DV11

CABLE TST+MAN PARAM IN

MD-11-DZDVE-B

EP-DZDVE-B-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN U.S.A.

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDME-B-D

PRODUCT NAME: MODEM CONTROL AND CABLE TESTS PLUS MANUAL PARAME

DATE RELEASED: 21-APRIL-1976

MAINTAINER: DIAGNOSTICS

AUTHOR: JOHN EGOLF

1. ABSTRACT

THE FUNCTION OF THE DV11 DIAGNOSTICS ARE TO VERIFY THAT THE OPTION OPERATES ACCORDING TO SPECIFICATIONS. THE DIAGNOSTICS VERFIY THAT THERE ARE NO MALFUNCTIONS AND THE ALL OPERATIONS OF THE DV11 ARE CORRECT IN ITS ENVIRONMENT.
PARAMETERS MAY BE SET TO ALERT DIAGNOSTICS AS TO THE DV11 CONFIGURATION BY USING THE "TRIAL" PROGRAM (DZDVE SA:210). ALL QUESTIONS SHOULD BE ANSWERED AND THEN EACH DIAGNOSTIC WILL "OVERLAY" THESE PARAMETERS WHICH ARE STORED IN THE "STATUS TABLE" (SEE SECTION 8.4A). THE ALTERNATIVE TO "TRIAL" PROGRAM IS "AUTO SIZING" (SEE SECTION 8.5).

DZDVE IS USED TO VERIFY THE CABLES USED FOR MODEM HOOK UP. MODEM BITS ARE TESTED AND INTERUPTS ARE ALSO CHECKED. ALL SIGNALS ARE TESTED AND THE TURN AROUND IS EITHER THROUGH THE SINGLE LINE TESTER(H325) OR 16 LINE TURN AROUND(H861). ALL SIGNALS THAT ARE LOOPED AROUND BY THE TEST CONNECTER ARE CHECKED. MODEM CONTROL SIGNALS AND DV11 TRANSMITTER AND RECEIVER DATA IS CHECKED. ANY COMBINATION OF LINES MAY BE SELECTED AND THESE INTURN WILL BE TESTED INDIVIDUALLY.
PART 2 -THE MANUAL PARAMETER INPUT(TRIAL)- IS USED TO GET THE PARAMETERS INTO THE STATUS TABLE FOR REFERENCE BY THE DIAGNOSTIC IF "AUTO SIZING" DOES NOT WORK OR IS NOT DESIRED. STARTING ADDRESS IS AT 210 AND THE EXECUTION OF THE PROGRAM IS SELF EXPLANATORY. (ANSWER THE QUESTIONS).

CURRENTLY THERE ARE SIX OFF LINE DIAGNOSTICS THAT ARE TO BE RUN IN SEQUENCE TO INSURE THAT IF AN ERROR SHOULD OCCUR IT WILL BE DETECTED AT AN EARLY STAGE AND INSURING THAT DIAGNOSIS OF ERROR WILL BE IMMEDIATE TO PROBLEM
NOTE: ADDITIONAL DIAGNOSTICS MAY BE ADDED IN THE FUTURE.

THE SIX DIAGNOSTICS ARE:
1. DZDVA [REV] BASIS R/W TEST AND ROM INSTRUCTION EXERCISER.
2. DZDVB [REV] STATIC LINE CARD TESTS.
3. DZDVC [REV] 'FREE RUNNING' ROM TESTS PART 1.
4. DZDVD [REV] 'FREE RUNNING' ROM TESTS PART 2.
5. DZDVE [REV] MODEM CONTROL AND CABLE TESTS PLUS MANUAL PARAMETER INPUT. (TRIAL PROGRAM)
6. DZDVF [REV] ASYNCHRONOUS LINE CARD TESTS.

2. REQUIREMENTS

2.1 EQUIPMENT

ANY PDP11 FAMILY CPU (WITH MINIMUM 8k MEMORY)
ASR 33 (OR EQUILIVALENT)
DV11-AA MUX CNTRL UNIT
AT LEAST ONE OF THE FOLLOWING
DV11-BA 8 LINE SYNC MODULES
DV11-BB 8 LINE ASYNC MODULES
DV11-BC 4 SYNC LINES, 4 ASYNC LINES

2.2 STORAGE

PROGRAM WILL USE ALL 9K OF MEMORY EXCEPT WHERE ABL AND BOOTSTRAP LOADER RESIDE. LOCATION 1500 THRU 1736 ARE ESPECIALLY TO BE NOTED AND TO BE UNTOUCHED BY OPERATOR AFTER DV11 TRIAL PROGRAM HAS BEEN EXECUTED; OR AFTER THE 'AUTO SIZING' HAS BEEN DONE.

3. LOADING PROCEEDURE

3.1 METHOD

ALL PROGRAMS ARE IN ABSOLUTE FORMAT AND ARE LOADED USING THE ABSOLUTE LOADER. NOTE: IF THE DIAGNOSTICS ARE ON A MEDIA SUCH AS DISK ,MAGTAPE,DECTAPE, OR CASSETTE; FOLLOW INSTRUCTIONS FOR THE MONITOR WHICH HAS BEEN PROVIDED ON THAT SPECIFIC MEDIA.

ABSOLUTE LOADER STARTING ADDRESS *500

MEMORY * SIZE

4K	[illegible]
8K	[illegible]
12K	[illegible]
16K	[illegible]
20K	[illegible]
24K	137
28K	157

3.1.1 PLACE ADDRESS OF ABS LOADER INTO SWITCH REGISTER.
(ALSO PLACE 'HALT' SW UP)

3.1.2 DEPRESS 'LOAD ADDRESS' KEY ON CONSOLE AND RELEASE.

3.1.3 DEPRESS 'START KEY' ON CONSOLE AND RELEASE (PROGRAM SHOULD NOW BE LOADING INTO CPU)

4. STARTING PROCEEDURE

A. SET SWITCH REGISTER TO 000200
B. DEPRESS 'LOAD ADDRESS' KEY AND RELEASE
C. SET SWR TO ZERO FOR 'AUTO SIZING' OR LEAVE
    LEAVE SWR BIT 7=1 TO USE EXISTING PARAMETERS SET UP BY DV11 TRIAL
    PROGRAM OR A PREVIOUSLY RUN DV11 DIAGNOSTIC THAT USED THE 'AUTO
    SIZING'.(SECTION 7.2 AND 8.4.8.5 MAY BE HELPFUL
D. DEPRESS 'START KEY' AND RELEASE THE PROGRAM WILL TYPE MAINDEC NAME
AND PROGRAM NAME (IF THIS WAS THE FIRST START UP OF THE PROGRAM) AND
ALSO THE FOLLOWING:

```
        'MAP OF DV11 STATUS'
        1500    175000
        1502    000300
        1504    000226
        1506    000062
        1510    000226
        1512    000062
        1514    000226
        1516    000062
        1520    000226
        1522    000062
```

THE ABOVE IS ONLY AN EXAMPLE! THIS WOULD INDICATE THE STATUS TABLE
STARTING AT ADD. 1500 IN THE PROGRAM. THE STATUS TABLE MUST BE
VERIFIED BY THE USER IF AUTO SIZING IS DONE. FOR INFORMATION OF STATUS
TABLE SEE SECTION 8.4 FOR HELP.

THE PROGRAM WILL TYPE 'R' AND PROCEED TO RUN THE DIAGNOSTIC

4.1 CONTROL SWITCH SETTINGS

NOTE: IF THERE IS NO REAL SWR (177570); SWR MAY BE MODIFIED AT
       LOC:176 OR BY HITTING CONTROL "G" (^G) ON CONSOLE TERMINAL.

```
SW 15   SET:  HALT ON ERROR
SW 14   SET:  LOOP ON CURRENT TEST
SW 13   SET:  INHIBIT ERROR PRINT OUT
SW 12   SET:  INHIBIT **ALL** TYPE OUT/BELL ON ERROR.
SW 11   SET:  INHIBIT ITERATIONS.  (QUICK PASS)
SW 10   SET:  ESCAPE TO NEXT TEST
SW 09   SET:  LOOP WITH CURRENT DATA
SW 08   SET:  CATCH ERROR AND LOOP ON IT
SW 07   SET:  USE PREVIOUS STATUS TABLE.  CLR-DO AUTO SIZE.
SW 06   SET:  SET- SINGLE H325 TURN AROUND CLR- MULTI H325 TURN AROUND
SW 05   SET:  RESERVED
SW 04   SET:  RESERVED
SW 03   SET:  RESERVED
SW 02   SET:  LOCK ON SELECTED TEST
SW 01   SET:  RESTART PROGRAM AT SELECTED TEST
SW 00   SET:  RESELECT DV11'S DESIRED ACTIVE.
```

4.1.2 SWITCH REGISTER RESTRICTIONS

SW 00 RESELECT DV11'S DESIRED ACTIVE. PLEASE NOTE THAT A MESSAGE IS TYPED OUT FOR SETTING THE SWITCH REGISTER EQUAL TO DV11'S ACTIVE. THIS MEANS IF THE SYSTEM HAS FOUR DV11S; BITS 00,01,02,03 WILL BE SET IN LOC 'DVACTV' FROM THE SWITCH REGISTER. USING THIS SWITCH(SW00) ALTERS THAT LOCATION;THEREFORE IF FOUR DV11S ARE IN THE SYSTEM ***DO NOT*** SET SWITCHS GREATER THAN SW 03 IN THE UP POSITION. THIS WOULD BE A FATAL ERROR. DO NOT SELECT MORE ACTIVE DV11S THAN HAS BEEN GIVEN INFORMATION ABOUT IN TRIAL PROGRAM.

METHOD: A: LOAD ADDRESS 200
B: START WITH SW 00=1
C: PROGRAM WILL TYPE MESSAGE
D: SET THE BINARY NUMBER OF DV11S DESIRED ACTIVE EXAMPLE: 1=1 DV11; 3=2 DV11; 7=3 DV11; 17=4 DV11 37=5 DV11 ETC. PRESS CONTINUE.
E: NUMBER (IF VALID) WILL BE IN DATA LIGHTS (EXCLUDING 11/05)
F: SET WITH ANY OTHER SWITCH SETTINGS DESIRED. PRESS CONTINUE.

SW 01 RESTART PROGRAM AT SELECTED TEST IT IS STRONGLY SUGGESTED THAT AT LEAST ONE PASS HASS BEEN MADE BEFORE TRYING TO SELECT A TEST THAT IS NOT IN THE ORDER OF SEQUENCE THE REASON BEING IS THAT THE PROGRAM HAS TO CLEAR AREAS AND SET UP PARAMETERS. ALSO WHEN A TEST IS SELECTED ALWAYS START AT THE VERY BEGINNING OF THAT TEST.

SW 09 LOOP ON CURRENT DATA: THIS SWITCH WILL ONLY WORK IF CALL 'SCOPI' IS IN THAT TEST. THE REASON BEING THAT MOST TESTS DEAL WITH BLOCKS OF DIFFERENT DATA TO BE SENT OR RECEIVED ALL AT ONCE THUS IN BLOCK DATA: ONE PATTERN CANN'T BE SINGLED OUT.

4.1.3 SWITCH REGISTER PRIORITYS

ERROR SWITCHES

1. SW 12 DELETE PRINT OUT/BELL ON ERROR.
2. SW 13 DELETE ERROR PRINTOUT.
3. SW 15 HALT ON THE ERROR.
4. SW 08 GOTO BEGINNING OF THE TEST(ON ERROR).
5. SW 10 GOTO NEXT TEST(ON ERROR).

SCOPE SWITCHES

1. SW 09 (IF ENABLED BY 'SCOP1') ON AN ERROR; IF AN '*' IS PRINTED IN FRONT OF THE TEST NO. (EX. *TEST NO. 10) SW09 IS INCORPORATED IN THAT TEST AND THEREFORE SW09 IS *USUALLY* THE BEST SWITCH FOR THE SCOPE LOOP (SW14=0, SW10=0, SW09=1, SW08=0). IF SW09 IS NOT ENABELED; AND THERE IS A *HARD* ERROR (CONSTANT); SW08 IS BEST.
   (SW14=1,0, SW10=0, SW09=0, SW08=1). FOR INTERMITTENT ERRORS; SW14=1 WILL LOOP ON TEST REGUARDLESS OF ERROR OR NOT ERROR.
   (SW14=1, SW10=0, SW09=0, SW08=1.0)
2. SW 14
3. SW 11

4.2 STARTING ADDRESS

STARTING ADDRESS IS AT 000200 THERE ARE NO OTHER STARTING ADDRESSES FOR THE DV11 DIAGNOSTICS PREVIOUSLY MENTIONED EXCEPT FOR DZDVE WHICH IS: 000200 FOR THE MODEM CONTROL AND CABLE TESTS AND 000210 FOR THE MANUAL PARAMETER INPUT PROGRAM.

NOTE: IF ADDRESS 000042 IS NON-ZERO THE PROGRAM ASSUMES IT IS UNDEF ACT11 OR XXDP CONTROL AND WILL ACT ACCORDINGLY AFTER *ALL* AVAILABLE DV11'S ARE TESTED THE PROGRAM WILL RETURN TO 'XXDP' OR 'ACT-11'.

5. OPERATING PROCEDURE

WHEN PROGRAM IS INITIALLY STARTED MESSAGES AS DESCRIBED IN SECTION FOUR WILL BE PRINTED.

AND PROGRAM WILL BEGIN RUNNING THE DIAGNOSTIC

5.2 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

1. HALT ON ERROR (VIA SW 15=1) W-EN EVER AN ERROR OCCURS.
2. CLEAR SW 15.
3. SET SW 14: (LOOP ON THIS TEST)
4. SET SW 13: (INHIBIT ERROR PRINT OUT)

THE TEST NUMBER AND PC WILL BE TYPED OUT AND POSSIBILY AN ERROR MESSAGE (THIS DEPENDS ON THE TEST) TO GIVE THE OPERATOR AN IDEA AS TO THE SOURCE OF THE PROBLEM. IF IT IS NECESSARY TO KNOW MORE INFORMATION CONCERNING THE ERROR REPORT; LOOK IN THE LISTING FOR THAT TEST NUMBER WHICH WAS TYPED OUT AND THEN NOTE THE PC OF THE ERROR REPORT THIS WAY THE EXACT FUNCTIONING OF THE TEST CAN BE INTERPEDITED.

6. ERRORS

AS DESCRIBED PREVIOUSLY THERE WILL ALWAYS BE A TEST NUMBER AND PC TYPED OUT AT THE TIME OF AN ERROR (PROVIDING SW 13=0 AND SW 12=0). IN MOST CASES ADDITIONAL INFORMATION WILL BE SUPPLIED TO THE THE ERROR MESSAGE WHICH IS TO GIVE THE OPERATOR AN INDICATION OF THE ERROR.

6.2 ERROR RECOVERY

IF FOR SOME REASON THE DV11 SHOULD 'HANG THE BUS' (GAIN CONTROL OF BUS SO THAT CONSOLE MANUAL FUNCTIONS ARE INHIBITED) AN INIT OR POWER DOWN/UP IS NECESSARY FOR OPERATOR TO REGAIN CONTROL OF CPU. IF THIS SHOULD HAPPEN; LOOK IN LOCATION 'TSTNO' (ADDRESS 1224)FOR THE NUMBER OF THE TEST THAT WAS RUNNING AT THE TIME OF THE CATASTROPHIC ERROR. IN THIS WAY THE OPERATOR WILL HAVE AN IDEA AS TO WHAT THE DV11 WAS DOING AT THE TIME OF THE ERROR.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

SEE SECTION 4. (PLEASE)
STATUS TABLE SHOULD BE VERIFIED REGUARDLESS OF HOW PROGRAM WAS STARTED.
ALSO IT IS IMPORTANT TO USE THIS LISTING ALONG WITH THE INFORMATION PRINTED ON THE TTY TO COMPLETLY ISOLATE PROBLEMS.

7.2 OPERATING RESTRICTIONS

DV11 TRIAL PROGRAM MUST BE RUN PRIOR TO THE FIRST AND ONLY THE FIRST RUNNING OF ANY DV11 DIAGNOSTIC IF "AUTO SIZING" IS NOT USED.
NOTE: IF NO PROGRAM OTHER THAN A DV11 DIAGNOSTIC WAS LOADED AFTER DV11 TRIAL OR IF CORE MEMORY HAS NOT BEEN CHANGED;OR IF THERE IS NO DV11 CONFIGURATION CHANGES; THE DV11 TRIAL PROGRAM NEED NEVER BE RUN AGAIN. HOWEVER IF ANY OF THE ABOVE HAVE BEEN VIOLATED THE DV11 TRIAL PROGRAM MUST BE RUN AGAIN BEFORE RUNNING THE DIAGNOSTICS NOTE: AN ALTERNATIVE TO THE ABOVE IS ATTEMPTING THE 'AUTO SIZING' WHEN PROGRAM IS INITIALLY STARTED WITH SW07=0.

7.3 HARDWARE CONFIGURATION RESTRICTIONS (SYNC LINE CARDS ONLY)

1. HARDWARE MUST BE SET TO FULL DUPLEX
2. PARITY OFF.
3. ALL LINES OF A PARTICULAR LINE CARD MUST BE CONFIGURED THE SAME.

8. MISCELLANEOUS

8.1 EXECUTION TIME

ALL DV11 DEVICE DIAGNOSTICS WILL GIVE AN 'END PASS' MESSAGE (PROVIDING NO ERRORS AND SW12=0) WITHIN 4 MINS. THIS IS ASSUMING SW11=1 (DELETE ITERATIONS) IS SET TO GIVE THE FASTEST POSSIBLE EXECUTION. THE ACTUAL EXECUTION TIME DEPENDS GREATLY ON THE PDP11 CPU CONFIGURATION.

8.2 PASS COMPLETE

NOTE: *EVERY* TIME THE PROGRAM IS STARTED; THE TESTS WILL RUN AS IF SW11 (DELETE ITERATIONS) WAS UP (=1). THIS IS TO 'VERIFY NO *HARD* ERRORS' AS SOON AS POSSIBLE. THEREFORE THE FIRST PASS -EACH TIME PROGRAM IS STARTED- WILL BE A 'QUICK PASS' UNTILL ALL DV11'S IN SYSTEM ARE TESTED. WHEN THE DIAGNOSTIC HAS COMPLETED A PASS THE FOLLOWING IS AN EXAMPLE OF THE PRINT OUT TO BE EXPECTED.

END PASS DZDVE-B CSR: 175000 VEC: 300 PASSES: 000001 ERRORS: 000000

NOTE: THE NUMBERS FOR CSR AND VEC ARE NOT NECESSARILY THE VALUES FOR THE DEVICE. THEY ARE ONLY FOR THIS EXAMPLE.
NOTE: DZDVE (MODEM AND CABLE TEST) END PASS MESSAGE IS A LARGE "END" TYPED OUT ON TTY. PLEASE NOTE THAT EACH CHARACTER PRINTED IS ACTUALLY AND "END PASS" INDICATION. THIS WAS USED IN PLACE OF "BELL" BECAUSE IF SW12=1 AND AN ERROR OCCURED THE BELL MAY BE MISTAKEN FOR END PASS. THE PASS EXECUTION IS SO FAST THAT THE STANDARD END PASS WAS TOO LENGHTLY. THEREFORE EACH CHAR IS AN "END PASS AND THE ENTIRE "END" IS NOT REQUIRED FOR ACCEPTANCE.

8.4 KEY LOCATIONS

RETURN (1212) CONTAINS THE ADDRESS WHERE PROGRAM WILL RETURN WHEN ITERATION COUNT IS REACHED OR IF LOOP ON TEST IS ASSERTED.

NEXT (1214) CONTAINS THE ADDRESS OF THE NEXT TEST TO BE PEFORMED.

TSTNO (1224) CONTAINS THE NUMBER OF THE TEST NOW BEING PEFORMED.

RUN (1302) THE BIT IN 'RUN' ALWAYS POINTS ONE PAST THE DV11 CURRENTLY BEING TESTED. EXAMPLE: (RUN) 1302/0000000001000000 MEANS THAT DV11 NO.05 IS THE DV11 NOW RUNNING.

DVCR00-DVCR17
DVST00-DVST17
(1500)-(1736)

THESE LOCATIONS CONTAIN THE INFORMATION NEEDED TO TEST UP TO 8 (DECIMAL) DV11S SEQUENTIALY. THEY CONTAIN THE CSR,VECTOR AND STATUS CONCERNING THE CONFIGURATION OF EACH DV11.

DVACTV (1276) EACH BIT SET IN THIS LOCATION INDICATES THAT THE ASSOCIATED DV11 WILL BE TESTED IN TURN. EXAMPLE: (DVACTV) 1276/0000000000011111 MEANS THAT DV11 NO. 00,01,02,03,04 WILL BE TESTED. EXAMPLE: (DVACTV) 1276/0000000000010001 MEANS THAT DV11 NO. 00,04 WILL BE TESTED.

DVSCR (1356) CONTAINS THE RECEIVER CSR OF THE CURRENT DV11 UNDER TEST.

L00.03 (1412)
L04.07 (1414)
L08.11 (1416)
L12.15 (1420) CONTAINS THE STATUS OF THE CURRENT DV11 UNDER TEST.

BIT 15 SET: LINE CARD *NOT INSTALLED (AND WONT BE TESTED)
BIT 14 SET: RESERVED
BIT 13 SET: RESERVED
BIT 12 SET: ONE SYNC, =0: TWO SYNCS.
BIT 11 SET: ASYNC LINE CARD, =0 SYNC LINE CARD.
BIT 10 SET: RESERVED
BIT 09 SET: BITS PER CHAR. (USED WITH BIT8)
BIT 08 SET: BITS PER CHAR. (USED WITH BIT9)

BIT09	BIT08	BITS PER CHAR.
0	0	8
0	1	7
1	0	6
1	1	5

BIT 07-00 SYNC "A" FOR SPECIFIED LINE CARD.

