
22432  0 35 22457          STA     F2S6B
22433  2 76 00002          LDA     2,2             POT B
22434  0 43 23042          BRM     DISCCK          USE THIS DISC
22435  0 01 22460          BRU     F2S6C           NO
22436  2 76 00001          LDA     1,2             POT A
22437  0 43 22767          BRM     SETUP3
22440  0 01 22460          BRU     F2S6C           DO NOT USE ADDRESSED DISC
```

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22441  0 02 10026          EOM     10026           ALERT DISC FILE
22442  0 13 23352          POT     POT+RD          POT A
22443  0 43 23126          BRM     NORMAL
22444  0 02 10026          EOM     10026           ALERT DISC FILE
22445  2 13 00002          POT     2,2             POT B
22446  0 43 23315          BRM     .500            WAIT 500 MILLISEC
22447  0 71 33737          LDX     **100000
22450  0 02 10026          EOM     10026           ALERT DISC FILE
22451  0 13 23352          POT     POT+RD          POT A
22452  0 41 22454  F2S6A    BRX     *+2
22453  0 01 22457          BRU     F2S6B           VERIFICATION TIME > 70 MS. = OK
22454  0 40 12026          SKS     12026           TRACK VERIFIED TEST
22455  0 01 22452          BRU     F2S6A           TRACK NOT VERIFIED = LOOP
22456  0 43 00460          BRM     ERROR           TRACK VERIFIED TOO SOON
22457  0 00 00000  F2S6B    PZE     0
22460  0 43 23126  F2S6C    BRM     NORMAL          NORMALIZE DISC
22461  0 43 00434          BRM     END
22462  0 61 22427          MIN     F2S6            INCREMENT RETURN
22463  0 61 22427          MIN     F2S6            INCREMENT RETURN
22464  0 51 22427          BRR     F2S6            RETURN
                       *
                       *       TEST SECTOR VERIFICATION LOGIC
                       *
22465  0 00 00000  F2S7     PZE     0
22466  0 77*22465           EAX*    F2S7
22467  2 75 00002           LDB     2,2             MESSAGE
22470  0 36 22504           STB     F2S7B
22471  2 76 00001           LDA     1,2             POTWORD
22472  0 43 22775           BRM     SETUP4
22473  0 01 22505           BRU     F2S7C           ERROR OR DISC OUT OF BOUNDS
22474  0 02 10026           EOM     10026           ALERT DISC FILE
22475  0 13 23352           POT     POT+RD          POT SAME ADDRESS
22476  0 71 33737           LDX     **100000
22477  0 40 12026           SKS     12026           TRACK VERIFIED TEST
22500  0 01 22502           BRU     *+2             TRACK NOT VERIFIED
22501  0 01 22505           BRU     F2S7C
```

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DISCW  TAP.3.C                          PAGE 290

22502  0 41 22477           BRX     F2S7A
22503  0 43 00460           BRM     ERROR           TIME > 70 MILLISEC
22504  0 00 00000  F2S7B     PZE     0
22505  0 43 00434  F2S7C     BRM     END
22506  0 61 22465           MIN     F2S7            INCREMENT RETURN
22507  0 51 22465           BRR     F2S7            RETURN
                       *
                       *       TEST 2MHAA
                       *
22510  0 00 00000  F3S1     PZE     0
22511  0 61 22510           MIN     F3S1            INCREMENT RETURN
22512  0 76 33550           LDA     =0              POTWORD
22513  0 43 22775           BRM     SETUP4          SET UP OBJECT TEST
22514  0 01 22534           BRU     F3S1C           ABORT
22515  0 77*22510           EAX*    F3S1
22516  2 76 00000           LDA     0,2             EOM
22517  0 35 22525           STA     F3S1A
22520  2 76 00001           LDA     1,2             MESSAGE
22521  0 35 22532           STA     F3S1B
22522  0 02*10000           EOM*    10000           ALERT CHANNEL
22523  0 02 14200           EOM     14200           EXTENDED MODE EOM
22524  0 13 33573           POT     =4B4+STADDR     WC = 1
22525  0 00 00000  F3S1A     PZE     0               EOM
22526  0 77 36706           EAX     =570D           WAIT 1 MILLISEC
22527  0 41 22527           BRX     *
22530  0 40 12026           SKS     12026           TRACK VERIFIED TEST
22531  0 43 00460           BRM     ERROR           CONTROLLER EXITED FROM STATE 1
22532  0 00 00000  F3S1B     PZE     0
22533  0 02 00000           EOM     0               DISCONNECT CHANNEL
22534  0 51 22510  F3S1C     BRR     F3S1            RETURN
                       *
                       *       TEST WRITE PARITY CHECKING
                       *
22535  0 00 00000  F3S2     PZE     0
22536  0 61 22535           MIN     F3S2            INCREMENT RETURN
22537  0 76 33550           LDA     =0              POTWORD
```

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22540  0 43 22775          BRM     SETUP4
22541  0 01 22555          BRU     F3S2B           ABORT
22542  0 76*22535          LDA*    F3S2            DATA WORD
22543  0 35 34000          STA     STADDR
22544  0 61 22535          MIN     F3S2            INCREMENT RETURN
22545  0 76*22535          LDA*    F3S2            MESSAGE
22546  0 35 22554          STA     F3S2A
22547  0 43 23006          BRM     CPBT1           PBT TB CHANNEL
22550    00074000          DATA    4B4*STADDR
22551  0 43 23305          BRM     W200            WAIT 200 MILLISEC
22552  0 40 11026          SKS     11026           DISC FILE ERROR TEST
22553  0 43 00460          BRM     ERROR           CONTROLLER ERROR SET
22554  0 00 00000  F3S2A   PZE     0
22555  0 43 00434  F3S2B   BRM     END
22556  0 51 22535          BRR     F3S2            RETURN
                    *
                    *       TEST INCREMENTING OF ADDRESS REGISTER
                    *
22557  0 00 00000  F3S3    PZE     0
22560  0 61 22557          MIN     F3S3            INCREMENT RETURN
22561  0 77*22557          EAX*    F3S3
22562  2 76 00000          LDA     0,2             PBTWORD
22563  0 55 15465          ADD     BIT23
22564  0 43 23042          BRM     DISCCK          USE THIS ADDRESS
22565  0 01 22632          BRU     F3S3C           NO
22566  2 76 00000          LDA     0,2             PBTWORD
22567  0 43 22775          BRM     SETUP4          SET UP
22570  0 01 22632          BRU     F3S3C           ABORT
22571  2 76 00001          LDA     1,2             MESSAGE
22572  0 35 22631          STA     F3S3B
22573  0 43 23006          BRM     CPBT1           PBT TB CHANNEL
22574    04074000          DATA    4048A*STADDR
22575  0 43 23143          BRM     WAIT            WAIT FOR CONTROLLER READY
22576  0 01 22632          BRU     F3S3C
22577  0 40 12000          SKS     12000           CHANNEL ZERO WORD COUNT TEST
22600  0 01 22602          BRU     *+2             WORD COUNT NOT ZERO
```

```
DISCW  TAP=3.C                          PAGE 292

22601  0 01 22613          BRU     F3S3A
22602  0 02 12000          EOM     12000           ALERT TO PIN CHANNEL ADDRESS
22603  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
22604  0 76 23330          LDA     TEMP
22605  0 54 33577          SUB     =STADDR         A = WORD COUNT
22606  0 75 33606          LDB     =101
22607  0 71 33577          LDX     =STADDR
22610  0 43 00460          BRM     ERROR
22611  2 20 30600          NOP     F3M20,2
22612  0 01 22632          BRU     F3S3C
22613  0 02 10026          EOM     10026           ALERT DISC FILE
22614  0 33 23330          PIN     TEMP            PIN CONTROLLER ADDRESS
22615  0 75 33551          LDB     *+1             MASK
22616  0 76*22557          LDA*    F3S3            PBTWORD
22617  0 55 15465          ADD     BIT23
22620  0 70 23330          SKM     TEMP            DID REGISTER INCREMENT CORRECTLY
22621  0 01 22623          BRU     *+2             NO
22622  0 01 22632          BRU     F3S3C
22623  0 46 00014          XAB
22624  0 76 23330          LDA     TEMP            REPORT ERROR
22625  0 71*22557          LDX*    F3S3
22626  0 43 00454          BRM     REPORT
22627  2 20 31360          NOP     F3M32,2
22630  0 43 00460          BRM     ERROR
22631  0 00 00000  F3S3B   PZE     0
22632  0 43 00434  F3S3C   BRM     END
22633  0 51 22557          BRR     F3S3            RETURN
                    *
                    *       GENERATE CONTROLLER READ ERROR
                    *
22634  0 00 00000  F3S4    PZE     0
22635  0 76 33550          LDA     =0              PBTWORD
22636  0 43 22775          BRM     SETUP4          SET UP
22637  0 01 22677          BRU     F3S4A           ABORT
22640  0 76 33600          LDA     =77             DATA WORD 1
22641  0 35 34000          STA     STADDR
```

```
DISCW  TAP=3=C                          PAGE 293

22642  0 76 33550          LDA     =0              DATA WORDS 2=64
22643  0 77 37701          EAX     =63D
22644  2 35 34100          STA     STADDR=64D,2
22645  0 41 22644          BRX     *=1
22646  0 43 23006          BRM     CPBT1           PBT TB CHANNEL
22647     04034000         DATA    4B6=STADDR
22650  0 43 23143          BRM     WAIT            WAIT FBR CBNTRBLLER READY
22651  0 01 22677          BRU     F3S4A
22652  0 35 34000          STA     STADDR          CLEAR FIRST WBRD
22653  0 43 23073          BRM     CHECK           CHECK FBR CHANNEL READY
22654  0 01 22677          BRU     F3S4A
22655  0 43 23173          BRM     PBTBUT          PBT TB DISC
22656  0 01 22677          BRU     F3S4A
22657  0 76 33413          LDA     =STADDR=3       CBMPARE ADDRESS
22660  0 75 33651          LDB     =-1             MASK
22661  0 43 23006          BRM     CPBT1           PBT TB CHANNEL
22662     04034000         DATA    4B6=STADDR
22663  0 02 12000          EBM     12000           ALERT TB PIN CHANNEL ADDRESS
22664  0 33 23330          PIN     TEMP            PIN CHANNEL ADDRESS
22665  0 70 23330          SKM     TEMP            DB ADDRESSES CBMPARE
22666  0 01 22663          BRU     *-3             NB
22667  0 02 10226          EBM     10226           CLEAR FILE
22670  0 02 00000          EBM     0               DISCBNNECT CHANNEL
22671  0 43 23173          BRM     PBTBUT          PBT TB DISC
22672  0 01 22677          BRU     F3S4A
22673  0 43 23015          BRM     CPBT2           PBT TB CHANNEL
22674     04034000         DATA    4B6=STADDR
22675  0 43 23305          BRM     =200            WAIT 200 MILLISEC
22676  0 61 22634          MIN     F3S4            INCREMENT RETURN
22677  0 51 22634  F3S4A   BRR     F3S4            RETURN
                    *
                    *       TEST PDBA LBGIC IN 5045 FILE (PBSITIBN DECBDER)
                    *
22700  0 00 00000  F5S1    PZE     0
22701  0 77=22700          EAX=    F5S1            BIAS
22702  2 76 00001          LDA     1,2             PBT A
```

```
DISCW  TAP=3=C                          PAGE 294

22703  0 43 23042          BRM     DISCCK          USE THIS ADDRESS
22704  0 01 22756          BRU     F5S1G           NB
22705  0 43 22760          BRM     SETUP2          SET UP
22706  0 76 33740          LDA     =31D            LBBP CBUNT = 32
22707  0 35 23330          STA     TEMP
22710  0 02 10026          EBM     10026           ALERT DISC FILE
22711  2 13 00001          PBT     1,2             PBT A
22712  0 43 23315          BRM     =500            WAIT 500 MILLISEC
22713  0 40 11026          SKS     11026           DISC FILE ERRBR TEST
22714  0 01 22716          BRU     *=2             CBNTRBLLER ERRBR
22715  0 01 22720          BRU     F5S1B
22716  2 76 00003          LDA     3,2             MESSAGE
22717  0 01 22751          BRU     F5S1F
22720  0 40 10026          SKS     10026           DISC FILE READY TEST
22721  0 01 22723          BRU     *=2             CBNTRBLLER NBT READY
22722  0 01 22725          BRU     F5S1C
22723  2 76 00004          LDA     4,2
22724  0 01 22751          BRU     F5S1F
22725  0 02 10026          EBM     10026           ALERT DISC FILE
22726  2 13 00002          PBT     2,2             PBT B
22727  0 43 23315          BRM     =500            WAIT 500 MILLISEC
22730  0 40 11026          SKS     11026           DISC FILE ERRBR TEST
22731  0 01 22733          BRU     *=2             CBNTRBLLER ERRBR SET
22732  0 01 22735          BRU     F5S1D
22733  2 76 00005          LDA     5,2             MESSAGE
22734  0 01 22751          BRU     F5S1F
22735  0 40 10026          SKS     10026           DISC FILE READY TEST
22736  0 01 22740          BRU     *=2             CBNTRBLLER NBT READY
22737  0 01 22742          BRU     F5S1E
22740  2 76 00006          LDA     6,2             MESSAGE
22741  0 01 22751          BRU     F5S1F
22742  0 60 23330  F5S1E   SKR     TEMP            DECREMENT TEMP
22743  0 20 00000          NBP     0
22744  0 40 20040          SKS     20040           BREAKPBINT 4 TEST
22745  0 43 23165          BRM     TERM            GB TB CBNTRBL
22746  0 53 23330          SKN     TEMP            FINISHED
```

```
22747  0 01 22710          BRU     F5S1A           NO = LOOP
22750  0 01 22756          BRU     F5S1G           YES = EXIT
22751  0 35 22755  F5S1F    STA     F5S1H           MESSAGE
22752  0 02 10226          EOM     10226           CLEAR FILE
22753  0 43 00460          BRM     ERROR
22754  4 20 32710          NOP     F5M1,4
22755  0 00 00000  F5S1H    PZE     0
22756  0 43 00434  F5S1G    BRM     END
22757  2 01 00007          BRU     7,2             RETURN
```



```
                    *
                    *       SETUP ROUTINE NUMBER 2
                    *
22760  0 00 00000  SETUP2  PZE     0
22761  0 35 23330          STA     TEMP            SAVE A REG
22762  0 43 00440          BRM     RETURN          SET INTERRUPT LINKAGE
22763  0 20 23371          NOP     ENTER
22764  0 76 23330          LDA     TEMP            GET A REG
22765  0 43 23126          BRM     NORMAL          NORMALIZE DISC AND CHANNEL
22766  0 51 22760          BRR     SETUP2          RETURN
                    *
                    *       SETUP ROUTINE NUMBER 3
                    *
22767  0 00 00000  SETUP3  PZE     0
22770  0 43 22760          BRM     SETUP2          SET SPIT LINKAGE, NORMALIZE
22771  0 43 23042          BRM     DISCCK          USE ADDRESSED DISC
22772  0 51 22767          BRR     SETUP3          NO = RETURN
22773  0 61 22767          MIN     SETUP3          INCREMENT RETURN
22774  0 51 22767          BRR     SETUP3          RETURN
                    *
                    *       SETUP ROUTINE NUMBER 4
                    *
22775  0 00 00000  SETUP4  PZE     0
22776  0 43 22760          BRM     SETUP2          SET SPIT LINKAGE, NORMALIZE
22777  0 43 23042          BRM     DISCCK          ADDRESSED DISC TO BE USED
23000  0 51 22775          BRR     SETUP4          NO = RETURN
23001  0 43 23173          BRM     PUTOUT          PUT TO DISC
23002  0 51 22775          BRR     SETUP4          ERROR
23003  0 61 22775          MIN     SETUP4          INCREMENT RETURN
23004  0 71 15447          LDX     BIT9            SET X NEGATIVE
23005  0 51 22775          BRR     SETUP4          RETURN
```

```
                        *
                        *       POT TO CHANNEL
                        *
23006  0 00 00000 CPOT1 PZE     0
23007  0 61 23006       MIN     CPOT1           INCREMENT RETURN
23010  0 02*10000       EOM*    10000           ALERT CHANNEL
23011  0 02 14200       EOM     14200           EXTENDED MODE EOM
23012  0 13*23006       POT*    CPOT1           POT TO CHANNEL
23013  0 02 03666       EOM     3666            WRITE DISC FILE - SECTOR
23014  0 51 23006       BRR     CPOT1           RETURN
                        *
                        *       POT TO CHANNEL
                        *
23015  0 00 00000 CPOT2 PZE     0
23016  0 61 23015       MIN     CPOT2           INCREMENT RETURN
23017  0 02*10000       EOM*    10000           ALERT CHANNEL
23020  0 02 14000       EOM     14000           EXTENDED MODE EOM
23021  0 13*23015       POT*    CPOT2           POT TO CHANNEL
23022  0 02 03626       EOM     3626            READ DISC FILE - SECTOR
23023  0 51 23015       BRR     CPOT2           RETURN
                        *
                        *       POT TO CHANNEL
                        *
23024  0 00 00000 CPOT3 PZE     0
23025  0 61 23024       MIN     CPOT3           INCREMENT RETURN
23026  0 02*10000       EOM*    10000           ALERT CHANNEL
23027  0 02 14200       EOM     14200           EXTENDED MODE EOM
23030  0 13*23024       POT*    CPOT3           POT TO CHANNEL
23031  0 02 02666       EOM     2666            WRITE DISC FILE - CHAIN
23032  0 51 23024       BRR     CPOT3           RETURN
                        *
                        *       POT TO CHANNEL
                        *
23033  0 00 00000 CPOT4 PZE     0
23034  0 61 23033       MIN     CPOT4           INCREMENT RETURN
23035  0 02*10000       EOM*    10000           ALERT CHANNEL
```



```
23036  0 02 14000       EOM     14000           EXTENDED MODE EOM
23037  0 13*23033       POT*    CPOT4           POT TO CHANNEL
23040  0 02 02626       EOM     2626            READ DISC FILE - CHAIN
23041  0 51 23033       BRR     CPOT4           RETURN
                        *
                        *       DISCCK - STORES 'A' IN POTWRD AND CHECKS TO SEE IF ADDRESSED DISC
                        *       IS TO BE USED. IF DISC IS TO BE USED, THE ROUTINE EXITS SKIPPING.
                        *
23042  0 00 00000 DISCCK PZE     0
23043  0 35 23352       STA     POTWRD          SAVE REGISTERS
23044  0 43 15257       BRM     SAV
23045  0 66 00015       RSH     13D             RIGHT JUSTIFY DISC NUMBER
23046  0 75 33550       LDB     =0
23047  0 72 15461       SKA     BIT19           IS DISC NUMBER > 17
23050  0 75 15465       LDB     BIT23           YES
23051  0 14 33705       ETR     =17             CLEAR HIGH ORDER BIT
23052  0 35 23330       STA     TEMP            A TO X
23053  0 71 23330       LDX     TEMP
23054  0 76 15436       LDA     BIT0            FORM COMPARE WORD
23055  0 36 23330       STB     TEMP            SAVE B
23056  0 75 33550       LDB     =0
23057  2 66 20000       RCY     0,2
23060  0 71 23330       LDX     TEMP
23061  2 72 05001       SKA     DOOT17,2        IS DISC TO BE USED
23062  0 61 23042       MIN     DISCCK          NO
23063  0 43 15264       BRM     GET             GET REGISTERS
23064  0 51 23042       BRR     DISCCK          RETURN
                        *
                        *       TERM - EXITS TO CONTROL VIA 'ERROR'. ERROR COUNTER WILL NOT
                        *       BE INCREMENTED
                        *
23065  0 00 00000 TERM  PZE     0
23066  0 60 00414       SKR     ERRORS          DECREMENT ERROR COUNTER
23067  0 20 00000       NOP     0
23070  0 43 00460       BRM     ERROR           GO TO CONTROL
23071  0 20 23460       NOP     J21Y12          NO MESSAGE
```

```
23072  0 51 23065          BRR     TERM            RETURN
                    *
                    *       CHECK - CHECKS CHANNEL FOR READY AND NO ERROR. IF CHANNEL ERROR
                    *       OR NOT READY FOR 500 MILLISEC, A MESSAGE WILL BE PRINTED AND THE
                    *       ROUTINE WILL EXIT WITHOUT SKIPPING.
                    *
23073  0 00 00000   CHECK   PZE     0
23074  0 35 23325           STA     A               SAVE A REG
23075  0 76 33550           LDA     =0              CLEAR TIMEOUT FLAG
23076  0 35 23351           STA     TIMOUT
23077  0 40 14000           SKS     14000           CHANNEL ACTIVE TEST
23100  0 01 23102           BRU     *+2             CHANNEL ACTIVE
23101  0 01 23111           BRU     CHECK1
23102  0 40 11000           SKS     11000           CHANNEL ERROR TEST
23103  0 01 23105           BRU     *+2             CHANNEL ERROR SET
23104  0 01 23114           BRU     CHECK2
23105  0 43 00460           BRM     ERROR
23106  0 20 23607           NOP     U21M8
23107  0 76 23325           LDA     A               RESTORE A REG
23110  0 51 23073           BRR     CHECK
23111  0 61 23073   CHECK1  MIN     CHECK           EXIT SKIPPING
23112  0 76 23325           LDA     A
23113  0 51 23073           BRR     CHECK
23114  0 55 15465   CHECK2  ADD     BIT23
23115  0 73 33741           SKG     =23809D         500 MILLISEC ELAPSED YET
23116  0 01 23077           BRU     CHECK+4         NO
23117  0 02 00000           EOM     0               DISCONNECT CHANNEL
23120  0 43 00460           BRM     ERROR           REPORT TIMEOUT ERROR
23121  0 20 23627           NOP     U21M9
23122  0 76 33551           LDA     =+1             SET TIMEOUT FLAG
23123  0 35 23351           STA     TIMOUT
23124  0 76 23325           LDA     A               RESTORE A REG
23125  0 51 23073           BRR     CHECK           EXIT
                    *
                    *       NORMALIZE DISC CONTROLLER AND CHANNEL
                    *
```



```
23126  0 00 00000   NORMAL  PZE     0
23127  0 35 23325           STA     A               SAVE A REGISTER
23130  0 76 33550           LDA     =0
23131  0 40 10026           SKS     10026           DISC FILE READY TEST
23132  0 01 23134           BRU     *+2             CONTROLLER NOT READY
23133  0 01 23137           BRU     NORML2
23134  0 55 15465           ADD     BIT23
23135  0 73 33571           SKG     =35714D         500 MILLISEC UP YET
23136  0 01 23131           BRU     NORML1          NO
23137  0 02 10226           EOM     10226           CLEAR FILE
23140  0 02 00000           EOM     0               DISCONNECT CHANNEL
23141  0 76 23325           LDA     A               SAVE A REGISTER
23142  0 51 23126           BRR     NORMAL
                    *
                    *       WAIT - WAITS 1 SECOND FOR CONTROLLER TO COME READY. IF CONTROLLER
                    *       ERROR SETS OR NOT READY WITHIN 1 SECOND, A MESSAGE WILL BE GIVEN
                    *       AND THE ROUTINE WILL EXIT NOT SKIPPING.
                    *
23143  0 00 00000   WAIT    PZE     0
23144  0 35 23325           STA     A               SAVE A REG
23145  0 76 33550           LDA     =0              CLEAR TIMEOUT FLAG
23146  0 35 23351           STA     TIMOUT
23147  0 40 10026           SKS     10026           DISC FILE READY TEST
23150  0 01 23152           BRU     *+2             CONTROLLER NOT READY
23151  0 01 23170           BRU     WAIT4
23152  0 40 11026           SKS     11026           DISC FILE ERROR TEST
23153  0 01 23165           BRU     WAIT3           CONTROLLER ERROR SET
23154  0 55 15465           ADD     BIT23
23155  0 73 33742           SKG     =519480D        TIMED OUT YET
23156  0 01 23147           BRU     WAIT1           NO
23157  0 43 00460           BRM     ERROR
23160  0 20 23640           NOP     U21M10
23161  0 76 33551           LDA     =+1             SET TIMEOUT FLAG
23162  0 35 23351           STA     TIMOUT
23163  0 76 23325   WAIT2   LDA     A               RESTORE A REG
23164  0 51 23143           BRR     WAIT            EXIT
```

```
23165  0 43 00460  WAIT3  BRM     ERROR           REPORT CONTROLLER ERROR
23166  0 20 23652          NOP     U21M11
23167  0 01 23163          BRU     WAIT2
23170  0 76 23325  WAIT4  LDA     A               RESTORE A REG
23171  0 61 23143          MIN     WAIT
23172  0 51 23143          BRR     WAIT            EXIT SKIPPING
                    *
                    *       POTOUT - ROUTINE TO POSITION AN ARM, CHECKS FOR FILE ON-LINE,
                    *       WRITE HEADER SWITCH OFF, TRACK VERIFIED, DISC WRITE PROTECTED,
                    *       AND CONTROLLER ERROR. IF NO ERROR OCCURES, ROUTINE WILL EXIT
                    *       SKIPPING.
                    *
23173  0 00 00000  POTOUT PZE     0
23174  0 35 23325          STA     A               SAVE A REG
23175  0 40 10226          SKS     10226           FILE ON LINE TEST
23176  0 01 23200          BRU     **2             FILE NOT ON LINE
23177  0 01 23203          BRU     P01
23200  0 43 00460          BRM     ERROR
23201  0 20 23511          NOP     U21M1
23202  0 01 23334          BRU     P05
23203  0 40 14026          SKS     14026           WRITE HEADER TEST
23204  0 11 23206          BRU     **2             WRITE HEADER SWITCH ON
23205  0 01 23211          BRU     P02
23206  0 43 00460          BRM     ERROR
23207  0 20 23516          NOP     U21M2
23210  0 01 23334          BRU     P05
23211  0 02 10226          EOM     10226           CLEAR FILE
23212  0 40 10226          SKS     10226           DISC FILE READY TEST
23213  0 01 23212          BRU     **1             WAIT FOR CONTROLLER READY
23214  0 02 10026          EOM     10026           ALERT DISC FILE
23215  0 13 23352          POT     POT.RD          POT TO CONTROLLER
23216  0 76 33550          LDA     =0
23217  0 40 12026          SKS     12026           TRACK VERIFIED TEST
23220  0 01 23222          BRU     **2             TRACK NOT VERIFIED
23221  0 01 23336          BRU     P06
23222  0 55 10465          ADD     BIT23
```



```
23223  0 73 33571          SKG     =357140         500 MILLISEC ELAPSED YET
23224  0 01 23217          BRU     P03             NO
23225  0 40 11026          SKS     11026           DISC FILE ERROR TEST
23226  0 01 23232          BRU     P04             CONTROLLER ERROR NOT SET
23227  0 43 00460          BRM     ERROR
23230  0 20 23525          NOP     U21M3
23231  0 01 23334          BRU     P05
23232  0 43 00460  P04     BRM     ERROR
23233  0 20 23537          NOP     U21M4
23234  0 76 23325  P05     LDA     A               RESTORE A REG
23235  0 51 23173          BRR     POTOUT          EXIT
23236  0 40 13026          SKS     13026           DISC WRITE PROTECT TEST
23237  0 01 23241          BRU     **2             DISC WRITE PROTECTED
23240  0 01 23244          BRU     P07
23241  0 43 00460          BRM     ERROR
23242  0 20 23550          NOP     U21M5
23243  0 01 23334          BRU     P05
23244  0 40 11026          SKS     11026           DISC FILE ERROR TEST
23245  0 01 23247          BRU     **2             CONTROLLER ERROR SET
23246  0 01 23252          BRU     P08
23247  0 43 00460          BRM     ERROR
23250  0 20 23556          NOP     U21M6
23251  0 01 23334          BRU     P05
23252  0 76 23325  P08     LDA     A               RESTORE A REG
23253  0 61 23173          MIN     POTOUT          INCREMENT RETURN
23254  0 51 23173          BRR     POTOUT          EXIT SKIPPING (NO ERROR)
                    *
                    *       CLINT - CLEARS ONE INTERRUPT LEVEL
                    *
23255  0 00 00000  CLINT   PZE     0
23256  0 53 23350          SKN     .EFLG           IS MACHINE A 940
23257  0 01*23261          BRU*    **2             NO - USE BRU*
23260  0 11 23261          BRI     **1             YES - USE BRI
23261  0 20 23262          NOP     **1
23262  0 51 23255          BRR     CLINT           EXIT ROUTINE
                    *
```

```
                    *       POTPIN = SUBROUTINE USED IN FUNCTION 2
                    *
23263  0 00 00000   POTPIN  PZE     0
23264  0 35 23352           STA     POTWRD
23265  0 46 30003           CLR
23266  0 40 10026           SKS     10026           DISC FILE READY TEST
23267  0 01 23271           BRU     **2             NOT READY
23270  0 01 23274           BRU     PTPN2
23271  0 55 15465           ADD     BIT23
23272  0 73 33571           SKG     =357140         IS 500 MS UP YET
23273  0 01 23266           BRU     PTPN1           NO - LOOP
23274  0 02 10226           EOM     10226           CLEAR FILE
23275  0 40 10026           SKS     10026           DISC FILE READY TEST
23276  0 01 23275           BRU     **1             WAIT FOR CONTROLLER READY
23277  0 02 10026           EOM     10026           ALERT DISC FILE
23300  0 13 23352           POT     POTWRD          POT TO CONTROLLER
23301  0 02 10026           EOM     10026           ALERT DISC FILE
23302  0 33 23330           PIN     TEMP            PIN CONTROLLER ADDRESS REGISTER
23303  0 76 23330           LDA     TEMP
23304  0 51 23263           BRR     POTPIN          RETURN
                    *
                    *       ROUTINE TO WAIT 200 MILLISEC
                    *
23305  0 00 00000   W200    PZE     0
23306  0 35 23325           STA     A               SAVE A REG
23307  0 76 33550           LDA     =0
23310  0 55 15465           ADD     BIT23
23311  0 73 33743           SKG     =228580         200 MILLISEC UP YET
23312  0 01 23310           BRU     **2             NO
23313  0 76 23325           LDA     A               RESTORE A REG
23314  0 51 23305           BRR     W200            RETURN
                    *
                    *       ROUTINE TO WAIT 500 MILLISEC
                    *
23315  0 00 00000   W500    PZE     0
23316  0 35 23325           STA     A               SAVE A REG
```



```
23317  0 76 33550           LDA     =0
23320  0 55 15465           ADD     BIT23
23321  0 73 33744           SKG     =571420         500 MILLISEC UP YET
23322  0 01 23320           BRU     **2             NO
23323  0 76 23325           LDA     A               RESTORE A REG
23324  0 51 23315           BRR     W500            RETURN
```

```
                    *
                    *       CONSTANTS AND TEMPORARY STORAGE CELLS
                    *
23325  0 00 00000   A       PZE     0               LOCATIONS WHERE REGISTERS SAVED
23326  0 00 00000   B       PZE     0
23327  0 00 00000   X       PZE     0
23330  0 00 00000   TEMP    PZE     0               TEMPORARY STORAGE
23331  0 00 00000   TEMPA   PZE     0
23332  0 00 00000   TEMPB   PZE     0
23333  0 00 00000   TEMPC   PZE     0
23334  0 00 00000   TEMPD   PZE     0
23335  0 00 00000   VAR1    PZE     0               COMMON VARIABLE STORAGE
23336  0 00 00000   VAR2    PZE     0
23337  0 00 00000   VAR3    PZE     0
23340  0 00 00000   VAR4    PZE     0
23341  0 00 00000   VAR5    PZE     0
23342  0 00 00000   VAR6    PZE     0
23343  0 00 00000   VAR7    PZE     0
23344  0 00 00000   VAR8    PZE     0
23345  0 00 00000   VAR9    PZE     0
23346  0 00 00000   STDISC  PZE     0               STARTING DISC ADDRESS (F18=23)
23347  0 00 00000   ENDISC  PZE     0               ENDING DISC ADDRESS (F18=23)
23350  0 00 00000   NFFLG   PZE     0               940 FLAG
23351  0 00 00000   TIMOUT  PZE     0               TIMEOUT ERROR FLAG
23352  0 00 00000   POTWRD  PZE     0               COMMON CELL FOR DISC POT WORD
```



```
                    *
                    *       INTERRUPT PROCESSORS
                    *
                    *
                    *       PROCESS I2 INTERRUPT
                    *
23353  0 02 20004   PI2     DIR                     DISABLE INTERRUPTS
23354  0 43 15257           BRM     SAV             SAVE REGISTERS
23355  0 76 00450           LDA     DIVERT          GET INTERRUPT MARK ADDRESS
23356  0 14 33560           ETR     =37777          EXTRACT ADDRESS PORTION
23357  0 75 33551           LDB     =+1             MASK
23360  0 70 33564           SKM     =IX2            WAS INTERRUPT AN I2
23361  0 43 23377           BRM     SPUR            NO
23362  0 20 33745           NOP     =33
23363  0 76 33551           LDA     =+1             SET I2 FLAG
23364  0 35 15476           STA     I2FLAG
23365  0 43 15264           BRM     GET             GET REGISTERS
23366  0 53 23350           SKN     NFFLG           IS MACHINE A 940
23367  0 01*0* 246          BRU*    INTX2           NO = RETURN
23370  0 11 00246           BRI     INTX2           YES = RETURN
                    *
                    *       ALL INTERRUPTS AND TRAPS SPURIOUS
                    *
23371  0 02 20004   ENTER   DIR                     DISABLE INTERRUPTS
23372  0 43 15257           BRM     SAV             SAVE REGISTERS
23373  0 76 00450           LDA     DIVERT          GET INTERRUPT MARK ADDRESS
23374  0 14 33560           ETR     =37777          EXTRACT ADDRESS PORTION
23375  0 43 23377           BRM     SPUR            PROCESS SPURIOUS INTERRUPT/TRAP
23376  0 20 33550           NOP     =0
                    *
                    *       PROCESS SPURIOUS POP, INTERRUPT, OR TRAP
                    *
23377  0 00 00000   SPUR    PZE     0
23400  0 73 33600           SKG     =77             WAS SPIT LEGAL
23401  0 01 23412           BRU     IEXT            NO
23402  0 73 33603           SKG     =177            WAS IT A POP
```