8.4A MORE ON THAT 'STATUS TABLE' (1500-1736)

```
                'MAP OF DV11 STATUS'
                1500    175000
                1502    000300
                1504    000226
                1506    000062
                1510    000226
                1512    000062
                1514    004000
                1516    000000
                1520    004000
                1522    000000


THE ABOVE INFORMATION WILL BE REPEATED FOR EACH OF UP TO 8 DV11'S IN THE
SYSTEM(THESE WILL FOLLOW UNDER THIS TABLE).  EXPLANATION:
1500    175000  THIS IS THE SYSTEM CONTROL REGISTER FOR THE 1ST DV11  IN
                THE SYSTEM.
1502    000300  THIS IS VECTOR 'A' FOR THE FIRST DV11 IN THE SYSTEM.
1504    000226  THIS REPRESENTS 'SYNC A' AND THE SOFTWARE STATUS FOR THE
                1ST LINE CARD IN THE 1ST DV11.  THE BITS ARE AS FOLLOWS:

                BIT 15  SET:    LINE CARD *NOT INSTALLED (AND WONT BE TESTED)
                BIT 14  SET:    RESERVED
                BIT 13  SET:    RESERVED
                BIT 12  SET:    ONE SYNC, =0:  TWO SYNCS.
                BIT 11  SET:    ASYNC LINE CARD, =0 SYNC LINE CARD
                BIT 10  SET:    RESERVED
                BIT 09   SET:   BITS PER CHAR.  (USED WITH BIT8)
                BIT 08  SET:    BITS PER CHAR.  (USED WITH BIT9)
                        BIT09 BIT08 BITS PER CHAR.
                          0     0      8
                          0     1      7
                          1     0      6
                          1     1      5
                BIT 07-00       SYNC 'A' FOR SPECIFIED LINE CARD.
1506    000062  THIS REPRESENTS 'SYNC B' FOR THE 1ST LINE CARD.
1510    000226  THIS IS 'SYNC A' AND LINE STATUS FOR THE 2ND LINE  CARD.
                (FOR BITS DEFINATION SEE EXPLANATION FOR LINE CARD 1).
1512    000062  THIS IS 'SYNC B' FOR THE SECOND LINE CARD.
1514    000226  THIS IS 'SYNC A' AND LINE STATUS FOR THE 3RD LINE  CARD.
                (FOR BITS DEFINATION SEE EXPLANATION FOR LINE CARD 1).
1516    000062  THIS IS 'SYNC B' FOR LINE CARD NO.  3.
1520    000226  THIS IS 'SYNC A' AND LINE STATUS FOR THE 4TH LINE  CARD.
                (FOR BITS DEFINATION SEE EXPLANATION FOR LINE CARD 1).
1522    000062  THIS IS SYNC B FOR THE 4TH LINE CARD.

THE ABOVE IS REPEATED FOR EACH DV11 IN THE SYSTEM.  THE TABLE IS
FILLED  BY  AUTO SIZING OR BY THE MANUAL PARAMETER INPUT PROGRAM
AS  DESCRIBED  PREVIOUSLY.   ALSO  IF  DESIRED  BY  USER;    THE
LOCATIONS  MAY  BE  ALTERED  BY  HAND  (TOGGLED  IN) TO SUIT THE
SPECIFIC CONFIGURATION.
```

```
476
```

8.5 *** METHOD OF AUTO SIZING ***

8.5.1 FINDING THE CONTROL STATUS REGISTER.

THE PROGRAM WILL START AT ADDRESS 175000 AND START 'REFERENCEING' ADDRESS. IF A NON-EX MEMORY TRAP OCCURES; THE POINTER (HOLDING 175000) IS UPDATED BY 10 AND THE ABOVE IS REPEATED UNTILL ADDRESS 175200 IS REACHED. IF A 'SLAVE SYNC RESPONSE' WAS ISSUED BY THE DV11 (OR ANY OTHER DEVICE) (NO NXM TRAP) ; POINTER PLUS 12 (SEL12) IS TESTED TO CONTAIN 177777 (MUST BE EXACTLY 177777); IF A TRAP IS ENCOUNTERED OR IF SEL12 DOES NOT CONTAIN 177777 THE ABOVE UPDATING IS PERFORMED. IF SEL12 WAS EQUAL TO 177777 THE POINTER IS STORED AWAY AND THE ROUTINE CONTINUES AS ABOVE:
NOTE: IF THE PROGRAM DOES NOT FIND YOUR DV11; SOMETHING IS WRONG AND AUTO SIZING SHOULD NOT BE DONE.

8.5.2 FINDING THE VECTOR

THE VECTOR AREA (ADDRESS 300-776) IS FILLED WITH THE INSTRUCTION IOT AND '.+2' (NEXT ADDRESS). BIT7 AND BIT6 (RX INTERUPT AND RX INTERUPT IE) ARE SET INTO DVSCR REGISTER; A DELAY IS MADE AND IF NO INTERUPT OCCURES (BECAUSE OF A BAD DV11) THE PROGRAM ASSUMES VECTOR ADDRESS 300 AND THE PROBLEM SHOULD BE FIXED IN THE DIAGNOSTIC. ONCE THE PROBLEM IS FIXED; THE PROGRAM SHOULD BE RE-SETUP AGAIN TO GET CORRECT VECTOR. IF AN INTERUPT OCCURED; THE ADDRESS TO WHICH THE DV11 INTERUPTED TO IS PICKED UP AND REPORTED AS THE VECTOR. NOTE: IF THE VECTOR REPORTED IS NOT THE VECTOR SET UP BY YOU; THERE IS A PROBLEM AND AUTO SIZING SHOULD NOT BE DONE.

8.5.3 PARAMETER ASSUMPTIONS.

SINCE TOO MUCH HARDWARE WOULD NEED TO BE TURNED ON TO SIZE THE REST OF THE PARAMETERS; THE PROGRAM MUST ASSUME THE REMAINING VARIATIONS. THE RESULT IF NOT TO YOUR SPECIFIC CONFIGURATION MAY BE ALTERED BY HANG (TOGGLE IN) IS DESIRED. IN THIS WAY 95% OF THE PARAMETER SETUP WAS DONE BY THE PROGRAM AND 5% BY YOU.
THEREFORE:

1) ALL LINE CARDS(4) ARE ASSUMED TO BE INSTALLED.
   SET BIT15 OF STATUS MAP OF ANY (APPROIATE) LINE CARDS MISSING
2) TWO SYNCS.
   SET BIT12 IF YOU HAVE A 4 LINE GROUP SET FOR 1 SYNC.
3) EIGHT BITS PER CHAR.
   ADJUST BITS 9 AND BIT 8 IN STATUS MAP FOR YOUR CORRECT CONFIG.
4) SYNCHRONOUS LINE CARDS INSTALLED
   SET BIT11 OF STATUS MAP FOR ASYNC LINE CARD AND ZERO SYNC CHARS.
5) SYNC "A"=226 AND SYNC "B"=062

IN ALL ADJUSTMENTS PLEASE REFER TO SECTION 8.4A FOR GREATER DETAIL.
$

```
                        ;*MAINDEC-11-DZDVE-A/(377)/MODEM CONTROL TESTS AND MANUAL PARAMETER INPUT
                        ;*COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                        ;*---------------------------------------------------------------

                                ;STARTING PROCEDURE
                                ;LOAD PROGRAM
                                ;LOAD ADDRESS 000200
                                ;PRESS START
                                ;PROGRAM WILL TYPE "MAINDEC-11-DZDVE-A/(377)/MODEM CONTROL TESTS AND MANUAL PARA
                                ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
                                ;AND THEN RESUME TESTING


                        ;SWITCH REGISTER OPTIONS
                        ;----------------------

  100000                SW15=100000             ;=1,HALT ON ERROR
  040000                SW14=40000              ;=1,LOOP ON CURRENT TEST
  020000                SW13=20000              ;=1,INHIBIT ERROR TYPEOUT
  010000                SW12=10000              ;=1,DELETE TYPEOUT/BELL ON ERROR.
  004000                SW11=4000               ;=1,INHIBIT ITERATIONS
  002000                SW10=2000               ;=1,ESCAPE TO NEXT TEST ON ERROR
  001000                SW09=1000               ;=1.LOOP WITH CURRENT DATA
  000400                SW08=400                ;=1.LOOP ON ERROR
  000200                SW07=200                ;=1, DO "AUTO SIZING" ON INITAL START UP.
  000100                SW06=100
  000040                SW05=40
  000020                SW04=20
  000010                SW03=10
  000004                SW02=4                  ;LOCK ON TEST SELECT
  000002                SW01=2                  ;RESTART PROGRAM AT SELECTED TEST
  000001                SW00=1                  ;RESELECT DV11 DESIRED ACTIVE
                                                ;NOTE: THIS MUST NOT EXCEED ORIGINAL COUNT
```

```
                                ;REGISTER DEFINITIONS
                                ;--------------------

                                R0=0            ;GENERAL REGISTER
                                R1=1            ;GENERAL REGISTER
                                R2=2            ;GENERAL REGISTER
                                R3=3            ;GENERAL REGISTER
                                R4=4            ;GENERAL REGISTER
                                R5=5            ;GENERAL REGISTER
                                SP=6            ;PROCESSOR STACK POINTER
                                PC=7            ;PROGRAM COUNTER

                                ;LOCATION EQUIVALENCIES
                                ;----------------------

                                PS=177776       ;PROCESSOR STATUS WORD
                                STACK=120       ;START OF PROCESSOR STACK

                                BIT15=100000
                                BIT14=40000
                                BIT13=20000
                                BIT12=10000
                                BIT11=4000
                                BIT10=2000
                                BIT9=1000
                                BIT8=400
                                BIT7=200
                                BIT6=100
                                BIT5=40
                                BIT4=20
                                BIT3=10
                                BIT2=4
                                BIT1=2
                                BIT0=1
                                ;---------------------------------

                                ALU=BIT12
                                RAM=BIT13
                                XFR=BIT13+BIT12
                                NPR=BIT14
                                S.C=BIT14+BIT12
                                BCC=BIT14+BIT13
                                BRB=BIT14+BIT13+BIT12
                                ;---------------------------------
```

```
                                ;;**********************************************************************
                                ;----------------------------------------------------------------------
                                        ;TRAPCATCAER FOR ILLEGAL INTERRUPTS
                                        ;THE STANDARD "TRAP CATCHER" IS PLACED
                                        ;BETWEEN ADDRESS 0 TO ADDRESS 776.
                                        ;IT LOOKS LIKE "PC+2 HALT".
                                ;----------------------------------------------------------------------
                                ;;**********************************************************************

                        000000  .=0
                                        ;STANDARD INTERRUPT VECTORS
                                        ;-------------------------

                        000024  .=24
000024  004402                  .PFAIL                  ;POWER FAIL HANDLER
000026  000340                 340                     ;SERVICE AT LEVEL 7
000030  004002                 .HLT                    ;ERROR HANDLER
000032  000340                 340                     ;SERVICE AT LEVEL 7
000034  003750                 .TRPSRV                 ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                 340                     ;SERVICE AT LEVEL 7
                        000040  .=40
000040  000001                 .BLKW 1                 ;SAVE FOR ACT-11 OR DDP2
000042  000001                 .BLKW 1                 ;RETURN ADDRESS IF UNDER ACT-11 OR DDP2
000044  000001                 .BLKW 1                 ;SAVE FOR ACT-11 OR DDP2
000046  002560                 LOGICAL                 ;FOR USE WITH ACT-11 OR DDP2

                        000174  .=174
000174  000000         LIGHT:  0
                        000176  .=176
000176  000000         SSWR:   0

                        000200  .=200
000200  000137  001742          JMP     .START          ;GO TO START OF PROGRAM


                        001000  .=1000
001000  035377  040515  047111  MTITLE: .ASCIZ  <377> 12> MAINDEC-11-DDDVE-A <377> MODEM CONTROL TESTS AND MANUAL PARAME

                        001200  .=1200
001200                  LIGHTS:
001200  177570                  177570
001202  177570         SWR:     177570
                                ;INDIRECT POINTERS TO TELETYPE VECTORS AND REGISTERS
                                ;--------------------------------------------------

001204  177560         TKCSR:  177560                  ;TELETYPE KEYBOARD CONTROL REGISTER
001206  177562         TKDBR:  177562                  ;TELETYPE KEYBOARD DATA BUFFER
001210  177564         TPCSR:  177564                  ;TELEPRINTER CONTROL REGISTER
001212  177566         TPDBR:  177566                  ;TELEPRINTER DATA BUFFER

                                ;PROGRAM CONTROL PARAMETERS
                                ;-------------------------

001214  000000         RETURN: 0                       ;SCOPE ADDRESS FOR LOOP ON TEST
001216  000000         NEXT:   0                       ;ADDRESS OF NEXT TEST TO BE EXECUTED
001220  000000         LOCK:   0                       ;ADDRESS FOR LOCK ON CURRENT DATA
```

```
 666  001222  000003                ICOUNT: 3                       ;NUMBER OF ITERATIONS THAT CURRENT TEST WILL BE EXECUTED
 667  001224  000000                LPCNT:  0                       ;NUMBER OF ITEREATIONS COMPLETED
 668  001226  000000                TSTNO:  0                       ;NUMBER OF TEST IN PROGRESS
 669  001230  000000                PASCNT: 0                       ;NUMBER OF PASSES COMPLETED
 670  001232  000000                ERRCNT: 0                       ;TOTAL NUMBER OF ERRORS
 671  001234  000000                LSTERR: 0                       ;PC OF LAST ERROR CALL
 672
 673                                        ;PROGRAM VARIABLES
 674                                        ;-----------------
 675
 676  001236  000000                STAT:   0                       ;DV STATUS WORD STORAGE
 677  001240  000000                SYNCX:  0
 678  001242  000000                CLKX:   0
 679  001244  000000                MASKX:  0
 680  001246  000000                TEMP1:  0                       ;TEMPORARY STORAGE
 681  001250  000000                TEMP2:  0                       ;TEMPORARY STORAGE
 682  001252  000000                TEMP3:  0                       ;TEMPORARY STORAGE
 683  001254  000000                TEMP4:  0                       ;TEMPORARY STORAGE
 684  001256  000000                TEMP5:  0                       ;TEMPORARY STORAGE
 685  001260  000000                SAVR0:  0                       ;R0 STORAGE
 686  001262  000000                SAVR1:  0                       ;R1 STORAGE
 687  001264  000000                SAVR2:  0                       ;R2 STORAGE
 688  001266  000000                SAVR3:  0                       ;R3 STORAGE
 689  001270  000000                SAVR4:  0                       ;R4 STORAGE
 690  001272  000000                SAVR5:  0                       ;R5 STORAGE
 691  001274  000000                SAVSP:  0                       ;STACK POINTER STORAGE
 692  001276  000000                SAVPC:  0                       ;PROGRAM COUNTER STORAGE
 693  001300  000001                DVACTV: .BLKB 1                 ;DVII'S SELECTED ACTIVE.
 694  001301  000001                DVNUM:  .BLKB 1                 ;OCTAL NUMBER OF DVII'S.
 695  001302  000001                SAVACT: .BLKB 1                 ;ORIGINAL ACTV.  DEVICES.
 696  001303  000001                SAVNUM: .BLKB 1                 ;WORKABLE NUMBER.
 697  001304  000001                RUN:    .BLKB 1                 ;POINTER ONE FAST RUNNING DEVICE.
 698                  001306        .EVEN
 699  001306  001500                DFEAM:  DV.MAP                  ;TABLE POINTER.
```

```
                                        ;PROGRAM CONTROL FLAGS
                                        ;--------------------

001310  000                     INIFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG
001311  000                     ERRFLG: .BYTE   0               ;ERROR OCCURED FLAG
001312  000                     LOKFLG: .BYTE   0               ;LOCK ON CURRENT TEST FLAG
001313  000                     QV.FLG: .BYTE   0               ;QUICK VERIFY FLAG.
                                                                ;ON FIRST PASS OF EACH DV11 ITERATIONS WILL BE SUPPRESSE
                                .EVEN
        000000                  $Y=0

                                        ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
                                        ;POINTERS TO SUBROUTINES CAN BE FOUND
                                        ;IN THE TABLE IMMEDIATLY FOLLOWING THE DEFINITIONS

                                ;;**************************************************************************
                                ;--------------------------------------------------------------------------
001314                          .TRPTAB:
        104400                  SCOPE=TRAP+0            ;CALL TO SCOPE LOOP AND ITERATION HANDLER
001314  002634                          .SCOPE
        104401                  SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
001316  003020                          .SCOP1
        104402                  TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
001320  003044                          .TYPE
        104403                  INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
001322  003120                          .INSTR
        104404                  INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
001324  003224                          .INSTER
        104405                  PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
001326  003244                          .PARAM
        104406                  SAV05=TRAP+6            ;CALL TO REGISTER SAVE ROUTINE
001330  003444                          .SAV05
        104407                  RES05=TRAP+7            ;CALL TO REGISTER RESTORE ROUTINE
001332  003504                          .RES05
        104410                  CONVRT=TRAP+10          ;CALL TO DATA OUTPUT ROUTINE
001334  003536                          .CONVRT
        104411                  CNVRT=TRAP+11           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR-LF.
001336  003542                          .CNVRT
        104412                  MSTCLR=TRAP+12          ;CALL TO ISUE A MASTER CLEAR
001340  004556                          .MSTCLR
        104413                  RAMCLR=TRAP+13          ;CALL TO CLEAR THE RAMS
001342  004516                          .RAMCLR
        104414                  DELAY=TRAP+14           ;CALL TO VARIABLE DELAY COUNTER
001344  004476                          .DELAY
        104415                  ROMCLK=TRAP+15          ;CALL TO CLOCK ROM ONCE
001346  004566                          .ROMCLK
        104416                  DATACLK=TRAP+16         ;CALL TO CLK DATA
001350  004576                          .DATACLK

                                ;--------------------------------------------------------------------------
                                ;;**************************************************************************
```

F02


```
                                        ;DV11 VECTOR AND REGISTER INDIRECT POINTERS
                                        ;
001352  000000          DVRVEC: 0             ;POINTER TO DV11 RECEIVER INTERRUPT VECTOR
001354  000000          DVRLVL: 0             ;POINTER TO DV11 RECEIVER INTERRUPT SERVICE PS
001356  000000          DVTVEC: 0             ;POINTER TO DV11 TRANSMITTER INTERRUPT VECTOR
001360  000000          DVTLVL: 0             ;POINTER TO DV11 TRANSMITTER INTERRUPT SERVICE PS
001362  000000          DVSCR:  0             ;POINTER TO DV11 SYSTEM CONTROL REGISTER
001364  000000          DVSCRH: 0             ;POINTER TO DV11 SYSTEM CONTROL REGISTER HIGH BYTE.
001366  000000          DVRIC:  0             ;POINTER TO DV11 NEXT RECEIVED CHARACTER REGISTER
001370  000000          DVLCR:  0             ;POINTER TO DV11 LINE PRAMETER REGISTER
001372  000000          DVSRS:  0             ;POINTER TO DV11 SECONDARY REGISTER SELECT REGISTER
001374  000000          DVSRSH: 0             ;POINTER TO DV11 SECONDARY REGISTER SELECT HIGH BYTE.
001376  000000          DVSRA:  0             ;POINTER TO DV11 SECONDARY REGISTER ACCESS REGISTER
001400  000000          DVSFR:  0             ;POINTER TO DV11 SPECIAL FUNCTIONS REGISTER
001402  000000          DVNSR:  0             ;POINTER TO DV11 NPR STATUS REGISTER
001404  000000          RESV16: 0             ;POINTER TO RESERVED REGISTER.


                                        ;DV11 CONTROL INDICATORS FOR CURRENT DV11 UNDER TEST
                                        ;--------------------------------------------------
001406  000           MASK.A: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 00-03
001407  000           MASK.B: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 04-07
001410  000           MASK.C: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 08-11
001411  000           MASK.D: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 12-15

001412  010           CLK.A:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 00-03
001413  010           CLK.B:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 04-07
001414  010           CLK.C:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 08-11
001415  010           CLK.D:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 12-15

001416  000000          L00.03: 000000        ;PARAMETERS FOR LINES 00-03
001420  000000          L04.07: 000000        ;PARAMETERS FOR LINES 04-07
001422  000000          L08.11: 000000        ;PARAMETERS FOR LINES 08-11
001424  000000          L12.15: 000000        ;PARAMETERS FOR LINES 12-15

001426  000000          SYNC2A: 000000        ;SYNC 2
001430  000000          SYNC2B: 000000        ;
001432  000000          SYNC2C: 000000        ;
001434  000000          SYNC2D: 000000        ;


                                        ;SUMMARY
                                        ;-------
                                        ;       MASK.X          040     5 BITS PER CHAR.
                                        ;                       100     6 BITS PER CHAR.
                                        ;                       200     7 BITS PER CHAR.
                                        ;                       000     8 BITS PER CHAR.
                                        ;
                                        ;       CLK.X           005     5 BITS PER CHAR.
                                        ;                       006     6 BITS PER CHAR.
                                        ;                       007     7 BITS PER CHAR.
                                        ;                       010     8 BITS PER CHAR.
```

```
                                        ;DV11 STATUS TABLE AND ADDRESS ASSIGNMENTS
                                        ;-----------------------------------------

            001500              .=1500
001500                          DV.MAP:
001500  000001                  DVCR00: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 00
001502  000001                  DVTR00: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 00
001504  000001                  DV00.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 00
001506  000001                  SYNA00: .BLKW 1         ;SYNC TWO
001510  000001                  DV00.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 00
001512  000001                  SYNB00: .BLKW 1         ;SYNC TWO
001514  000001                  DV00.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 00
001516  000001                  SYNC00: .BLKW 1         ;SYNC TWO
001520  000001                  DV00.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 00
001522  000001                  SYND00: .BLKW 1         ;SYNC TWO

001524  000001                  DVCR01: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 01
001526  000001                  DVTR01: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 01
001530  000001                  DV01.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 01
001532  000001                  SYNA01: .BLKW 1         ;SYNC TWO
001534  000001                  DV01.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 01
001536  000001                  SYNB01: .BLKW 1         ;SYNC TWO
001540  000001                  DV01.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 01
001542  000001                  SYNC01: .BLKW 1         ;SYNC TWO
001544  000001                  DV01.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 01
001546  000001                  SYND01: .BLKW 1         ;SYNC TWO

001550  000001                  DVCR02: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 02
001552  000001                  DVTR02: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 02
001554  000001                  DV02.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 02
001556  000001                  SYNA02: .BLKW 1         ;SYNC TWO
001560  000001                  DV02.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 02
001562  000001                  SYNB02: .BLKW 1         ;SYNC TWO
001564  000001                  DV02.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 02
001566  000001                  SYNC02: .BLKW 1         ;SYNC TWO
001570  000001                  DV02.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 02
001572  000001                  SYND02: .BLKW 1         ;SYNC TWO

001574  000001                  DVCR03: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 03
001576  000001                  DVTR03: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 03
001600  000001                  DV03.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 03
001602  000001                  SYNA03: .BLKW 1         ;SYNC TWO
001604  000001                  DV03.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 03
001606  000001                  SYNB03: .BLKW 1         ;SYNC TWO
001610  000001                  DV03.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 03
001612  000001                  SYNC03: .BLKW 1         ;SYNC TWO
001614  000001                  DV03.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 03
001616  000001                  SYND03: .BLKW 1         ;SYNC TWO

001620  000001                  DVCR04: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 04
001622  000001                  DVTR04: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 04
001624  000001                  DV04.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 04
001626  000001                  SYNA04: .BLKW 1         ;SYNC TWO
001630  000001                  DV04.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 04
001632  000001                  SYNB04: .BLKW 1         ;SYNC TWO
001634  000001                  DV04.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 04
```

```
   860  001636  000001                  SYNC04: .BLKW 1         ;SYNC TWO
   861  001640  000001                  DV04.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 04
   862  001642  000001                  SYND04: .BLKW 1         ;SYNC TWO
   863
   864  001644  000001                  DVCR05: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 05
   865  001646  000001                  DVTR05: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 05
   866  001650  000001                  DV05.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 05
   867  001652  000001                  SYNA05: .BLKW 1         ;SYNC TWO
   868  001654  000001                  DV05.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 05
   869  001656  000001                  SYNB05: .BLKW 1         ;SYNC TWO
   870  001660  000001                  DV05.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 05
   871  001662  000001                  SYNC05: .BLKW 1         ;SYNC TWO
   872  001664  000001                  DV05.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 05
   873  001666  000001                  SYND05: .BLKW 1         ;SYNC TWO
   874
   875  001670  000001                  DVCR06: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 06
   876  001672  000001                  DVTR06: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 06
   877  001674  000001                  DV06.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 06
   878  001676  000001                  SYNA06: .BLKW 1         ;SYNC TWO
   879  001700  000001                  DV06.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 06
   880  001702  000001                  SYNB06: .BLKW 1         ;SYNC TWO
   881  001704  000001                  DV06.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 06
   882  001706  000001                  SYNC06: .BLKW 1         ;SYNC TWO
   883  001710  000001                  DV06.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 06
   884  001712  000001                  SYND06: .BLKW 1         ;SYNC TWO
   885
   886  001714  000001                  DVCR07: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 07
   887  001716  000001                  DVTR07: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 07
   888  001720  000001                  DV07.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 07
   889  001722  000001                  SYNA07: .BLKW 1         ;SYNC TWO
   890  001724  000001                  DV07.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 07
   891  001726  000001                  SYNB07: .BLKW 1         ;SYNC TWO
   892  001730  000001                  DV07.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 07
   893  001732  000001                  SYNC07: .BLKW 1         ;SYNC TWO
   894  001734  000001                  DV07.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 07
   895  001736  000001                  SYND07: .BLKW 1         ;SYNC TWO
   896
   897  001740  000000                  DV.END: 000000
```

```
                                        ;PROGRAM INITIALIZATION
                                        ;LOCK OUT INTERRUPTS
                                        ;SET UP PROCESSOR STACK
                                        ;SET UP POWER FAIL VECTOR
                                        ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
                                        ;TYPE TITLE MESSAGE

001742  012737  000340  177776  .START: MOV     #340,PS                 ;LOCK OUT INTERRUPTS
001750  012706  001200                  MOV     #STACK,SP               ;SET UP STACK
001754  012737  004402  000024          MOV     #.PFAIL,@#24            ;SET UP POWER FAIL VECTOR
001762  113737  001301  001303          MOVB    DVNUM,SAVNUM            ;SAVE NUMBER OF DEVICES IN SYSTEM.
001770  005037  001230                  CLR     PASCNT                  ;CLEAR PASS COUNT
001774  105037  001311                  CLRB    ERRFLG                  ;CLEAR ERROR FLAG
002000  105037  001313                  CLRB    QV.FLG                  ;ZERO QUICK VERIFY FLAG
002004  012737  001500  001306          MOV     #DV.MAP,CREAM           ;GET MAP POINTER.
002012  112737  000001  001304          MOVB    #1,RUN                  ;POINT POINTER TO FIRST DEVICE.
002020  005037  001232                  CLR     ERRCNT                  ;CLEAR ERROR COUNT
002024  005037  001234                  CLR     LSTERR                  ;CLEAR LAST ERROR POINTER
002030  012737  000001  001226          MOV     #1,TSTNO                ;SET UP FOR TEST 1
002036  012737  001742  001214          MOV     #.START,RETURN          ;SET UP FOR POWER FAIL BEFORE
                                                                        ;TESTING STARTS
002044  105737  001310                  TSTB    INIFLG                  ;HAS INITIALIZATION BEEN PERFORMED
002050  001063                          BNE     1$                      ;BR IF YES
002052  013746  000004                  MOV     4,-(SP)                 ;
002056  013746  000006                  MOV     6,-(SP)                 ;
002062  005037  000006                  CLR     6                       ;
002066  012737  002104  000004          MOV     #80$,4                  ;
002074  005777  177102                  TST     @SWR                    ;
002100  000240                          NOP                             ;
002102  000407                          BR      81$                     ;
002104  022626                  80$:    CMP     (SP)+,(SP)+             ;
002106  012737  000174  001200          MOV     #LIGHTS,LIGHTS          ;
002114  012737  000176  001202          MOV     #SSWR,$WR               ;
002122  012637  000006          81$:    MOV     (SP)+,6                 ;
002126  012637  000004                  MOV     (SP)+,4                 ;
002132  104402  001000                  TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
002136  105137  001310                  COMB    INIFLG                  ;IF NOT SET FLAG AND DO
002142  105777  177034                  TSTB    @SWR                    ;BIT7=1??
002146  100402                          BMI     16$                     ;BR IF NO AUTO SIZE
002150  004737  006624                  JSR     PC,CSRMAP               ;GO DO THE AUTO SIZE
002154  104402  005461          15$:    TYPE    ,XHEAD          ;TYPE HEADER
002160  012737  001500  001246          MOV     #DV.MAP,TEMP1           ;SET POINTER
002166  017737  177054  001250  5$:     MOV     @TEMP1,TEMP2            ;SET DATA
002174  022737  177777  001250          CMP     #177777,TEMP2           ;ALL DONE?
002202  001406                          BEQ     1$                      ;BR IF YES
002204  104410                          CONVRT                          ;
002206  005506                          XSTATQ                          ;
002210  062737  000002  001246          ADD     #2,TEMP1                ;UPDATE POINTER
002216  000763                          BR      5$
002220  005737  000042          1$:     TST     @#42                    ;IS PROGRAM RUNNING UNDER MONITOR
002224  001030                          BNE     3$                      ;BR IF YES
002226  032777  000001  176746          BIT     #SW00,@SWR              ;SELECT SPECIFIC DEVICES??
002234  001424                          BEQ     3$                      ;BR IF NO.
002236  104402  005402                  TYPE    ,MNEW                   ;TYPE THE MESSAGE.
002242  005000                          CLR     R0                      ;ZERO DATA LIGHTS
```

```
                                                HALT                    ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
                                                CMPB    @SWR,SAVACT     ;IS THE NUMBER VALID?
                                                BLOS    2$              ;BR IF NUMBER IS OK.
                                                TYPE    .MERR3          ;TELL USER OF INVALID NUMBER.
                                                HALT                    ;STOP EVERY THING.
                                                BR      .-2             ;RESTART THE PROGRAM AGAIN.
                                        2$:     MOVB    @SWR,DVACTV     ;GET NEW DEVICE PATTERN
                                                MOVB    DVACTV,R0       ;SHOW THE USER WHAT HE SELECTED.
                                                BIC     #^C<377>,R0     ;USE ONLY LOW BYTE.
                                                HALT                    ;CONTINUE DYNAMIC SWITCHES.
                                        3$:     MOV     #300,R0         ;PREPARE TO CLEAR THE FLOATING
                                                MOV     #302,R1         ;VECTOR AREA. 300-776
                                        4$:     MOV     R1,(R0)+        ;START PUTTING "PC+2 - HALT"
                                                CLR     (R1)+           ;IN VECTOR AREA.
                                                CMP     (R0)+,(R1)+     ;POP POINTERS
                                                CMP     #1000,R0        ;ALL DONE??
                                                BNE     4$              ;BR IF NO.

                                                ;TEST START AND RESTART
                                                ;----------------------

                                .BEGIN: MOV     #340,PS         ;LOCK OUT INTERRUPTS
                                                MOV     #STACK,SP       ;SET UP STACK
                                                TST     @#42            ;IS PROGRAM UNDER MONITOR CONTROL
                                                BNE     3$              ;BR IF YES
                                                BIT     #BIT2,@SWR      ;CHECK FOR LOCK ON TEST
                                                BEQ     1$              ;BR IF NO LOCK DESIRED.
                                                TYPE    ,MLOCK          ;TYPE LOCK SELECTED.
                                                MOV     #NOP,TTST       ;ADJUST SCOPE ROUTINE.
                                                MOV     #NOP,TTST+2     ;SET UP TO LOCK
                                                BR      2$              ;CONTINUE ALONG.
                                        1$:     MOV     BRW,TTST        ;PREPARE NORMAL SCOPE ROUTINE
                                                MOV     BRX,TTST+2      ;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOP
                                        2$:
                                        3$:     MOV     #CYCLE,RETURN   ;START AT "CYCLE" FIND WHICH DEVICE TO TEST
                                        4$:     TYPE    ,MR             ;TYPE R
                                                JMP     @RETURN         ;START TESTING
```

```
                                                        ;END OF PASS
                                                        ;TYPE NAME OF TEST
                                                        ;UPDATE PASS COUNT
                                                        ;CHECK FOR EXIT TO ACT-11
                                                        ;RESTART TEST

 002436  000005                          .EOP:  RESET                    ;MAKE THE  WORLD CLEAN AGAIN.
 002440  005037  001234                         CLR     LSTERR           ;CLEAR LAST ERROR PC
 002444  105037  001311                         CLRB    ERRFLG           ;CLEAR ERROR FLAG
 002450  005237  001230                         INC     PASCNT           ;UPDATE PASS COUNT
 002454  013777  001230  176516                 MOV     PASCNT,@LIGHTS   ;DISPLAY PASS COUNT
 002462  104402  005145                         TYPE    ,MEPASS          ;TYPE END PASS
 002466  104402  005330                         TYPE    ,MCSRX           ;TYPE CSR
 002472  104411  002604                         CNVRT   ,XCSR            ;SHOW IT
 002476  104402  005336                         TYPE    ,MVECX           ;TYPE VECTOR
 002502  104411  002612                         CNVRT   ,XVEC            ;SHOW IT
 002506  104402  005344                         TYPE    ,MPASSX          ;TYPE PASSES
 002512  104411  002620                         CNVRT   ,XPASS           ;SHOW IT
 002516  104402  005355                         TYPE    ,MERRX           ;TYPE ERRORS
 002522  104411  002626                         CNVRT   ,XERR            ;SHOW IT
 002526  105337  001303                         DECB    $AVNUM           ;ARE ALL DEVICES TESTED?
 002532  001017                                 BNE     RESTRT           ;BR IF NO.
 002534  112737  000377  001313                 MOVB    #377,QV.FLG      ;SET THE QUICK VERIFY FLAG.
 002542  113737  001301  001303                 MOVB    DVNUM,SAVNUM     ;RESTORE THE COUNT
 002550  013701  000042                         MOV     @#42,R1          ;CHECK FOR ACT-11 OR DDP
 002554  001406                                 BEQ     RESTRT           ;IF NOT, CONTINUE TESTING
 002556  000005                                 RESET                    ;STOP THE SHOW--CLEAR THE WORLD
 002560                             LOGICAL:
 002560  004711                                 JSR     PC,(R1)
 002562  000240                                 NOP
 002564  000240                                 NOP
 002566  000240                                 NOP
 002570  000240                                 NOP
 002572  012737  005666  001214  RESTRT: MOV     #CYCLE,RETURN
 002600  000137  005666                         JMP     CYCLE
 002604  000001                     XCSR:   1
 002606     006     002                         .BYTE   6,2
 002610  001362                                 DVSCR
 002612  000001                     XVEC:   1
 002614     003     002                         .BYTE   3,2
 002616  001352                                 DVRVEC
 002620  000001                     XPASS:  1
 002622     006     002                         .BYTE   6,2
 002624  001230                                 PASCNT
 002626  000001                     XERR:   1
 002630     006     002                         .BYTE   6,2
 002632  001232                                 ERRCNT

                                                        ;SCOPE LOOP AND INTERATION HANDLER
                                                        ;--------------------------------

 002634                             .SCOPE:
 002634  022737  177570  001202                 CMP     #177570,SWR      ;IS THERE A REAL SWR?
 002642  001411                                 BEQ     64$              ;BR IF YES
 002644  017746  176336                         MOV     @TKDBR,-(SP)     ;SAVE KEYBOARD CHAR
 002650  042716  000200                         BIC     #BIT7,(SP)       ;CLEAR PARITY BIT
```

```
 1047  002654  122726  000007                    CMPB    #7,(SP)+        ;WAS IT CNTRL 'G' ?
 1048  002660  001002                            BNE     .+6             ;BR IF NO.
 1049  002662  004737  004640                    JSR     PC,SERV.G       ;SERVICE "CNTRL 'G'".
 1050  002666  005037  001234            64$:    CLR     LSTERR          ;CLEAR LAST ERROR PC.
 1051  002672  010016                            MOV     R0,(SP)         ;SAVE R0 ON THE STACK
 1052  002674  032777  040000  176300            BIT     #BIT14,@SWR     ;"LOOP ON THIS TEST"?
 1053  002702  001407                    TTST:   BEQ     1$              ;BR IF NO.  (IF LOCK SW01=1; THIS LOC =240)
 1054  002704  000437                            BR      3$              ;GOTO 3$    (IF LOCK SW01=1; THIS LOC =240)
 1055  002706  105777  176272                    TSTB    @TKCSR          ;KEYBOAD DONE?
 1056  002712  100034                            BPL     3$              ;BR IF NO. (LOCK: HIT KEY TO GOTO NEXT TEST)
 1057  002714  017700  176266                    MOV     @TKDBR,R0       ;CLEAR DONE BIT
 1058  002720  000415                            BR      2$              ;CONTINUE
 1059  002722  032777  004000  176252    1$:     BIT     #SW11,@SWR      ;DELETE ITERATION?  (QUICK PASS)
 1060  002730  001011                            BNE     2$              ;BR IF YES
 1061  002732  105737  001313                    TSTB    QV.FLG          ;HAVE PASSES BEECOMPLETED?
 1062  002736  001406                            BEQ     2$              ;BR IF QUICK PASS.
 1063  002740  005237  001224                    INC     LPCNT           ;UPDATE ITERATION COUNTER
 1064  002744  023737  001224  001222            CMP     LPCNT,ICOUNT    ;ARE ALL ITERATIONS DONE??
 1065  002752  001014                            BNE     3$              ;BR IF NOT YET
 1066  002754  105037  001311            2$:     CLRB    ERRFLG          ;PREPARE FOR NEW TEST