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23403  0 01 23416          BRU     P8P             YES
23404  0 73 33746          SKG     .237            WAS IT LEGAL
23405  0 01 23412          BRU     IEXT            NO
23406  0 73 33747          SKG     .273            WAS IT I30 - T44
23407  0 01 23422          BRU     I30T44          YES
23410  0 73 33750          SKG     .337            WAS IT I56 - I74
23411  0 01 23421          BRU     I56I74          YES
                    *
                    *       PROCESS ILLEGAL OR EXTERNAL INTERRUPT
                    *
23412  0 76 33551  IEXT    LDA     ..1
23413  0 35 23462          STA     ITABLE+1        RECEIVED
23414  0 76 00450          LDA     DIVERT          MARK
23415  0 01 23430          BRU     COMMON
                    *
                    *       PROCESS SPURIOUS P8PS
                    *
23416  0 35 23462  P8P     STA     ITABLE+1        RECEIVED
23417  0 76 00000          LDA     0               MARK
23420  0 01 23430          BRU     COMMON
                    *
                    *       PROCESS I56 THROUGH I74
                    *
23421  0 55 15461  I56I74  ADD     BIT19
                    *
                    *       PROCESS I30 THROUGH T44
                    *
23422  0 54 33440  I30T44  SUB     .161
23423  0 66 00001          RSH     1
23424  0 35 23462          STA     ITABLE+1        RECEIVED
23425  0 77*00450          EAX*    DIVERT
23426  2 77 37777          EAX     -1,2
23427  2 76 00000          LDA     0,2
                    *
                    *       COMMON INTERRUPT ROUTINE
                    *
```

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23430  0 35 23463  COMMON  STA     ITABLE+2        MARK
23431  0 76*23463          LDA*    ITABLE+2
23432  0 35 23464          STA     ITABLE+3        INSTRUCTION
23433  0 61 23377          MIN     SPUR
23434  0 77*23377          EAX*    SPUR
23435  2 76*00000          LDA*    0,2
23436  0 35 23461          STA     ITABLE          EXPECTED
23437  0 43 23447          BRM     CLEAR           CLEAR ALL PENDING INTERRUPTS
23440  0 43 15264          BRM     GET             RESTORE REGISTERS
23441  0 43 00454          BRM     REPORT          REPORT ERROR
23442  4 20 23466          NOP     IMSG2,4         MESSAGE
23443  0 04 23461          FOUR    ITABLE          DATA
23444  0 43 00460          BRM     ERROR           GO TO CONTROL
23445  0 20 23465          NOP     IMSG1           (NO MESSAGE)
23446  0 01*00430          BRU*    OBJECT          RETURN TO LAST OBJECT TRANSFER
                    *
                    *       CLEAR ALL PENDING INTERRUPTS
                    *
23447  0 00 00000  CLEAR   PZE     0
23450  0 43 00440          BRM     RETURN          SET INTERRUPT LINKAGE
23451  0 20 23453          NOP     *+2
23452  0 02 20002          EIR                     ENABLE INTERRUPTS
23453  0 53 23350          SKN     NFFLG           CLEAR INTERRUPT
23454  0 01*23456          BRU*    *+2             925/930
23455  0 11 23456          BRI     *+1             940/945
23456  0 20 23456          NOP     *
23457  0 02 20004          DIR                     DISABLE INTERRUPTS
23460  0 51 23447          BRR     CLEAR           RETURN
                    *
                    *       MESSAGES
                    *
23461  0 00 00000  ITABLE  PZE     0               INTERRUPTS EXPECTED
23462  0 00 00000          PZE     0               INTERRUPT RECEIVED
23463  0 00 00000          PZE     0               LOCATION AT TIME OF INTERRUPT/TRAP
23464  0 00 00000          PZE     0               INSTRUCTION BEING EXECUTED
23465    37121212  IMSG1   BCD     111
```

```
23466    52526947  IMSG2  BCD     ' SPURIOUS POP, INTERRUPT, OR TRAP!
23467    64513146
23470    64621247
23471    46477312
23472    31456725
23473    51516447
23474    63731246
23475    51126351
23476    21471212
23477    52256747        BCD     ' EXPECTED RECEIVED LOCATION CONTENTS !!
23500    25236325
23501    24125125
23502    23253165
23503    25241243
23504    46232163
23505    31464512
23506    23464563
23507    25456762
23510    52371212
```



```
                  *
                  *      UNIT MESSAGES
                  *
23511    52522431  U21M1  BCD     ' FILE NOT ON LINE!!
23512    43251245
23513    46631246
23514    45124331
23515    45253713
23516    52526651  U21M2  BCD     ' WRITE HEADER SWITCH ON!!
23517    31632512
23520    30252124
23521    25511262
23522    66316323
23523    30124445
23524    37121212
23525    52520500  U21M3  BCD     ' 500 MILLISEC TIMEOUT ERROR NOT SET!!
23526    00124431
23527    43433162
23530    25231263
23531    31442546
23532    64635225
23533    51514451
23534    12454463
23535    12622563
23536    37121212
23537    52520500  U21M4  BCD     ' 500 MILLISEC TIMEOUT ERROR SET!!
23540    00124431
23541    43433162
23542    25231263
23543    31442546
23544    64635225
23545    51514451
23546    12622563
23547    37121212
23550    52522431  U21M5  BCD     ' DISC WRITE PROTECTED!!
23551    62231266
```

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23552    51316325
23553    12475146
23554    63252363
23555    25243712
23556    52522346  U21M6  BCD     '  CONTROLLER ERROR AFTER TRACK VERIFICATION!!
23557    45635146
23560    43432551
23561    12255151
23562    46511221
23563    26632551
23564    12635121
23565    23421265
23566    25513126
23567    31232163
23570    31464537
23571    52522431  U21M7  BCD     '  DISC FILE NOT ON LINE UNIT ABORTED AFTER FUNCTION 1.!!
23572    62231226
23573    31432512
23574    45466312
23575    46451243
23576    31452552
23577    64453163
23600    12212246
23601    51632524
23602    12212463
23603    25511226
23604    64452363
23605    31444512
23606    01333712
23607    52522330  U21M8  BCD     '  CHANNEL ERROR SET AFTER DATA TRANSMISSION OR SECT9!
23610    21454525
23611    43122551
23612    51465112
23613    62256312
23614    21266325
23615    51122421
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23616    63211263
23617    51214562
23620    44316262
23621    31464512
23622    46511262
23623    25236346
23624    51126225          BCD     'R SEARCH!!
23625    21512330
23626    37121212
23627    52522330  U21M9  BCD     '  CHANNEL ACTIVE AFTER 500 MILLISEC!!
23630    21454525
23631    43122123
23632    63316525
23633    12212463
23634    25511205
23635    00001244
23636    31434231
23637    62252337
23640    52522346  U21M10 BCD     '  CONTROLLER NOT READY AFTER 1 SECOND!!
23641    45635146
23642    43432551
23643    12454463
23644    12512521
23645    24701221
23646    26632551
23647    12011262
23650    25234445
23651    24371212
23652    52522346  U21M11 BCD     '  CONTROLLER ERROR SET!!
23653    45635146
23654    43432551
23655    12255151
23656    46511262
23657    25633712
23660    37121212  U21M12 BCD     '!!
23661    52522330  U21M13 BCD     '  CHANNEL INTERLACE NOT AT ZERO WORD COUNT.!!
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23662    21454525
23663    43123145
23664    63255143
23665    21232512
23666    45466312
23667    21631271
23670    25514412
23671    66465124
23672    12234464
23673    45633337
23674    52371212  U21M14 BCD     ' ''
```



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                   *
                   *       MESSAGES - FUNCTION 1
                   *
23675    52020524  F1M1   BCD     ' 25D02(44)''
23676    00027404
23677    04343712
23700    52010224  F1M2   BCD     ' 12D08(44),14D10(44),25D02(44),03C14(31)''
23701    00107404
23702    04347301
23703    04240100
23704    74040434
23705    73020524
23706    00027404
23707    04347300
23710    03230104
23711    74030134
23712    37121212
23713    52020524  F1M3   BCD     ' 25D27(44)''
23714    00277404
23715    04343712
23716    52020524  F1M4   BCD     ' 25D27(44)''
23717    00277404
23720    04343712
23721    52020524  F1M5   BCD     ' 25D34(44),22D37(35)''
23722    00347404
23723    04347302
23724    02240307
23725    74030534
23726    37121212
23727    52020224  F1M6   BCD     ' 22D09(44)''
23730    00117404
23731    04343712
23732    52010223  F1M7   BCD     ' 12C17(31),10C37(34),18C26(34),12C31(34)''
23733    01077403
23734    01347301
23735    00230307
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23736    74030434
23737    73011023
23740    02067403
23741    04347301
23742    02230301
23743    74030434
23744    37121212
23745    52000223  F1M8   BCD     ' 02C03(31),25E42(55),16C02(31),12D08(44)''
23746    00037403
23747    01347302
23750    05250402
23751    74050534
23752    73010623
23753    00027403
23754    01347301
23755    02240010
23756    74040434
23757    37121212
23760    52000223  F1M9   BCD     ' 02C28(31),25E27(55),12D08(44)''
23761    02107403
23762    01347302
23763    05250207
23764    74050534
23765    73010224
23766    00107404
23767    04343712
23770    52000223  F1M10  BCD     ' 02C14(31),29E37(55),12D08(44)''
23771    01047403
23772    01347302
23773    11250307
23774    74050534
23775    73010224
23776    00107404
23777    04343712
24000    52000323  F1M11  BCD     ' 03C14(31),29E27(55),12D08(44)''
24001    01047403
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24002    01347302
24003    11250207
24004    74050534
24005    73010224
24006    00107404
24007    04343712
24010    52020524  F1M12  BCD     ' 25D15(44),17C35(40)''
24011    01057404
24012    04347301
24013    07230305
24014    74040034
24015    37121212
24016    52010723  F1M13  BCD     ' 17C02(40),21C12(41),29E04(55)''
24017    00027404
24020    00347302
24021    01230102
24022    74040134
24023    73021125
24024    00047405
24025    05343712
24026    52010723  F1M14  BCD     ' 17C02(40),22C12(41),26E30(55)''
24027    00027404
24030    00347302
24031    02230102
24032    74040134
24033    73020425
24034    03007405
24035    05343712
24036    52010723  F1M15  BCD     ' 17C08(40),22C28(41),26E31(55)''
24037    00107404
24040    00347302
24041    02230210
24042    74040134
24043    73020425
24044    03017405
24045    05343712
```