 1067  002760  005037  001224                    CLR     LPCNT           ;START ICOUNTER AT 0
 1068  002764  005037  001220                    CLR     LOCK
 1069  002770  012737  000005  001222            MOV     #5.,ICOUNT      ;RESET ITERATIONS
 1070  002776  013737  001216  001214            MOV     NEXT,RETURN     ;GET NEXT TEST
 1071  003004  011600                    3$:     MOV     (SP),R0         ;POP R0 OFF OF THE STACK
 1072  003006  022626                            POP2SP                  ;FAKE AN "RTI"
 1073  003010  000177  176200                    JMP     @RETURN         ;GO DO THE TEST
 1074  003014  001407                    BRW:    1407
 1075  003016  000437                    SRX:    437
 1076
 1077                                            ;CHECK FOR FREEZE ON CURRENT DATA
 1078                                            ;--------------------------------
 1079
 1080  003020  022777  001000  176154    .SCOP1: BIT     #SW09,@SWR      ;IS SW09=1(SET)?
 1081  003026  001405                            BEQ     1$              ;BR IF NOT SET.
 1082  003030  005737  001220                    TST     LOCK
 1083  003034  001402                            BEQ     1$
 1084  003036  013716  001220                    MOV     LOCK,(SP)       ;GOTO THE ADDRESS IN LOCK.
 1085  003042  000002                    1$:     RTI                     ;GO BACK.
 1086
 1087                                            ;TELETYPE OUTPUT ROUTINE
 1088                                            ;-----------------------
 1089
 1090  003044  010546                    .TYPE:  MOV     R5,-(SP)        ;SAVE R5 ON THE STACK.
 1091  003046  017605  000002                    MOV     @2(SP),R5       ;GET ADDRESS OF MESSAGE.
 1092  003052  062766  000002  000002            ADD     #2,2(SP)        ;POP OVER ADDRESS.
 1093  003060  032777  010000  176114    1$:     BIT     #SW12,@SWR      ;INHIBIT ALL PRINT OUT??
 1094  003066  001012                            BNE     3$              ;BR IF NO PRINT OUT WANTED (SW12=1)
 1095  003070  105715                            TSTB    (R5)            ;IS NUMBER MINUS? (MSB=1(BIT7))
 1096  003072  100002                            BPL     2$              ;BR IF NUMBER IS PLUS
 1097  003074  104402  005104                    TYPE    ,MCRLF          ;TYPE A CR/LF!
 1098  003100  105777  176104            2$:     TSTB    @TPCSR          ;TTY READY?
 1099  003104  100375                            BPL     2$              ;BR IF NO.
 1100  003106  112577  176100                    MOVB    (R5)+,@TPDBR    ;PRINT CURRENT CHAR.
 1101  003112  001362                            BNE     1$              ;IF NOT ZERO KEEP PRINTING!
 1102  003114  012605                    3$:     MOV     (SP)+,R5        ;END OF OUTPUT. RESTORE R5
```

```
1103  003116  000002                          RTI                     ;GO HOME
1104                                          ;-----------------------
1105
1106  003120  010346                  .INSTR: MOV     R3,-(SP)        ;SAVE R3 ON STACK
1107  003122  010446                          MOV     R4,-(SP)        ;SAVE R4 ON STACK
1108  003124  017637  000004  003142          MOV     @4(SP),.MSG
1109  003132  062766  000002  000004          ADD     #2,4(SP)
1110  003140  104402                  .INST1: TYPE
1111  003142  000000                  .MSG:   0
1112  003144  012704  005520                  MOV     #INBUF,R4
1113  003150  012703  000007                  MOV     #7,R3
1114  003154  105777  176024          1$:     TSTB    @TKCSR
1115  003160  100375                          BPL     1$
1116  003162  117714  176020                  MOVB    @TKDBR,(R4)
1117  003166  142714  000200                  BICB    #200,(R4)
1118  003172  122427  000015                  CMPB    (R4)+,#15
1119  003176  001417                          BEQ     INSTR2
1120  003200  105777  176004          2$:     TSTB    @TPCSR
1121  003204  100375                          BPL     2$
1122  003206  017777  175774  175776          MOV     @TKDBR,@TPDBR
1123  003214  005303                          DEC     R3
1124  003216  001356                          BNE     1$
1125  003220  012604                          MOV     (SP)+,R4
1126  003222  012603                          MOV     (SP)+,R3
1127  003224  104402  005100          .INSTE: TYPE    .MQM
1128  003230  010346                          MOV     R3,-(SP)
1129  003232  010446                          MOV     R4,-(SP)
1130  003234  000741                          BR      .INST1
1131  003236  012604                  INSTR2: MOV     (SP)+,R4        ;RESTORE R4
1132  003240  012603                          MOV     (SP)+,R3        ;RESTORE R3
1133  003242  000002                          RTI
1134
1135                                          ;CONVERT ASCII STRING TO OCTAL
1136                                          ;-----------------------------
1137
1138  003244  010546                  .PARAM: MOV     R5,-(SP)
1139  003246  010446                          MOV     R4,-(SP)
1140  003250  016605  000004                  MOV     4(SP),R5
1141  003254  012537  003434                  MOV     (R5)+,LOLIM
1142  003260  012537  003436                  MOV     (R5)+,HILIM
1143  003264  012537  003440                  MOV     (R5)+,DEVADR
1144  003270  112537  003442                  MOVB    (R5)+,LOBITS
1145  003274  112537  003443                  MOVB    (R5)+,ADRCNT
1146  003300  010566  000004                  MOV     R5,4(SP)
1147  003304  005005                  PARAM1: CLR     R5
1148  003306  012704  005520                  MOV     #INBUF,R4
1149  003312  122714  000015                  CMPB    #15,(R4)
1150  003316  001420                          BEQ     PARERR
1151  003320  121427  000060          1$:     CMPB    (R4),#60
1152  003324  002415                          BLT     PARERR
1153  003326  121427  000067                  CMPB    (R4),#67
1154  003332  003012                          BGT     PARERR
1155  003334  142714  000060                  BICB    #60,(R4)
1156  003340  152405                          BISB    (R4)+,R5
1157  003342  122714  000015                  CMPB    #15,(R4)
1158  003346  001406                          BEQ     LIMITS
```

```
1159  003350  006305                          ASL     R5
1160  003352  006305                          ASL     R5
1161  003354  006305                          ASL     R5
1162  003356  000760                          BR      1$
1163  003360  104404                PARERR:   INSTER
1164  003362  000750                          BR      PARAM1
1165
1166                                          ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
1167                                          ;--------------------------------------
1168
1169  003364  020537  003436        LIMITS:   CMP     R5,HILIM
1170  003370  101373                          BHI     PARERR
1171  003372  020537  003434                  CMP     R5,LOLIM
1172  003376  103770                          BLO     PARERR
1173  003400  133705  003442                  BITB    LOBITS,R5
1174  003404  001365                          BNE     PARERR
1175
1176                                          ;STORE NUMBER AT SPECIFIED ADDRESS
1177
1178  003406  013704  003440                  MOV     DEVADR,R4
1179  003412  010524                1$:       MOV     R5,(R4)+
1180  003414  062705  000002                  ADD     #2,R5
1181  003420  105337  003443                  DECB    ADRCNT
1182  003424  001372                          BNE     1$
1183  003426  012604                          MOV     (SP)+,R4
1184  003430  012605                          MOV     (SP)+,R5
1185  003432  000002                          RTI
1186  003434  000000                LOLIM:    0
1187  003436  000000                HILIM:    0
1188  003440  000000                DEVADR:   0
1189  003442  000000                LOBITS:   0
1190          003443                ADRCNT=LOBITS+1
1191
1192                                          ;SAVE PC OF TEST THAT FAILED AND R0-R5
1193                                          ;-------------------------------------
1194
1195  003444  016637  000004  001276  .SAV05:  MOV     4(SP),SAVPC     ;SAVE R7 (PC)
1196
1197                                          ;SAVE R0-R5
1198
1199  003452  010537  001272        SV05:     MOV     R5,SAVR5        ;SAVE R5
1200  003456  010437  001270                  MOV     R4,SAVR4        ;SAVE R4
1201  003462  010337  001266                  MOV     R3,SAVR3        ;SAVE R3
1202  003466  010237  001264                  MOV     R2,SAVR2        ;SAVE R2
1203  003472  010137  001262                  MOV     R1,SAVR1        ;SAVE R1
1204  003476  010037  001260                  MOV     R0,SAVR0        ;SAVE R0
1205  003502  000002                          RTI                     ;LEAVE.
1206
1207                                          ;RESTORE R0-R5
1208
1209  003504  013700  001260        .RES05:   MOV     SAVR0,R0        ;RESTORE R0
1210  003510  013701  001262                  MOV     SAVR1,R1        ;RESTORE R1
1211  003514  013702  001264                  MOV     SAVR2,R2        ;RESTORE R2
1212  003520  013703  001266                  MOV     SAVR3,R3        ;RESTORE R3
1213  003524  013704  001270                  MOV     SAVR4,R4        ;RESTORE R4
1214  003530  013705  001272                  MOV     SAVR5,R5        ;RESTORE R5
```

```
                                                RTI                     ;LEAVE

                                                ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
                                                ;-----------------------------------------------------

003536  104402  005104            .CONVR: TYPE    ,MCRLF
003542  010046                    .CNVRT: MOV     R0,-(SP)
003544  010146                            MOV     R1,-(SP)
003546  010346                            MOV     R3,-(SP)
003550  010446                            MOV     R4,-(SP)
003552  010546                            MOV     R5,-(SP)
003554  017601  000012                    MOV     12(SP),R1
003560  062766  000002  000012            ADD     #2,12(SP)
003566  012137  003742                    MOV     (R1)+,WRDCNT
003572  112137  003744            1$:     MOVB    (R1)+,CHRCNT
003576  112137  003745                    MOVB    (R1)+,SPACNT
003602  013137  003746                    MOV     @(R1)+,BINWRD
003606  013704  003746            2$:     MOV     BINWRD,R4
003612  113705  003744                    MOVB    CHRCNT,R5
003616  012700  005562                    MOV     #TEMP,R0
003622  010403                    3$:     MOV     R4,R3
003624  042703  177770                    BIC     #177770,R3
003630  062703  000060                    ADD     #C60,R3
003634  110320                            MOVB    R3,(R0)+
003636  000241                            CLC
003640  006004                            ROR     R4
003642  000241                            CLC
003644  006004                            ROR     R4
003646  000241                            CLC
003650  006004                            ROR     R4
003652  005305                            DEC     R5
003654  001362                            BNE     3$
003656  012703  005624                    MOV     #MDATA,R3
003662  114023                    4$:     MOVB    -(R0),(R3)+
003664  105337  003744                    DECB    CHRCNT
003670  001374                            BNE     4$
003672  105737  003745                    TSTB    SPACNT
003676  001405                            BEQ     6$
003700  112723  000040            5$:     MOVB    #040,(R3)+
003704  105337  003745                    DECB    SPACNT
003710  001373                            BNE     5$
003712  105013                    6$:     CLRB    (R3)
003714  104402  005624                    TYPE    ,MDATA
003720  005337  003742                    DEC     WRDCNT
003724  001322                            BNE     1$
003726  012605                            MOV     (SP)+,R5
003730  012604                            MOV     (SP)+,R4
003732  012603                            MOV     (SP)+,R3
003734  012601                            MOV     (SP)+,R1
003736  012600                            MOV     (SP)+,R0
003740  000002                            RTI
003742  000000                    WRDCNT: 0
003744  000000                    CHRCNT: 0
        003745                    SPACNT=CHRCNT+1
003746  000000                    BINWRD: 0
```

```
                                                ;TRAP DISPATCH SERVICE
                                                ;ARGUMENT OF TRAP IS EXTRACTED
                                                ;AND USED AS OFFSET TO OBTAIN POINTER
                                                ;TO SELECTED SUBROUTINE

003750  011646                  .TRPSR: MOV     (SP),-(SP)              ;GET PC OF RETURN
003752  162716  000002                  SUB     #2,(SP)                 ;=PC OF TRAP
003756  017616  000000                  MOV     @(SP),(SP)              ;GET TRP
003762  006316              .TRP0k:     ASL     (SP)                    ;MULTIPLY TRAP ARG BY 2
003764  042716  177001                  BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
003770  062716  001314                  ADD     #.TRPTAB,(SP)           ;POINTER TO SUBROUTINE ADDRESS
003774  017616  000000                  MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
004000  000136                        JMP     @(SP)+                  ;GO TO SUBROUTINE

                                                ;ERROR HANDLER
                                                ;-------------

004002                      .HLT:
004002  022737  177570  001202          CMP     #177570,SWR             ;IS THERE A REAL SWR?
004010  001411                        BEQ     64$                     ;BR IF YES
004012  017746  175170                  MOV     @TKDBR,-(SP)            ;SAVE KEYBOARD CHAR
004016  042716  000200                  BIC     #BIT7,(SP)              ;CLEAR PARITY BIT
004022  122726  000007                  CMPB    #7,(SP)+                ;WAS IT CNTRL 'G' ?
004026  001002                        BNE     .+6                     ;BR IF NO.
004030  004737  004640                  JSR     PC,SERV.G               ;SERVICE "CNTRL 'G'".
004034  032777  010000  175140  64$:     BIT     #SW12,@SWR              ;BELL ON ERROR?
004042  001406                        BEQ     XBX                     ;BR IF NO BELL
004044  105777  175140                  TSTB    @TPCSR                  ;TTY READY.
004050  100003                        BPL     XBX                     ;DON'T WAIT IF TTY NOT READY.
004052  112777  000207  175132          MOVB    #207,@TPDBF             ;PUSH A BELL AT THE TTY.
004060  032777  020000  175114  XBX:     BIT     #SW13,@SWR              ;DELETE ERROR PRINT OUT?
004066  001105                        BNE     HALTS                   ;BR IF NO PRINT OUT WANTED.
004070  021637  001234                  CMP     (SP),LSTERR             ;WAS THIS ERROR FOUND LAST TIME?
004074  001404                        BEQ     1$                      ;BR IF YES
004076  011637  001234                  MOV     (SP),LSTERR             ;RECORD BEING HERE
004102  105037  001311                  CLRB    ERRFLG                  ;PREPARE HEADER
004106  104406                  1$:     SAVD5                           ;SAVE ALL PROC REGISTERS
004110  011605                        MOV     (SP),R5                 ;GET THE PC OF ERROR
004112  162705  000002                  SUB     #2,R5                   ;GET ADDRESS OF TRAP CALL
004116  011504                        MOV     (R5),R4                 ;GET HLT INSTRUCTION
004120  006304                        ASL     R4                      ;MULT BY TWO
004122  061504                        ADD     (R5),R4                 ;DOUBLE IT
004124  006304                        ASL     R4                      ;MULT AGAIN
004126  042704  177001                  BIC     #177001,R4              ;CLEAR JUNK
004132  062704  025662                  ADD     #.ERRTAB,R4             ;GET POINTER
004136  012437  004252                  MOV     (R4)+,ERRMSG            ;GET ERROR MESSAGE
004142  012437  004264                  MOV     (R4)+,DATAHD            ;GET DATA HEADRER
004146  011437  004276                  MOV     (R4),DATABP             ;GET DATA TABLE
004152  105737  001311                  TSTB    ERRFLG                  ;TYPE HEADREER
004156  001403                        BEQ     TYPMSG                  ;BR IF YES
004160  005737  004276                  TST     DATABP                  ;DOES DATA TABLE EXIST?
004164  001040                        BNE     TYPDAT                  ;BR IF YES.
004166  104402  005104          TYPMSG: TYPE    ,MCRLF
004172  104402  005104                  TYPE    ,MCRLF
004176  005737  001220                  TST     LOOK
```

```
1327  004202  001402                        BEQ     1$
1328  004204  104402  005400                TYPE    .MASTEK
1329  004210  104402  005366        1$:     TYPE    .MTSTN
1330  004214  104411  004374                CNVRT   .XTSTN          ;SHOW IT
1331  004220  104402  005454                TYPE    .MERRPC         ;TYPE PC.
1332  004224  104411  004366                CNVRT   .ERTABO         ;SHOW IT
1333  004230  104402  005104                TYPE    .MCRLF          ;GIVE A CR/LF
1334  004234  112737  177777  001311        MOVB    #-1,ERRFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
1335  004242  005737  004252                TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
1336  004246  001402                        BEQ     WRKO.FM         ;BR IF NO.
1337  004250  104402                        TYPE                    ;TYPE
1338  004252  000000                ERRMSG: 0                       ;    ERROR MESSAGE
1339  004254                         WRKO.FM:                        ;
1340  004254  005737  004264                TST     DATAHD          ;DATA HEADER?
1341  004260  001402                        BEQ     TYPDAT          ;BR IF NO
1342  004262  104402                        TYPE                    ;TYPE
1343  004264  000000                DATAHD: 0                       ;    DATA HEADER
1344  004266  005737  004276        TYPDAT: TST     DATABP          ;DATA TABLE?
1345  004272  001402                        BEQ     RESREG          ;BR IF NO.
1346  004274  104410                        CONVRT                  ;SHOW
1347  004276  000000                DATABP: 0                       ;    DATA TABLE
1348  004300  104407                RESREG: RESOS                   ;RESTORE PROC REGISTERS
1349  004302  005777  174674        HALTS:  TST     @SWR            ;HALT ON ERROR?
1350  004306  100005                        BPL     EXITER          ;BR IF NO HALT ON ERROR
1351  004310  010046                        PUSHRO                  ;SAVE RO
1352  004312  016600  000002                MOV     2(SP),RO        ;SHOW ERROR PC IN DATA LIGHTS
1353  004316  000000                        HALT                    ;HALT
1354  004320  012600                        POPRO                   ;GET RO
1355  004322  005237  001232        EXITER: INC     ERRCNT          ;UPDATE ERROR COUNT
1356  004326  032777  000400  174646        BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
1357  004334  001007                        BNE     1$              ;BR IF YES
1358  004336  032777  002000  174636        BIT     #SW10,@SWR      ;GOTO NEXT TEST?
1359  004344  001407                        BEQ     2$              ;BR IF NO
1360  004346  013737  001216  001214        MOV     NEXT,RETURN     ;SET FOR NEXT TEST
1361  004354  012706  001200        1$:     MOV     #STACK,SP       ;RESET SP
1362  004360  000177  174630                JMP     @RETURN         ;GOTO SPECIFIED TEST
1363  004364  000002                2$:     RTI                     ;RETURN
1364  004366  000001                ERTABO: 1
1365  004370     006     002                .BYTE   6,2
1366  004372  001276                        SAVPC
1367  004374  000001                XTSTN:  1
1368  004376     003     002                .BYTE   3,2
1369  004400  001226                        TSTNO
1370                                        ;ENTER HERE ON POWER FAILURE
1371                                        ;-------------------------
1372
1373
1374  004402                        .PFAIL:
1375  004402  012737  004414  000024        MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
1376  004410  000000                        HALT                            ;HALT ON POWER DOWN NORMAL
1377  004412  000777                        BR      .
1378
1379                                        ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
1380
1381  004414                        RESTAR:
1382  004414  012737  004402  000024        MOV     #.PFAIL,24      ;SET UP FOR POWER FAILURE
```

```
 1383  004422  012706  001200                  MOV     #STACK,SP       ;RESET THE STACK POINTER
 1384  004426  005037  005562                  CLR     TEMP            ;READY FOR TIMMER
 1385  004432  005237  005562                  INC     TEMP            ;PLUS ONE TO THE TIMER!
 1386  004436  001375                          BNE     .-4             ;BR IF MORE TO GO
 1387  004440  104402  005107                  TYPE    .MPFAIL         ;TYPE THE MESSAGE
 1388  004444  104411  004470                  CNVRT   ,PFTAB          ;TELL WHAT TEST TO RETURN TO.
 1389  004450  105037  001311                  CLRB    ERRFLG          ;START CLEAN
 1390  004454  005037  001234                  CLR     LSTERR          ;**************
 1391  004460  104412                          MSTCLR                  ;START CLEAN UP OF DEVICE
 1392  004462  104413                          RAMCLR                  ;CLEAR IT ALL!
 1393  004466  000177  174564                  JMP     @RETURN         ;START DOING THAT TEST AGAIN.
 1394  004470  000001                  PFTAB:  1
 1395  004472      003     002          .BYTE   3,2
 1396  004474  001226                          TSTNO
 1397  004476  010046                  .DELAY: MOV     R0,-(SP)
 1398  004500  013700  004514                  MOV     1$,R0
 1399  004504  005300                          DEC     R0
 1400  004506  001376                          BNE     .-2
 1401  004510  012600                          MOV     (SP)+,R0
 1402  004512  000002                          RTI
 1403  004514  000036                  1$:     30.
 1404
 1405  004516                          .RAMCLR:
 1406  004516  012777  004000  174636          MOV     #MRESET,@DVSCR  ;ISSUE A MASTER CLEAR
 1407  004524  010146                          MOV     R1,-(SP)        ;SAVE R1 ON THE STACK
 1408  004526  010446                          MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
 1409  004530  013701  001372                  MOV     DVSRS,R1        ;GET SECONDARY SEL. REG.
 1410  004534  013704  001376                  MOV     DVSRA,R4        ;GET SECONDARY REGISTER ACCESS REG.
 1411  004540  005014                  1$:     CLR     (R4)            ;ZERO THE SECONDARY REGISTER.
 1412  004542  062711  170361                  ADD     #^C<BIT11+BIT10+BIT9+BIT8+BIT3+BIT2+BIT1+BIT0>+BIT5,(R1
 1413  004546  001374                          BNE     1$
 1414  004550  012604                          MOV     (SP)+,R4        ;RESTORE R4
 1415  004552  012601                          MOV     (SP)+,R1        ;RESTORE R1
 1416  004554  000002                          RTI
 1417
 1418  004556                          .MSTCLR:
 1419  004556  012777  004000  174576          MOV     #MRESET,@DVSCR  ;ISSUE MASTER CLEAR.
 1420  004564  000002                          RTI
 1421
 1422  004566                          .ROMCLK:
 1423  004566  052777  000002  174566          BIS     #BIT1,@DVSCR
 1424  004574  000002                          RTI
 1425
 1426  004576                          .DATACLK:
 1427  004576  010046                          MOV     R0,-(SP)
 1428  004600  005000                          CLR     R0
 1429  004602  052777  000400  174560          BIS     #BIT8,@DVLCR
 1430  004610  017737  174554  004636  1$:     MOV     @DVLCR,3$
 1431  004616  106037  004637                  RORB    3$+1
 1432  004622  103003                          BCC     2$
 1433  004624  005200                          INC     R0
 1434  004626  001370                          BNE     1$
 1435  004630  104000                          HLT     0
 1436  004632  012600                  2$:     MOV     (SP)+,R0
 1437  004634  000002                          RTI
 1438  004636  000001                  3$:     .BLKW 1
```