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24046    52010723  F1M16  BCD     ' 17C08(40),22C26(41),26E29(55)''
24047    00107404
24050    00347302
24051    02230206
24052    74040134
24053    73020625
24054    02117405
24055    05343712
24056    52010723  F1M17  BCD     ' 17C36(40),23C12(41),26E23(55)''
24057    03067404
24060    00347302
24061    03230102
24062    74040134
24063    73020625
24064    02037405
24065    05343712
24066    52010723  F1M18  BCD     ' 17C36(40),23C41(41),26E10(55)''
24067    03067404
24070    00347302
24071    03230401
24072    74040134
24073    73020625
24074    01007405
24075    05343712
24076    52010723  F1M19  BCD     ' 17C36(40),23C26(41),26E11(55)''
24077    03067404
24100    00347302
24101    03230206
24102    74040134
24103    73020625
24104    01017405
24105    05343712
24106    52010723  F1M20  BCD     ' 17C36(40),24C12(42),26E07(55)''
24107    03067404
24110    00347302
24111    04230102
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24112    74040234
24113    73020625
24114    00077405
24115    05343712
24116    52010723  F1M21  BCD     ' 17C36(40),24C41(42),26E08(55)''
24117    03067404
24120    00347302
24121    04230401
24122    74040234
24123    73020625
24124    00107405
24125    05343712
24126    52010723  F1M22  BCD     ' 17C35(40),24C26(42),26E06(55)''
24127    03067404
24130    00347302
24131    04230206
24132    74040234
24133    73020625
24134    00067405
24135    05343712
24136    52010723  F1M23  BCD     ' 17C35(40),17C20(40),18C27(40),25C12(42),25E42(55)''
24137    03067404
24140    00347301
24141    07230300
24142    74040034
24143    73011023
24144    02077404
24145    00347302
24146    05230102
24147    74040234
24150    73020625
24151    04027405
24152    05343712
24153    52010723  F1M24  BCD     ' 17C35(40),25C41(42),25E27(55)''
24154    03057404
24155    00347302
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24156    05230401
24157    74040234
24160    73020525
24161    02077405
24162    05343712
24163    52010723  F1M25  BCD     ' 17C35(40),25C26(42),29E37(55)''
24164    03057404
24165    00347302
24166    05230206
24167    74040234
24170    73021125
24171    03077405
24172    05343712
24173    52010723  F1M26  BCD     ' 17C35(40),26C12(42),29E34(55)''
24174    03057404
24175    00347302
24176    06230102
24177    74040234
24200    73021125
24201    03047405
24202    05343712
24203    52010723  F1M27  BCD     ' 17C35(40),26C41(42),29E27(55)''
24204    03057404
24205    00347302
24206    06230401
24207    74040234
24210    73021125
24211    02077405
24212    05343712
24213    52020123  F1M28  BCD     ' 21C28(41),15C12(40),18C37(40),19C03(40),25E43(55)''
24214    02107404
24215    01347301
24216    05230102
24217    74040034
24220    73011023
24221    03077404
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24222    00347301
24223    11230003
24224    74040034
24225    73020525
24226    04037405
24227    05343712
24230    52020123  F1M29  BCD     ' 21C41(41),25E43(55),15C37(40),17C28(40)''
24231    04017404
24232    01347302
24233    05250403
24234    74050534
24235    73010523
24236    03077404
24237    00347301
24240    07230210
24241    74040034
24242    37121212
24243    52020123  F1M30  BCD     ' 21C14(41),25E10(55)''
24244    01047404
24245    01347302
24246    05250100
24247    74050534
24250    37121212
24251    52020123  F1M31  BCD     ' 21C26(41),25E10(55)''
24252    02067404
24253    01347302
24254    05250100
24255    74050534
24256    37121212
24257    52020723  F1M32  BCD     ' 27C03(42),29E36(55)''
24260    00037404
24261    02347302
24262    11250306
24263    74050534
24264    37121212
24265    52020223  F1M33  BCD     ' 22C12(42),29E36(55)''
```

```
24266    01027404
24267    02347302
24270    11250306
24271    74050534
24272    37121212
24273    52020723  F1M34  BCD     ' 27C28(42),29E35(55)''
24274    02107404
24275    02347302
24276    11250305
24277    74050534
24300    37121212
24301    52020723  F1M35  BCD     ' 27C41(42),29E35(55)''
24302    04017404
24303    02347302
24304    11250305
24305    74050534
24306    37121212
24307    52020723  F1M36  BCD     ' 27C14(42),29E26(55)''
24310    01047404
24311    02347302
24312    11250206
24313    74050534
24314    37121212
24315    52020723  F1M37  BCD     ' 27C26(42),29E26(55)''
24316    02047404
24317    02347302
24320    11250206
24321    74050534
24322    37121212
24323    52021023  F1M38  BCD     ' 28C03(43),15C10(40),24E29(55)''
24324    00037404
24325    03347301
24326    05330100
24327    74040034
24330    73020425
24331    02117405
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24332    05343712
24333    52021023  F1M39  BCD     ' 28C12(43),24E29(55)''
24334    01027404
24335    03347302
24336    04250211
24337    74050534
24340    37121212
24341    52021023  F1M40  BCD     ' 28C28(42),29E20(55)''
24342    02107404
24343    02347302
24344    11250200
24345    74050534
24346    37121212
24347    52021023  F1M41  BCD     ' 28C41(42),29E20(55)''
24350    04017404
24351    02347302
24352    11250200
24353    74050534
24354    37121212
24355    52021023  F1M42  BCD     ' 28C14(43),29E42(55)''
24356    01047404
24357    03347302
24360    11250402
24361    74050534
24362    37121212
24363    52021023  F1M43  BCD     ' 28C26(43),29E42(55)''
24364    02067404
24365    03347302
24366    11250402
24367    74050534
24370    37121212
24371    52021123  F1M44  BCD     ' 29C03(43),26E42(55)''
24372    00037404
24373    03347302
24374    04250402
24375    74050534
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```
24376    37121212
24377    52021123  F1M45  BCD     ' 29C12(43),26E42(55)''
24400    01027404
24401    03347302
24402    06250402
24403    74050534
24404    37121212
24405    52021123  F1M46  BCD     ' 29C28(43),26E35(55)''
24406    02107404
24407    03347302
24410    06250305
24411    74050534
24412    37121212
24413    52021123  F1M47  BCD     ' 29C41(43),26E35(55)''
24414    04017404
24415    03347302
24416    06250305
24417    74050534
24420    37121212
24421    52021123  F1M48  BCD     ' 29C14(43),26E33(55)''
24422    01047404
24423    03347302
24424    06250303
24425    74050534
24426    37121212
24427    52021123  F1M49  BCD     ' 29C26(43),26E33(55)''
24430    02067404
24431    03347302
24432    06250303
24433    74050534
24434    37121212
24435    52030023  F1M50  BCD     ' 30C03(43),26E34(55)''
24436    00037404
24437    03347302
24440    06250304
24441    74050534
```



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24442    37121212
24443    52030023  F1M51  BCD     ' 30C12(43),26E34(55)''
24444    01027404
24445    03347302
24446    06250304
24447    74050534
24450    37121212
24451    52030023  F1M52  BCD     ' 30C28(43),29E14(44)''
24452    02107404
24453    03347302
24454    11250104
24455    74040434
24456    37121212
24457    52030023  F1M53  BCD     ' 30C41(43),29E14(55)''
24460    04017404
24461    03347302
24462    11250104
24463    74050534
24464    37121212
24465    52030023  F1M54  BCD     ' 30C14(43),29E08(55)''
24466    01047404
24467    03347302
24470    11250010
24471    74050534
24472    37121212
24473    52030023  F1M55  BCD     ' 30C26(43),29E08(55)''
24474    02067404
24475    03347302
24476    11250010
24477    74050534
24500    37121212
24501    52030123  F1M56  BCD     ' 31C03(43),18C27(40),17C20(40)''
24502    00037404
24503    03347301
24504    10230207
24505    74040034
```

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24506    73010723
24507    02007404
24510    00343712
24511    52030123  F1M57  BCD     ' 31C12(43)''
24512    01027404
24513    03343712
24514    52030123  F1M58  BCD     ' 31C28(43)''
24515    02107404
24516    03343712
24517    52030123  F1M59  BCD     ' 31C41(43)''
24520    04017404
24521    03343712
24522    52522124  F1M60  BCD     '  ADDRESS INCREMENTING ERROR'
24523    24512562
24524    62123145
24525    23512544
24526    25456331
24527    45271225
24530    51514451
24531    52212424         BCD     ' ADDR SB  ADDR IS  NOT SIGNIFICANT ''
24532    51126222
24533    12122124
24534    24511231
24535    62121245
24536    46631262
24537    31274531
24540    26312321
24541    45635237
24542    52310112  F1M65  BCD     ' I1 INTERRUPT NOT RECEIVED''
24543    31456325
24544    51516447
24545    63124546
24546    63125125
24547    23253165
24550    25243712
24551    52010423  F1M66  BCD     ' 16C06(33),20Cxx(41),31HXX(BASIC INT),23D11(33)''
```



```
24552    00067403
24553    03347302
24554    00236767
24555    74040134
24556    73030130
24557    67677422
24560    21623123
24561    12314563
24562    34730203
24563    24010174
24564    03033437
24565    52010623  F1M67  BCD     ' 16C11(33),09C31(33),10C31(34),12C31(34),24E34(55)'
24566    01017403
24567    03347300
24570    11230301
24571    74030334
24572    73010223
24573    03017403
24574    04347301
24575    02230301
24576    74030434
24577    73020425
24600    03047405
24601    05341212
24602    02032401         BCD     '23D11(33)''
24603    01740303
24604    34371212
24605    52310212  F1M70  BCD     ' I2 INTERRUPT NOT RECEIVED''
24606    31456325
24607    51516447
24610    63124546
24611    63125125
24612    23253165
24613    25243712
24614    52030230  F1M71  BCD     ' 32HXX(BASIC INT),23D04(33),11C25(33),18C43(40),'
24615    67677422
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24616    21623123
24617    12314563
24620    34730203
24621    24000474
24622    03033473
24623    01012302
24624    05746303
24625    34730110
24626    23040374
24627    04003473
24630    02002301          BCD     !20C14(41),20C28(41),11C31(34),08C16(34)!!
24631    04740401
24632    34730200
24633    23021074
24634    04013473
24635    01012303
24636    01746304
24637    34730010
24640    23010674
24641    03043437
```



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                  *
                  *       MESSAGES - FUNCTION 2
                  *
24642    52522431 F2M1    BCD     '  FILE ON LINE TEST FAILS'
24643    43251246
24644    45124331
24645    45251263
24646    25626312
24647    26213143
24650    62121212
24651    52116231          BCD     ' 9S10A,20L5A,8C16A,2CAAA,4SKSC'
24652    46211302
24653    46436221
24654    33102301
24655    06213302
24656    23212121
24657    33046242
24660    62231212
24661    52121202          BCD     '   2CAAA,8C17V,8C19A,9C20A,8C21A,8C22A,9C23A'
24662    23212121
24663    13102301
24664    07653310
24665    23011121
24666    33112302
24667    00213310
24670    23020121
24671    33102302
24672    02213311
24673    23020321
24674    52121202          BCD     '   20L5A,20L0A,5C12A,3C13A,3C14A'
24675    46436221
24676    13024643
24677    00213305
24700    23010221
24701    33032301
24702    03213303
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24703    23010421
24704    52056101          BCD     ' 5/13(35),2/17,2/21,2/25,3/18,5/07,5/09,5/12,6/01,'
24705    03748305
24706    34730261
24707    01077302
24710    61020173
24711    02610205
24712    73036101
24713    10730561
24714    00077305
24715    61001173
24716    05610102
24717    73066100
24720    01731212
24721    52066100          BCD     ' 6/05,6/06,6/07,6/11,6/22''
24722    05730461
24723    00067306
24724    61000773
24725    06610101
24726    73066102
24727    02371212
24730    52526042  F2M2    BCD     '  SKS 10227 SKIPS'
24731    62120100
24732    02037212
24733    62423147
24734    62121212
24735    52022221          BCD     ' 2CAAA'
24736    21211212
24737    52036101          BCD     ' 3/18(45),2/25,5/07,5/12,5/13,6/05,6/22''
24740    10740405
24741    34730261
24742    00057305
24743    61001773
24744    05610102
24745    73056101
24746    03730461
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24747    00057306
24750    61020237
24751    52526042  F2M3    BCD     '  SKS 10224 SKIPS'
24752    62120100
24753    02037412
24754    62423147
24755    62121212
24756    52022221          BCD     ' 2CAAA'
24757    21211212
24760    52026102          BCD     ' 2/25,6/05''
24761    05730461
24762    00053712
24763    52526042  F2M4    BCD     '  SKS 10222 SKIPS'
24764    62120100
24765    02037212
24766    62423147
24767    62121212
24770    52022221          BCD     ' 2CAAA'
24771    21211212
24772    52026102          BCD     ' 2/25,6/05''
24773    05730461
24774    00053712
24775    52526042  F2M6    BCD     '  SKS 10206 SKIPS'
24776    62120100
24777    02006412
25000    62423147
25001    62121212
25002    52022221          BCD     ' 2CAAA'
25003    21211212
25004    52026101          BCD     ' 2/17,6/05''
25005    05730461
25006    00053712
25007    52526042  F2M7    BCD     '  SKS 10326 SKIPS'
25010    62120100
25011    02037412
25012    62423147
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25013    62121212
25014    52022321          BCD     ' 2CAAA'
25015    21211212
25016    52026101          BCD     ' 2/17,6/11''
25017    07730461
25020    01013712
25021    52526242  F2M8    BCD     '  SKS 17026 SKIPS'
25022    62120107
25023    00020412
25024    62423147
25025    62121212
25026    52066231          BCD     ' 6S18A0=8S18F'
25027    46210013
25030    10623146
25031    26121212
25032    52056100          BCD     ' 5/09(35),5/10,5/13,6/03''
25033    11740305
25034    34730561
25035    01007305
25036    61010073
25037    06610003
25040    37121212
25041    52526242  F2M9    BCD     '  SKS 11226 SKIPS'
25042    62120101
25043    02020412
25044    62423147
25045    62121212
25046    52066231          BCD     ' 6S18A0=28LSA=8C16A'
25047    46210013
25050    02464362
25051    21331023
25052    01062112
25053    52056101          BCD     ' 5/12(35),2/21,5/07,5/08,5/09,5/10,6/01,6/06,6/22''
25054    02740305
25055    34730261
25056    02017305
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25057    61000773
25060    05610010
25061    73056100
25062    11730561
25063    01007305
25064    61000173
25065    06610006
25066    73066102
25067    02371212
25070    52526242  F2M10   BCD     '  SKS 12226 SKIPS'
25071    62120102
25072    02020612
25073    62423147
25074    62121212
25075    52064643          BCD     ' 68LSA0'
25076    62210012
25077    52056100          BCD     ' 5/07,5/08,5/09,5/10,6/22''
25100    07730561
25101    00107305
25102    61001173
25103    05610100
25104    73066102
25105    02371212
25106    52526242  F2M11   BCD     '  SKS 13226 SKIPS'
25107    62120103
25110    02020612
25111    62423147
25112    62121212
25113    52064643          BCD     ' 68LSA0'
25114    62210012
25115    52056100          BCD     ' 5/08,5/09,5/10,6/22''
25116    10730561
25117    00117305
25120    61010073
25121    06610202
25122    37121212
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25123    52526242  F2M12  BCD     '  SKS 14226 SKIPS'
25124    62120104
25125    02023412
25126    62423147
25127    62121212
25130    52064443          BCD     ' 69LSAO'
25131    62210212
25132    52056100          BCD     ' 5/03,5/07,5/08,5/10,6/06,6/07,6/22''
25133    03730561
25134    00077305
25135    61001073
25136    05610100
25137    73066100
25140    06730661
25141    00077306
25142    61000037
25143    52526242  F2M13  BCD     '  SKS 15226 SKIPS'
25144    62120105
25145    02023612
25146    62423147
25147    62121212
25150    52064443          BCD     ' 69LSAO'
25151    62210212
25152    52056100          BCD     ' 5/08,6/22''
25153    10730661
25154    02023712
25155    52526242  F2M14  BCD     '  SKS 16226 SKIPS'
25156    62120106
25157    02023612
25160    62423147
25161    62121212
25162    52064443          BCD     ' 69LSAO'
25163    62210212
25164    52056100          BCD     ' 5/08,6/22''
25165    10730661
25166    02023712
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25167    52526242  F2M15  BCD     '  SKS 17226 SKIPS'
25170    62120107
25171    02023612
25172    62423147
25173    62121212
25174    52064443          BCD     ' 69LSAO'
25175    62210212
25176    52056101          BCD     ' 5/10,6/22''
25177    00730661
25200    02023712
25201    52526651  F2M16  BCD     '  WRITE HEADER SWITCH TEST FAILS'
25202    31630512
25203    30252124
25204    25511262
25205    66316323
25206    30126325
25207    62631226
25210    21314262
25211    52066231          BCD     ' 6SI8AO=4SKSC=2CAAA=2C12A=3C13A,3C14A,3C16A=3WHRA'
25212    4A210213
25213    04624262
25214    23331223
25215    21212133
25216    02230102
25217    21330323
25220    01032133
25221    03230104
25222    21330323
25223    01062133
25224    03663051
25225    21121212
25226    52056101          BCD     ' 5/10(35),5/03,5/07,6/01,6/06''
25227    00740305
25230    34731561
25231    00037305
25232    61000773
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25233    06610001
25234    73066100
25235    06371212
25236    52526242  F2M17  BCD      '  SKS 15026 SKIPS'
25237    62120105
25240    00020412
25241    62423147
25242    62121212
25243    52066231         BCD      ' 6SI8A0'
25244    46210012
25245    52056101         BCD      ' 5/10''
25246    00371212
25247    52526242  F2M18  BCD      '  SKS 16026 SKIPS'
25250    62120106
25251    00020412
25252    62423147
25253    62121212
25254    52066231         BCD      ' 6SI8A0'
25255    46210012
25256    52056101         BCD      ' 5/10,6/01,6/06''
25257    00730461
25260    00017306
25261    61000637
25262    52522346  F2M19  BCD      '  CONTROLLER READY TEST FAILS'
25263    45635146
25264    43432551
25265    12512521
25266    24701263
25267    25626312
25270    26213143
25271    62121212
25272    52066231         BCD      ' 6SI8A0*200FA*1E04A*2IGDA*5C12A,3C13A*3C14A*3C16A'
25273    46210013
25274    02000026
25275    21330125
25276    00042133
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25277    02312724
25300    21330323
25301    01022133
25302    03230103
25303    21330323
25304    01042133
25305    03230106
25306    21121212
25307    52026101         BCD      ' 2/14(35),1/15,1/20,1/22,2/15,2/24,2/25,3/15,3/19,'
25310    04740305
25311    34730161
25312    01057701
25313    61020073
25314    01610202
25315    73026101
25316    05730261
25317    02047302
25320    61020573
25321    03610105
25322    73036101
25323    11731212
25324    52046102         BCD      ' 4/23,5/09,5/10,5/12,6/13,6/14,6/23''
25325    03730561
25326    00117305
25327    61010073
25330    05610102
25331    73066101
25332    03730461
25333    01047306
25334    61020337
25335    52526351  F2M20  BCD      '  TRACK VERIFIED TEST ERRONIOUSLY SKIPS'
25336    21234212
25337    65255131
25340    26312524
25341    12632562
25342    63122551
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25343    51464531
25344    46646243
25345    70126242
25346    31476212
25347    52066231          BCD     ' 6S18A0=201FA,5C12A,2C13A,3C14A,3C16A'
25350    46210213
25351    62001126
25352    21330523
25353    01027133
25354    02230103
25355    21330323
25356    01042133
25357    03230106
25360    21121212
25361    52056100          BCD     ' 5/09(35),1/15,3/15,5/10,6/01''
25362    11740305
25363    34730161
25364    01057303
25365    61010573
25366    05610100
25367    73066100
25370    01371212
25371    52522046  F2M21   BCD     '  CONTROLLER ERROR TEST FAILS'
25372    46630146
25373    43430551
25374    12255151
25375    46511263
25376    25626312
25377    26213143
25400    62121212
25401    52066231          BCD     ' 6S18A0=312EA,1E04,5C12A,3C13A,2C14A,3C16A'
25402    46210213
25403    03012225
25404    21330125
25405    00043305
25406    23010221
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25407    33032301
25410    03213302
25411    23012421
25412    33032301
25413    06211212
25414    52056101          BCD     ' 5/10(35),1/20,2/11,6/22''
25415    00740305
25416    34730161
25417    02007302
25420    61010173
25421    06610202
25422    37121212
25423    52526451  F2M22   BCD     '  WRITE PROTECT SWITCH TEST FAILS'
25424    31632512
25425    47514463
25426    25236312
25427    62663163
25430    23301263
25431    25626312
25432    26213143
25433    62121212
25434    52066231          BCD     ' 6S18A0=9WLKA,5C12A,2C13A,2C14A,3C16A'
25435    46210213
25436    11664342
25437    21330523
25440    01022133
25441    02230103
25442    21330323
25443    01042133
25444    03230106
25445    21121212
25446    52056100          BCD     ' 5/09(35),5/10''
25447    11740305
25450    34730561
25451    01003712
25452    52527021  F2M32   BCD     '  YA23A=2LARA,8C23A'
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25453    02032113
25454    02432151
25455    21331023
25456    02032112
25457    52024921          BCD     ' 2LARA*2U01A*200FA*0X04A*8PT2A'
25460    51211302
25461    64000121
25462    33020000
25463    26213300
25464    67000421
25465    33104763
25466    02211212
25467    52046100          BCD     ' 4/07(15),2/07,2/11,3/07,3/13,3/18,3/19,4/01,4/02,'
25470    07740105
25471    34730261
25472    00077302
25473    61010173
25474    03610007
25475    73036101
25476    03730361
25477    01107303
25500    61011173
25501    04610001
25502    73046100
25503    02731212
25504    52046100          BCD     ' 4/03,4/23,5/02,5/03,5/04,5/06,5/07,6/05,6/08'
25505    03730461
25506    02037305
25507    61000273
25510    05610003
25511    73056100
25512    04730561
25513    00067305
25514    61000773
25515    06610005
25516    73066100
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25517    10121212
25520    52112102          BCD     ' 9A23A*0X04A*0A23A'
25521    03211300
25522    67000421
25523    33002102
25524    03211212
25525    52006700          BCD     ' 0X04A*8PINA*0X01A*1F01A'
25526    04211310
25527    47314521
25530    33006700
25531    01213301
25532    26000121
25533    52056101          BCD     ' 5/18(34),4/01,4/02,5/03,5/07,6/07,6/08''
25534    10740304
25535    34730461
25536    00017304
25537    61000273
25540    05610003
25541    73056100
25542    07730661
25543    00077306
25544    61001037
25545    52525121  F2M33   BCD     '  RA23A*3RGRA'
25546    02032113
25547    03512751
25550    21121212
25551    52065127          BCD     ' 6RGRA0*200FA*2U01A*1X04A'
25552    51210013
25553    02000026
25554    21330264
25555    00012133
25556    01670004
25557    21121212
25560    52046100          BCD     ' 4/07(15),3/18,5/02,5/06,6/05,5/18''
25561    07740105
25562    34730361
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25563     01107305
25564     61000273
25565     05610006
25566     73066100
25567     05730561
25570     01103712
25571     52527021   F2M34   BCD      '  YA22A'
25572     02020112
25573     52046100           BCD      ' 4/08(15),5/02,4/04,5/18''
25574     10740105
25575     34730561
25576     00027304
25577     61000473
25600     05610110
25601     37121212
25602     52525121   F2M35   BCD      '  RA22A=3RARA'
25603     02022113
25604     03512151
25605     21121212
25606     52065121           BCD      ' 6RARA0=200FA.2U01A.1X04A'
25607     51210013
25610     02000026
25611     21330264
25612     00010133
25613     01670004
25614     21121212
25615     52046100           BCD      ' 4/08(15),5/02,5/03,5/04,5/18''
25616     10740105
25617     34730561
25620     00027305
25621     61000373
25622     05610004
25623     73050101
25624     10371212
25625     52527021   F2M36   BCD      '  YA21A'
25626     02012112
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DISCW   TAP-3.0                              PAGE 342

25627     52046100           BCD      ' 4/08(15),5/18,5/02,4/04''
25630     10740105
25631     34730561
25632     01107305
25633     61000273
25634     04610004
25635     37121212
25636     52525121   F2M37   BCD      '  RA21A'
25637     02012112
25640     52046100           BCD      ' 4/08(15),5/02,5/18,6/05''
25641     10740105
25642     34730561
25643     00027305
25644     61011073
25645     06610005
25646     37121212
25647     52527021   F2M38   BCD      '  YA20A'
25650     02002112
25651     52046100           BCD      ' 4/08(15),5/02,5/18,6/05''
25652     10740105
25653     34730561
25654     00027305
25655     61011073
25656     06610005
25657     37121212
25660     52525121   F2M39   BCD      '  RA20A'
25661     02002112
25662     52046100           BCD      ' 4/08(15),5/02,5/18''
25663     10740105
25664     34730561
25665     00027305
25666     61011037
25667     52527021   F2M40   BCD      '  YA19A'
25670     01112112
25671     52046100           BCD      ' 4/08(15),5/02,5/18''
25672     10740105
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25673    34730561
25674    00027305
25675    61011037
25676    52525121  F2M41  BCD     '  RA19A'
25677    01112112
25700    52046100         BCD     ' 4/08(15),5/02,5/18''
25701    10740105
25702    34730561
25703    00027305
25704    61011037
25705    52527021  F2M42  BCD     '  YA18A'
25706    01102112
25707    52046100         BCD     ' 4/09(14),5/02,5/18,6/06''
25710    11740104
25711    34730561
25712    00027305
25713    61011073
25714    06610006
25715    37121212
25716    52525121  F2M43  BCD     '  RA18A'
25717    01102112
25720    52046100         BCD     ' 4/09(14),5/02,5/18,6/06''
25721    11740104
25722    34730561
25723    00027305
25724    61011073
25725    06610006
25726    37121212
25727    52527021  F2M44  BCD     '  YA17A'
25730    01072112
25731    52046100         BCD     ' 4/09(14),5/02,5/18,6/06''
25732    11740104
25733    34730561
25734    00027305
25735    61011073
25736    06610006
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25737    37121212
25740    52525121  F2M45  BCD     '  RA17A'
25741    01072112
25742    52046100         BCD     ' 4/09(14),5/02,5/18,6/06''
25743    11740104
25744    34730561
25745    00027305
25746    61011073
25747    06610006
25750    37121212
25751    52527021  F2M46  BCD     '  YA16A'
25752    01062112
25753    52046100         BCD     ' 4/09(14),5/02,5/17''
25754    11740104
25755    34730561
25756    00027305
25757    61010737
25760    52525121  F2M47  BCD     '  RA16A'
25761    01062112
25762    52046100         BCD     ' 4/09(14),5/02,5/17''
25763    11740104
25764    34730561
25765    00027305
25766    61010737
25767    52527021  F2M48  BCD     '  YA15A'
25770    01052112
25771    52046100         BCD     ' 4/08(14),5/02,5/17,6/06''
25772    10740104
25773    34730561
25774    00027305
25775    61010773
25776    06610006
25777    37121212
26000    52525121  F2M49  BCD     '  RA15A'
26001    01052112
26002    52046100         BCD     ' 4/09(14),5/02,5/17,6/06''
```