F03


```
 1439
 1440  004640  032777  004000  174336  SERV.G: BIT     #4000,@TKCSR    ;RX BUSY?
 1441  004646  001374                  BNE     SERV.G          ;BR IF YES
 1442  004650  017737  174326  005072  MOV     @SWR,90$        ;SAVE (SWR).
 1443  004656  013777  005072  174316  1$:     MOV     90$,@SWR        ;
 1444  004664  104402  005052          TYPE    ,89$            ;
 1445  004670  104411  005064          CNVRT   ,88$            ;
 1446  004674  104402  005074          TYPE    ,91$            ;
 1447  004700  105777  174300          TSTB    @TKCSR          ;WAIT FOR DONE.
 1448  004704  100375                  BPL     .-4
 1449  004706  017746  174274          MOV     @TKDBR,-(SP)    ;
 1450  004712  042716  000200          BIC     #BIT7,(SP)      ;
 1451  004716  122726  000015          CMPB    #15.,(SP)+      ;
 1452  004722  001450                  BEQ     5$              ;
 1453  004724  005077  174252          CLR     @SWR            ;
 1454  004730  105777  174254          2$:     TSTB    @TPCSR          ;
 1455  004734  100375                  BPL     .-4
 1456  004736  016677  177776  174246  MOV     -2(SP),@TPDBR   ;
 1457  004744  000241                  CLC                     ;
 1458  004746  006177  174230          ROL     @SWR            ;
 1459  004752  006177  174224          ROL     @SWR            ;
 1460  004756  006177  174220          ROL     @SWR            ;
 1461  004762  103735                  BCS     1$              ;ERROR
 1462  004764  026627  177776  000060  CMP     -2(SP),#60      ;
 1463  004772  002731                  BLT     1$              ;
 1464  004774  026627  177776  000067  CMP     -2(SP),#67      ;
 1465  005002  003325                  BGT     1$              ;
 1466  005004  042766  177770  177776  BIC     #10(7),-2(SP)   ;
 1467  005012  056677  177776  174162  BIS     -2(SP),@SWR     ;
 1468  005020  105777  174160          TSTB    @TKCSR          ;
 1469  005024  100375                  BPL     .-4             ;
 1470  005026  017746  174154          MOV     @TKDBR,-(SP)
 1471  005032  042716  000200          BIC     #BIT7,(SP)
 1472  005036  122726  000015          CMPB    #15.,(SP)+
 1473  005042  001332                  BNE     2$              ;
 1474  005044  104402  005104          5$:     TYPE    ,MCRLF          ;
 1475  005050  000207                  RTS     PC
 1476
 1477  005052  020377  051450  051127  89$:     .ASCIZ  <377>? (SWR)=/?
 1478  005060  036451  000057
 1479                                  .EVEN
 1480  005064  000001                  88$:    1
 1481  005066     006     000                  .BYTE   6,0
 1482  005070  005072                  90$
 1483  005072  000000                  90$:    .WORD   0
 1484  005074  036457  000057          91$:    .ASCIZ  ?/=/?
 1485                                  .EVEN
 1486  005100  020040  000077          MQM:    .ASCIZ  /  ?/
       005104  005015     000          MCRLF:  .ASCIZ  <15><12>
       005107     377  053520  020122  MPFAIL: .ASCIZ  <377>/PWR FAILED. RESTART AT TEST
       005145     377  047105  020104  MEPASS: .ASCIZ  <377>/END PASS DZDVE-B
       005171     377  000122          MR:     .ASCIZ  <377>/R/
       005174  050377  047522  051107  MERR2:  .ASCIZ  <377>/PROGRAM INDICATES NO DEVICES PRESENT.
       005243     377  047111  052523  MERR3:  .ASCIZ  <377>/INSUFFICIENT DATA!/
       005267     377  042524  052123  MTSTPC: .ASCIZ  <377>/TEST PC-/
       005301     377  047514  045503  MLOCK:  .ASCIZ  <377>/LOCK ON SELECTED TEST
```

```
                005330  051503  035122  000040  MCSRX:  .ASCIZ    CSR:
                005336  042526  035103  000040  MVECX:  .ASCIZ   VEC:
                005344  040520  051523  051505  MPASSX: .ASCIZ   PASSES:
                005355     105  051122  05111   MERRX:  .ASCIZ   ERRORS:
                005366  042524  052123  047040  MTSTN:  .ASCIZ   TEST NO:
                005400  000052                  MASTEK: .ASCIZ  *
                005402  051777  052105  051440  MNEW:   .ASCIZ  <377> SET SWITCH REG TO DV11'S DESIRED ACTIVE.
                005454  041520  020072     000  MERRPC: .ASCIZ  PC:
                005461     377  040515  020120  XHEAD:  .ASCIZ  <377> MAP OF DV11 STATUS<377>
                                                .EVEN
                005506  000002                  XSTATQ: 2
  1487          005510     006     003                  .BYTE   6,3
  1488          005512  001246                          TEMP1
  1489          005514     006     002                  .BYTE   6,2
  1490          005516  001250                          TEMP2
  1491                                          .EVEN
  1492
  1493                                                   ;BUFFERS FOR INPUT-OUTPUT
  1494
  1495          005520  000000                  INBUF:  0
  1496                  005562                  .=.+40
  1497          005562  000000                  TEMP:   0
  1498                  005624                  .=.+40
  1499          005624  000000                  XDATA:  0
  1500                  005666                  .=.+40
```

```
                                        ;
                                        ;ROUTINE USED TO "CYCLE" THROUGH UP TO EIGHT DV11'S
                                        ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
                                        ;AND RUNS THE SPECIFIED DV11'S.   THIS ROUTINE *MUST*
                                        ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
                                        ;SETUP NECESSARY.
                                        ;
1510  005666  105737  001300    CYCLE:  TSTB    DVACTV          ;ARE ANY DV11'S TO BE TESTED?
1511  005672  001004                    BNE     1$              ;BR IF OK.
1512  005674  104402  005174            TYPE    .MERR2          ;NO DV11'S SELECTED!!
1513  005700  000000                    HALT                    ;STOP THE SHOW.
1514  005702  000776                    BR      .-2             ;DISQUALIFY CONT. SW.
1515  005704  133737  001304  001300 1$:  BITB    RUN,DVACTV      ;IS THIS ONE "ACTIVE"
1516  005712  001020                    BNE     2$              ;BR IF GOOD ONE FOUND.
1517  005714  000241                    CLC                     ;CLEAR PROC. CARRY BIT.
1518  005716  106137  001304            ROLB    RUN             ;UPDATE POINTER
1519  005722  105537  001304            ADCB    RUN             ;CATCH CARRY FROM RUN
1520  005726  062737  000024  001306    ADD     #24,CREAM       ;UPDATE ADDRESS POINTER.
1521  005734  022737  001740  001306    CMP     #DV.END,CREAM
1522  005742  001360                    BNE     1$              ;KEEP GOING; NOT ALL TESTED FOR.
1523  005744  012737  001500  001306    MOV     #DV.MAP,CREAM   ;RESET ADDRESS POINTER.
1524  005752  000754                    BR      1$              ;KEEP LOOKING FOR ACTIVE DV11
1525  005754  000241            2$:     CLC                     ;CLEAR PROC. CARRY.
1526  005756  106137  001304            ROLB    RUN             ;UPDATE POINTER.
1527  005762  105537  001304            ADCB    RUN             ;CATCH CARRY.
1528  005766  013700  001306            MOV     CREAM,R0        ;GET ADDRESS POINTER.
1529  005772  062737  000024  001306    ADD     #24,CREAM       ;UPDATE.
1530  006000  022737  001740  001306    CMP     #DV.END,CREAM
1531                                                            ;ALL DONE?
1532  006006  001003                    BNE     3$              ;BR IF NO.
1533  006010  012737  001500  001306    MOV     #DV.MAP,CREAM   ;RESTORE POINTER.
1534  006016  012037  001362    3$:     MOV     (R0)+,DVSCR     ;LOAD SYSTEM CTRL. REG
1535  006022  012037  001352            MOV     (R0)+,DVRVEC    ;LOAD VECTOR
1536  006026  012037  001416            MOV     (R0)+,L00.03    ;GET LINE PARAMETERS. 00-03
1537  006032  012037  001426            MOV     (R0)+,SYNC2A    ;
1538  006036  012037  001420            MOV     (R0)+,L04.07    ;                     04-07
1539  006042  012037  001430            MOV     (R0)+,SYNC2B    ;
1540  006046  012037  001422            MOV     (R0)+,L08.11    ;                     08-11
1541  006052  012037  001432            MOV     (R0)+,SYNC2C    ;
1542  006056  012037  001424            MOV     (R0)+,L12.15    ;                     12-15
1543  006062  012037  001434            MOV     (R0)+,SYNC2D    ;
1544  006066  012700  000002            MOV     #2,R0           ;SAVE CORE THIS WAY!
1545  006072  013737  001362  001364    MOV     DVSCR,DVSCRH    ;GET SYS CTRL. REG HIGH BYTE.
1546  006100  005237  001364            INC     DVSCRH          ;GOT IT.
1547  006104  013737  001364  001366    MOV     DVSCRH,DVRIC    ;GET NXT REC. CHAR REG.
1548  006112  005237  001366            INC     DVRIC           ;GOT IT
1549  006116  013737  001366  001370    MOV     DVRIC,DVLCR     ;GET LN. PAR.REG.
1550  006124  060037  001370            ADD     R0,DVLCR        ;GOT IT
1551  006130  013737  001370  001372    MOV     DVLCR,DVSRS     ;GET SEC. REG. SEL. REG.
1552  006136  060037  001372            ADD     R0,DVSRS        ;GOT IT
1553  006142  013737  001372  001374    MOV     DVSRS,DVSRSH    ;GET HIGH BYTE.
1554  006150  005237  001374            INC     DVSRSH          ;GOT IT
1555  006154  013737  001374  001376    MOV     DVSRSH,DVSRA    ;SEC. REG. ACCESS.
1556  006162  005237  001376            INC     DVSRA           ;GOT IT
```

```
 1557  006166  013737  001376  001          MOV     DVSRA,DVSFR     ;SPEC. FUN. REG.
 1558  006174  060037  001400               ADD     R0,DVSFR        ;
 1559  006200  013737  001400  001402       MOV     DVSFR,DVNSR     ;NPR STAT. REG.
 1560  006206  060037  001402               ADD     R0,DVNSR        ;
 1561  006212  013737  001402  001404       MOV     DVNSR,RESV16    ;RESERVED REG
 1562  006220  060037  001404               ADD     R0,RESV16       ;
 1563
 1564  006224  013737  001352  001354       MOV     DVRVEC,DVRLVL   ;PTY LVL
 1565  006232  060037  001354               ADD     R0,DVRLVL       ;
 1566  006236  013737  001354  001356       MOV     DVRLVL,DVTVEC   ;TX VEC
 1567  006244  060037  001356               ADD     R0,DVTVEC       ;
 1568  006250  013737  001356  001360       MOV     DVTVEC,DVTLVL   ;TX LVL
 1569  006256  060037  001360               ADD     R0,DVTLVL
 1570
 1571  006262  012700  001416               MOV     #L00.03,R0      ;LOAD STAUS 00-03
 1572  006266  012701  001406               MOV     #MASK.A,R1      ;PREPARE MASK.
 1573  006272  012702  001412               MOV     #CLK.A,R2       ;PREPARE CLOCKS
 1574  006276  004737  006516               JSR     PC,FIX.00       ;GO AND CALCULATE CONFIGURATION.
 1575
 1576  006302  012700  001420               MOV     #L04.07,R0      ;LOAD STAUS 00-03
 1577  006306  012701  001407               MOV     #MASK.B,R1      ;PREPARE MASK.
 1578  006312  012702  001413               MOV     #CLK.B,R2       ;PREPARE CLOCKS
 1579  006316  004737  006516               JSR     PC,FIX.00       ;GO AND CALCULATE CONFIGURATION.
 1580
 1581  006322  012700  001422               MOV     #L08.11,R0      ;LOAD STAUS 00-03
 1582  006326  012701  001410               MOV     #MASK.C,R1      ;PREPARE MASK.
 1583  006332  012702  001414               MOV     #CLK.C,R2       ;PREPARE CLOCKS
 1584  006336  004737  006516               JSR     PC,FIX.00       ;GO AND CALCULATE CONFIGURATION.
 1585
 1586  006342  012700  001424               MOV     #L12.15,R0      ;LOAD STAUS 00-03
 1587  006346  012701  001411               MOV     #MASK.D,R1      ;PREPARE MASK.
 1588  006352  012702  001415               MOV     #CLK.D,R2       ;PREPARE CLOCKS
 1589  006356  004737  006516               JSR     PC,FIX.00       ;GO AND CALCULATE CONFIGURATION.
 1590  006362  032777  000002  172612       BIT     #SW01,@SWR
 1591  006370  001445                       BEQ     7$
 1592  006372                          4$:
 1593  006372  005737  000042               TST     @#42
 1594  006376  001042                       BNE     7$
 1595  006400  104402  005104               TYPE    .MORLF
 1596  006404  104403                       INSTR
 1597  006406  005366                       MTSTN
 1598  006410  104405                       PARAM
 1599  006412  000001                       1
 1600  006414  001000                       1000
 1601  006416  001226                       TSTNO
 1602  006420     000                  .BYTE  0
 1603  006421     001                  .BYTE  1
 1604  006422  012700  007306               MOV     #TST1,R0
 1605  006426  022710                  5$:  CMP     (PC)+,(R0)
 1606  006430  012737                       MOV     (PC)+,@(PC)+
 1607  006432  001015                       BNE     6$
 1608  006434  023760  001226  000002       CMP     TSTNO,2(R0)
 1609  006442  001011                       BNE     6$
 1610  006444  022760  001226  000004       CMP     #TSTNO,4,R0)
 1611  006452  001005                       BNE     6$
 1612  006454  010037  001214               MOV     R0,RETURN
```

```
 1613  006460  104402  005104                    TYPE    ,MCRLF
 1614  006464  000412                            BR      9$
 1615  006466  005720                    6$:     TST     (R0)+
 1616  006470  020027  020456                    CMP     R0,#TLAST+10
 1617  006474  001354                            BNE     5$
 1618  006476  104402  005100                    TYPE    ,MQM
 1619  006502  000733                            BR      4$
 1620  006504  012737  007306  001214  7$:     MOV     #TST1,RETURN    ;PREPARE RETURN ADDRESS
 1621  006512  000177  172476          8$:     JMP     @RETURN         ;GO START TESTING.
 1622
 1623  006516  011003                    FIX.00: MOV     (R0),R3         ;GET PARAMETERS.
 1624  006520  042703  176377                    BIC     #^C<1400>,R3    ;CLEAR JUNK.
 1625  006524  005703                            TST     R3              ;TEST FOR EIGHT BITS.
 1626  006526  001004                            BNE     1$              ;BR IF NOT 8 BITS.
 1627  006530  105011                            CLRB    (R1)            ;SET
 1628  006532  112712  000010                    MOVB    #8.,(R2)        ;
 1629  006536  000424                            BR      4$
 1630  006540  022703  000400          1$:     CMP     #400,R3         ;CHECK FOR SEVEN BITS.
 1631  006544  001005                            BNE     2$              ;BR IF NOT 7 BITS.
 1632  006546  112711  000200                    MOVB    #200,(R1)       ;
 1633  006552  112712  000007                    MOVB    #7,(R2)         ;
 1634  006556  000414                            BR      4$
 1635  006560  022703  001000          2$:     CMP     #1000,R3        ;CHECK FOR SIX BITS.
 1636  006564  001005                            BNE     3$              ;BR IF NOT SIX BITS.
 1637  006566  112711  000300                    MOVB    #300,(R1)       ;
 1638  006572  112712  000006                    MOVB    #6,(R2)         ;
 1639  006576  000404                            BR      4$
 1640  006600  112711  000340          3$:     MOVB    #340,(R1)       ;IF NONE OF THE ABOVE; MUST BE 5 BITS.
 1641  006604  112712  000005                    MOVB    #5,(R2)         ;
 1642  006610  032710  040000          4$:     BIT     #PARBIT,(R0)    ;PARITY ENABLED?
 1643  006614  001401                            BEQ     5$              ;IF =0; THEN NO PARITY.
 1644  006616  105212                            INCB    (R2)            ;PLUS ONE TO THE CLOCK!
 1645  006620  000207                    5$:     RTS     PC              ;
 1646
 1647                                            ;*ROUTINE USED TO "AUTO SIZE" THE DV11
 1648                                            ;*CSR AND VECTOR.
 1649                                            ;*NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
 1650                                            ;*      ADDRESS RANGE (175000:175400)
 1651                                            ;*      AND THE VECTOR MAY BE ANY WHERE IN THE
 1652                                            ;*      FLOATING VECTOR RANGE (300:770)
 1653                                            ;*
 1654
 1655  006622                    AUTO.SIZE:
 1656  006622  000005                            RESET                   ;INSURE A BUS INIT.
 1657  006624  012702  001500          CSRMAP: MOV     #DV.MAP,R2      ;LOAD MAP POINTER.
 1658  006630  005022                    1$:     CLR     (R2)+           ;ZERO ENTIRE MAP
 1659  006632  022702  001740                    CMP     #DV.END,R2      ;ALL DONE?
 1660  006636  001374                            BNE     1$              ;BR IF NO
 1661  006640  105037  001301                    CLRB    DVNUM           ;SET OCTAL NUMBER OF DV11'S TO 0
 1662  006644  012702  001500                    MOV     #DV.MAP,R2
 1663  006650  012701  175000                    MOV     #175000,R1      ;SET FOR FIRST ADDRESS TO BE TESTED
 1664  006654  012737  007074  000004          MOV     #6$,@#4         ;SET FOR NON-EXISTANT DEVICE TIME OUT
 1665  006662  005711                    2$:     TST     (R1)            ;IF DV11 DVSCR S/B 0
 1666  006664  001037                            BNE     3$              ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO DV11
 1667  006666  022761  177777  000012          CMP     #177777,12(R1)  ;IF DV11 THEN DVSFR S/B ALL 1'S ON INIT!
 1668  006674  001033                            BNE     3$              ;BR IF NOT DV11
```

```
1669  006676  005761  000016                  TST     16(R1)          ;IF DV11 THEN RESV16 S/B ALL 0'S
1670  006702  001030                          BNE     3$              ;BR IF NOT DV11
1671                                  ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DV11 CSR ADDRESS.
1672  006704  010122                          MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
1673  006706  005722                          TST     (R2)+           ;POP OVER VECTOR STORE AREA
1674  006710  052722  000226                  BIS     #226,(R2)+      ;SET LINE CARD 1 STAT AND SYNC
1675  006714  052722  000062                  BIS     #62,(R2)+       ;
1676  006720  052722  000226                  BIS     #226,(R2)+      ;SET LINE CARD 2 STAT AND SYNC
1677  006724  052722  000062                  BIS     #62,(R2)+       ;
1678  006730  052722  000226                  BIS     #226,(R2)+      ;SET LINE CARD 3 STAT AND SYNC
1679  006734  052722  000062                  BIS     #62,(R2)+       ;
1680  006740  052722  000226                  BIS     #226,(R2)+      ;SET LINE CARD 4 STAT AND SYNC
1681  006744  052722  000062                  BIS     #62,(R2)+       ;
1682  006750  105237  001301                  INCB    DVNUM           ;UPDATE DEVICE COUNTER
1683  006754  122737  000010  001301          CMPB    #10,DVNUM       ;ARE MAX. NO. OF DEV FOUND?
1684  006762  001405                          BEQ     100$            ;YES DON'T LOOK FOR ANY MORE.
1685  006764  062701  000010          3$:     ADD     #10,R1          ;UPDATE CSR POINTER ADDRESS
1686  006770  022701  175400                  CMP     #175400,R1
1687  006774  001332                          BNE     2$              ;BR IF MORE ADDRESS TO CHECK.
1688  006776  012722  177777          100$:   MOV     #177777,(R2)+   ;TERMINATER.
1689  007002  105037  001300                  CLRB    DVACTV
1690  007006  105737  001301                  TSTB    DVNUM           ;WERE ANY DV11'S FOUND AT ALL?
1691  007012  001423                          BEQ     5$              ;ERROR AUTO SIZER FOUND NO DV11'S IN THIS SYS.
1692  007014  113701  001301                  MOVB    DVNUM,R1
1693  007020  110137  001303                  MOVB    R1,SAVNUM       ;SAVE NUMBER OF DEVICES
1694  007024  000241                  4$:     CLC
1695  007026  106137  001300                  ROLB    DVACTV          ;GENERATE ACTIVE REGISTER OF DEVICES.
1696  007032  105237  001300                  INCB    DVACTV          ;SET THE BIT
1697  007036  005301                          DEC     R1
1698  007040  001371                          BNE     4$              ;BR IF MORE TO GENERATE
1699  007042  012737  000006  000004          MOV     #6,@#4          ;RESTORE TRAP VECTOR
1700  007050  113737  001300  001302          MOVB    DVACTV,SAVACT   ;SAVE ACTIVE REGISTER
1701  007056  000137  007102                  JMP     VECMAP          ;GO FIND THE VECTOR NOW.
1702  007062  104402  005174          5$:     TYPE    ,MERR2          ;NOTIFY OPR THAT NO DV11'S FOUND.
1703  007066  005000                          CLR     R0              ;MAKE DATA LIGHTS ZERO
1704  007070  000000                          HALT                    ;STOP THE SHOW
1705  007072  000776                          BR      .-2             ;DISABLE CONT. SW.
1706  007074  012716  006764          6$:     MOV     #3$,(SP)        ;ENTERED BY NON-EXISTANT TIME-OUT.
1707  007100  000002                          RTI                     ;RETURN TO MAINSTREAM
1708
1709  007102  012737  000340  000022  VECMAP: MOV     #340,@#22       ;SET IOT TRAP PRIO TO 7
1710  007110  012737  007232  000020          MOV     #4$,@#20        ;SET IOT TRAP VECTOR
1711  007116  012702  001500                  MOV     #DV.MAP,R2      ;SET SOFTWARE POINTER
1712  007122  012700  000300                  MOV     #300,R0         ;FLOATING VECTORS START HERE.
1713  007126  012701  000302                  MOV     #302,R1         ;PC OF IOT INSTR.
1714  007132  010120                  1$:     MOV     R1,(R0)+        ;START FILLING VECTOR AREA
1715  007134  012721  000004                  MOV     #4,(R1)+        ;WITH .+2; IOT
1716  007140  022021                          CMP     (R0)+,(R1)+     ;ADD 2 TO R0 +R1
1717  007142  020127  001000                  CMP     R1,#1000
1718  007146  101771                          BLOS    1$              ;BR IF MORE TO FILL
1719  007150  113737  001300  001246          MOVB    DVACTV,TEMP1    ;STORE TEMPORALLY
1720  007156  006037  001246          2$:     ROR     TEMP1           ;BRING OUT A BIT
1721  007162  103034                          BCC     5$              ;BR IF ALL DONE
1722  007164  005037  177776                  CLR     PS              ;ZERO CPU PRIO
1723  007170  012772  001300  000000          MOV     #BIT9+BIT7+BIT6,@(R2)
1724  007176  005000                          CLR     R0              ;ATTEMPT TO FORCE AN INTERUPT
```

```
1725  007200  005200                          INC     R0              ;STALL
1726  007202  001376                          BNE     .-2             ;       FOR TIME TO INTERUPT
1727  007204  052762  000300  000002          BIS     #300,2(R2)      ;NO INTERUPT ASSUME 300 AND FIX DV11 LATER
1728  007212  042772  176777  000000  3$:     BIC     #^C<BIT9>,@(R2)
1729  007220  005072  000000                  CLR     @(R2)
1730  007224  062702  000024                  ADD     #24,R2          ;POP SOFTWARE POINTER
1731  007230  000752                          BR      2$              ;KEEP GOING
1732  007232  051662  000002          4$:     BIS     (SP),2(R2)      ;GET VECTOR ADDRESS
1733  007236  042762  000007  000002          BIC     #7,2(R2)        ;CLEAR JUNK
1734  007244  022626                          CMP     (SP)+,(SP)+     ;POP IOT JUNK OFF STACK
1735  007246  012716  007212                  MOV     #3$,(SP)        ;SET FOR RETURN
1736  007252  000002                          RTI
1737  007254  000207                  5$:     RTS     PC              ;ALL DONE WITH "AUTO SIZING"
1738
```

```
1739                                    ;CONTROL STATUS REGISTER BIT FUNCTIONS
1740
1741            000020                  BUSY=20         ;LINE SCANNER RUNNING
1742            000040                  SCNENA=40       ;LINE SCANNER ENABLE
1743            000100                  INTENA=100      ;INTERRUPT ENABLE
1744            000200                  DONE=200        ;SCANNER DONE
1745            000400                  STEP=400        ;CAUSES LINE COUNTER TO BE INCREMENTED BY 1 COUNT
1746            001000                  MAINT=1000      ;FORCES IS TO INPUT OF SCRATCH PAD MEMORY
1747            002000                  CLRMUX=2000     ;CLEAR MULTIPLEXER FUNCTION FLIPFLOPS
1748            004000                  CLRSCN=4000     ;CLEARS SCANNER SCRATCHPAD MEMORY
1749            010000                  SECRXF=10000    ;SECONDARY RECEIVE TRANSITION WAS DETECTED BY SCANNER
1750            020000                  CSF=20000       ;CLEAR TO SEND TRANSITION WAS DETECTED BY SCANNER
1751            040000                  COF=40000       ;CARRIER TRANSITION WAS DETECTED BY SCANNER
1752            100000                  RINGF=100000    ;RING SIGNAL WAS DETECTED BY SCANNER
1753
1754                                    ;LINE REGISTER BIT FUNCTIONS
1755
1756            000001                  LINENA=BIT0     ;=1, RECOGNIZE TRANSITIONS ON THIS LINE
1757            000010                  SECTX=10        ;=1, SEND SECONDARY TRANSMIT TO MODEM
1758            000020                  SECRX=20        ;=1, SECONDARY RECEIVE TURNED ON BY MODEM
1759            000002                  TRMRDY=BIT1     ;=1, SEND TERMINAL READY TO MODEM
1760            000004                  RS=BIT2         ;=1, SEND REQUEST TO SEND TO MODEM
1761            000010                  NS=BIT3         ;=1,  NEW SYNC LEAD.
1762            000020                  DSR=BIT4        ;=1, DATA SET READY.
1763            000040                  CS=BIT5         ;=1, CLEAR TO SEND TURNED ON BY MODEM
1764            000100                  CO=BIT6         ;=1, CARRIER TURNED ON BY MODEM
1765            000200                  RING=BIT7       ;=1, RING TURNED ON BY MODEM
1766
1767  007256    000000                  TURFLG: 0
1768  007260    000000                  LINE:   0
1769  007262    000000                  POINTER:        0
1770  007264    000000                  CHAR:   0
1771  007266    000000                  COUNT:  0
1772  007270    000000                  SELECT: 0
1773  007272    000000                  EXERCISE:       0
1774  007274    000000                  TOTAL:  0
1775  007276    000001                  MC.CSR: .BLKW 1
1776  007300    000001                  MC.LSR: .BLKW 1
1777  007302    000300                  MC.VEC: 300             ;DEFAULT VECTOR!!
1778  007304    000001                  MC.LVL: .BLKW 1


                        ;*TABLE OF LOOP AROUND FUNCTIONS  (H325)
                        ;*-------------------------------
              ;*
              ;*RING      CO       CTS      SECRX   SECTX      RTS     TRDY    LENAB  *** SIGNALS FOR ASYNC LC.
              ;*RING      CO       CTS       DSR     NS        RTS     TRDY    LENAB  *** SIGNALS FOR SYNC LC
              ;*BIT07    BIT06    BIT05    BIT04    BIT03    BIT02    BIT01    BIT00
              ;*                            †+++++++++†
              ;*           †+++++++++†++++++++++++++++++++++++†
              ;*  †++++++++++++++++++++++++++++++++++++++++++++++++++++++++†
              ;*
              ;*
              ;*
```

```
1793                    ;*********************************************************************
1794                    ;*      THIS "TEST 1" IS NOT ACTUALLY A TEST.
1795                    ;*      IT IS USED TO GET USERS INPUTS FOR WHICH LINE(S) ARE TO BE
1796                    ;*      EXERCISED. THE PROGRAM WILL TYPE OUT:
1797                    ;*      (A) H325
1798                    ;*      (B) H861
1799                    ;*      TYPE "A" "OR "B"
1800                    ;*
1801                    ;*      THE H325 TURN AROUND IS USED FOR THE SINGLE LINE
1802                    ;*      TURN AROUND AT THE DISTRIBUTION PANEL OR
1803                    ;*      AT THE END OF THE MODEM CABLE.
1804                    ;*      THE H861 TURN AROUND IS USED FOR THE 16 LINE TURN AROUND.
1805                    ;*      IF THE H325 WAS SELECTED (A) THE FOLLOWING WILL BE TYPED
1806                    ;*      IF SW06=0:
1807                    ;*      SELECT LINE(S):  XXXXXXXXXXXXXXXX
1808                    ;*
1809                    ;*      THE FIRST "X" REPRESENTS LINE 15 AND EACH "X" IS THE
1810                    ;*      NEXT LOWER LINE TILL THE LAST "X" IS LINE 0. TYPE
1811                    ;*      A "1" OR A "0" UNDER THE APPROIATE "X"(LINE)
1812                    ;*      TO EITHER SELECT(1) OR NOT TEST(0) EACH LINE.
1813                    ;*      AFTER ALL 1'S AND 0'S ARE TYPED; TYPE A <CR>.
1814                    ;*      THE PROGRAM WILL TYPE OUT IN OCTAL THE LINES YOU
1815                    ;*      HAVE SELECTED; AND THE PROGRAM WILL BEGIN RUNNING