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26003    11740104
26004    34730561
26005    00027305
26006    61010773
26007    05610001
26010    37121212
26011    52527121  F2M50  BCD     '  YA14A'
26012    01042112
26013    52046101         BCD     ' 4/10(14),5/02,5/17''
26014    00740104
26015    34730561
26016    00027305
26017    61010737
26020    52525121  F2M51  BCD     '  RA14A'
26021    01042112
26022    52046101         BCD     ' 4/10(14),5/02,5/17''
26023    00740104
26024    34730561
26025    00027305
26026    61010737
26027    52527121  F2M52  BCD     '  YA13A'
26030    01042112
26031    52046101         BCD     ' 4/10(14),6/01,5/17,5/01,3/20''
26032    00740104
26033    34730661
26034    00017305
26035    61010773
26036    05610001
26037    73036102
26040    00371212
26041    52525121  F2M53  BCD     '  RA13A'
26042    01042112
26043    52046101         BCD     ' 4/10(14),6/01,5/17,5/01,3/20''
26044    00740104
26045    34730661
26046    00017305
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26047    61010773
26050    05610001
26051    73036102
26052    00371212
26053    52527121  F2M54  BCD     '  YA12A'
26054    01042112
26055    52046101         BCD     ' 4/10(14),6/01,5/17,5/01,3/20''
26056    00740104
26057    34730661
26060    00017305
26061    61010773
26062    05610001
26063    73036102
26064    00371212
26065    52525121  F2M55  BCD     '  RA12A'
26066    01042112
26067    52046101         BCD     ' 4/10(14),6/01,5/17,5/01,3/20''
26070    00740104
26071    34730661
26072    00017305
26073    61010773
26074    05610001
26075    73036102
26076    00371212
26077    52527121  F2M56  BCD     '  YA11A'
26100    01042112
26101    52046101         BCD     ' 4/10(14),5/01,4/21,5/17,6/07''
26102    00740104
26103    34730561
26104    00017304
26105    61030173
26106    05610107
26107    73066100
26110    07371212
26111    52525121  F2M57  BCD     '  RA11A'
26112    01042112
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26113    52046101          BCD     ' 4/10(14),5/01,4/21,5/17,6/07''
26114    00740104
26115    34730561
26116    00017304
26117    61020173
26120    05610107
26121    73066100
26122    07371212
26123    52527021  F2M58   BCD     '  YA10A'
26124    01002112
26125    52046101          BCD     ' 4/11(14),6/07,5/17,5/01,4/21''
26126    01740104
26127    34730461
26130    00077305
26131    61010773
26132    05610001
26133    73046102
26134    01371212
26135    52525121  F2M59   BCD     '  RA10A'
26136    01002112
26137    52046101          BCD     ' 4/11(14),6/07,5/17,5/01,4/21''
26140    01740104
26141    34730461
26142    00077305
26143    61010773
26144    05610001
26145    73046102
26146    01371212
26147    52527021  F2M60   BCD     '  YA09A'
26150    00112112
26151    52046101          BCD     ' 4/11(14),6/07,5/16,5/01''
26152    01740104
26153    34730461
26154    00077305
26155    61010473
26156    05610001
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26157    37121212
26160    52525121  F2M61   BCD     '  RA09A'
26161    00112112
26162    52046101          BCD     ' 4/11(14),6/07,5/16,5/01''
26163    01740104
26164    34730661
26165    00077305
26166    61010473
26167    05610001
26170    37121212
26171    52527021  F2M62   BCD     '  YA08A'
26172    00102112
26173    52046101          BCD     ' 4/11(14),6/07,5/16,5/01''
26174    01740104
26175    34730661
26176    00077305
26177    61010673
26200    05610001
26201    37121212
26202    52525121  F2M63   BCD     '  RA08A'
26203    00102112
26204    52046101          BCD     ' 4/11(14),6/07,5/16,5/01''
26205    01740104
26206    34730661
26207    00077305
26210    61010673
26211    05610001
26212    37121212
26213    52527021  F2M64   BCD     '  YA07A'
26214    00072112
26215    52046101          BCD     ' 4/11(14),6/07,5/16,5/01''
26216    01740104
26217    34730661
26220    00077305
26221    61010673
26222    05610001
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26223    37121212
26224    52525121  F2M65  BCD      '  RA07A'
26225    00072112
26226    52046101         BCD      ' 4/11(14),6/07,5/16,5/01''
26227    01740104
26230    34736461
26231    00017305
26232    61016473
26233    05616001
26234    37121212
26235    52527221  F2M66  BCD      '  YA06A'
26236    00062112
26237    52046101         BCD      ' 4/12(14),5/01,5/16,6/08''
26240    01740104
26241    34736461
26242    00017305
26243    61016473
26244    05616010
26245    37121212
26246    52525121  F2M67  BCD      '  RA06A'
26247    00062112
26250    52046101         BCD      ' 4/12(14),5/01,5/16,6/08''
26251    01740104
26252    34736461
26253    00017305
26254    61016473
26255    05616010
26256    37121212
26257    52526221  F2M68  BCD      '  DA05A TESTS SET'
26260    00052112
26261    63256263
26262    62126225
26263    63121212
26264    52056101         BCD      ' 5/16(37),4/12=18 NOT GROUNDED (14)''
26265    01740307
26266    34736461
```



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26267    01024001
26270    10124546
26271    63122751
26272    46644524
26273    25241274
26274    01043437
26275    52526221  F2M69  BCD      '  DA04A TESTS SET'
26276    00042112
26277    63256263
26300    62126225
26301    63121212
26302    52056101         BCD      ' 5/16(37),4/12=33 NOT GROUNDED (14)''
26303    01740307
26304    34736461
26305    01024003
26306    10124546
26307    63122751
26310    46644524
26311    25241274
26312    01043437
26313    52526221  F2M70  BCD      '  DA03A TESTS SET'
26314    00032112
26315    63256263
26316    62126225
26317    63121212
26320    52056101         BCD      ' 5/16(37),4/12=36 NOT GROUNDED (14)''
26321    01740307
26322    34736461
26323    01024003
26324    10124546
26325    63122751
26326    46644524
26327    25241274
26330    01043437
26331    52522346  F2M71  BCD      '  CONTROLLER ADDRESS REGISTER AFFECTED BY POT T0'
26332    45635146
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26333    43432551
26334    12212424
26335    51256262
26336    12512527
26337    31626325
26340    51122126
26341    26252363
26342    25241222
26343    70124746
26344    63126346
26345    12233021          BCD     ' CHANNEL'
26346    45452543
26347    52056100          BCD     ' 5/04(15),5/01,5/02''
26350    04740105
26351    34730561
26352    00017305
26353    61000237
26354    52522346  F2M72   BCD     '  CONTROLLER INTERFERING WITH CHANNEL PIN'
26355    45635146
26356    43432551
26357    12314563
26360    25512525
26361    51314527
26362    12663163
26363    30122330
26364    21454525
26365    43124731
26366    45121212
26367    52056101          BCD     ' 5/16,5/17,5/18''
26370    06730561
26371    01077305
26372    61011037
26373    52522124  F2M73   BCD     '  ADDRESS 00.000.00 NOT VERIFIED IN 120 MILLISEC'
26374    24512562
26375    62120000
26376    40000000
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26377    40000012
26400    45466312
26401    65255131
26402    26312524
26403    12314512
26404    01020012
26405    44314343
26406    31622523
26407    52626321          BCD     ' STATE SEQUENCING SHOULD BE STATES 0.4.1''
26410    63251262
26411    25506425
26412    45233145
26413    27126230
26414    46644324
26415    12222512
26416    62632163
26417    25621200
26420    40044001
26421    37121212
26422    52522124  F2M73A  BCD     '  ADDRESS 00.000.00 VERIFIED WITHIN 70 MILLISEC'
26423    24512562
26424    62120000
26425    40000000
26426    40000012
26427    65255131
26430    26312524
26431    12663163
26432    30314512
26433    07001244
26434    31434331
26435    62252312
26436    52633144          BCD     ' TIME SHOULD BE 116 MILLISEC'
26437    25126230
26440    46644324
26441    12222512
26442    01010412
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26443    44314343
26444    31622523
26445    52626321          BCD     ' STATE SEQUENCING SHOULD BE STATES 0-4-1'
26446    63251262
26447    25506425
26450    45233145
26451    27126230
26452    46644324
26453    12222512
26454    62632163
26455    25621200
26456    40044001
26457    37121212
26460    52522124  F2M74   BCD     '  ADDRESS 00-000-00 NOT VERIFIED IN 500 MILLISEC'
26461    24512562
26462    62120000
26463    40000000
26464    40000012
26465    45466312
26466    65255131
26467    26312524
26470    12314512
26471    05000012
26472    44314343
26473    31622523
26474    52626321          BCD     ' STATE SEQUENCING SHOULD BE STATES 0-4-2-1'
26475    63251262
26476    25506425
26477    45233145
26500    27126230
26501    46644324
26502    12222512
26503    62632163
26504    25621200
26505    40044002
26506    40013712
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26507    52522124  F2M74A  BCD     '  ADDRESS 00-000-00 VERIFIED WITHIN 120 MILLISEC'
26510    24512562
26511    62120000
26512    40000000
26513    40000012
26514    65255131
26515    26312524
26516    12663163
26517    36314512
26520    01000012
26521    44314343
26522    31622523
26523    52633144          BCD     ' TIME SHOULD BE GREATER THAN 140 MILLISEC'
26524    65126230
26525    46644324
26526    12222512
26527    27512521
26530    63255112
26531    63302145
26532    12010400
26533    12443143
26534    43316225
26535    03121212
26536    52626321          BCD     ' STATE SEQUENCING SHOULD BE STATES 0-4-2-1'
26537    63251262
26540    25506425
26541    45233145
26542    27126230
26543    46644324
26544    12222512
26545    62632163
26546    25621200
26547    40044002
26550    40013712
26551    52522124  F2M75   BCD     '  ADDRESS 37-377-37 NOT VERIFIED IN 500 MILLISEC'
26552    24512562
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26553    62120307
26554    40030707
26555    40030712
26556    45466312
26557    65255131
26560    26312524
26561    12314512
26562    05000012
26563    44314343
26564    31622523
26565    52506423          BCD     ' QUCAO, VUCAO, XUCAO, ZUCAO, OR BAD HEADER'
26566    21007312
26567    65542321
26570    00731267
26571    64232100
26572    73127164
26573    23210073
26574    12465112
26575    22212412
26576    30252124
26577    25511212
26600    52036100          BCD     ' 2/01,2/05,3/01,3/02,3/03,3/04,3/05,3/08,3/09,3/10,'
26601    01730361
26602    00057303
26603    61000173
26604    03610002
26605    73036100
26606    03730361
26607    00047303
26610    61000573
26611    03610010
26612    73036100
26613    11730361
26614    01007312
26615    52036101          BCD     ' 3/17,3/18''
26616    07730361
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26617    01103712
26620    52522124  F2M76   BCD     '  ADDRESS 20=000=00 NOT VERIFIED IN 500 MILLISEC'
26621    24512562
26622    62120200
26623    40000000
26624    40000012
26625    45466312
26626    65255131
26627    26312524
26630    12314512
26631    05000012
26632    44314343
26633    31622523
26634    52222124          BCD     ' BAD HEADER'
26635    12302821
26636    24255112
26637    52016100          BCD     ' 1/05,1/06,3/04,3/05,3/08,3/09,3/11,3/12(26=28)''
26640    05730161
26641    00067303
26642    61000473
26643    03610005
26644    73036100
26645    10730361
26646    00117303
26647    61010173
26650    03610102
26651    74020440
26652    02103437
26653    52522124  F2M77   BCD     '  ADDRESS 10=000=00 NOT VERIFIED IN 500 MILLISEC'
26654    24512562
26655    62120100
26656    40000000
26657    40000012
26660    45466312
26661    65255131
26662    26312524
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26663    12314512
26664    05000012
26665    44314343
26666    31622523
26667    52222124          BCD     ' BAD HEADER'
26670    12300521
26671    24255112
26672    52236100          BCD     ' 3/04,3/05,3/09(27+28)''
26673    04730361
26674    00057303
26675    61001174
26676    02074002
26677    10343712
26700    52532124  F2M78   BCD     '  ADDRESS 04+000+00 NOT VERIFIED IN 500 MILLISEC'
26701    24512562
26702    62120004
26703    40000000
26704    40000012
26705    45466312
26706    65255131
26707    26312524
26710    12314512
26711    05000012
26712    44314343
26713    31622523
26714    52222124          BCD     ' BAD HEADER'
26715    12300521
26716    24255112
26717    52236100          BCD     ' 2/05,3/02,3/04,3/11,3/12(26+28)''
26720    04730361
26721    00027303
26722    61000473
26723    03610101
26724    73036101
26725    02747206
26726    40021034
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26727    37121212
26730    52532124  F2M79   BCD     '  ADDRESS 02+000+00 NOT VERIFIED IN 500 MILLISEC'
26731    24512562
26732    62120002
26733    40000000
26734    40000012
26735    45466312
26736    65255131
26737    26312524
26740    12314512
26741    05000012
26742    44314343
26743    31622523
26744    52222124          BCD     ' BAD HEADER'
26745    12300521
26746    24255112
26747    52236100          BCD     ' 2/05,3/02,3/04,3/11(26+28)''
26750    04730361
26751    00027303
26752    61000473
26753    03610101
26754    74020440
26755    02103437
26756    52532124  F2M80   BCD     '  ADDRESS 01+000+00 NOT VERIFIED IN 500 MILLISEC'
26757    24512562
26760    62120001
26761    40000000
26762    40000012
26763    45466312
26764    65255131
26765    26312524
26766    12314512
26767    05000012
26770    44314343
26771    31622523
26772    52222124          BCD     ' BAD HEADER'
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DISCW  TAP=3,C                          PAGE 359

26773    12302521
26774    24255112
26775    52016100          BCD     ' 1/01,1/03,1/04,1/06,2/05,3/02,3/04,3/08,3/11,3/12'
26776    01730161
26777    00037303
27000    61000473
27001    01610006
27002    73026100
27003    05730361
27004    00027303
27005    61000473
27006    03610010
27007    73036101
27010    01730361
27011    01021212
27012    52740206          BCD     ' (26-28)''
27013    40021034
27014    37121212
27015    52522124  F2M81   BCD     '  ADDRESS 00-200-00 NOT VERIFIED IN 500 MILLISEC'
27016    24512562
27017    62120000
27020    40020000
27021    40000012
27022    45466312
27023    65255131
27024    26312524
27025    12314512
27026    05000012
27027    44314343
27030    31622523
27031    52222124          BCD     ' BAD HEADER'
27032    12302521
27033    24255112
27034    52016100          BCD     ' 1/04,3/05,3/08''
27035    04730361
27036    00057303
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DISCW  TAP=3,C                          PAGE 360

27037    61001037
27040    52522124  F2MR2   BCD     '  ADDRESS 00-100-00 NOT VERIFIED IN 500 MILLISEC'
27041    24512562
27042    62120000
27043    40010000
27044    40000012
27045    45466312
27046    65255131
27047    26312524
27050    12314512
27051    05000012
27052    44314343
27053    31622523
27054    52222124          BCD     ' BAD HEADER'
27055    12302521
27056    24255112
27057    52036100          BCD     ' 3/08,3/09(27)''
27060    10730361
27061    00117402
27062    07343712
27063    52522124  F2M83   BCD     '  ADDRESS 00-040-00 NOT VERIFIED IN 500 MILLISEC'
27064    24512562
27065    62120000
27066    40000400
27067    40000012
27070    45466312
27071    65255131
27072    26312524
27073    12314512
27074    05000012
27075    44314343
27076    31622523
27077    52222124          BCD     ' BAD HEADER'
27100    12302521
27101    24255112
27102    52036100          BCD     ' 3/04,3/05,3/09,3/11(26-28)''
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27103    04730361
27104    00057303
27105    61001173
27106    03610101
27107    74020440
27110    02103437
27111    52522124  F2M84  BCD     '  ADDRESS 00*020*00 NOT VERIFIED IN 500 MILLISEC'
27112    24512562
27113    62120000
27114    40000200
27115    40000012
27116    45466312
27117    65255131
27120    66312524
27121    12314512
27122    05000012
27123    44314343
27124    31622523
27125    52222124          BCD     ' BAD HEADER'
27126    12302521
27127    24255112
27130    52036100          BCD     ' 3/02,3/04(27*28)''
27131    02730361
27132    00047402
27133    07400210
27134    34371212
27135    52522124  F2M85  BCD     '  ADDRESS 00*010*00 NOT VERIFIED IN 500 MILLISEC'
27136    24512562
27137    62120000
27140    40000100
27141    40000012
27142    45466312
27143    65255131
27144    66312524
27145    12314512
27146    05000012
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27147    44314343
27150    31622523
27151    52222124          BCD     ' BAD HEADER'
27152    12302521
27153    24255112
27154    52036100          BCD     ' 3/02,3/04,3/11(26*28)''
27155    02730361
27156    00047303
27157    61010174
27160    02064002
27161    10343712
27162    52522124  F2M86  BCD     '  ADDRESS 00*004*00 NOT VERIFIED IN 500 MILLISEC'
27163    24512562
27164    62120000
27165    40000004
27166    40000012
27167    45466312
27170    65255131
27171    66312524
27172    12314512
27173    05000012
27174    44314343
27175    31622523
27176    52222124          BCD     ' BAD HEADER'
27177    12302521
27200    24255112
27201    52026100          BCD     ' 2/05,3/02,3/05(27*28)''
27202    02730361
27203    00027303
27204    61000574
27205    02074002
27206    10343712
27207    52522124  F2M87  BCD     '  ADDRESS 00*002*00 NOT VERIFIED IN 500 MILLISEC'
27210    24512562
27211    62120000
27212    40000002
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27213    40000012
27214    45466312
27215    65255131
27216    26312524
27217    12314512
27220    05000012
27221    44314343
27222    31622523
27223    52222124          BCD     ' BAD HEADER'
27224    12302521
27225    24255112
27226    52036100          BCD     ' 3/02,3/05(27=28)''
27227    02730361
27230    00057402
27231    07400210
27232    34371212
27233    52522124  F2M88   BCD     '  ADDRESS 00=001=00 NOT VERIFIED IN 500 MILLISEC'
27234    24512562
27235    62120000
27236    40000001
27237    40000012
27240    45466312
27241    65255131
27242    26312524
27243    12314512
27244    05000012
27245    44314343
27246    31622523
27247    52222124          BCD     ' BAD HEADER'
27250    12302521
27251    24255112
27252    52036100          BCD     ' 3/05(28)''
27253    05740210
27254    34371212
27255    52524721  F2M89   BCD     '  PAVA ERRONIOUSLY LOW'
27256    65211225
```



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27257    51514445
27260    31466462
27261    43701243
27262    46661212
27263    52026102          BCD     ' 2/21,2/2/,2/23,2/24(29),6/21(47)''
27264    01730261
27265    02617302
27266    61020373
27267    02610204
27270    74021134
27271    73066102
27272    01740407
27273    34371212
27274    52520747  F2M90   BCD     '  7PAVA0'
27275    21652100
27276    52026102          BCD     ' 2/21(29)''
27277    01740211
27300    34371212
27301    52520747  F2M91   BCD     '  7PAVA0'
27302    21652100
27303    52026102          BCD     ' 2/22(29)''
27304    02740211
27305    34371212
27306    52520747  F2M92   BCD     '  7PAVA0'
27307    21652100
27310    52026102          BCD     ' 2/22(29)''
27311    02740211
27312    34371212
27313    52520747  F2M93   BCD     '  7PAVA0'
27314    21652100
27315    52026102          BCD     ' 2/22(29)''
27316    02740211
27317    34371212
27320    52520747  F2M94   BCD     '  7PAVA0'
27321    21652100
27322    52026102          BCD     ' 2/22(29)''
```

```
27323    02740211
27324    34371212
27325    52520747  F2M95  BCD      '  7PAVA0'
27326    21652100
27327    52026102         BCD      ' 2/22(29)''
27330    02740211
27331    34371212
27332    52520747  F2M96  BCD      '  7PAVA0'
27333    21652100
27334    52026102         BCD      ' 2/23(29)''
27335    02740211
27336    34371212
27337    52074721  F2M97  BCD      ' 7PAVA0'
27340    65210212
27341    52026102         BCD      ' 2/23(29)''
27342    02740211
27343    34371212
27344    52520747  F2M98  BCD      '  7PAVA0'
27345    21652100
27346    52026102         BCD      ' 2/23(29)''
27347    02740211
27350    34371212
27351    52520747  F2M99  BCD      '  7PAVA0'
27352    21652100
27353    52026102         BCD      ' 2/23(29)''
27354    02740211
27355    34371212
27356    52520747  F2M100 BCD      '  7PAVA0'
27357    21652100
27360    52026102         BCD      ' 2/23(29)''
27361    02740211
27362    34371212
27363    52520747  F2M101 BCD      '  7PAVA0'
27364    21652100
27365    52026102         BCD      ' 2/21(29),6/21(47)''
27366    01740211
```



```
27367    34730661
27370    02017404
27371    07343712
27372    52520747  F2M102 BCD      '  7PAVA0'
27373    21652100
27374    52026102         BCD      ' 2/22(29),6/21(47)''
27375    02740211
27376    34730661
27377    02017404
27400    07343712
27401    52520747  F2M103 BCD      '  7PAVA0'
27402    21652100
27403    52026102         BCD      ' 2/22(29),6/21(47)''
27404    02740211
27405    34730661
27406    02017404
27407    07343712
27410    52520747  F2M104 BCD      '  7PAVA0'
27411    21652100
27412    52026102         BCD      ' 2/22(29),6/21(47)''
27413    02740211
27414    34730661
27415    02017404
27416    07343712
27417    52520747  F2M105 BCD      '  7PAVA0'
27420    21652100
27421    52026102         BCD      ' 2/22(29),6/21(47)''
27422    02740211
27423    34730661
27424    02017404
27425    07343712
27426    52520747  F2M106 BCD      '  7PAVA0'
27427    21652100
27430    52026102         BCD      ' 2/22,2/24(29),6/21(47)''
27431    02730261
27432    02047402
```

```
27433    11347306
27434    61020174
27435    04073437
27436    52520747  F2M107 BCD     '  7PAVA0'
27437    21652100
27440    52026102         BCD     ' 2/23(29),6/21(47)''
27441    03740211
27442    34730661
27443    02017404
27444    07343712
27445    52520747  F2M108 BCD     '  7PAVA0'
27446    21652100
27447    52026102         BCD     ' 2/23(29),6/21(47)''
27450    03740211
27451    34730461
27452    02017404
27453    07343712
27454    52520747  F2M109 BCD     '  7PAVA0'
27455    21652100
27456    52026102         BCD     ' 2/23(29),6/21(47)''
27457    03740211
27460    34730661
27461    02017404
27462    07343712
27463    52520747  F2M110 BCD     '  7PAVA0'
27464    21652100
27465    52026102         BCD     ' 2/23(29),6/21(47)''
27466    03740211
27467    34730661
27470    02017404
27471    07343712
27472    52520747  F2M111 BCD     '  7PAVA0'
27473    21652100
27474    52026102         BCD     ' 2/23,2/24(29),6/21(47)''
27475    03730261
27476    02047402
```



```
27477    11347306
27500    61020174
27501    04073437
27502    52520662  F2M112 BCD     '  6SI8A0'
27503    31462100
27504    52026101         BCD     ' 2/14,5/10,5/12(35)''
27505    04730561
27506    01007305
27507    61010274
27510    03053437
27511    52520662  F2M113 BCD     '  6SI8A0'
27512    31462100
27513    52056101         BCD     ' 5/10(35)''
27514    00740305
27515    34371212
27516    52526242  F2M114 BCD     '  SkS 16026 SKIPS IN STATE 1'
27517    62120106
27520    00020612
27521    62423147
27522    62123145
27523    12626321
27524    63251201
27525    52056101         BCD     ' 5/10(35)''
27526    00740305
27527    34371212
27530    52526242  F2M115 BCD     '  SkS 12226 SKIPS IN STATE 1'
27531    62120102
27532    02020612
27533    62423147
27534    62123145
27535    12626321
27536    63251201
27537    52056101         BCD     ' 5/10(35)''
27540    00740305
27541    34371212
27542    52522124  F2M116 BCD     '  ADDRESS 00•000•00 NOT VERIFIED IN 500 MILLISEC'
```

```
27543    24512562
27544    62120000
27545    40000000
27546    40000012
27547    45466312
27550    65255131
27551    26312524
27552    12314512
27553    05000012
27554    44314343
27555    31620523
27556    52626321          BCD     ' STATE SEQUENCING SHOULD BE STATES 0-3-4-1!!
27557    63251262
27560    25506425
27561    45233145
27562    27126230
27563    46644324
27564    12222512
27565    62632163
27566    25621200
27567    40034004
27570    40013712
27571    52523124  F2M117 BCD     '  ADDRESS 00-000-00 NOT VERIFIED WITHIN 70 MILLISEC'
27572    24512562
27573    62120000
27574    40000000
27575    40000012
27576    45466312
27577    65255131
27600    26312524
27601    12663163
27602    30314512
27603    07001244
27604    31434331
27605    62252312
27606    52626321          BCD     ' STATE SEQUENCING SHOULD BE STATES 0-3-4-1'
```



```
27607    63251262
27610    25506425
27611    45233145
27612    27126230
27613    46644324
27614    12222512
27615    62632163
27616    25621200
27617    40034004
27620    40011212
27621    52302521          BCD     ' HEADER MAY HAVE BEEN MISREAD ONCE!!
27622    24255112
27623    44217212
27624    30216525
27625    12220525
27626    45124431
27627    62512521
27630    24124445
27631    63253712
27632    52522124  F2M118 BCD     '  ADDRESS 37-377-37 NOT VERIFIED WITHIN 70 MILLISEC'
27633    24512562
27634    62120307
27635    40030707
27636    40030712
27637    45466312
27640    65255131
27641    26312524
27642    12663163
27643    30314512
27644    07001244
27645    31434331
27646    62252312
27647    52314512          BCD     ' IN STATE 3'
27650    62632163
27651    25120312
27652    52222124          BCD     ' BAD HEADER'
```

```
27653    12302521
27654    24255112
27655    52026100          BCD     ' 2/01,3/10(28)''
27656    01730361
27657    01007402
27660    10343712
27661    52522124  F2M119  BCD     '  ADDRESS 00=000=02 NOT VERIFIED WITHIN 70 MILLISEC'
27662    24512562
27663    62120000
27664    40000000
27665    40000212
27666    45466312
27667    65255131
27670    26312524
27671    12663163
27672    30314512
27673    07001244
27674    31434331
27675    62252312
27676    52314512          BCD     ' IN STATE 3'
27677    62632163
27700    25120312
27701    52222124          BCD     ' BAD HEADER'
27702    12302521
27703    24255112
27704    52026100          BCD     ' 2/05,3/05(28)''
27705    05730361
27706    00057402
27707    10343712
27710    52522124  F2M120  BCD     '  ADDRESS 00=000=01 NOT VERIFIED WITHIN 70 MILLISEC'
27711    24512562
27712    62120000
27713    40000000
27714    40000112
27715    45466312
27716    65255131
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27717    26312524
27720    12663163
27721    30314512
27722    07001244
27723    31434331
27724    62252312
27725    52314512          BCD     ' IN STATE 3'
27726    62632163
27727    25120312
27730    52222124          BCD     ' BAD HEADER'
27731    12302521
27732    24255112
27733    52026100          BCD     ' 2/05(28)''
27734    05740210
27735    34371212
27736    52522551  F2M121  BCD     '  ERROR SET DURING VERIFICATION OF ADDRESS 00=000=00'
27737    51465112
27740    62256312
27741    24645131
27742    45271265
27743    25513126
27744    31232163
27745    31464512
27746    46261221
27747    24245125
27750    62621200
27751    00400000
27752    00400000
27753    52212500          BCD     ' AE02A=203FA=2G03A=2IXDA''
27754    02211302
27755    00032621
27756    33022700
27757    03213302
27760    31672421
27761    37121212
27762    52522551  F2M122  BCD     '  ERROR SET DURING VERIFICATION OF ADDRESS 00=000=00'
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```
27763    51465112
27764    62256712
27765    24645131
27766    45271265
27767    25513126
27770    31230163
27771    31464512
27772    46261221
27773    24245125
27774    62621200
27775    00400000
27776    00400000
27777    52622524          BCD     ' SEDA0=0G01A=202FA=0G02A=2TUGA'
30000    21001300
30001    27000121
30002    33020002
30003    26213300
30004    27000221
30005    33026364
30006    27211212
30007    52702521          BCD     ' YEAA0=1G01A=1G02A=1G03A=204FA=2M8NA'
30010    21001301
30011    27000121
30012    33012700
30013    02213301
30014    27000321
30015    33020004
30016    26213302
30017    44464521
30020    52121212          BCD     '       =202FA=2M8NA=2CK0A''
30021    12122002
30022    00022621
30023    33024446
30024    45213302
30025    23420021
30026    37121212
```



```
                  *
                  *       MESSAGES - FUNCTION 3
                  *
30027    52522167 F3M1    BCD     '  AX03A=3C12A=2MHAA=8BUCA'
30030    00032113
30031    03230102
30032    21330244
30033    30212133
30034    10226423
30035    21121212
30036    52121212          BCD     '    7MHAA0=9Y10A=8Y11A=9Y12A=9Y13A=8Y14A'
30037    07443021
30040    21001311
30041    70010021
30042    20107001
30043    01212011
30044    70010221
30045    20117001
30046    03212010
30047    70010421
30050    52216400          BCD     ' A002A=201FA=2FWZB=2BNCA=6Q20A'
30051    02211302
30052    00012621
30053    33022651
30054    71223302
30055    22452321
30056    33065002
30057    00211213
30060    52121202          BCD     '   2BNCA=8FHAF=2X03A'
30061    22452321
30062    13102630
30063    21263302
30064    67000321
30065    52212600          BCD     ' AF02A=201FA=2IUFA=4Q20A'
30066    02211302
30067    00012621
```

```
30070    33023164
30071    26213304
30072    50020021
30073    52016101          BCD     ' 1/12,1/14(2),4/01,4/03(24),5/04,5/05(36),1/16,2/13(39),'
30074    02730161
30075    01047402
30076    34730461
30077    00017304
30100    61000374
30101    02043473
30102    05610004
30103    73056100
30104    05740306
30105    34730161
30106    01067302
30107    61010374
30110    03113473
30111    52066100          BCD     ' 6/01(41),6/13(42),1/22,2/25(45),6/12(46)''
30112    01740401
30113    34730661
30114    01037404
30115    02347301
30116    61020273
30117    02610205
30120    74040534
30121    73066101
30122    02740406
30123    34371212
30124    52520244  F3M2    BCD     '  2MHAA'
30125    30212112
30126    52066101          BCD     ' 6/13(42),5/04,5/05(36),4/01(24)''
30127    03740402
30130    34730561
30131    00047305
30132    61000574
30133    03063473
```



```
30134    04610001
30135    74020434
30136    37121212
30137    52520244  F3M3    BCD     '  2MHAA'
30140    30212112
30141    52066101          BCD     ' 6/13(42),5/05(36)''
30142    03740402
30143    34730561
30144    00057403
30145    06343712
30146    52520244  F3M4    BCD     '  2MHAA'
30147    30212112
30150    52066101          BCD     ' 6/12(46),5/05(36)''
30151    02740406
30152    34730561
30153    00057403
30154    06343712
30155    52522523  F3M6    BCD     '  ECW NOT RECEIVED DURING WRITE ATTEMPT'
30156    66124546
30157    63125125
30160    23253165
30161    25241224
30162    64513145
30163    27126651
30164    31632512
30165    21636325
30166    44476312
30167    52216400          BCD     ' AU01A=207FA=2CK0A'
30170    01211302
30171    00072621
30172    33022342
30173    00211212
30174    52022342          BCD     ' 2CKBA=207FA=2U01A=2CK0A'
30175    22211302
30176    00072621
30177    33026400
```

```
30200    01213302
30201    23420021
30202    52216400          BCD     ' AU04A=207FA=3U02A=2H07A=2CT1A=2CK0A'
30203    04211302
30204    00072A21
30205    33036400
30206    02213302
30207    30000721
30210    33022363
30211    01213302
30212    23420021
30213    52226400          BCD     ' AU04A=207FA=3U02A=246BA=2CK0A'
30214    04211302
30215    00072A21
30216    33036400
30217    02213302
30220    04062221
30221    33022342
30222    00211212
30223    52062523          BCD     ' 6ECYA0=207FA=2U04A''
30224    70210013
30225    02000726
30226    21330264
30227    00042137
30230    52522346  F3M7    BCD     '  CONTROLLER DID NOT SEQUENCE TO STATE 0 FROM STATE 7''
30231    45635146
30232    43432551
30233    12243124
30234    12454663
30235    12622550
30236    64254523
30237    25126344
30240    12626321
30241    63251200
30242    12265146
30243    44126263
```



```
30244    21632512
30245    07371212
30246    52522224  F3M8    BCD     '  BF03A'
30247    00032112
30250    52016101          BCD     ' 1/10,1/14(11)''
30251    00730161
30252    01047401
30253    01343712
30254    52522346  F3M9    BCD     '  CONTROLLER NOT READY AFTER 112 MILLISEC''
30255    45635146
30256    43432551
30257    12454663
30260    12512521
30261    24701221
30262    26632551
30263    12010102
30264    12443143
30265    43316225
30266    23371212
30267    52526451  F3M10   BCD     '  WRITE MONITOR OR SEARCH ERROR = ADDRESS 00=000=00''
30270    31632512
30271    44464531
30272    63465112
30273    46511262
30274    25215123
30275    30122551
30276    51465112
30277    40122124
30300    24512562
30301    62120000
30302    40000000
30303    40000037
30304    52520625  F3M11   BCD     '  6ECYA0=207FA=2U04A'
30305    23702100
30306    13020007
30307    26213302
```

```
30310    64000421
30311    52216400          BCD     ' AU04A.207FA.2IUEA.2CT2A.2CK0A'
30312    04211302
30313    00072621
30314    33023164
30315    25213302
30316    23630221
30317    33022342
30320    00211212
30321    52226400          BCD     ' BU04A.2VFCA.2U02A.2CT5A'
30322    04211302
30323    65262321
30324    33026400
30325    02213302
30326    23630521
30327    52026100          BCD     ' 2/02,2/07,2/13,2/21,2/18,3/05,1/16,3/14''
30330    02730261
30331    00077302
30332    61010373
30333    02610201
30334    73026101
30335    10730361
30336    00057301
30337    61010673
30340    03610104
30341    37121212
30342    52522147  F3M12   BCD     '  APO1A.2SGSX.8RP0A'
30343    00012113
30344    02622762
30345    67331051
30346    47002112
30347    52226200          BCD     ' BS01A.2SSRX.1S02A'
30350    01211302
30351    62625167
30352    33016200
30353    02211212
```



```
30354    52074723          BCD     ' 7PCHA0.0P01A.1S01A+1P01A.0S01A'
30355    30210013
30356    00470001
30357    21330162
30360    00012120
30361    01470001
30362    21330062
30363    00012112
30364    52212500          BCD     ' AE01A.207FA.2U02A.2CT5A.8PCHA.2X03A.2CK0A'
30365    01211302
30366    00072621
30367    33026400
30370    02213302
30371    23630521
30372    33104723
30373    30213302
30374    67000321
30375    33022342
30376    00211212
30377    52222500          BCD     ' BE02A. SAME'
30400    02211312
30401    62214425
30402    52212500          BCD     ' AE03A. SAME'
30403    03211312
30404    62214425
30405    52046102          BCD     ' 4/24,3/23,3/22,3/24,6//11,4/15,4/16,4/24,4/25,4/20,4/19,'
30406    04730361
30407    02037303
30410    61020273
30411    03610204
30412    73066161
30413    01017304
30414    61010573
30415    04610106
30416    73046102
30417    04730461
```

```
30420    02057304
30421    61020073
30422    04610111
30423    73121212
30424    52036102          BCD     ! 3/21,5/03,5/04,1/17,6/11,6/12!!
30425    01730561
30426    00037305
30427    61000473
30430    01610107
30431    73066101
30432    01730661
30433    01023712
30434    52526451  F3M13   BCD     !  WRITE ERROR = DATA=40000000!
30435    31632512
30436    25515146
30437    51124212
30440    24216321
30441    13040000
30442    00000000
30443    00121212
30444    52046101          BCD     ! 4/15,4/24,4/25,6/23,6/12,3/20,3/18,1/17!!
30445    05730461
30446    02047304
30447    61020573
30450    06610303
30451    73066101
30452    02730361
30453    02007303
30454    61011073
30455    01610107
30456    37121212
30457    52526451  F3M14   BCD     !  WRITE ERROR = DATA=20000000!
30460    31632512
30461    25515146
30462    51124212
30463    24216321
```



```
30464    13020000
30465    00000000
30466    00121212
30467    52046102          BCD     ! 4/24,4/25,4/15,6/12!!
30470    04730461
30471    02057304
30472    61010573
30473    06610102
30474    37121212
30475    52526451  F3M15   BCD     !  WRITE ERROR = DATA=10000000!
30476    31632512
30477    25515146
30500    51124212
30501    24216321
30502    13010000
30503    00000000
30504    00121212
30505    52046101          BCD     ! 4/15,4/19,4/20,4/25,6/12!!
30506    05730461
30507    01117304
30510    61020073
30511    04610205
30512    73066101
30513    02371212
30514    52526451  F3M16   BCD     !  WRITE ERROR = DATA=04000000!
30515    31632512
30516    25515146
30517    51124212
30520    24216321
30521    13000400
30522    00000000
30523    00121212
30524    52046102          BCD     ! 4/20,4/15,4/19,6/12!!
30525    00730461
30526    01057304
30527    61011173
```