1816                    ;*      THE HIGHEST SELECTED LINE THROUGH *ALL* TESTS THEN
1817                    ;*      UPDATING TO THE NEXT LOWEST LINE TILL ALL SELECTED
1818                    ;*      LINES ARE DONE. THEN THE PROGRAM WILL TYPE AN
1819                    ;*      "END" CHAR.  PLEASE READ  THE SECTION ON PASS COMPLETE
1820                    ;*                      IN DOCUMENT.
1821                    ;*      IF THE H325 IS SELECTED AND SW06=1 THE FOLLOWING WILL BE TYPED:
1822                    ;*      SINGLE LINE:
1823                    ;*      THE USER MUST THEN TYPE IN A SINGLE LINE HE DESIRES (00-17) -OCTAL-
1824                    ;*      END PASS IS THE SAME.
1825                    ;*      REGUARDLESS OF WHICH CONNECTOR WAS SELECTED; THE
1826                    ;*      THE LAST QUESTION IS:
1827                    ;*      MODEM VECTOR: `
1828                    ;*      (THIS WILL BE ASKED ONLY AT THE INIATL START OF PROGRAM
1829                    ;*      OR WHEN A DIFFERENT DV11 IN THE SYSTEM IS UNDER TEST)
1830                    ;*      TYPE IN THE VECTOR OF THE MODEM CONTROL(300:774).
1831                    ;*      THE CSR(MC.CSR) IS ASSUMED TO BE =DVSCR+20.
1832                    ;*      NOTE:   IF CABLE TESTS ARE TO BE DONE ON OTHER
1833                    ;*      DV11'S IN SYSTEM; SELECT THEM BY USING SW00 AS DESCRIBED
1834                    ;*      IN THE DOCUMENTATION.
1835                    ;*      UNLESS LOCATION 42 IS NON-ZERO IN WHICH CASE THE PROGRAM
1836                    ;*      ASSUMES ITS UNDER ACT-11 MONITOR.  THE PROGRAM WILL
1837                    ;*      CYCLE THROUGH ALL DV11S AND MODEM CONTROL *HOWEVER*
1838                    ;*      THE RESTRICTIONS ARE:
1839                    ;*      ***ALL*** MODEM VECTORS MUST BE AT 300
1840                    ;*      ***ALL*** TURN AROUNDS MUST BE H861.
1841                    ;*      "LONG END PASS" WILL BE GIVEN AT END OF LARGE END TO
1842                    ;*              INDICATE DEVICES TESTED. PASSES TYPED IN THIS
1843                    ;*              MESSAGE DO NOT INDICATE PASSES BUT RATHER THE
1844                    ;*              NUMBER OF FULL PASSES THROUGH MULTIPLE DEVICES.
1845                    ;*                      !LARGE END AND TYPE OUT MAY BE INHIBITED BY SW12!
1846                    ;*********************************************************************
```

```
                                        ;  TEST 1
                                        ;--------------
007306  012737  000001  001226  TST1:   MOV     #1,TSTNO
007314  012737  010766  001216          MOV     #TST2,NEXT
007322  005037  177776                  CLR     PS                      ;CLEAR CPU STATUS
007326  013737  001362  007276          MOV     DVSCR,MC.CSR            ;GET MODEM CSR
007334  062737  000020  007276          ADD     #20,MC.CSR              ;IT HAS TO BE 20(8) MORE THAN DVSCR.
007342  013737  007276  007300          MOV     MC.CSR,MC.LSR           ;GET MODEM LSR
007350  062737  000002  007300          ADD     #2,MC.LSR               ;MUST BE 2 MORE THAN CSR
007356  012737  010274  000060          MOV     #KBISR,@#60             ;SET KEYBOARD INTERUPT VEC
007364  012737  000340  000062          MOV     #340,@#62               ;SET LEV TO 7
007372  012777  000100  171604          MOV     #100,@TKCSR             ;SET INTERUPT ENABLE
007400  012737  000340  177776          MOV     #340,PS                 ;LOCK OUT TTY
007406  005737  000042                  TST     @#42
007412  001020                          BNE     44$
007414  104402  023247          1$:     TYPE    ,MTURN
007420  004737  023334                  JSR     PC,TKRDY
007424  122737  000101  001272          CMPB    #101,SAVRS
007432  001034                          BNE     70$
007434  012737  000377  007256          MOV     #377,TURFLG
007442  000412                          BR      71$
007444  122737  000102  001272  70$:    CMPB    #102,SAVRS
007452  001360                          BNE     1$
007454  005037  007256          44$:    CLR     TURFLG
007460  012737  000001  007270          MOV     #1,SELECT
007466  000523                          BR      68$
007470  032777  000100  171504  71$:    BIT     #SW06,@SWR
007476  001421                          BEQ     72$
007500                          MAP18=.
007500  104403  022240                  INSTR   ,MSING
007504  104405                          PARAM
007506  000000                          CC
007510  000017                          17
007512  007260                          LINE
007514     000     001                  .BYTE   0,1
007516  012737  000001  007270          MOV     #1,SELECT
007524  005337  007260          74$:    DEC     LINE
007530  100502                          BMI     68$
007532  000241                          CLC
007534  006137  007270                  ROL     SELECT
007540  000771                          BR      74$
007542  104402  022125          72$:    TYPE    ,MSEL                   ;ASK FOR LINES
007546  013737  007270  001252          MOV     SELECT,TEMP3            ;GET PREVIOUS LINE SELECT
007554  005037  007270                  CLR     SELECT                  ;MAKE IT 0
007560  105777  171420          2$:     TSTB    @TKCSR                  ;READY?
007564  100375                          BPL     2$                      ;BR IF NO
007566  017700  171414                  MOV     @TKDBR,R0               ;READ CHAR
007572  010077  171414                  MOV     R0,@TPDBR               ;ECHO CHAR
007576  042700  177600                  BIC     #^C<177>,R0             ;STRIP ALL BUT DATA
007602  022700  000123                  CMP     #123,R0                 ;WAS IT "S(AME)"
007606  001004                          BNE     .+12                    ;BR IF NO
007610  013737  001252  007270          MOV     TEMP3,SELECT            ;RESTORE PREVIOUS LINES SELECTED
007616  000415                          BR      4$                      ;GO ON
007620  022700  000015                  CMP     #15,R0                  ;WAS IT "<CR>"
007624  001412                          BEQ     4$                      ;BR IF YES
007626  022700  000060                  CMP     #60,R0                  ;WAS IT "0"
```

```
1903  007632  001403                          BEQ     3$              ;BR IF YES
1904  007634  022700  000061                  CMP     #61,R0          ;WAS IT "1"
1905  007640  001265                          BNE     1$              ;BR IF NO. RETYPE MSG
1906  007642  006000                  3$:     ROR     R0              ;SHIFT THE BITS
1907  007644  006137  007270                  ROL     SELECT          ;BRING CARRY INTO SELECT
1908  007650  000743                          BR      2$              ;CONT.
1909  007652  005737  007270          4$:     TST     SELECT          ;ARE ANY LINES SELECTED?
1910  007656  001656                          BEQ     1$              ;BR IF NO. AND TYPE MSG
1911  007660  005037  001266                  CLR     SAVR3           ;SET TYPE OUT
1912  007664  013705  007270                  MOV     SELECT,R5       ;SAVE
1913  007670  104402  022206                  TYPE    ,MLINE          ;ALERT USER TO WHAT
1914  007674  005037  177776          65$:    CLR     @S              ;HE SELECTED
1915  007700  006005                  5$:     ROR     R5              ;
1916  007702  103002                          BCC     6$              ;
1917  007704  104411  023420                  CNVRT   ,XXLIN          ;
1918  007710  005237  001266          6$:     INC     SAVR3           ;
1919  007714  022737  000020  001266          CMP     #16.,SAVR3      ;
1920  007722  001366                          BNE     5$              ;
1921  007724  104402  022235                  TYPE    ,M.CRLF         ;
1922  007730  022700  000123                  CMP     #123,R0         ;
1923  007734  001427                          BEQ     69$             ;
1924  007736  005737  000042          68$:    TST     @#42            ;
1925  007742  001016                          BNE     98$             ;
1926  007744  022737                          CMP     (PC)+,@(PC)+    ;
1927  007746  000000                  80$:    .WORD   0               ;
1928  007750  001362                          DVSCR                   ;
1929  007752  001412                          BEQ     98$             ;
1930  007754  104403  023314                  INSTR   .MVECZ          ;
1931  007760  104405                          PARAM                   ;
1932  007762  000300                          300                     ;
1933  007764  000774                          774                     ;
1934  007766  007302                          MC.VEC                  ;
1935  007770     003     001                  .BYTE   3,1             ;
1936  007772  013737  001362  007746          MOV     DVSCR,80$       ;
1937  010000  013737  007302  007304  98$:    MOV     MC.VEC,MC.LVL   ;GET PRIORITY LEVEL
1938  010006  062737  000002  007304          ADD     #2,MC.LVL       ;UP IT.
1939  010014  012737  010326  007262  69$:    MOV     #TABLE,POINTER  ;
1940  010022  117737  177234  007266          MOVB    @POINTER,COUNT  ;
1941  010030  005237  007262                  INC     POINTER         ;
1942  010034  117737  177222  007264          MOVB    @POINTER,CHAR   ;
1943  010042  005237  007262                  INC     POINTER         ;
1944  010046  013737  007270  007272          MOV     SELECT,EXERCISE ;
1945  010054  012737  000020  007260          MOV     #20,LINE        ;
1946  010062  005337  007260          TESTER: DEC     LINE            ;
1947  010066  006337  007272                  ASL     EXERCISE        ;
1948  010072  103451                          BCS     2$              ;
1949  010074  001372                          BNE     TESTER          ;
1950  010076  112737  000377  001313          MOVB    #377,DV.FLG     ;
1951  010104  104402  007264                  TYPE    ,CHAR           ;
1952  010110  005337  007266                  DEC     COUNT           ;
1953  010114  001031                          BNE     3$              ;
1954  010116  117737  177140  007266          MOVB    @POINTER,COUNT  ;
1955  010124  001016                          BNE     4$              ;
1956  010126  005737  000042                  TST     42              ;
1957  010132  001405                          BEQ     .+14            ;
1958  010134  012737  002436  001214          MOV     #.EOP,RETURN
```

```
                                                JMP     @RETURN
                                                MOV     #TABLE,POINTER  ;
                                                MOVB    @POINTER,COUNT  ;
                                                INC     POINTER         ;
                                        4$:     INC     POINTER         ;
                                                MOVB    @POINTER,CHAR
                                                INC     POINTER         ;
                                        3$:     MOV     SELECT,EXERCISE ;
                                                MOV     #20,LINE        ;
                                                BR      TESTER          ;
                                        2$:     MOV     #TST2,RETURN    ;
                                                MOV     RETURN,NEXT     ;
                                                CLR     -(SP)           ;SET FOR FAKE INTR
                                                MOV     #5$,-(SP)       ;SET FAKE PC OF INTR
                                                BIT     #BIT11,@TKCSR   ;TTY ACTIVE?
                                                BNE     .-6             ;YES WAIT TILL DONE.
                                                MOV     @TKDBR,-(SP)
                                                BIC     #BIT7,(SP)      ;CLEAR PARITY
                                                CMPB    #1,(SP)+        ;WAS ^A (CHANGE LINES) HIT?
                                                BEQ     KBISR           ;BR IF YES
                                                CMP     (SP)+,(SP)+     ;BR TO KBISR NOT TAKEN
                                                                        ;POP FAKE INTR OFF STACK
                                        5$:     JMP     @RETURN         ;

                                        KBISR:  MOV     R0,-(SP)        ;
                                                MOV     @TKDBR,R0       ;SAVE CHAR IN R0
                                                BIC     #^C<177>,R0     ;CLEAR ALL BUT DATA
                                                CMP     #1,R0           ;WAS IT ^A (CNTRL A)?
                                                BNE     1$              ;BR IF NO
                                                MOV     #MAR18,2(SP)    ;SET RETURN
                                        1$:     MOV     (SP)+,R0        ;RESTORE R0
                                                RTI                     ;CONT.

                                        TABLE:  .BYTE 1,15,2,12
                                                .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,2,105,12.,40,2,116,6,40,2,116,4,40,2,104,6,40,2,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,2,105,12.,40,2,116,6,40,2,116,4,40,2,104,6,40,2,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,2,105,12.,40,4,116,4,40,2,.16,4,40,2,104,6,40,2,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,2,105,12.,40,4,116,4,40,2,116,4,40,2,104,6,40,2,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,8.,105,6,40,2,116,2,40,2,116,2,40,2,116,4,40,2,104,6,40,2,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,8.,105,6,40,2,116,2,40,2,116,2,40,2,116,4,40,2,104,6,40,2,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,2,105,12.,40,2,116,4,40,4,116,4,40,2,104,6,40,2,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,2,105,12.,40,2,116,4,40,4,116,4,40,2,104,6,40,2,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
                                                .BYTE 1,15,1,12
                                                .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
```

```
013755  001  015  001        .BYTE 1.15,1.12
013752  000  000  000        .BYTE 0,0,0
        013756               .EVEN
```

```
                                        ;************************ TEST 2 *********************************
                                        ;*INITIALIZATION CHECK
                                        ;*VERIFY THAT CONTROL STATUS REGISTER AND LINE STATUS
                                        ;*REGISTER WERE CLEARED BY INITIALIZE
                                        ;;*************************************************************

                                ;  TEST 2
                                ;--------------
001226  010766  012737  000002  001226  TST2:   MOV     #2,TSTNO
001216  010774  012737  011124  001216          MOV     #TST3,NEXT
        011002  105777  170202                  TSTB    @TPCSR          ;WAIT FOR TTY READY
        011006  100375                          BPL     .-4             ;BR IF NOT READY
        011010  000005                          RESET                   ;INIT
        011012  005005                          CLR     R5
170162  011014  052777  000100  170162          BIS     #100,@TKCSR     ;SET TTY INTERUPT ENABLE
000004  011022  012737  011112  000004          MOV     #1$,@#4         ;SET FOR NON-EX DEVICE.
        011030  012702  000010                  MOV     #8.,R2          ;SET COUNTER
170144  011034  027777  170144  170142  65$:    CMP     @TKCSR,@TKCSR   ;WASTE TIME
170134  011042  027777  170136  170134          CMP     @TKCSR,@TKCSR   ;WASTE TIME
        011050  005302                          DEC     R2              ;DELAY DONE?
        011052  001370                          BNE     65$             ;BR IF NO
        011054  005200                          INC     R0              ;FLASH LIGHTS
007276  011056  013703  007276                  MOV     MC.CSR,R3       ;SET MC.CSR POINTER
        011062  011304                          MOV     (R3),R4         ;READ REGISTER
        011064  001401                          BEQ     .+4
        011066  104002                          HLT     2               ;CONTROL STATUS NOT CLEARED, ERROR
007300  011070  013703  007300                  MOV     MC.LSR,R3       ;SET POINTER
        011074  011304                          MOV     (R3),R4         ;READ MC.LSR
        011076  001401                          BEQ     .+4
        011100  104002                          HLT     2               ;LINE STATUS NOT CLEARED, ERROR
000004  011102  012737  000006  000004          MOV     #6,@#4          ;RESET TRAP CATCHER
        011110  104400                          SCOPE                   ;CHECK FOR LOOP
        011112  104005                  1$:     HLT     5               ;SHOULD NOT TRAP.
001200  011114  012706  001200                  MOV     #STACK,SP       ;
        011120  000177  170070                  JMP     @RETURN


                                        ;************************ TEST 3 *********************************
                                        ;*VERIFY THAT "INTERUPT ENABLE" CAN BE
                                        ;*SET AND CLEARED.
                                        ;;*************************************************************

                                ;  TEST 3
                                ;--------------
001226  011124  012737  000003  001226  TST3:   MOV     #3,TSTNO
001216  011132  012737  011216  001216          MOV     #TST4,NEXT
007276  011140  013703  007276                  MOV     MC.CSR,R3       ;SET POINTER TO MC.CSR
        011144  012713  000100                  MOV     #INTENA,(R3)    ;LOAD FUNCTION
        011150  011304                          MOV     (R3),R4         ;READ RESULTS
        011152  042704  177677                  BIC     #^C<INTENA>,R4  ;MASK OFF ALL OTHER BITS.
        011156  012705  000100                  MOV     #INTENA,R5              ;MAKE R5=GOOD
        011162  020504                          CMP     R5,R4           ;RESULTS OK?
        011164  001401                          BEQ     .+4             ;BR IF YES
        011166  104002                          HLT     2               ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
000100  011170  042705  000100                  BIC     #INTENA,R5
000100  011174  042713  000100                  BIC     #INTENA,(R3)    ;CLEAR BIT
```

```
 2048  011200  011304                    MOV     (R3),R4                 ;READ REGISTER
 2049  011202  042704  177577            BIC     #^C<INTENA>,R4          ;MASK OFF ALL OTHER BITS.
 2050  011206  020504                    CMP     R5,R4                   ;REGISTER OK?
 2051  011210  001401                    BEQ     .+4                     ;BR IF YES
 2052  011212  104002                    HLT     2                       ;BIT FAILED TO CLEAR
 2053  011214  104400                    SCOPE                           ;SCOPE TEST.
 2054
 2055
 2056                                    ;************************ TEST 4 ******************************
 2057                                    ;*VERIFY THAT "DONE" CAN BE
 2058                                    ;*SET AND CLEARED.
 2059                                    ;;*************************************************************
 2060
 2061                            ;  TEST 4
 2062                            ;--------------
 2063  011216  012737  000004  001226  TST4:   MOV     #4,TSTNO
 2064  011224  012737  011310  001216          MOV     #TST5,NEXT
 2065  011232  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
 2066  011236  012713  000200                  MOV     #DONE,(R3)              ;LOAD FUNCTION
 2067  011242  011304                          MOV     (R3),R4                 ;READ RESULTS
 2068  011244  042704  177577                  BIC     #^C<DONE>,R4            ;MASK OFF ALL OTHER BITS.
 2069  011250  012705  000200                  MOV     #DONE,R5                        ;MAKE R5=GOOD
 2070  011254  020504                          CMP     R5,R4                   ;RESULTS OK?
 2071  011256  001401                          BEQ     .+4                     ;BR IF YES
 2072  011260  104002                          HLT     2                       ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
 2073  011262  042705  000200                  BIC     #DONE,R5
 2074  011266  042713  000200                  BIC     #DONE,(R3)              ;CLEAR BIT
 2075  011272  011304                          MOV     (R3),R4                 ;READ REGISTER
 2076  011274  042704  177577                  BIC     #^C<DONE>,R4            ;MASK OFF ALL OTHER BITS.
 2077  011300  020504                          CMP     R5,R4                   ;REGISTER OK?
 2078  011302  001401                          BEQ     .+4                     ;BR IF YES
 2079  011304  104002                          HLT     2                       ;BIT FAILED TO CLEAR
 2080  011306  104400                          SCOPE                           ;SCOPE TEST.
 2081
 2082
 2083                                    ;************************ TEST 5 ******************************
 2084                                    ;*VERIFY THAT "MAINTENANCE MODE" CAN BE
 2085                                    ;*SET AND CLEARED.
 2086                                    ;;*************************************************************
 2087
 2088                            ;  TEST 5
 2089                            ;--------------
 2090  011310  012737  000005  001226  TST5:   MOV     #5,TSTNO
 2091  011316  012737  011402  001216          MOV     #TST6,NEXT
 2092  011324  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
 2093  011330  012713  001000                  MOV     #MAINT,(R3)             ;LOAD FUNCTION
 2094  011334  011304                          MOV     (R3),R4                 ;READ RESULTS
 2095  011336  042704  176777                  BIC     #^C<MAINT>,R4           ;MASK OFF ALL OTHER BITS.
 2096  011342  012705  001000                  MOV     #MAINT,R5                       ;MAKE R5=GOOD
 2097  011346  020504                          CMP     R5,R4                   ;RESULTS OK?
 2098  011350  001401                          BEQ     .+4                     ;BR IF YES
 2099  011352  104002                          HLT     2                       ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
 2100  011354  042705  001000                  BIC     #MAINT,R5
 2101  011360  042713  001000                  BIC     #MAINT,(R3)             ;CLEAR BIT
 2102  011364  011304                          MOV     (R3),R4                 ;READ REGISTER
 2103  011366  042704  176777                  BIC     #^C<MAINT>,R4           ;MASK OFF ALL OTHER BITS.
```

```
 2104  011372  020504                        CMP     R5,R4                   ;REGISTER OK?
 2105  011374  001401                        BEQ     .+4                     ;BR IF YES
 2106  011376  104002                        HLT     2                       ;BIT FAILED TO CLEAR
 2107  011400  104420                        SCOPE                           ;SCOPE TEST.
 2108
 2109
 2110                                        ;************************ TEST 6 ******************************
 2111                                        ;*VERIFY THAT "SCAN ENABLE" CAN BE
 2112                                        ;*SET AND CLEARED.
 2113                                        ;;*****************************************************************
 2114
 2115                                ;  TEST 6
 2116                                ;--------------
 2117  011402  012737  000006  001226 TST6:   MOV     #6,TSTNO
 2118  011410  012737  011474  001216         MOV     #TST7,NEXT
 2119  011416  013703  007276                 MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
 2120  011422  012713  000040                 MOV     #SCNENA,(R3)            ;LOAD FUNCTION
 2121  011426  011304                         MOV     (R3),R4                 ;READ RESULTS
 2122  011430  042704  177737                 BIC     #^C<SCNENA>,R4          ;MASK OFF ALL OTHER BITS.
 2123  011434  012705  000040                 MOV     #SCNENA,R5                      ;MAKE R5=GOOD
 2124  011440  020504                         CMP     R5,R4                   ;RESULTS OK?
 2125  011442  001401                         BEQ     .+4                     ;BR IF YES
 2126  011444  104002                         HLT     2                       ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
 2127  011446  042705  000040                 BIC     #SCNENA,R5
 2128  011452  042713  000040                 BIC     #SCNENA,(R3)            ;CLEAR BIT
 2129  011456  011304                         MOV     (R3),R4                 ;READ REGISTER
 2130  011460  042704  177737                 BIC     #^C<SCNENA>,R4          ;MASK OFF ALL OTHER BITS.
 2131  011464  020504                         CMP     R5,R4                   ;REGISTER OK?
 2132  011466  001401                         BEQ     .+4                     ;BR IF YES
 2133  011470  104002                         HLT     2                       ;BIT FAILED TO CLEAR
 2134  011472  104420                         SCOPE                           ;SCOPE TEST.
 2135
```

```
                                        ;********************** TEST 7 ****************************
                                        ;*VERIFY THAT "BUSY" IS SET WHEN "SCAN ENABLE" IS SET
                                        ;*VERIFY THAT "BUSY" IS CLEARED WHEN "SCAN ENABLE" IS CLEARED
                                        ;;*********************************************************

                                ;  TEST 7
                                ;-------------
011474  012737  000007  001226  TST7:  MOV     #7,TSTNO
011502  012737  011576  001216        MOV     #TST10,NEXT
011510  013703  007276                MOV     MC.CSR,R3               ;SET REGISTER POINTER
011514  012713  000040                MOV     #SCNENA,(R3)            ;SET SCAN ENABLE
011520  011304                        MOV     (R3),R4                 ;READ REGISTER
011522  010405                        MOV     R4,R5                   ;GET IMAGE
011524  052705  000020                BIS     #BUSY,R5                ;SET BUSY BIT IN GOOD.
011530  020504                        CMP     R5,R4                   ;REGISTER OK?
011532  001401                        BEQ     .+4
011534  104002                        HLT     2                       ;BUSY NOT SET, ERROR
011536  042713  000040                BIC     #SCNENA,(R3)            ;CLEAR SCAN ENABLE
011542  023737  000000  000000        CMP     0,0                     ;GIVE BUSY A CHANCE TO CLEAR
011550  023737  000000  000000        CMP     0,0                     ;WHEN ON A HOT ROD MACHINE (11/70)!
011556  011304                        MOV     (R3),R4                 ;READ MC.CSR
011560  010405                        MOV     R4,R5                   ;GET IMAGE
011562  042705  000020                BIC     #BUSY,R5                ;CLEAR BUSY IN GOOD.
011566  020504                        CMP     R5,R4                   ;BUSY CLEARED?
011570  001401                        BEQ     .+4
011572  104002                        HLT     2                       ;BUSY NOT CLEARED, ERROR
011574  104400                        SCOPE                           ;CHECK FOR LOOP, ITERATIONS

                                        ;********************** TEST 10 ***************************
                                        ;*VERIFY THAT SETTING "DONE" DOES NOT CAUSE AN
                                        ;*INTERRUPT IF "INTERRUPT ENABLE" IS CLEARED.
                                        ;;*********************************************************

                                ;  TEST 10
                                ;--------------
011576  012737  000010  001226  TST10: MOV     #10,TSTNO
011604  012737  011664  001216        MOV     #TST11,NEXT
011612  012737  000340  177776        MOV     #340,PS                 ;LOCK OUT INTERRUPTS
011620  005077  175452                CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
011624  012777  011656  175450        MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
011632  012777  000340  175444        MOV     #340,@MC.LVL            ;SET UP INTERRUPT PRIORITY
011640  052777  000200  175430        BIS     #DONE,@MC.CSR           ;SET DONE