```
30530    06610102
30531    37121212
30532    52526651  F3M17  BCD     ' WRITE ERROR - DATA=02000000'
30533    31632512
30534    25515146
30535    51124012
30536    24216321
30537    13000200
30540    00000000
30541    00121212
30542    52036102         BCD     ' 3/23,4/16,4/19,6/12''
30543    03730461
30544    01067304
30545    61011173
30546    06610102
30547    37121212
30550    52526651  F3M18  BCD     ' WRITE ERROR - DATA=01000000'
30551    31632512
30552    25515146
30553    51124012
30554    24216321
30555    13000100
30556    00000000
30557    00121212
30560    52036102         BCD     ' 3/23,3/21,4/16,6/11,5/03''
30561    03730361
30562    02017304
30563    61010473
30564    06610101
30565    73036100
30566    03371212
30567    52522330  F3M19  BCD     ' CHANNEL ACTIVE AFTER 500 MILLISEC''
30570    21454525
30571    43122123
30572    63316525
30573    12212663
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30574    25511205
30575    00001244
30576    31434331
30577    62252337
30600    52522330  F3M20  BCD     ' CHANNEL ADDRESS OR WORD COUNT INCREMENTING ERROR OR'
30601    21454525
30602    43122124
30603    24512562
30604    62124651
30605    12664651
30606    24122346
30607    64456312
30610    31452351
30611    25442545
30612    63314527
30613    12255151
30614    46511246
30615    51121212
30616    52475125         BCD     ' PREMATURE DISCONNECT'
30617    44216364
30620    51251224
30621    31622346
30622    45452523
30623    63121212
30624    52234664         BCD     ' COUNT IS COUNT $B CORE ADD OVERFLOW  ERRORS ''
30625    45631231
30626    62122346
30627    64456312
30630    62221223
30631    46512512
30632    21242412
30633    46652551
30634    26434666
30635    12122551
30636    51465162
30637    52371212
```

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30640    52522431  F3M21  BCD     ' DISC ERROR ON WRITE-DATA = 0, ADDRESS = 00-000-00''
30641    62231225
30642    51514451
30643    12464512
30644    66513163
30645    25402421
30646    63211213
30647    12007312
30650    21242451
30651    25626212
30652    13120000
30653    40000000
30654    40000037
30655    52522124  F3M22  BCD     ' ADDRESS 00-000-01 NOT VERIFIED AFTER 500 MILLISEC'
30656    24512563
30657    62120000
30660    40000000
30661    40000112
30662    45466312
30663    65255131
30664    26312524
30665    12212663
30666    25511205
30667    00001244
30670    31434331
30671    62252312
30672    52212663          BCD     ' AFTER 200 WORDS WRITTEN STARTING AT SECTOR 0'
30673    25511202
30674    00001266
30675    46512462
30676    12665131
30677    63632545
30700    12626321
30701    51633145
30702    27122163
30703    12622523
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30704    63465112
30705    00121212
30706    52221251          BCD     ' B REGISTER NOT COUNTING PROPERLY'
30707    25273162
30710    63255112
30711    45466312
30712    23466445
30713    63314527
30714    12475146
30715    47255143
30716    70121212
30717    52226400          BCD     ' B-01A-207FA-2FLBA-2CKDA'
30720    01211302
30721    00072621
30722    33022443
30723    22213302
30724    23420021
30725    52016100          BCD     ' 1/03,1/05,1/06(26),2/12(13)''
30726    03730141
30727    00057301
30730    61000674
30731    02063473
30732    02610102
30733    74010334
30734    37121212
30735    52522523  F3M23   BCD     ' ECW NOT RECEIVED DURING READ ATTEMPT'
30736    66124546
30737    63125125
30740    23253165
30741    25241224
30742    64513145
30743    27125126
30744    21241221
30745    63632544
30746    47631212
30747    52627245          BCD     ' SYNC BIT NOT RECORDED PROPERLY IN STATE 7'
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30750    23122231
30751    63124546
30752    63125125
30753    23465124
30754    25241247
30755    51464725
30756    51437012
30757    31451262
30760    63216325
30761    12071212
30762    52062523          BCD     ' 6FCYA0=205FA=0U04A'
30763    70210013
30764    02000526
30765    21330064
30766    00042112
30767    52121221          BCD     '   AJ04A=2RDTA=3J03A'
30770    64000421
30771    13025124
30772    63213303
30773    64000321
30774    52121222          BCD     '   BJ04A=205FA=2CT3A=2RDKA'
30775    64000421
30776    13020005
30777    26213302
31000    23630321
31001    33025124
31002    42211212
31003    52026100          BCD     ' 2/02,2/03,2/12,2/15,2/21,3/01,3/02,3/09,3/16,3/25,4/04,'
31004    02730361
31005    00037302
31006    61010273
31007    02610105
31010    73026102
31011    01730361
31012    00017303
31013    61000273
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31014    03610011
31015    73036101
31016    06730361
31017    02057304
31020    61000473
31021    52046100          BCD     ' 4/06,5/14,2/09,2/13,2/01,3/04,5/05''
31022    06730561
31023    01047302
31024    61001173
31025    02610103
31026    73026100
31027    01730361
31030    00047305
31031    61000537
31032    52522226  F3M24   BCD     '  BF01A=2BGCA=2IGAA'
31033    00012113
31034    02222723
31035    21330231
31036    27212112
31037    52222600          BCD     ' BF03A=2BGCA=2IGAA'
31040    03211302
31041    22272321
31042    33023127
31043    21211212
31044    52016101          BCD     ' 1/12,1/13(7)''
31045    02730161
31046    01037407
31047    34371212
31050    52522346  F3M25   BCD     '  CONTROLLER DID NOT SEQUENCE TO STATE 0 FROM STATE 5'
31051    45635146
31052    43432551
31053    12243124
31054    12454663
31055    12622550
31056    64254523
31057    25126346
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31060    12626321
31061    63251200
31062    12665146
31063    44126263
31064    21632512
31065    05121212
31066    52472123          BCD     ' PACKET BIT FOR PACKET 4 NOT RESET DURING PREVIOUS'
31067    42256312
31070    22316312
31071    26465112
31072    47212342
31073    25631204
31074    12454663
31075    12512562
31076    25631224
31077    64513145
31100    27124751
31101    25653144
31102    64621212
31103    52462241          BCD     ' OBJECT TEST DURING WRITE PHASE'
31104    25236312
31105    63256263
31106    12246451
31107    31452712
31110    66513163
31111    25124730
31112    21632512
31113    52016101          BCD     ' 1/12,1/13,2/02,2/04,2/08,2/09,2/12,2/13,2/15,2/16,4/04,'
31114    02730161
31115    01037302
31116    61000273
31117    02610304
31120    73026100
31121    10730261
31122    00117302
31123    61010273
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31124    02610103
31125    73026101
31126    05730261
31127    01067304
31130    61000473
31131    52046102          BCD     ' 4/22''
31132    02371212
31133    52525125  F3M26   BCD     '  READ DATA ERROR'
31134    21241224
31135    21632112
31136    25515144
31137    51121212
31140    52242163          BCD     ' DATA IS  DATA SB  CORE ADD OVERFLOW ERRORS ''
31141    21123162
31142    12122421
31143    63211262
31144    22121223
31145    46512512
31146    21242412
31147    46652551
31150    26434666
31151    12255151
31152    46516252
31153    37121212
31154    52016101  F3M27   BCD     ' 1/19,1/23,2/18,2/19,2/24,3/18,3/20,3/22,3/23,3/25,3/35,'
31155    11730161
31156    02037302
31157    61011273
31160    02610111
31161    73026102
31162    04730361
31163    01037303
31164    61020273
31165    03610202
31166    73036102
31167    03730361
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31170    02057303
31171    61030573
31172    52046101          BCD     ' 4/13,4/14,4/22,4/25,5/15,5/21,6/12,6/14''
31173    03730461
31174    01047304
31175    61020273
31176    04610205
31177    73056101
31200    05730561
31201    02017306
31202    61010273
31203    06610104
31204    37121212
31205    52016101  F3M28   BCD     ' 1/19,4/13,4/14,5/15''
31206    11730461
31207    01037304
31210    61010473
31211    05610105
31212    37121212
31213    52522330  F3M29   BCD     '  CHANNEL ERROR SET AFTER READ'
31214    21454525
31215    43122551
31216    51465112
31217    62256312
31220    21266325
31221    51125125
31222    21241212
31223    52242163          BCD     ' DATA = 00000000'
31224    21121312
31225    00000000
31226    00000000
31227    52016100          BCD     ' 1/03,1/04,1/17,2/16,2/18,2/19,2/20,3/18,3/20,3/21,3/22,'
31230    03730161
31231    00047301
31232    61010773
31233    02610106
```



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31234    73026101
31235    10730261
31236    01117302
31237    61020073
31240    03610110
31241    73036102
31242    00730361
31243    02017303
31244    61020273
31245    52036102          BCD     ' 3/23,3/24,4/16,4/17,4/18,4/19,4/20,4/22,4/24,4/25,5/03,'
31246    03730361
31247    02047304
31250    61010673
31251    04610107
31252    73046101
31253    10730461
31254    01117304
31255    61020073
31256    04610202
31257    73046102
31260    04730461
31261    02057305
31262    61000373
31263    52056100          BCD     ' 5/04,5/06''
31264    04730561
31265    00063712
31266    52522330  F3M30   BCD     '  CHANNEL ERROR SET AFTER READ'
31267    21454525
31270    43122551
31271    51465112
31272    62256312
31273    21266325
31274    51125125
31275    21241212
31276    52242163          BCD     ' DATA = 00000077'
31277    21121312
```

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31300    00000000
31301    00000707
31302    52036101          BCD     ' 3/18,3/21,3/22,3/23,4/16,4/17,4/18,4/19,4/20,4/24,4/25,'
31303    10730361
31304    02017303
31305    61020273
31306    03610203
31307    73046101
31310    06730461
31311    01077304
31312    61011073
31313    04610111
31314    73046102
31315    00730461
31316    02047304
31317    61020573
31320    52036102          BCD     ' 3/25,1/23!!'
31321    05730161
31322    02033712
31323    52526630  F3M31   BCD     '   HS NOT RECEIVED FROM CONTROLLER'
31324    62124546
31325    63125125
31326    23253165
31327    25241226
31330    51464412
31331    23464563
31332    51464343
31333    25511212
31334    52067230          BCD     ' 6YHGAD=OXJ6A'
31335    62210313
31336    00670206
31337    61121212
31340    52121270          BCD     '   YXJ6A=2DGCA,2IGAA'
31341    67000421
31342    17022227
31343    63213302
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31344    31272121
31345    52016102          BCD     ' 1/22,1/25,2/12,3/19,4/01,4/02,4/03,5/07!!'
31346    02730161
31347    02057302
31350    61010273
31351    03610111
31352    73046100
31353    01730461
31354    00027304
31355    61000373
31356    05610007
31357    57121212
31360    52522346  F3M32   BCD     '  CONTROLLER ADDRESS INCREMENTING ERROR DURING STATE 7'
31361    45635146
31362    43432551
31363    12212424
31364    51256262
31365    12314523
31366    51254425
31367    45633145
31370    27122551
31371    51465112
31372    24645131
31373    45271262
31374    63216325
31375    12071212
31376    52212424          BCD     ' ADDR IS  ADDR SB  ST ADDR  OVERFLOW ERRORS !!'
31377    51123162
31400    12122124
31401    24511262
31402    22121262
31403    63122124
31404    24511212
31405    46652551
31406    26434466
31407    12255151
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DISCW  TAP=3,C                          PAGE 395

31410    46516952
31411    37121212
31412    52022342  F3M33  BCD      ' 2CKRA=2BGDA=2X03A'
31413    51211302
31414    22272421
31415    33026700
31416    03211212
31417    52046100         BCD      ' 4/07(15),3/15,2/21,5/04,5/06,4/04''
31420    07740105
31421    34730361
31422    01057302
31423    61020173
31424    05610004
31425    73056100
31426    06730461
31427    00043712
31430    52046100  F3M34  BCD      ' 4/07,4/08(15),5/06(39)''
31431    07730461
31432    00107401
31433    05347305
31434    61000674
31435    03113437
31436    52056100  F3M35  BCD      ' 5/06(39)''
31437    06740311
31440    34371212
31441    52046100  F3M36  BCD      ' 4/08,4/04(15),5/04,5/06(30)''
31442    10730461
31443    00047401
31444    05347305
31445    61000473
31446    05610006
31447    74030034
31450    37121212
31451    52046100  F3M37  BCD      ' 4/08(15)''
31452    10740105
31453    34371212
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DISCW  TAP=3,C                          PAGE 396

31454    52046100  F3M38  BCD      ' 4/09(14),4/08(15),5/06(39)''
31455    11740104
31456    34730461
31457    00107401
31460    05347305
31461    61000674
31462    03113437
31463    52046100  F3M39  BCD      ' 4/04,4/09,5/02(14),5/04,5/06(39)''
31464    04730461
31465    00117305
31466    61000274
31467    01043473
31470    05610004
31471    73056100
31472    06740311
31473    34371212
31474    52056100  F3M40  BCD      ' 5/06(39)''
31475    06740311
31476    34371212
31477    52046100  F3M41  BCD      ' 4/04(14)''
31500    04740104
31501    34371212
31502    52046100  F3M42  BCD      ' 4/09(14)''
31503    11740104
31504    34371212
31505    52046100  F3M43  BCD      ' 4/09,4/10(14),5/05(30)''
31506    11730461
31507    01007401
31510    04347305
31511    61000574
31512    03003437
31513    52046100  F3M44  BCD      ' 4/04,4/10,5/02(14),5/05(30)''
31514    04730461
31515    01007305
31516    61000274
31517    01043473
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31520    05610005
31521    74030034
31522    37121212
31523    52056100  F3M45  BCD     ' 5/05(39)''
31524    05740311
31525    34371212
31526    52046101  F3M46  BCD     ' 4/10(14)''
31527    00740104
31530    34371212
31531    52046101  F3M47  BCD     ' 4/10,4/11(14),5/05(30)''
31532    00730461
31533     1017401
31534    04347305
31535    61000574
31536    03003437
31537    52046100  F3M48  BCD     ' 4/04,4/11,5/02(14),5/05(30)''
31540    04730461
31541    01017305
31542    61000274
31543    01043473
31544    05610005
31545    74030034
31546    37121212
31547    52056100  F3M49  BCD     ' 5/02(14)''
31550    00740104
31551    34371212
31552    52046101  F3M50  BCD     ' 4/11(14)''
31553    01740104
31554    34371212
31555    52046101  F3M51  BCD     ' 4/11,4/12(14)''
31556    01730461
31557    01027401
31560    04343712
31561    52046101  F3M52  BCD     ' 4/12(14)''
31562    00740104
31563    34371212
```



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31564    52520623  F3M53  BCD     '  6CKRA0'
31565    42512100
31566    52026102         BCD     ' 2/21(11)''
31567    01740101
31570    34371212
31571    52520026  F3M54  BCD     '  CF02A ERRONIOUSLY RESET AT TERMINATION OF STATE 7'
31572    00022112
31573    25515146
31574    45314464
31575    62437012
31576    51256225
31577    63122163
31600    12632451
31601    44314521
31602    63314445
31603    12462612
31604    62632163
31605    25120712
31606    52016101         BCD     ' 1/10(11)''
31607    00740101
31610    34371212
31611    52522346  F3M55  BCD     '  CONTROLLER ERRONIOUSLY CYCLED TO STATE 0 FROM STATE 7'
31612    45635146
31613    43432551
31614    12256151
31615    46453146
31616    64624370
31617    12237723
31620    43252412
31621    63461262
31622    63216325
31623    12001226
31624    51464412
31625    62632163
31626    25120712
31627    52623046         BCD     ' SHOULD BE IN STATE 3'
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31630    64432412
31631    22251231
31632    45126263
31633    21632512
31634    03121212
31635    52066102          BCD     ' 6/23(47),3/06(18)''
31636    03740407
31637    34730361
31640    00067401
31641    10343712
31642    52522421  F3M56   BCD     '  DATA NOT BEING TRANSMITTED WITHIN 1 MILLISEC OF '
31643    63211345
31644    46631222
31645    25314527
31646    12635121
31647    45624431
31650    63632524
31651    12663163
31652    30314512
31653    01124431
31654    43433162
31655    25231246
31656    26121212
31657    52665131          BCD     ' WRITING LAST DATA ON PREVIOUS SECTOR'
31660    63314527
31661    12432162
31662    63122421
31663    63211246
31664    45124751
31665    25653146
31666    64621262
31667    25236346
31670    51121212
31671    52302521          BCD     ' HEADER NOT VERIFIED ON FIRST ATTEMPT'
31672    24255112
31673    45466312
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31674    65255131
31675    26312524
31676    12464512
31677    26315162
31700    63122163
31701    63254447
31702    63121212
31703    52016101          BCD     ' 1/10(11),3/06,5/04,5/06(18)''
31704    00740101
31705    34730361
31706    00067305
31707    61000473
31710    05613006
31711    74011034
31712    37121212
31713    52526225  F3M57   BCD     '  SEARCH ERROR OCCURED WHILE LOOKING FOR ADDRESS'
31714    21512330
31715    12255151
31716    46511246
31717    23236451
31720    25241266
31721    30314325
31722    12434646
31723    42314527
31724    12264451
31725    12712424
31726    51256262
31727    52000040          BCD     ' 00=002=00 AFTER INITIATING A WRITE FROM ADDRESS'
31730    00000240
31731    00001221
31732    26632551
31733    12314531
31734    63312163
31735    31452712
31736    21126651
31737    31632512
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31740    26514444
31741    12212424
31742    51256262
31743    52001040          BCD     ' 00=001=77'
31744    00001140
31745    07071212
31746    52032643          BCD     ' 3FLSA'
31747    62211212
31750    52056100          BCD     ' 5/04,5/06(18,30)''
31751    04732561
31752    00067401
31753    10730300
31754    34371212
31755    52522431  F3M58   BCD     '  DISC ERRONIOUSLY CYCLED TO STATE 0 FROM STATE 7'
31756    62231225
31757    51514645
31760    51466462
31761    43701223
31762    70234325
31763    24126346
31764    12626225
31765    63251200
31766    12265146
31767    44126263
31770    21636512
31771    07121212
31772    52016101          BCD     ' 1/11(11)''
31773    01740101
31774    34371212
31775    52522346  F3M59   BCD     '  CONTROLLER HUNG WITH NO ERROR INDICATED'
31776    45635146
31777    43432651
32000    12306445
32001    27126631
32002    63301245
32003    46122651
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32004    51465112
32005    31452431
32006    23216325
32007    24121212
32010    52016101          BCD     ' 1/10(11),3/06(18)''
32011    00740101
32012    34730361
32013    00067401
32014    10343712
32015    52523025  F3M60   BCD     '  HEADER FOR ADDRESS 00=002=00 DESTROYED'
32016    21242551
32017    12264451
32020    12212424
32021    51256262
32022    12000040
32023    00000240
32024    00001224
32025    25626351
32026    46703524
32027    52016101          BCD     ' 1/10(11)''
32030    00740101
32031    34371212
32032    52522346  F3M61   BCD     '  CONTROLLER ERRONIOUSLY CYCLED TO STATE 0 FROM STATE 5'
32033    45635146
32034    43432651
32035    12255151
32036    46453146
32037    64624372
32040    12237223
32041    43252412
32042    63461262
32043    63214325
32044    12001226
32045    51464412
32046    62632163
32047    25121512
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32050    52016101          BCD     ' 1/12,2/16(7)''
32051    02730261
32052    01067407
32053    34371212
32054    52522346  F3M62   BCD     '  CONTROLLER ERRONIOUSLY CYCLED TO STATE 0 FROM STATE 5'
32055    45635146
32056    43432551
32057    12255151
32060    46453146
32061    64624370
32062    12237123
32063    43252412
32064    63461262
32065    63216325
32066    12001226
32067    51464412
32070    62632163
32071    25120512
32072    52026101          BCD     ' 2/12,2/16(7),4/01,4/02,4/03(24),1/03,1/04(26),2/19,'
32073    02730261
32074    01067407
32075    34730461
32076    00017304
32077    61006273
32100    04610003
32101    74020434
32102    73016100
32103    03730161
32104    00047402
32105    34347303
32106    61011173
32107    52026102          BCD     ' 2/20(12)''
32110    00740102
32111    34371212
32112    52522421  F3M63   BCD     '  DATA NOT BEING READ WITHIN 1 MILLISEC OF READING LAST'
32113    63211245
```



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32114    46631222
32115    25314527
32116    12512521
32117    24126631
32120    63303145
32121    27120112
32122    44314343
32123    31622523
32124    12462612
32125    51252124
32126    31452712
32127    43216263
32130    52242163          BCD     ' DATA ON PREVIOUS SECTOR'
32131    21124445
32132    12475125
32133    65314664
32134    62126225
32135    23634651
32136    52302521          BCD     ' HEADER NOT VERIFIED ON FIRST ATTEMPT'
32137    24255112
32140    45466312
32141    65255131
32142    26312524
32143    12464512
32144    26315162
32145    63122163
32146    63254447
32147    63121212
32150    52016101          BCD     ' 1/10,1/13(7)''
32151    00730161
32152    01037407
32153    34371212
32154    52520231  F3M64   BCD     '  2IGAA'
32155    27212112
32156    52026101          BCD     ' 2/12,2/16,1/12(7)''
32157    02730261
```

```
32160    01067301
32161    61010374
32162    07343712
32163    52520231  F3M65  BCD     '  2IGAA'
32164    67212112
32165    62026101          BCD     ' 2/12(7)''
32166    02740734
32167    37121212
32170    52522330  F3M66  BCD     '  CHAIN BIT NOT RECORDED AS 0 OR CHECKED DURING READ'
32171    21314512
32172    22316312
32173    45466312
32174    51252346
32175    51242524
32176    12216212
32177    00124451
32200    12233225
32201    23420524
32202    12246451
32203    31452712
32204    51252124
32205    52026101          BCD     ' 2/12(7),2/18(11),2/20(11,12)''
32206    02740734
32207    73026101
32210    10740101
32211    34730261
32212    02007401
32213    01730102
32214    34712112
32215    52525126  F3M67  BCD     '  RECA0=2BGCA,2FLSA'
32216    63212013
32217    02222723
32220    61330326
32221    43622112
32222    52016101          BCD     ' 1/10(7)''
32223    00740734
```



```
32224    37121212
32225    52525126  F3M68  BCD     '  RFAA0=2BGCA,3FLSA+2IGAA,2BGCA (BOTH TERMS LOW)'
32226    61212013
32227    02222723
32230    61330326
32231    43622126
32232    02312721
32233    61330322
32234    67232112
32235    74224663
32236    30126325
32237    51446212
32240    43466634
32241    52016101          BCD     ' 1/13(7)''
32242    02740734
32243    37121212
32244    52526226  F3M69  BCD     '  SF3A0=2BGCA,3IGAA,3FLSA (SHOULD BE LOW)'
32245    62212013
32246    02222723
32247    61330331
32250    67212133
32251    03764362
32252    61127462
32253    30466443
32254    74122225
32255    12434466
32256    34121212
32257    52016101          BCD     ' 1/12(7)''
32260    02740734
32261    37121212
32262    52520470  F3M70  BCD     '  6YHTA0'
32263    30632100
32264    52056100          BCD     ' 5/07(7)''
32265    07740734
32266    37121212
32267    52520423  F3M71  BCD     '  6CKRA0'
```

```
32270    42518100
32271    52026102          BCD     ' 2/21(7)!'
32272    01740734
32273    37121212
32274    52522330  F3M72   BCD     '  CHANNEL ERROR ON READ'
32275    21454525
32276    43122551
32277    51465112
32300    46451251
32301    25212412
32302    52242163          BCD     ' DATA = 77777777'
32303    21121312
32304    07077707
32305    17077707
32306    52056101          BCD     ' 5/15(34),4/24(7,8),4/20,4/21,3/20(7),5/12,6/21,6/11(8)!'
32307    05741304
32310    34730461
32311    02047407
32312    73103473
32313    04612001
32314    73046102
32315    01730561
32316    02007407
32317    34730561
32320    01027306
32321    61020173
32322    06612101
32323    74103437
32324    52522330  F3M73   BCD     '  CHANNEL ERROR ON READ'
32325    21454525
32326    43122551
32327    51465112
32330    46451251
32331    25212412
32332    52242163          BCD     ' DATA = 00000000'
32333    21121312
```



```
32334    00000000
32335    00000000
32336    52036103          BCD     ' 3/30,4/22,4/28(8),3/20,4/21(7)!'
32337    00730461
32340    02027304
32341    61021074
32342    10347303
32343    61020073
32344    04612001
32345    74073437
32346    52522330  F3M74   BCD     '  CHANNEL ERROR ON READ'
32347    21454525
32350    43122551
32351    51465112
32352    46451251
32353    25212412
32354    52242163          BCD     ' DATA = 25522552'
32355    21121312
32356    02052502
32357    02052502
32360    52046102          BCD     ' 4/20,4/24(7),5/15(34)!'
32361    00730461
32362    02047407
32363    34730561
32364    01057403
32365    04343712
32366    52527125  F3M75   BCD     '  ZEROS NOT WRITTEN ON ADDRESS 00=000=00 AFTER CHANNEL!
32367    51466212
32370    45466312
32371    66513163
32372    63254512
32373    46451221
32374    24245125
32375    62621200
32376    00400000
32377    00400000
```

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32400    12212663
32401    25511223
32402    30214545
32403    25431212
32404    52243162          BCD     ' DISCONNECTED'
32405    23464545
32406    25236325
32407    24121212
32410    52664451          BCD     ' WORD NO  DATA IS  IGNORE   OVERFLOW ERRORS '
32411    24124546
32412    12122421
32413    63211231
32414    62121231
32415    27454451
32416    25121212
32417    45650551
32420    26434466
32421    12255151
32422    4451a252
32423    37121212
32424    52371212  F3M76   BCD     ' '
32425    52036102  F3M77   BCD     ' 3/20,3/21,3/23,4/19,4/20,4/24,4/25(23),3/22(13),2/03,'
32426    00730361
32427    62017303
32430    61020373
32431    04610111
32432    73046102
32433    00730461
32434    62047304
32435    61020574
32436    62033473
32437    03610202
32440    74013334
32441    73026100
32442    03731212
32443    52026100          BCD     ' 2/06(11)''
```



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32444    04746101
32445    34371212
32446    52526746  F3M78   BCD     '  CONTROLLER DID NOT ENTER STATE 0 FROM STATE 7 WHEN'
32447    45635146
32450    43432551
32451    12243124
32452    12454663
32453    12254563
32454    25511262
32455    63216325
32456    12001226
32457    51464412
32460    62632163
32461    65120712
32462    66322545
32463    52254644          BCD     ' E9M 10226 ISSUED'
32464    12016202
32465    62061231
32466    62636425
32467    24121212
32470    52016101          BCD     ' 1/15(20),3/19,4/23,5/12(1),6/23(47)''
32471    05740200
32472    34731241
32473    01117304
32474    61020373
32475    05610102
32476    74013473
32477    06612202
32500    74040734
32501    37121212
32502    52526226  F3M79   BCD     '  CF03A NOT RESET BY 3ZBFA'
32503    00232112
32504    45446312
32505    51756225
32506    63122272
32507    12037122
```

```
32510    26211212
32511    52016101          BCD     ' 1/15(20)''
32512    05743200
32513    34371212
32514    52520623  F3M80   BCD     '  6CLMAO'
32515    43442100
32516    52056101          BCD     ' 5/12(1)''
32517    02740134
32520    37121212
32521    52520423  F3M81   BCD     '  6CLMAO'
32522    43442100
32523    52056101          BCD     ' 5/12(1)'
32524    02740134
32525    52103146          BCD     ' 8I8CA'
32526    23211212
32527    52066101          BCD     ' 6/13,6/14(42)''
32530    03730661
32531    01047404
32532    02343712
32533    52522367  F3M82   BCD     '  BX03A=2MHAA=8IY0A'
32534    00032113
32535    02443221
32536    21331031
32537    70002112
32540    52046100          BCD     ' 4/01(24),6/13,6/14(42)''
32541    01740204
32542    34730461
32543    01037306
32544    61010474
32545    04023437
32546    52520367  F3M83   BCD     '  CX02A'
32547    00022112
32550    52046100          BCD     ' 4/03(24)''
32551    03740204
32552    34371212
32553    52520361  F3M84   BCD     '  2/08(8),2/18(13)''
```



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32554    00107410
32555    34730361
32556    01107401
32557    03343712
32560    52520261  F3M85   BCD     '  2/08(8),2/18(12)''
32561    00107410
32562    34730261
32563    01107401
32564    02343712
32565    52521170  F3M94   BCD     '  9YESA'
32566    25622112
32567    52056101          BCD     ' 5/14(36),4/04,5/09(7)''
32570    04740306
32571    34730461
32572    00047305
32573    61001174
32574    07343712
32575    52521170  F3M95   BCD     '  9YHSA'
32576    30622112
32577    52056101          BCD     ' 5/14(36)''
32600    04740306
32601    34371212
```

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                    *
                    *       MESSAGES - FUNCTION 4
                    *
32602    52522431   F4M1    BCD     ' DISC KEYING ERROR'
32603    62231242
32604    25703145
32605    27122551
32606    51465112
32607    52662412           BCD     ' AD CT IS AD CT SB PBT ADDR PIN ADDR CHN ERR  CON ER'
32610    23631231
32611    62126624
32612    12236312
32613    62221247
32614    46631221
32615    24245112
32616    47314512
32617    21242451
32620    12233245
32621    12255151
32622    12122346
32623    45122551
32624    51121263           BCD     'R  TIMEOUT '
32625    31442546
32626    64635237
32627    52371212   F4M2    BCD     ' '
32630    52522431   F4M3    BCD     ' DISC ERROR DURING READ ATTEMPT'
32631    62231225
32632    51514451
32633    12246451
32634    31452712
32635    51252124
32636    12216263
32637    25444763
32640    52662412           BCD     ' AD CT IS AD CT SB PBT ADDR PIN ADDR CHN ERR  CON ER'
32641    23631231
32642    62126624
```



```
32643    12236312
32644    62221247
32645    46631221
32646    24245112
32647    47314512
32650    21242451
32651    12233245
32652    12255151
32653    12122346
32654    45122551
32655    51121263           BCD     'R  TIMEOUT '
32656    31442546
32657    64635237
32660    52522421   F4M4    BCD     ' DATA ERROR OR DISC ADDRESSING ERROR.'
32661    23211225
32662    51514451
32663    12465112
32664    24316223
32665    12212424
32666    51256262
32667    31452712
32670    25515146
32671    51331212
32672    52242163           BCD     ' DATA CORRESPONDS TO DISC ADDRESS.'
32673    21122346
32674    51512562
32675    47464524
32676    62126346
32677    12243162
32700    23122124
32701    24512562
32702    62331212
32703    52242163           BCD     ' DATA SB  DATA IS '
32704    21126222
32705    12122421
32706    62211231
```

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32707    62523712
```



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                    *
                    *       MESSAGES • FUNCTION 5
                    *
32710    52524724   F5M1    BCD     '  PDBA RELAY FAILURE • !!
32711    22211251
32712    25432170
32713    12262131
32714    43645125
32715    12401237
32716    42017342   F5M2    BCD     'K1,K3,K4,K8!!
32717    03734204
32720    73421037
32721    42021224   F5M3    BCD     'K2 DROPOUT!!
32722    51464746
32723    64633712
32724    42017342   F5M4    BCD     'K1,K3,K4,K8!!
32725    03734204
32726    73421037
32727    42061224   F5M5    BCD     'K6 DROPOUT!!
32730    51464746
32731    64633712
32732    42017342   F5M6    BCD     'K1,K3,K4!!
32733    03734204
32734    37121212
32735    42021224   F5M7    BCD     'K2 DROPOUT!!
32736    51464746
32737    64633712
32740    42017342   F5M8    BCD     'K1,K2,K4!!
32741    02734204
32742    37121212
32743    42031224   F5M9    BCD     'K3 DROPOUT!!
32744    51464746
32745    64633712
32746    42027342   F5M10   BCD     'K2,K4,K6!!
32747    04734206
32750    37121212
```

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32751      42031224  F5M11   BCD       'K3 DROPOUT''
32752      51464746
32753      64633712
32754      42027342  F5M12   BCD       'K2,K3,K6''
32755      03734206
32756      37121212
32757      42041224  F5M13   BCD       'K4 DROPOUT''
32760      51464746
32761      64633712
32762      42037342  F5M14   BCD       'K3,K6,K8''
32763      06734210
32764      37121212
32765      42041224  F5M15   BCD       'K4 DROPOUT''
32766      51464746
32767      64633712
32770      42037342  F5M16   BCD       'K3,K4,K8''
32771      04734210
32772      37121212
32773      42061224  F5M17   BCD       'K6 DROPOUT''
32774      51464746
32775      64633712
32776      42057342  F5M18   BCD       'K5,K9,K10,K12''
32777      11734201
33000      00734201
33001      02371212
33002      42071224  F5M19   BCD       'K7 DROPOUT''
33003      51464746
33004      64633712
33005      42057342  F5M20   BCD       'K5,K9,K10,K12''
33006      11734201
33007      00734201
33010      02371212
33011      42010112  F5M21   BCD       'K11 DROPOUT''
33012      24514647
33013      46646337
33014      42057342  F5M22   BCD       'K5,K9,K10''
```

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DISCW  TAP-3.0                                  PAGE 418

33015      11734201
33016      00371212
33017      42071224  F5M23   BCD       'K7 DROPOUT''
33020      51464746
33021      64633712
33022      42057342  F5M24   BCD       'K5,K7,K10''
33023      07734201
33024      00371212
33025      42111224  F5M25   BCD       'K9 DROPOUT''
33026      51464746
33027      64633712
33030      42077342  F5M26   BCD       'K7,K10,K11''
33031      01007342
33032      01013712
33033      42111224  F5M27   BCD       'K9 DROPOUT''
33034      51464746
33035      64633712
33036      42077342  F5M28   BCD       'K7,K9,K11''
33037      11734201
33040      01371212
33041      42010012  F5M29   BCD       'K10 DROPOUT''
33042      24514647
33043      46646337
33044      42117342  F5M30   BCD       'K9,K11,K12''
33045      01017342
33046      01023712
33047      42010012  F5M31   BCD       'K10 DROPOUT''
33050      24514647
33051      46646337
33052      42117342  F5M32   BCD       'K9,K10,K12''
33053      01007342
33054      01023712
33055      42010112  F5M33   BCD       'K11 DROPOUT''
33056      24514647
33057      46646337
33060      52526225  F5M34   BCD       '  SEEK ERROR AFTER EXECUTING EOM 10226 (CLEAR)'
```

```
33061    25421225
33062    51514651
33063    12212663
33064    25511225
33065    67252364
33066    63314527
33067    12254444
33070    12010602
33071    02061274
33072    23432521
33073    51341212
33074    52262346          BCD     ' FC8=6121 NOT INCORPERATED!
33075    40060102
33076    01124546
33077    63123145
33100    23465147
33101    25512163
33102    25241212
33103    52234351          BCD     ' CLR LOGIC = D15,E15 = DP LOGIC PAGES 1 AND 21!
33104    12434427
33105    31231243
33106    12240105
33107    73251105
33110    12401224
33111    47124346
33112    27312312
33113    47212725
33114    62120112
33115    21452412
33116    02371212
33117    52526331  F5=35   BCD     '  TIME TO VERIFY POSITION WITH POWER INITIALLY OFF!
33120    44251263
33121    46126525
33122    51312470
33123    12474662
33124    31633146
```



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33125    45126431
33126    63301247
33127    46662551
33130    12314531
33131    63312143
33132    43701246
33133    26261212
33134    52275125          BCD     ' GREATER THAN 118 MILLISEC.!
33135    21632551
33136    12633221
33137    45120101
33140    10124431
33141    43433162
33142    25233312
33143    52446443          BCD     ' MULTIVIBRATOR IN LOCATION C6 (ACCESS B) = MVBA =!
33144    63316531
33145    22512163
33146    46511231
33147    45124346
33150    23216331
33151    46451223
33152    06127421
33153    23232562
33154    62122234
33155    12401244
33156    65222112
33157    40121212
33160    52623346          BCD     ' SHOULD BE SET FOR 2 MILLISEC DURATION!
33161    64432412
33162    22251262
33163    25631226
33164    46511202
33165    12443143
33166    43316225
33167    23122464
33170    51216331
```

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33171    46451212
33172    52512526          BCD     ' REF: TIMING CHART - FIG 4-10, DP MANUAL P.4-36''
33173    15126331
33174    44314527
33175    12233021
33176    51631245
33177    12263127
33200    12044001
33201    [illegible]
33202    47124421
33203    45642143
33204    12473304
33205    40036437
33206    52527124  FSM36   BCD     '  ADDRESS 00-000-00 NOT VERIFIED WITHIN 500 MILLISEC''
33207    24512562
33210    [illegible]
33211    [illegible]
33212    [illegible]
33213    45464312
33214    65255131
33215    66312524
33216    12663163
33217    30314512
33220    [illegible]
33221    44314343
33222    31622523
33223    37121212
```



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                         *
                         *       MESSAGES - FUNCTION 10
                         *
33224    52527664  F10M1   BCD     '  FUNCTION PARAMETER ERROR''
33225    45236331
33226    46451247
33227    21512144
33230    25632551
33231    12255151
33232    46513712
33233    52434424  F10M2   BCD     ' LODISC''
33234    31622337
33235    52434623  F10M3   BCD     ' LOCORE''
33236    46512537
33237    52432545  F10M4   BCD     ' LENGTH''
33240    [illegible]
33241    52464744  F10M5   BCD     ' OPMODE''
33242    46242537
33243    52303124  F10M6   BCD     ' HIDISC''
33244    31622337
33245    52371212  F10M7   BCD     ' ''
33246    12664451  F10M8   BCD     ' WORDIS   WORDSR  DISC ADD CORE ADD STRTDISC  LENGTH  WORD NO  ERROR NO''
33247    24316212
33250    12126446
33251    51244223
33252    12122431
33253    62231221
33254    24241223
33255    46512512
33256    21242412
33257    62635163
33260    24314223
33261    12134325
33262    45276330
33263    12126446
33264    51241245
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33265    46121225
33266    51514451
33267    12454437
33270    52523025  F10M9  BCD     ' HEADER!!'
33271    21242551
33272    37121212
33273    52303123  F10M10 BCD     ' HICORE!!'
33274    46512537
33275    52255151  F10M11 BCD     ' ERR FLAG IOSTATUS TIS--TSB SRT DISC END DISC SRT CORE END CORE BLK LGTH!!'
33276    12264321
33277    27123146
33300    62637163
33301    64621263
33302    31624040
33303    63622312
33304    62516312
33305    24316223
33306    12254524
33307    12243162
33310    23126051
33311    63122346
33312    51251225
33313    45241223
33314    46512612
33315    22434212
33316    43276330
33317    37121212
```



```
                  *
                  *       MESSAGES - FUNCTION 18
                  *
33320    52303127  F18M1  BCD     ' HIGH ARM TOO LARGE!!'
33321    30122151
33322    44126346
33323    46124321
33324    51270537
33325    52303127  F18M2  BCD     ' HIGH ARM LESS THAN LOW ARM!!'
33326    30122151
33327    44124325
33330    62621263
33331    30214512
33332    43466612
33333    21514437
33334    52665131  F18M3  BCD     ' WRITE PROTECTED - DISC '
33335    63251247
33336    51466325
33337    23632524
33340    12401224
33341    31622312
33342    12121237  F18M4  BCD     '  !!'
```

```
                    *
                    *       MESSAGES - FUNCTION 19
                    *
33343    52303127   F19M1   BCD     ' HIGH ARM TOO LARGE!!'
33344    30122151
33345    44126346
33346    46124321
33347    51272537
33350    52434466   F19M2   BCD     ' LOW ARM > HIGH ARM!!'
33351    12215144
33352    12161330
33353    31273712
33354    21514437
33355    52325454   F19M3   BCD     '  ****************DISC - '
33356    54545454
33357    54547454
33360    54545454
33361    54545424
33362    51622312
33363    40121212
33364    37121212   F19M4   BCD     '''
33365    52243162   F19M5   BCD     ' DISC TIMEOUT ERROR!!'
33366    23121331
33367    44254464
33370    60122551
33371    51465137
```



```
                    *
                    *       MESSAGES - FUNCTION 20
                    *
33372    52303127   F20M1   BCD     ' HIGH ARM TOO LARGE.!!'
33373    30122151
33374    44126346
33375    46124321
33376    51272533
33377    37121212
33400    52434466   F20M2   BCD     ' LOW ARM TOO LARGE.!!'
33401    12215144
33402    12634646
33403    12432151
33404    27253337
33405    52255151   F20M3   BCD     ' ERROR - TRACK NOT VERIFIED WITHIN 500MSEC.!'
33406    46511242
33407    12635121
33410    23421245
33411    46631265
33412    25513126
33413    31252412
33414    66316332
33415    31451205
33416    00004462
33417    25233312
33420    52215144           BCD     ' ARM NUMBER - !!'
33421    12456444
33422    22255112
33423    13123712
33424    52325454   TITLE   BCD     '  ********** DISC '
33425    54545454
33426    54545454
33427    12243162
33430    23121212
33431    00 00 00000  TITLE1 BZF
```

```
                        *
                        *       MESSAGES = FUNCTION 21
                        *
33432    52303124  F21^M1  BCD     ' MIDISC = LODISC'!
33433    31622312
33434    36124346
33435    24316223
33436    37121212
33437    52263143  F21^M2  BCD     ' FILE NOT ON LINE'!
33440    25124546
33441    63124545
33442    12433145
33443    25371212
33444    52233021  F21^M3  BCD     ' CHANGE WRITE HEADER SWITCH'!
33445    45272512
33446    66513163
33447    25123025
33450    21242551
33451    12626631
33452    63233037
33453    52475125  F21^M4  BCD     ' PREMATURE CHANNEL DISCONNECT'!
33454    44214364
33455    51251223
33456    30214545
33457    25431224
33460    31622346
33461    45452623
33462    63371212
33463    52243162  F21^M5  BCD     ' DISC WRITE PROTECTED'!
33464    23126451
33465    31632512
33466    47514463
33467    25236325
33470    24371212
33471    52233021  F21^M6  BCD     ' CHANNEL ERROR'!
33472    45452543
```



```
33473    12255151
33474    46513712
33475    52665131  F21^M7  BCD     ' WRITE MONITOR ERROR'!
33476    63251244
33477    46453163
33500    46511225
33501    51514451
33502    37121212
```

```
                    *
                    *       MESSAGES - FUNCTION 22
                    *
33503    52254524   F22M1  BCD      ' ENDISC < STDISC!!'
33504    31622312
33505    36126263
33506    24316323
33507    37121212
33510    52622623   F22M2  BCD      ' SECTOR COUNT ERROR!!'
33511    63465112
33512    23460445
33513    63122551
33514    51465137
33515    52263143   F22M3  BCD      ' FILE NOT ON LINE!!'
33516    25124546
33517    63124445
33520    12433145
33521    25371212
33522    52233021   F22M4  BCD      ' CHANGE WRITE HEADER SWITCH!!'
33523    45272512
33524    66513163
33525    25123025
33526    21242551
33527    12626431
33530    63233037
33531    52243162   F22M5  BCD      ' DISC WRITE PROTECTED!!'
33532    23126451
33533    31632512
33534    47514463
33535    25236325
33536    24371212
33537    52233021   F22M6  BCD      ' CHANNEL ERROR!!'
33540    45452543
33541    12255151
33542    46513712
33543    52234445   F22M7  BCD      ' CONTROLLER ERROR!!'
```



```
33544    63514443
33545    43255112
33546    25515146
33547    51371212
                            END
LITERALS USED:
33550    00000000
33551    77777777
33552    00000007
33553    77600000
33554    00177400
33555    00000003
33556    77740000
33557    00177777
33560    00037777
33561    00077777
33562    00000243
33563    00000005
33564    00000247
33565    00007000
33566    00777777
33567    00020573
33570    00011610
33571    00105602
33572    77770143
33573    00074000
33574    00234000
33575    00017500
33576    00034200
33577    00034000
33600    00000077
33601    00034077
33602    04074000
33603    00000177
33604    00034100
33605    00062566
```

```
33606    00000101
33607    00034040
33610    00037200
33611    10034000
33612    25522552
33613    00034003
33614    77774000
33615    77760000
33616    00760000
33617    77777775
33620    77776720
33621    00000764
33622    00000166
33623    00700000
33624    22026410
33625    77770007
33626    00005520
33627    00017777
33630    70000000
33631    07000000
33632    00000700
33633    70005600
33634    20004400
33635    00003300
33636    00032200
33637    00000341
33640    00000161
33641    00070000
33642    00000307
33643    00004160
33644    00003000
33645    00001700
33646    77077777
33647    01760000
33650    00000377
33651    00000140
```