011646  005037  177776                CLR     PS                      ;ALLOW INTERRUPTS
011652  000240                        NOP                             ;DELAY FOR INTERRUPT
011654  000402                        BR      2$                      ;NO INTERRUPT, CONTINUE
011656  022626                1$:     POP2SP                          ;RESTORE STACK, INTERRUPT
011660  104003                        HLT     3                       ;OCCURED, ERROR
011662  104400                2$:     SCOPE                           ;CHECK FOR LOOP, ITERATIONS
```

```
                                        ;************************ TEST 11 ******************************
                                        ;*VERIFY THAT NO INTERRUPT OCCURS WITH "INTERRUPT ENABLE"
                                        ;*SET AND "DONE" CLEARED.
                                        ;;*************************************************************

                                ;  TEST 11
                                ;--------------
011664  012737  000011  001226  TST11:  MOV     #11,TSTNO
011672  012737  011752  001216          MOV     #TST12,NEXT
011700  012737  000340  177776          MOV     #340,PS                 ;LOCK OUT INTERRUPTS
011706  005077  175364                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
011712  012777  011744  175362          MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
011720  012777  000340  175356          MOV     #340,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
011726  052777  000100  175342          BIS     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
011734  005037  177776                  CLR     PS                      ;ALLOW INTERRUPTS
011740  000240                          NOP                             ;DELAY FOR INTERRUPTS
011742  000402                          BR      2$                      ;NO INTERRUPT, CONTINUE
011744  022626                  1$:     POP2SP                          ;RESTORE STACK
011746  104003                          HLT     3                       ;INTERRUPT OCCURED, ERROR
011750  104400                  2$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP

                                        ;************************ TEST 12 ******************************
                                        ;*VERIFY THAT SETTING "DONE" CAUSES AN INTERRUPT
                                        ;*WITH "INTERRUPT ENABLE" SET
                                        ;;*************************************************************

                                ;  TEST 12
                                ;--------------
011752  012737  000012  001226  TST12:  MOV     #12,TSTNO
011760  012737  012046  001216          MOV     #TST13,NEXT
011766  012737  000340  177776          MOV     #340,PS                 ;LOCK OUT INTERRUPTS
011774  005077  175276                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012000  012777  012042  175274          MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012006  012777  000100  175262          MOV     #INTENA,@MC.CSR         ;SET "INTERRUPT ENABLE"
012014  012777  000340  175262          MOV     #340,@MC.LVL            ;SET "INTERRUPT LEVEL"
012022  005037  177776                  CLR     PS                      ;ALLOW INTERRUPTS
012026  052777  000200  175242          BIS     #DONE,@MC.CSR           ;SET "DONE"
012034  000240                          NOP                             ;DELAY FOR INTERRUPT
012036  104004                          HLT     4                       ;INTERRUPT OCCURED, ERROR
012040  000401                          BR      2$                      ;CONTINUE
012042  022626                  1$:     POP2SP                          ;INTERRUPT OCCURED, RESTOR STACK
012044  104400                  2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```
                                        ;********************** TEST 13 ****************************
                                        ;*VERIFY THAT NO INTERRUPT OCCURS WITH
                                        ;*"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 7.
                                        ;:**********************************************************

                                ;  TEST 13
                                ;--------------
012046  012737  000013  001226  TST13:  MOV     #13,TSTNO
012054  012737  012136  001216         MOV     #TST14,NEXT
012062  005077  175210                 CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012066  012737  000340  177776         MOV     #340,PS                 ;TO LEVEL 7.
012074  012777  012130  175200         MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012102  012777  000340  175174         MOV     #340,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
012110  012777  000100  175160         MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012116  052777  000200  175152         BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012124  000240                         NOP                             ;DELAY FOR INTERRUPT
012126  000402                         BR      2$                      ;NO INTERRUPT, CONTINUE
012130  022626                 1$:     POP2SP                          ;RESTORE STACK
012132  104003                         HLT     3                       ;INTERRUPT OCCURED, ERROR
012134  104400                 2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP

                                        ;********************** TEST 14 ****************************
                                        ;*VERIFY THAT NO INTERRUPT OCCURS WITH
                                        ;*"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 6.
                                        ;:**********************************************************

                                ;  TEST 14
                                ;--------------
012136  012737  000014  001226  TST14:  MOV     #14,TSTNO
012144  012737  012226  001216         MOV     #TST15,NEXT
012152  005077  175120                 CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012156  012737  000300  177776         MOV     #300,PS                 ;TO LEVEL 6.
012164  012777  012220  175110         MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012172  012777  000300  175104         MOV     #300,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
012200  012777  000100  175070         MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012206  052777  000200  175062         BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012214  000240                         NOP                             ;DELAY FOR INTERRUPT
012216  000402                         BR      2$                      ;NO INTERRUPT, CONTINUE
012220  022626                 1$:     POP2SP                          ;RESTORE STACK
012222  104003                         HLT     3                       ;INTERRUPT OCCURED, ERROR
012224  104400                 2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```
2270
2271                                        ;************************ TEST 15 ******************************
2272                                        ;*VERIFY THAT NO INTERRUPT OCCURS WITH
2273                                        ;*"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 5.
2274                                        ;:**************************************************************
2275
2276                                ;  TEST 15
2277                                ;--------------
2278  012226  012737  000015  001226  TST15:  MOV     #15,TSTNO
2279  012234  012737  012316  001216          MOV     #TST16,NEXT
2280  012242  005077  175030                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
2281  012246  012737  000240  177776          MOV     #240,PS                 ;TO LEVEL 5.
2282  012254  012777  012310  175020          MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
2283  012262  012777  000240  175014          MOV     #240,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
2284  012270  012777  000100  175000          MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
2285  012276  052777  000200  174772          BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
2286  012304  000240                          NOP                             ;DELAY FOR INTERRUPT
2287  012306  000402                          BR      2$                      ;NO INTERRUPT, CONTINUE
2288  012310  022626                  1$:     POP2SP                          ;RESTORE STACK
2289  012312  104003                          HLT     3                       ;INTERRUPT OCCURED, ERROR
2290  012314  104400                  2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
2291
2292                                        ;************************ TEST 16 ******************************
2293                                        ;*VERIFY THAT NO INTERRUPT OCCURS WITH
2294                                        ;*"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 4.
2295                                        ;:**************************************************************
2296
2297                                ;  TEST 16
2298                                ;--------------
2299  012316  012737  000016  001226  TST16:  MOV     #16,TSTNO
2300  012324  012737  012406  001216          MOV     #TST17,NEXT
2301  012332  005077  174740                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
2302  012336  012737  000200  177776          MOV     #200,PS                 ;TO LEVEL 4.
2303  012344  012777  012400  174730          MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
2304  012352  012777  000200  174724          MOV     #200,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
2305  012360  012777  000100  174710          MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
2306  012366  052777  000200  174702          BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
2307  012374  000240                          NOP                             ;DELAY FOR INTERRUPT
2308  012376  000402                          BR      2$                      ;NO INTERRUPT, CONTINUE
2309  012400  022626                  1$:     POP2SP                          ;RESTORE STACK
2310  012402  104003                          HLT     3                       ;INTERRUPT OCCURED, ERROR
2311  012404  104400                  2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```
2312
2313                                        ;********************** TEST 17 ******************************
2314                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
2315                                        ;*ENABLE" SET AND "DONE" SET AT PRIORITY 0.
2316                                        ;:************************************************************
2317
2318                                    ;  TEST 17
2319                                    ;--------------
2320  012406  012737  000017  001226  TST17:  MOV     #17,TSTNO
2321  012414  012737  012474  001216          MOV     #TST20,NEXT
2322  012422  005077  174650                 CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
2323  012426  012777  012470  174646         MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
2324  012434  005077  174644                 CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
2325  012440  012737  000000  177776         MOV     #0,PS                   ;SET PROCESSOR PRIORITY TO LEVEL 0.
2326  012446  012777  000100  174622         MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
2327  012454  052777  000200  174614         BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
2328  012462  000240                         NOP                             ;WAIT FOR INTERRUPT
2329  012464  104004                         HLT     4                       ;NO INTERRUPT, ERROR.
2330  012466  000401                         BR      2$                      ;CONTINUE
2331  012470  022626                  1$:    POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
2332  012472  104400                  2$:    SCOPE                           ;CHECK FOR INTERATIONS, LOOP.
2333
2334                                        ;********************** TEST 20 ******************************
2335                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
2336                                        ;*ENABLE" SET AND "DONE" SET AT PRIORITY 1.
2337                                        ;:************************************************************
2338
2339                                    ;  TEST 20
2340                                    ;--------------
2341  012474  012737  000020  001226  TST20:  MOV     #20,TSTNO
2342  012502  012737  012562  001216          MOV     #TST21,NEXT
2343  012510  005077  174562                 CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
2344  012514  012777  012556  174560         MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
2345  012522  005077  174556                 CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
2346  012526  012737  000040  177776         MOV     #40,PS                  ;SET PROCESSOR PRIORITY TO LEVEL 1.
2347  012534  012777  000100  174534         MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
2348  012542  052777  000200  174526         BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
2349  012550  000240                         NOP                             ;WAIT FOR INTERRUPT
2350  012552  104004                         HLT     4                       ;NO INTERRUPT, ERROR.
2351  012554  000401                         BR      2$                      ;CONTINUE
2352  012556  022626                  1$:    POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
2353  012560  104400                  2$:    SCOPE                           ;CHECK FOR INTERATIONS, LOOP.
```

```
                                        ;************************ TEST 21 ******************************
                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
                                        ;*ENABLE" SET AND "DONE" SET AT PRIORITY 2.
                                        ;;**********************************************************************

                                        ;  TEST 21
                                        ;--------------
012562  012737  000021  001226  1ST21:  MOV     #21,TSTNO
012570  012737  012650  001216          MOV     #TST22,NEXT
012576  005077  174474                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012602  012777  012644  174472          MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012610  005077  174470                  CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
012614  012737  000100  177776          MOV     #100,PS                 ;SET PROCESSOR PRIORITY TO LEVEL 2.
012622  012777  000100  174446          MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012630  052777  000200  174440          BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012636  000240                          NOP                             ;WAIT FOR INTERRUPT
012640  104004                          HLT     4                       ;NO INTERRUPT, ERROR.
012642  000401                          BR      2$                      ;CONTINUE
012644  022626                  1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
012646  104400                  2$:     SCOPE                           ;CHECK FOR INTERATIONS, LOOP.

                                        ;************************ TEST 22 ******************************
                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
                                        ;*ENABLE" SET AND "DONE" SET AT PRIORITY 3.
                                        ;;**********************************************************************

                                        ;  TEST 22
                                        ;--------------
012650  012737  000022  001226  1ST22:  MOV     #22,TSTNO
012656  012737  012736  001216          MOV     #TST23,NEXT
012664  005077  174406                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012670  012777  012732  174404          MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012676  005077  174402                  CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
012702  012737  000140  177776          MOV     #140,PS                 ;SET PROCESSOR PRIORITY TO LEVEL 3.
012710  012777  000100  174360          MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012716  052777  000200  174352          BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012724  000240                          NOP                             ;WAIT FOR INTERRUPT
012726  104004                          HLT     4                       ;NO INTERRUPT, ERROR.
012730  000401                          BR      2$                      ;CONTINUE
012732  022626                  1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
012734  104400                  2$:     SCOPE                           ;CHECK FOR INTERATIONS, LOOP.
```

```
                                        ;************************ TEST 23 ******************************
                                        ;*VERIFY THAT ALL LINE NUMBERS CAN BE WRITTEN INTO AND
                                        ;*READ BACK FROM LINE COUNTER
                                        ;;*************************************************************

                                ;  TEST 23
                                ;--------------
012736  012737  000023  001226  TST23:  MOV     #23,TSTNO
012744  012737  013024  001216          MOV     #TST24,NEXT
012752  012737  013000  001220          MOV     #1$,LOCK
012760  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER
012764  005013                          CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
012766  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
012772  005005                          CLR     R5                      ;CLEAR EXPECTED LINE NUMBER
012774  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 LINE NUMBERS
013000  010513                  1$:     MOV     R5,(R3)                 ;SET LINE NUMBER
013002  011304                          MOV     (R3),R4                 ;READ BACK LINE NUMBER
013004  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED
013006  001401                          BEQ     2$                      ;LINE NUBMERS THE SAME
013010  104002                          HLT     2                       ;LINE NUMBERS DIFFERENT, ERROR
013012  104401                  2$:     SCOP1                           ;CHECK FOR DATA FREEZE
013014  005205                          INC     R5                      ;UPDATE LINE COUNT
013016  005300                          DEC     R0                      ;UPDATE LINE NUMBER
013020  001365                          BNE     1$                      ;CONTINUE
013022  104403                          SCOPE                           ;CHECK FOR ITERATION, LOOP

                                        ;************************ TEST 24 ******************************
                                        ;*USING "STEP" MODE, VERIFY THAT THE
                                        ;*LINE COUNTER CAN BE STEPPED THRU ALL STATES.
                                        ;;*************************************************************

                                ;  TEST 24
                                ;--------------
013024  012737  000024  001226  TST24:  MOV     #24,TSTNO
013032  012737  013122  001216          MOV     #TST25,NEXT
013040  012737  013052  001220          MOV     #1$,LOCK
013046  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER
013052  005037  177776          1$:     CLR     PS                      ;ENABLE INTERRUPTS
013056  005013                          CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
013060  005005                          CLR     R5                      ;CLEAR EXPECTED LINE COUNT
013062  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 VALUES
013066  012713  000017                  MOV     #17,(R3)                ;FIRST VALUE =0
013072  052713  000400          2$:     BIS     #STEP,(R3)              ;STEP LINE COUNTER
013076  104414                          DELAY
013100  011304                          MOV     (R3),R4                 ;READ LINE COUNTER
013102  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND
013104  001401                          BEQ     3$                      ;RECEIVED LINE NUMBERS
013106  104002                          HLT     2                       ;LINE COUNTER ERROR
013110  104401                  3$:     SCOP1                           ;CHECK FOR DATA FREEZE
013112  005205                          INC     R5                      ;UPDATE EXPECTED LINE NUMBER
013114  005300                          DEC     R0
013116  001365                          BNE     2$
013120  104403                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 25 ******************************
                                        ;*WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS.
                                        ;*VERIFY THAT ALL LOCATIONS HAVE BEEN WRITTEN
                                        ;*TO 1'S.
                                        ;*VERIFY THAT "CLEAR SCAN" CLEARS ALL SCANNER
                                        ;*MEMORY LOCATIONS.
                                        ;;*************************************************************

                                ;  TEST 25
                                ;--------------
013122  012737  000025  001226  TST25:  MOV     #25,TSTNO
013130  012737  013324  001216          MOV     #TST26,NEXT
013136  012737  013150  001220          MOV     #1$,LOCK
013144  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER
013150  012713  002000          1$:     MOV     #CLRMUX,(R3             ;CLEAR CONTROL STATUS REGISTER
013154  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
013160  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 LOCATIONS
013164  052713  001017                  BIS     #MAINT+17,(R3)          ;SET MAINTEANCE MODE
013170  052713  000400          2$:     BIS     #STEP,(R3)              ;SET LINE COUNTER THRU ALL
013174  005300                  2$:     DEC     R0                      ;STATES, WRITING 1'S INTO
013176  001374                          BNE     2$                      ;ALL MEMORY WORDS
013200  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 WORDS
013204  012705  070000                  MOV     #70000,R5               ;SET UP EXPECTED STATUS REGISTER
013210  012713  000017                  MOV     #17,(R3)                ;START WITH LINE 0
013214  052713  000400          3$:     BIS     #STEP,(R3)              ;ACCESS SCANNER MEMORY
013220  104414                          DELAY
013222  011304                          MOV     (R3),R4                 ;READ DATA
013224  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
013226  001401                          BEQ     4$                      ;DATA
013230  104002                          HLT     2                       ;CONTROL STATUS OR MEMORY ERROR
013232  104401          4$:     4$:     SCOPE1                          ;CHECK FOR DATA FREEZE
013234  005205                          INC     R5                      ;UPDATE EXPECTED STATUS
013236  005300                          DEC     R0                      ;UPDATE LINE COUNT
013240  001365                          BNE     3$                      ;CONTINUE
013242  012737  013250  001220          MOV     #5$,LOCK                ;SET RETURN
013250  012713  004000          5$:     MOV     #CLRSCN,(R3)            ;SET "CLEAR SCAN"
013254  032713  000020                  BIT     #BUSY,(R3)              ;WAIT FOR "CLEAR CYCLES"
013260  001375                          BNE     .-4
013262  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 MEMORY
013266  005005                          CLR     R5                      ;LOCATIONS
013270  012713  000017                  MOV     #17,(R3)                ;FIRST TO BE TESTED=0
013274  052713  000400          6$:     BIS     #STEP,(R3)              ;ACCESS SEANNER MEMORY
013300  104414                          DELAY
013302  011304                          MOV     (R3),R4                 ;READ DATA
013304  020504                          CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
013306  001402                          BEQ     7$                      ;DATA
013310  104002                          HLT     2                       ;CONTROL  STATUS OF MEMORY ERROR
013312  104401                          SCOPE1                          ;CHECK FOR DATA FREEZE
013314  005205          7$:     7$:     INC     R5                      ;UPDATE EXPECTED DATA
013316  005300                          DEC     R0                      ;UPDATE LINE COUNT
013320  001365                          BNE     6$                      ;CONTTINUE
013322  104401                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
2501                                    ;************************ TEST 26 ********************************
2502                                    ;*WRITE 1'S INTO SELECTED SCANNER MEMORY LOCATION.
2503                                    ;*VERIFY THAT ONLY SELECTED LOCATION WAS WRITTEN INTO.
2504                                    ;;*****************************************************************
2505
2506                                    ;  TEST 26
2507                                    ;--------------
2508  013324  012737  000026  001226  TST26:  MOV     #26,TSTNO
2509  013332  012737  013506  001216          MOV     #TST27,NEXT
2510  013340  012737  013352  001220          MOV     #1$,LOCK
2511  013346  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER
2512  013352  005013                  1$:     CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
2513  013354  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
2514  013360  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 ADDRESSES
2515  013364  012702  000017                  MOV     #17,R2                  ;FIRST ADDRESS TO BE TESTED=0
2516  013370  012713  004000          2$:     MOV     #CLRSCN,(R3)            ;CLEAR ACANNER MEMORY
2517  013374  032713  000020                  BIT     #BUSY,(R3)              ;WAIT FOR CLEAR CYCLE
2518  013400  001375                          BNE     .-4
2519  013402  012713  001000                  MOV     #MAINT,(R3)             ;SET "MAINTENANCE MODE"
2520  013406  050213                          BIS     R2,(R3)                 ;SET LINE COUNTER TO TEST ADDRESS-1
2521  013410  052713  000400                  BIS     #STEP,(R3)              ;WRITE 1'S INTO TEST ADDRESS
2522  013414  042713  001000                  BIC     #MAINT,(R3)             ;CLEAR "MAINTENANCE MODE"
2523  013420  012737  000020  001252          MOV     #16.,TEMP3              ;SET UP TO TEST ALL 16
2524  013426  012713  000017                  MOV     #17,(R3)                ;SCANNER MEMORY LOCATIONS
2525  013432  005202                          INC     R2
2526  013434  005001                          CLR     R1
2527  013436  052713  000400          3$:     BIS     #STEP,(R3)              ;ACCESS SCANNER MEMORY
2528  013442  104414                          DELAY
2529  013444  111304                          MOVB    (R3),R4                 ;READ CONPENTS OF MEMORY
2530  013446  010105                          MOV     R1,R5                   ;SET UP EXPECTED CONTENTS
2531  013450  120402                          CMPB    R4,R2                   ;OF SCANNER MEMORY
2532  013452  001002                          BNE     4$
2533  013454  052705  070000                  BIS     #70000,R5
2534  013460  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND RECEIVED
2535  013462  001402                          BEQ     5$                      ;VALUES
2536  013464  104002                          HLT     2                       ;SCANNER MEMORY ERROR
2537  013466  104401                          SCOPI                           ;CHECK FOR DATA FREEZE
2538  013470  005201                  5$:     INC     R1
2539  013472  005337  001252                  DEC     TEMP3                   ;TEST NEXT SCANNEB LOCATION
2540  013476  001357                          BNE     3$