```
33652    77777771
33653    00003777
33654    77777701
33655    77777700
33656    00017400
33657    77777211
33660    77774721
33661    77771434
33662    77771431
33663    00303837
33664    71007000
33665    00000600
33666    00000170
33667    00174000
33670    00001777
33671    53577345
33672    00310033
33673    00001070
33674    00000727
33675    00003737
33676    77776716
33677    60606040
33700    00000016
33701    52025500
33702    52604054
33703    00006000
33704    00006A00
33705    00000017
33706    54545454
33707    52606060
33710    00606060
33711    00010203
33712    04050407
33713    37373737
33714    77777723
33715    00001750
```

```
33716    00000062
33717    00000024
33720    00000012
33721    00040000
33722    00000056
33723    77776571
33724    00001700
33725    00000042
33726    52040500
33727    00000500
33730    52010000
33731    04040404
33732    37121012
33733    00777400
33734    77777400
33735    00777740
33736    04034000
33737    77754360
33740    00000037
33741    00056401
33742    00145354
33743    00054512
33744    00157466
33745    00000033
33746    00000037
33747    00000073
33750    00000037
```

33751 CELLS USED BY PROGRAM

LOCAL SYMBOLS USED =

A1	15510+	ABORT	14732+	ABORT1	14742+
A	23325+	B1A2A	13462+	B1A2B	13466+
B1AND2	13416+	B1ONLY	13364+	B1	15511+
B2ONLY	13366+	BADTIM	15503+	BEGN18	17045+
BIT0	15436+	BIT1	15437+	BIT10	15450+
BIT11	15451+	BIT12	15452+	BIT13	15453+
BIT14	15454+	BIT15	15455+	BIT16	15456+
BIT17	15457+	BIT18	15460+	BIT19	15461+
BIT2	15440+	BIT20	15462+	BIT21	15463+
BIT22	15464+	BIT23	15465+	BIT3	15441+
BIT4	15442+	BIT5	15443+	BIT6	15444+
BIT7	15445+	BIT8	15446+	BIT9	15447+
BLKMAX	15505+	B	23326+	C1A2A	15114+
C1A2B	15131+	C1A2C	15151+	C1A2D	15153+
C1AND2	15102+	CAPTBL	15523+	CDVR1	14461+
CDVR2	14471+	CDVR3	14472+	CDVR4	14474+
CDVR5	14513+	CDVR6	14522+	CDVR7	14541+
CHART	20445+	CHART1	20453+	CHART2	20501+
CHART3	20521+	CHART4	20537+	CHECK	23073+
CHECK1	23111+	CHECK2	23114+	CHNCK	14560+
CHNCK0	14621+	CHNCK1	14635+	CHNCK2	14637+
CHNCK3	14652+	CHNCK4	14613+	CHNDVR	14452+
CK0	13143+	CK1	13165+	CK2	13173+
CK3	13216+	CK4	13221+	CLCHT	20410+
CLEAR	23447+	CLINT	23255+	CNTRS	15730+
COMMON	23430+	COMP1	13531+	COMPAR	13501+
CSNKEY	13560+	COUNT	15506+	CP0T1	23006+
CP0T2	23015+	CP0T3	23024+	CP0T4	23033+
D00T17	5001+	D20T37	5002+	DATA1	14761+
DATA2	14773+	DATA3	15015+	DATA4	15020+
DATA5	15037+	DATA6	15045+	DATA7	15060+
DATA8	15100+	DATACK	14745+	DATERR	15170+
DDVR0	14307+	DDVR1	14320+	DDVR2	14330+
DDVR3	14400+	DDVR4	14412+	DDVR5	14440+
DELTA	17642+	DERR1	15240+	DERR2	15247+
DHEAD	15472+	DISCCK	23042+	DIVERT	450

D[illegible]E		452	DRIVE1		14274+	DRIVER		14245+
DSCDVR		14277+	DSCSIZ		404	END		434
END19	N	17566+	END21	N	21254+	ENDF10		13415+
ENDF2	N	6677+	ENDF3		11513+	ENDF4		12210+
ENDF5	N	12650+	ENDISC		23347+	ENDIT		20176+
ENDP8S		15276+	ENTER		23371+	ENTIM		20373+
ERR8R		460	ERR8RS		414	ERRTBL		15513+
ETBLE		35207	F10E'D		13405+	F10M1		33224+
F10M10		33273+	F10M11		33275+	F10M2		33233+
F10M3		33235+	F10M4		33237+	F10M5		33241+
F10M6		33243+	F10M7		33245+	F10M8		33246+
F10M9		33270+	F18E1		17065+	F18M1		33320+
F18M2		33325+	F18M3		33334+	F18M4		33342+
F19I1		17277+	F19I10		17544+	F19I11		17567+
F19I12		17346+	F19I13		17560+	F19I14		17636+
F19I15		17655+	F19I2		17311+	F19I3		17330+
F19I4		17366+	F19I5		17412+	F19I6		17425+
F19I7		17441+	F19I7A		17472+	F19I8		17476+
F19I9		17513+	F19M1		33343+	F19M2		33350+
F19M3		33355+	F19M4		33364+	F19M5		33365+
F1M1		23675+	F1M10		23770+	F1M11		24000+
F1M12		24010+	F1M13		24016+	F1M14		24026+
F1M15		24036+	F1M16		24046+	F1M17		24056+
F1M18		24066+	F1M19		24076+	F1M2		23700+
F1M20		24106+	F1M21		24116+	F1M22		24126+
F1M23		24136+	F1M24		24153+	F1M25		24163+
F1M26		24173+	F1M27		24203+	F1M28		24213+
F1M29		24230+	F1M3		23713+	F1M30		24243+
F1M31		24251+	F1M32		24257+	F1M33		24265+
F1M34		24273+	F1M35		24301+	F1M36		24307+
F1M37		24315+	F1M38		24323+	F1M39		24333+
F1M4		23716+	F1M40		24341+	F1M41		24347+
F1M42		24355+	F1M43		24363+	F1M44		24371+
F1M45		24377+	F1M46		24405+	F1M47		24413+
F1M48		24421+	F1M49		24427+	F1M5		23721+
F1M50		24435+	F1M51		24443+	F1M52		24451+

F1M53		24457+	F1M54		24465+	F1M55		24473+
F1M56		24501+	F1M57		24511+	F1M58		24514+
F1M59		24517+	F1M6		23727+	F1M60		24522+
F1M65		24542+	F1M66		24551+	F1M67		24565+
F1M7		23732+	F1M70		24605+	F1M71		24614+
F1M8		23745+	F1M9		23760+	F1S1		4552+
F1S1		22212+	F1S1A		22225+	F1S1B		22232+
F1S2		22235+	F1S2A		22253+	F1S2B		22263+
F1S2C		22267+	F1S2D		22301+	F20L1		20144+
F20M1		33372+	F20M2		33400+	F20M3		33405+
F21E0		21155+	F21E1		21172+	F21E2		21133+
F21M1		33432+	F21M2		33437+	F21M3		33444+
F21M4		33453+	F21M5		33463+	F21M6		33471+
F21M7		33475+	F22M1		33503+	F22M2		33510+
F22M3		33515+	F22M4		33522+	F22M5		33531+
F22M6		33537+	F22M7		33543+	F23E1		22056+
F23L1		22045+	F23L2		22043+	F2E10		6231+
F2E49		6572+	F2E50		6607+	F2E51		6624+
F2E52		6261+	F2E56		6657+	F2E57		6676+
F2E58		6556+	F2E9		6204+	F2L1		6170+
F2L2		6216+	F2L3		6226+	F2L31		6244+
F2L32		6255+	F2M1		24642+	F2M10		25070+
F2M100		27356+	F2M101		27363+	F2M102		27372+
F2M103		27401+	F2M104		27410+	F2M105		27417+
F2M106		27426+	F2M107		27436+	F2M108		27445+
F2M109		27454+	F2M11		25106+	F2M110		27463+
F2M111		27472+	F2M112		27502+	F2M113		27511+
F2M114		27516+	F2M115		27530+	F2M116		27542+
F2M117		27571+	F2M118		27632+	F2M119		27661+
F2M12		25123+	F2M120		27710+	F2M121		27736+
F2M122		27762+	F2M13		25143+	F2M14		25155+
F2M15		25167+	F2M16		25201+	F2M17		25236+
F2M18		25247+	F2M19		25262+	F2M2		24730+
F2M20		25335+	F2M21		25371+	F2M22		25423+
F2M3		24751+	F2M32		25452+	F2M33		25545+
F2M34		25571+	F2M35		25602+	F2M36		25625+

F2M37	[illegible]536+	F2M38	25647+	F2M39	25660+
F2M4	[illegible]763+	F2M40	25667+	F2M41	25676+
F2M42	[illegible]705+	F2M43	25716+	F2M44	25727+
F2M45	[illegible]740+	F2M46	25751+	F2M47	25760+
F2M48	[illegible]767+	F2M49	26000+	F2M50	26011+
F2M51	[illegible]+	F2M52	26027+	F2M53	26041+
F2M54	26053+	F2M55	26065+	F2M56	26077+
F2M57	[illegible]111+	F2M58	26123+	F2M59	26135+
F2M6	[illegible].775+	F2M60	26147+	F2M61	26160+
F2M62	[illegible]171+	F2M63	26202+	F2M64	26213+
F2M65	[illegible]224+	F2M66	26235+	F2M67	26246+
F2M68	[illegible]267+	F2M69	26275+	F2M7	25007+
F2M70	[illegible]313+	F2M71	26331+	F2M72	26354+
F2M73	[illegible]373+	F2M73A	26422+	F2M74	26460+
F2M74A	[illegible]527+	F2M75	26551+	F2M76	26620+
F2M77	[illegible]653+	F2M78	26700+	F2M79	26730+
F2M8	[illegible]021+	F2M80	26756+	F2M81	27015+
F2M82	[illegible]040+	F2M83	27063+	F2M84	27111+
F2M85	[illegible]135+	F2M86	27162+	F2M87	27207+
F2M88	[illegible]238+	F2M89	27255+	F2M9	25041+
F2M90	[illegible]274+	F2M91	27301+	F2M92	27306+
F2M93	[illegible]313+	F2M94	27320+	F2M95	27325+
F2M96	[illegible]332+	F2M97	27337+	F2M98	27344+
F2M99	[illegible]351+	F2S1	22304+	F2S1A	22315+
F2S1B	[illegible]325+	F2S2	22323+	F2S2A	22334+
F2S2B	[illegible]336+	F2S3	22341+	F2S3A	22357+
F2S4	[illegible]362+	F2S4A	22377+	F2S5	22402+
F2S5A	[illegible]424+	F2S5B	22425+	F2S6	22427+
F2S6A	[illegible]452+	F2S6B	22457+	F2S6C	22460+
F2S7	[illegible]445+	F2S7A	22477+	F2S7B	22504+
F2S7C	[illegible]505+	F3E1	7130+	F3E10	7275+
F3E11	7313+	F3E18	7421+	F3E19	7436+
F3E2	7143+	F3E20	7461+	F3E21	7530+
F3E22	7577+	F3E23	7624+	F3E24	7651+
F3E25	7743+	F3E3	7153+	F3E60	10273+
F3E61	[illegible]312+	F3E62	7705+	F3E63	10017+

F3E64	[illegible]361+	F3E65	10411+	F3E66	[illegible]444+
F3E67	[illegible]476+	F3E68	10622+	F3E69	10667+
F3E70	[illegible]72[illegible]+	F3E71	10747+	F3E72	11021+
F3E73	[illegible]073+	F3E74	11146+	F3E75	11253+
F3E76	[illegible]302+	F3E77	11325+	F3E78	11350+
F3E79	[illegible]374+	F3E8	7207+	F3E81	11423+
F3E82	[illegible]451+	F3E83	10545+	F3E85	11462+
F3E86	11512+	F3E9	7236+	F3L1	7254+
F3L2	7273+	F3L3	7355+	F3L4	7366+
F3L44	[illegible]257+	F3L45	7662+	F3L46	7677+
F3L47	7702+	F3L48	7754+	F3L49	7761+
F3L5	7403+	F3L50	7774+	F3L51	7777+
F3L52	[illegible]005+	F3L53	10007+	F3L54	10333+
F3L55	[illegible]354+	F3L56	10353+	F3L57	10432+
F3L58	[illegible]465+	F3L59	10566+	F3L6	7411+
F3L60	[illegible]602+	F3L61	10607+	F3L62	10621+
F3L63	[illegible]652+	F3L64	11005+	F3L65	11016+
F3L66	[illegible]057+	F3L67	11070+	F3L68	11131+
F3L69	11143+	F3L7	7457+	F3L70	11223+
F3L71	[illegible]254+	F3L72	11242+	F3L73	11264+
F3L74	[illegible]303+	F3L75	11314+	F3L76	11337+
F3L77	11362+	F3L78	10537+	F3L8	7516+
F3L9	7565+	F3M1	30027+	F3M10	30267+
F3M11	[illegible]304+	F3M12	30342+	F3M13	30434+
F3M14	[illegible]457+	F3M15	30475+	F3M16	30514+
F3M17	[illegible]532+	F3M18	30550+	F3M19	30567+
F3M2	[illegible]124+	F3M20	30600+	F3M21	30640+
F3M22	[illegible]655+	F3M23	30735+	F3M24	31032+
F3M25	[illegible]080+	F3M26	31133+	F3M27	31154+
F3M28	[illegible]205+	F3M29	31213+	F3M3	30137+
F3M30	[illegible]266+	F3M31	31323+	F3M32	31360+
F3M33	31412+	F3M34	31430+	F3M35	31436+
F3M36	[illegible]441+	F3M37	31451+	F3M38	31454+
F3M39	[illegible]463+	F3M4	30146+	F3M40	31474+
F3M41	[illegible]477+	F3M42	31502+	F3M43	31505+
F3M44	[illegible]513+	F3M45	31523+	F3M46	31526+

F3M47	31531+	F3M48	31537+	F3M49	31547+
F3M50	31552+	F3M51	31556+	F3M52	31561+
F3M53	31564+	F3M54	31571+	F3M55	31611+
F3M56	31642+	F3M57	31713+	F3M58	31755+
F3M59	31775+	F3M6	30155+	F3M60	32015+
F3M61	32032+	F3M62	32054+	F3M63	32112+
F3M64	32154+	F3M65	32162+	F3M66	32170+
F3M67	32215+	F3M68	32225+	F3M69	32244+
F3M7	30230+	F3M70	32262+	F3M71	32267+
F3M72	32274+	F3M73	32324+	F3M74	32346+
F3M75	32366+	F3M76	32424+	F3M77	32425+
F3M78	32446+	F3M79	32502+	F3M8	30246+
F3M80	32514+	F3M81	32521+	F3M82	32533+
F3M83	32546+	F3M84	32553+	F3M85	32560+
F3M9	30254+	F3M94	32565+	F3M95	32575+
F3S1	22510+	F3S1A	22525+	F3S1B	22532+
F3S1C	22534+	F3S2	22535+	F3S2A	22554+
F3S2B	22555+	F3S3	22557+	F3S3A	22613+
F3S3B	22631+	F3S3C	22632+	F3S4	22634+
F3S4A	22677+	F4E1	12072+	F4E2	12207+
F4L1	11764+	F4L10	12151+	F4L11	12211+
F4L11A	12227+	F4L2	11776+	F4L3	12007+
F4L4	12034+	F4L5	12022+	F4L6	12076+
F4L7	12110+	F4L8	12131+	F4L9	12137+
F4M1	32602+	F4M2	32627+	F4M3	32630+
F4M4	32660+	F401	12074+	F5E10	12647+
F5E9	12637+	F5L49	12562+	F5L50	12627+
F5L51	12644+	F5M1	32710+	F5M10	32746+
F5M11	32751+	F5M12	32754+	F5M13	32757+
F5M14	32762+	F5M15	32765+	F5M16	32770+
F5M17	32773+	F5M18	32776+	F5M19	33002+
F5M2	32716+	F5M20	33005+	F5M21	33011+
F5M22	33014+	F5M23	33017+	F5M24	33022+
F5M25	33025+	F5M26	33030+	F5M27	33033+
F5M28	33036+	F5M29	33041+	F5M3	32721+
F5M30	33044+	F5M31	33047+	F5M32	33052+

F5M33	33055+	F5M34	33060+	F5M35	33117+
F5M36	33206+	F5M4	32724+	F5M5	32727+
F5M6	32732+	F5M7	32735+	F5M8	32740+
F5M9	32743+	F5S1	22700+	F5S1A	22710+
F5S1B	22720+	F5S1C	22725+	F5S1D	22735+
F5S1E	22742+	F5S1F	22751+	F5S1G	22756+
F5S1H	22755+	FAM1	5356+	FAM10	15763+
FAM18	17136+	FAM19	17677+	FAM2	6726+
FAM20	20622+	FAM21	21273+	FAM22	21530+
FAM23	22077+	FAM3	11541+	FAM4	12251+
FAM5	12670+	FDONE	456	FIM1	5350+
FIM10	15731+	FIM18	17120+	FIM19	17664+
FIM2	4706+	FIM20	20610+	FIM21	21263+
FIM22	21521+	FIM23	22067+	FIM3	11522+
FIM4	12236+	FIM5	12657+	FIXC	14025+
FIXD	13652+	FLAGS	332	FORT	20563+
FPT1	5003+	FPT10	15713+	FPT18	17112+
FPT19	17656+	FPT2	6700+	FPT20	20576+
FPT21	21255+	FPT22	21513+	FPT23	22061+
FPT3	11514+	FPT4	12230+	FPT5	12651+
FSTART	13101+	FUNCTN	424	FUNC1 N	4044+
FUNC10	12773+	FUNC18	17013+	FUNC19	17247+
FUNC2	5504+	FUNC20	20136+	FUNC21	21122+
FUNC22	21415+	FUNC23	21772+	FUNC2A	5516+
FUNC3	7100+	FUNC4	11742+	FUNC5	12445+
FVM1	5476+	FVM10	15740+	FVM18	17131+
FVM23	22074+	FVT1	5011+	GET	15264+
GETCAP	15310+	GETIME	15321+	HICORE	15723+
HIDISC	15725+	HILBL	52040500	I1FLAG	15475+
I2FLAG	15476+	I30T44	23422+	I31	243
I33	247	I56174	23421+	IEXT	23412+
IMSG1	23465+	IMSG2	23466+	INPOS1	13060+
INPOS2	13063+	INPOS3	13071+	INPOS4	13076+
INT31	242	INT33	246	INTER	15403+
INTER1	15421+	INTRPT	15474+	INTX1	242
INTX2	246	IOHEAD	15473+	IOSTAT	15340+

ITABLE	23441+	IX1	243	IX2	247
KEY	15503+	LAST	22060+	LENGTH	15726+
LINES	46	LOCORE	15722+	LODISC	15724+
LTIME	13	MASK	17646+	MINUS	17652+
MLVTIM	15504+	NENSEC	15502+	NFFLG	23350+
NORMAL	23126+	NORML1	23131+	NORML2	23137+
OBJECT	430	OPMODE	15721+	OUT18	17073+
PATERN	15727+	PERR1	13341+	PERR2	13346+
PLAGE	15513+	PI2	23353+	PLOT	20204+
PLOT1	20223+	PLOT1A	20232+	PLOT2	20243+
PLOT2A	20256+	PLOT2B	20266+	PLOT3	20330+
PLOT4	20345+	PLOT4A	20361+	PLOT4B	20371+
P01	23203+	P02	23211+	P03	23217+
P04	23230+	P05	23234+	P06	23236+
P07	23244+	P08	23252+	P0P	23416+
POTOUT	23173+	POTPIN	23263+	POTWRD	23352+
PRE1	13006+	PRE2	13013+	PRE3	13015+
PRE4	13046+	PRE5	13052+	PTPN1	23266+
PTPN2	23274+	PUT	20416+	RANC1	13770+
RANC2	13774+	RANC3	13775+	RAND	13613+
RAMMY	13772+	READ	15467+	REP1	14723+
REPER	14653+	REPORT	454	RESET N	15271+
RETRY	15507+	RETURN	440	RL1	415
RLP	416	RMODE	15466+	RNSW	15501+
SAV	17257+	SAVDPA	13662+	SCARET	14030+
SDVR2	14065+	SDVR3	14077+	SDVR3	14113+
SDVR4	14102+	SDVR5	14111+	SDVR6	14107+
SEED	406	SEQC	14002+	SEQD	13625+
SETC1	13624+	SETCA2	13743+	SETDVR	14032+
SETDVR	13604+	SETUP2	22760+	SETUP3	22767+
SETUP4	22775+	SLEN	13663+	SLEN0	13671+
SLEN1	13675+	SLEN2	13700+	SLEN3	13711+
SLEN4	13721+	SLEN5	13734+	SLEN6	13730+
SPR1	14134+	SPR2	14146+	SPR3	14167+
SPR4	14210+	SPR5	14226+	SPR6	14243+
SPREAD	14117+	SPUR	23377+	STADDR	34000

START	13353+	STATUS	401	STDISC	23346+
STFLAG	15477+	STRT18	17047+	STRTIT	20166+
SYSIZE	405	TABLE	34000	TABLE1	15563+
TABLE2	15573+	TABLE3	15603+	TEMP	23330+
TEMPA	23331+	TEMPB	23332+	TEMPC	23333+
TEMPD	23334+	TENS	4	TERM	23065+
TIMOUT	23351+	TIMTBL	15613+	TITLE	33424+
TITLE1	33431+	TMIT	20274+	TMIT1	20312+
U21M1	23511+	U21M10	23640+	U21M11	23652+
U21M12	23660+	U21M13	23661+	U21M14	23674+
U21M2	23516+	U21M3	23525+	U21M4	23537+
U21M5	23550+	U21M6	23556+	U21M7	23571+
U21M8	23607+	U21M9	23627+	UAM	5022+
UIS	5012+	UNITS	5	UNIT	420
UOT	5773+	UTIME	55	UVM	5341+
UVT	5502+	VAR1	23335+	VAR2	23336+
VAR3	23337+	VAR4	23340+	VAR5	23341+
VAR6	23342+	VAR7	23343+	VAR8	23344+
VAR9	23345+	VERROR	20555+	W200	23305+
W500	23315+	WAIT	23143+	WAIT1	23147+
WAIT2	23143+	WAIT3	23165+	WAIT4	23170+
WFI0	14543+	WFI01	14547+	WFI02	14556+
WORDS	1206	WORD	20604+	WRITE	15470+
XMODE	15471+	XTI2	4737+	XTI3	4755+
X	23307+				