2541  013500  005300                          DEC     R0                      ;UPDATE LINE COUNT
2542  013502  001332                          BNE     2$
2543  013504  104400                          SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```
                                        ;************************ TEST 27 ******************************
                                        ;*WITH ALL SCANNER MEMORY LOCATIONS SET TO 1'S.
                                        ;*WRITE 0'S INTO SELECTED LOCATION
                                        ;*VERIFY THAT ONLY SELECTED LOCATION WAS CLEARED.
                                        ;;*************************************************************

                                ;  TEST 27
                                ;--------------
013506  012737  000027  001226  TST27:  MOV     #27,TSTNO
013514  012737  013672  001216         MOV     #TST30,NEXT
013522  012737  013552  001220         MOV     #2$,LOCK
013530  013703  007276                 MOV     MC.CSR,R3               ;SET POINTER
013534  005013                  1$:    CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
013536  005037  177776                 CLR     PS                      ;ENABLE INTERRUPTS
013542  012700  000020                 MOV     #16.,R0                 ;SET UP TO TEST 16 ADDRESSES
013546  012702  000017                 MOV     #17,R2                  ;FIRST ADDRESS TO BE TESTED=0
013552  012737  000020  001252  2$:    MOV     #16.,TEMP3              ;WRITE 1'S INTO ALL SCANNER
013560  012713  001017                 MOV     #MAINT+17,(R3)  ;MEMORY LOCATIONS
013564  052713  000400          3$:    BIS     #STEP,(R3)
013570  005337  001252                 DEC     TEMP3
013574  001373                         BNE     3$
013576  010213                         MOV     R2,(R3)                 ;SET LINE COUNTER TO TEST ADDRESS-1
013600  052713  000400                 BIS     #STEP,(R3)              ;WRITE 0'S INTO TEST ADDRESS
013604  012737  000020  001252         MOV     #16.,TEMP3              ;SET UP TO TEST ALL 16
013612  012713  000017                 MOV     #17,(R3)                ;SCANNER MEMORY LOCATIONS
013616  005202                         INC     R2
013620  005001                         CLR     R1
013622  052713  000400          4$:    BIS     #STEP,(R3)              ;ACESS SCANNER MEMORY
013626  104414                         DELAY
013630  111304                         MOVB    (R3),R4                 ;READ CONTENTS OF MEMORY
013632  010105                         MOV     R1,R5                   ;SET UP EXPECTED CONTENTS
013634  120402                         CMPB    R4,R2                   ;OF SCANNER MEIORY
013636  001002                         BNE     5$
013640  052705  070000                 BIS     #70000,R5
013644  020405                  5$:    CMP     R4,R5                   ;COMPARE EXPECTED AND
013646  001402                         BEQ     6$                      ;RECEIVED VALUES
013650  104002                         HLT     2                       ;SCANNER MEMORY ERROR
013652  104401                         SCOPE1                          ;CHECK FOR DATA FREEZE
013654  005201                  6$:    INC     R1
013656  005337  001252                 DEC     TEMP3                   ;TEST NEXT SCANNER LOCATION
013662  001357                         BNE     4$
013664  005300                         DEC     R0                      ;UPDATE ADDRESS COUNT
013666  001331                         BNE     2$
013670  104400                         SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```
                                        ;************************ TEST 30 ******************************
                                        ;*VERIFY THAT "CLEAR MULTIPLXER" CLEARS ALL MULTIPLEXER
                                        ;*FUNCTION FLIP-FLOPS
                                        ;;**************************************************************


                                ;  TEST 30
                                ;--------------
013672  012737  000030  001226  TST30:  MOV     #30,TSTNO
013700  012737  014050  001216          MOV     #TST31,NEXT
013706  012737  013760  001220          MOV     #3$,LOCK
013714  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER
013720  005013                  1$:     CLR     (R3)                    ;CLEAR CONTROL REGISTER
013722  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
013726  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 LINES
013732  012777  000017  173340  2$:     MOV     #17,@MC.LSR             ;WRITE 15 INTO  ALL MULTIPLEXER
013740  052713  000400                  BIS     #STEP,(R3)              ;FUNCTION FLIPFLOPS
013744  005300                          DEC     R0
013746  001371                          BNE     2$
013750  005037  001252                  CLR     TEMP3                   ;SET UP FOR 16 LINES
013754  012700  000020                  MOV     #16.,R0
013760  012713  002000          3$:     MOV     #CLRMUX,(R3)            ;CLEAR MULTIPLEXER
013764  013713  001252          4$:     MOV     TEMP3,(R3)                      ;SELECT LINE
013770  017704  173304                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
013774  005005                          CLR     R5                      ;EXPECT 0S
013776  005704                          TST     R4                      ;WAS LINE STATUS REGISTER CLEARED
014000  001402                          BEQ     5$
014002  104002                          HLT     2                       ;LINE STATUS ERROR
014004  104401                          SCOP1                           ;CHECK FOR LOOP ON SAME DATA
014006  005205                  5$:     INC     R5                      ;EXPECT LINE ENABLE
014010  052777  000001  173262          BIS     #LINENA,@MC.LSR         ;SET LINE ENABLE ON SELECTED LINE
014016  017704  173256                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
014022  020504                          CMP     R5,R4                   ;IS ANYTHING BUT LINE ENABLE SET
014024  001402                          BEQ     6$
014026  104002                          HLT     2                       ;LINE STATUS ERROR
014030  104401                          SCOP1                           ;CHECK FOR LOOP ON SAME DATA
014032  005237  001252          6$:     INC     TEMP3                   ;UPDATE LINE NUMBER
014036  005077  173236                  CLR     @MC.LSR                 ;CLEAR CURRENT LINE
014042  005300                          DEC     R0                      ;CONTINUE IF ALL LINES NOT
014044  001347                          BNE     4$                      ;TESTED
014046  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 31 ******************************
                                        ;*WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS
                                        ;*SET "LINE ENABLE FOR ALL LINES
                                        ;*VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE
                                        ;;*************************************************************

                                ;  TEST 31
                                ;--------------
014050  012737  000031  001226  TST31:  MOV     #31,TSTNO
014056  012737  014302  001216          MOV     #TST32,NEXT
014064  012737  014076  001220          MOV     #1$,LOCK
014072  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER
014076  012713  002000          1$:     MOV     #CLRMUX,(R3)            ;CLEAR ALL MULTIPLEXER FLIPFLOPS
014102  005013                          CLR     (R3)                    ;CLEAR CONTROL REGISTER
014104  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
014110  012700  000020                  MOV     #16.,R0                 ;SET UP TO WRITE 1'S INTO
014114  012713  001017                  MOV     #MAINT+17,(R3)          ;ALL SCANNER MEMORY LOCATION
014120  052713  000400          2$:     BIS     #STEP,(R3)              ;WRITE A LOCATION
014124  012777  000001  173146          MOV     #LINENA,@MC.LSR         ;LET "LINE ENABLE"
014132  005300                          DEC     R0
014134  001371                          BNE     2$
014136  012705  070340                  MOV     #70340,R5               ;EXPECT "DONE"+"SCNENA"+"CSF"+"CSF"+"SECRXF"
014142  012777  014252  173132          MOV     #4$,@MC.VEC             ;SET UP LOCAL INTERRUPT SERVICE
014150  013777  177776  173126          MOV     PS,@MC.LVL              ;SERVICE AT LEVEL 7
014156  012700  000020                  MOV     #16.,R0
014162  012713  000117                  MOV     #INTENA+17,(R3)         ;SET INTERRUPT ENABLE
014166  012737  000340  177776  3$:     MOV     #340,PS                 ;LOCK OUT INTERRUPTS
014174  052713  000040                  BIS     #SCNENA,(R3)            ;START SCANNER
014200  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
014204  005037  001270                  CLR     SAVR4
014210  105713                          TSTB    (R3)                    ;WAIT FOR DONE
014212  100410                          BMI     .+22
014214  104414                          DELAY
014216  000240                          NOP
014220  000240                          NOP
014222  062737  000001  001270          ADD     #1,SAVR4
014230  001367                          BNE     .-20
014232  104006                          HLT     6
014234  012737  000340  177776          MOV     #340,PS                 ;INTERRUPT DID NOT OCCUR
014242  011304                          MOV     (R3),R4                 ;ERROR
014244  104004                          HLT     4                       ;CONTROL STATUS ERROR
014246  104401                          SCOP1                           ;CHECK FOR LOOP ON SAME DATA
014250  000406                          BR      5$
014252  022626                  4$:     POP2SP                          ;INTERRUPT OCCURED, REPOSITION STACK
014254  011304                          MOV     (R3),R4                 ;READ CONTROL STATUS
014256  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED
014260  001402                          BEQ     5$                      ;REGISTERS THE SAME
014262  104002                          HLT     2                       ;NO, LINE STATUS ERROR
014264  104401                          SCOP1                           ;CHECK FOR LOOP WITH CURRENT DATA
014266  042713  000240          5$:     BIC     #SCNENA+DONE,(R3)       ;CLEAR SCAN ENABLE AND DONE
014272  005205                          INC     R5                      ;UPDATE EXPECTED RESULT
014274  005300                          DEC     R0                      ;CONTINUE IF NOT DONE
014276  001333                          BNE     3$
014300  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
2683                                            ;************************ TEST 32 ******************************
2684                                            ;*WRITE 1'S INTO ALL MULTIPLEXER FUNCTION FLIP-FLOPS
2685                                            ;*CLEAR SCANNER MEMORY
2686                                            ;*VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE
2687                                            ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
2688                                            ;;*************************************************************
2689
2690                                        ;  TEST 32
2691                                        ;--------------
2692  014302  012737  000032  001226  TST32:  MOV     #32,TSTNO
2693  014310  012737  014646  001216          MOV     #TST33,NEXT
2694  014316  012737  014434  001220          MOV     #1$,LOCK
2695  014324  005000                          CLR     R0
2696  014326  005737  001416                  TST     L00.03
2697  014332  100402                          BMI     68$
2698  014334  062700  000004                  ADD     #4,R0
2699  014340  005737  001420          68$:    TST     L04.07
2700  014344  100402                          BMI     69$
2701  014346  062700  000004                  ADD     #4,R0
2702  014352  005737  001422          69$:    TST     L08.11
2703  014356  100402                          BMI     70$
2704  014360  062700  000004                  ADD     #4,R0
2705  014364  005737  001424          70$:    TST     L12.15
2706  014370  100402                          BMI     71$
2707  014372  062700  000004                  ADD     #4,R0
2708  014376  005700                  71$:    TST     R0
2709  014400  001001                          BNE     .+4
2710  014402  000000                          HALT                    ;TEST CAN NOT RUN WITH NO LINE CARDS!!
2711  014404  010037  007274                  MOV     R0,TOTAL
2712  014410  005737  007256                  TST     TURFLG
2713  014414  001405                          BEQ     65$
2714  014416  013737  001216  001214          MOV     NEXT,RETURN
2715  014424  000177  164564                  JMP     @RETURN
2716  014430  013703  007276          65$:    MOV     MC.CSR,R3               ;SET POINTER
2717  014434  012700  000020          1$:     MOV     #16.,R0                 ;WRITE IS INTO ALL
2718  014440  012713  002000                  MOV     #CLRMUX,(R3)            ;CLEAR MULTIPLEXER
2719  014444  005013                          CLR     (R3)                    ;MULTIPLEXER FUNCTION
2720  014446  005037  177776                  CLR     PS                      ;ENABLE TELETYPE INTERRUPTS
2721  014452  012777  000017  172620  2$:     MOV     #17,@MC.LSR             ;FLIPFLOPS
2722  014460  052713  000400                  BIS     #STEP,(R3)
2723  014464  005300                          DEC     R0
2724  014466  001371                          BNE     2$
2725  014470  012713  004000                  MOV     #CLRSCN,(R3)            ;CLEAR SCANNER MEMORY
2726  014474  032713  000020                  BIT     #BUSY,(R3)              ;WAIT FOR CLEAR CYCLE TO COMPLETE
2727  014500  001375                          BNE     .-4
2728  014502  013700  007274                  MOV     TOTAL,R0
2729  014506  012705  170340                  MOV     #170340,R5              ;FIRST EXPECTED RESULT
2730  014512  012777  014616  172562          MOV     #4$,@MC.VEC             ;SET UP LOCAL INTERRUPT RETURN
2731  014520  013777  177776  172556          MOV     PS,@MC.LVL
2732  014526  012713  000117                  MOV     #INTENA+17,(R3)         ;SET INTERRUPT ENABLE
2733  014532  012737  000340  177776  3$:     MOV     #340,PS                 ;LOCK OUT INTERRUPTS
2734  014540  052713  000040                  BIS     #SCNENA,(R3)            ;START SCANNER
2735  014544  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
2736  014550  005037  001270                  CLR     SAVR4
2737  014554  105713                          TSTB    (R3)                    ;WAIT FOR DONE
2738  014556  100410                          BMI     .+22
```

```
 2739  014560  104414                        DELAY
 2740  014562  000240                        NOP
 2741  014564  000240                        NOP
 2742  014566  062737  000001  001270        ADD     #1,SAVR4
 2743  014574  001367                        BNE     .-20
 2744  014576  104006                        HLT     6
 2745  014600  012737  000340  177776        MOV     #340,PS                 ;LOCK OUT INTERRUPTS
 2746  014606  011304                        MOV     (R3),R4                 ;READ CONTROL STATUS
 2747  014610  104004                        HLT     4                       ;INTERRUPT DID NOT OCCUR
 2748  014612  104401                        SCOP1                           ;CHECK FOR LOOP ON CURRENT DATA
 2749  014614  000406                        BR      5$                      ;CONTINUE
 2750  014616  022626              4$:       POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
 2751  014620  011304                        MOV     (R3),R4                 ;READ CONTROL STATUS REGISTER
 2752  014622  020504                        CMP     R5,R4                   ;COMPARE TO EXPECTED RESULT
 2753  014624  001402                        BEQ     5$
 2754  014626  104002                        HLT     2                       ;CONTROL STATUS ERROR
 2755  014630  104401                        SCOP1                           ;CHECK FOR LOOP ON CURRENT DATA
 2756  014632  042713  000240        5$:     BIC     #SCNENA+DONE,(R3)       ;CLEAR SCAN ENABLE AND DONE
 2757  014636  005205                        INC     R5                      ;UPDATE EXPECTED RESULT
 2758  014640  005300                        DEC     R0                      ;CONTINUE IF ALL
 2759  014642  001333                        BNE     3$                      ;LINES NOT TESTED
 2760  014644  104420                        SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 33 ******************************
                                        ;*VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
                                        ;*BE SET AND CLEARED FOR SELECTED LINE
                                        ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED.
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;:*****************************************************************

                                ;  TEST 33
                                ;--------------
014646  012737  000033  001226  TST33:  MOV     #33,TSTNO
014654  012737  015046  001216          MOV     #TST34,NEXT
014662  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
014666  001005                          BNE     1$                      ;BR IF H325
014670  013737  001216  001214          MOV     NEXT,RETURN
014676  000177  164312                  JMP     @RETURN
014702  005077  172370          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
014706  005037  177776                  CLR     PS                      ;ZERO PSW.
014712  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
014716  012777  002000  172352  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
014724  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
014730  010177  172342                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
014734  012777  000001  172336          MOV     #LINENA,@MC.LSR         ;SET LINE ENABLE FUNCTION FLIP-FLOP
014742  005077  172330                  CLR     @MC.CSR                 ;ZERO CSR
014746  005005                  3$:     CLR     R5                      ;SET EXPECTED
014750  017704  172324                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
014754  117703  172316                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
014760  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
014764  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
014766  001002                          BNE     4$                      ;EXCEPT LINE ENABLE FUNCTION FLIP FLOP
014770  012705  000001                  MOV     #LINENA,R5              ;SET "GOOD"
                                                                        ;TO BE SET
014774  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
014776  001401                          BEQ     5$                      ;RESULTS
015000  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015002  052777  000400  172266  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
015010  005302                          DEC     R2                      ;ALL LINES DONE?
015012  001355                          BNE     3$                      ;BR IF NO
015014  005005                          CLR     R5                      ;CLEAR "GOOD"
015016  010177  172254          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
015022  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
015024  005077  172250                  CLR     @MC.LSR                 ;CLEAR LINE ENABLE FLIP FLOP
015030  104414                          DELAY                           ;DELAY FOR CABLE
015032  017704  172242                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
015036  005704                          TST     R4                      ;WAS LINE ENABLE FUNCTION FLIP FLOP
015040  001401                          BEQ     .+4                     ;CLEARED
015042  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015044  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 34 *******************************
                                        ;*VERIFY THAT TERMINAL READY FUNCTION FLIP-FLOP CAN
                                        ;*BE SET AND CLEARED FOR SELECTED LINE
                                        ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;:*************************************************************

                                ;  TEST 34
                                ;--------------
015046  012737  000034  001226  TST34:  MOV     #34,TSTNO
015054  012737  015245  001216          MOV     #TST35,NEXT
015062  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
015066  001005                          BNE     1$                      ;BR IF H325
015070  013737  001216  001214          MOV     NEXT,RETURN
015076  000177  164112                  JMP     @RETURN
015102  005077  172170          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
015106  005037  177776                  CLR     PS                      ;ZERO PSW.
015112  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
015116  012777  002000  172152  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
015124  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
015130  010177  172142                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
015134  012777  000002  172136          MOV     #TRMRDY,@MC.LSR         ;SET TERMINAL READY FUNCTION FLIP-FLOP
015142  005077  172130                  CLR     @MC.CSR                 ;ZERO CSR
015146  005005                  3$:     CLR     R5                      ;SET EXPECTED
015150  017704  172124                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
015154  117703  172116                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
015160  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
015164  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
015166  001002                          BNE     4$                      ;EXCEPT TERMINAL READY FUNCTION FLIP FLOP
015170  012705  000002                  MOV     #TRMRDY,R5              ;SET "GOOD"
                                                                        ;TO BE SET
015174  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
015176  001401                          BEQ     5$                      ;RESULTS
015200  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015202  052777  000400  172066  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
015210  005302                          DEC     R2                      ;ALL LINES DONE?
015212  001355                          BNE     3$                      ;BR IF NO
015214  005005                          CLR     R5                      ;CLEAR "GOOD"
015216  010177  172054          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
015222  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
015224  005077  172050                  CLR     @MC.LSR                 ;CLEAR TERMINAL READY FLIP FLOP
015230  104414                          DELAY                           ;DELAY FOR CABLE
015232  017704  172042                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
015236  005704                          TST     R4                      ;WAS TERMINAL READY FUNCTION FLIP FLOP
015240  001401                          BEQ     .+4                     ;CLEARED
015242  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015244  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 35 ******************************
                                        ;*VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
                                        ;*BE SET AND CLEARED FOR SELECTED LINE
                                        ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;*************************************************************

                                ;  TEST 35
                                ;--------------
015246  012737  000035  001226  TST35:  MOV     #35,TSTNO
015254  012737  015446  001216          MOV     #TST36,NEXT
015262  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
015266  001005                          BNE     1$                      ;BR IF H325
015270  013737  001216  001214          MOV     NEX.,RETURN
015276  000177  163712                  JMP     @RETURN
015302  005077  171770          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
015306  005037  177776                  CLR     PS                      ;ZERO PSW.
015312  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
015316  012777  002000  171752  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
015324  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
015330  010177  171742                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
015334  012777  000004  171736          MOV     #RS,@MC.LSR             ;SET REQUEST TO SEND FUNCTION FLIP-FLOP
015342  005077  171730                  CLR     @MC.CSR                 ;ZERO CSR
015346  005005                  3$:     CLR     R5                      ;SET EXPECTED
015350  017704  171724                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
015354  117703  171716                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
015360  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
015364  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
015366  001002                          BNE     4$                      ;EXCEPT REQUEST TO SEND FUNCTION FLIP FLOP
015370  012705  000004                  MOV     #RS,R5          ;SET "GOOD"
                                                                        ;TO BE SET
015374  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
015376  001401                          BEQ     5$                      ;RESULTS
015400  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015402  052777  000400  171666  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
015410  005302                          DEC     R2                      ;ALL LINES DONE?
015412  001355                          BNE     3$                      ;BR IF NO
015414  005005                          CLR     R5                      ;CLEAR "GOOD"
015416  010177  171654          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
015422  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
015424  005077  171650                  CLR     @MC.LSR                 ;CLEAR REQUEST TO SEND FLIP FLOP
015430  104414                          DELAY                           ;DELAY FOR CABLE
015432  017704  171642                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
015436  005704                          TST     R4                      ;WAS REQUEST TO SEND FUNCTION FLIP FLOP
015440  001401                          BEQ     .+4                     ;CLEARED
015442  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015444  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
2902                                        ;********************** TEST 36 ****************************
2903                                        ;*VERIFY THAT NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP-FLOP CAN
2904                                        ;*BE SET AND CLEARED FOR SELECTED LINE
2905                                        ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
2906                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
2907                                        ;***********************************************************
2908
2909                                    ;  TEST 36
2910                                    ;--------------
2911  015446  012737  000036  001226  TST36:  MOV     #36,TSTNO
2912  015454  012737  015646  001216          MOV     #TST37,NEXT
2913  015462  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
2914  015466  001005                          BNE     1$                      ;BR IF H325
2915  015470  013737  001216  001214          MOV     NEXT,RETURN
2916  015476  000177  163512                  JMP     @RETURN
2917  015502  005077  171570          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
2918  015506  005037  177776                  CLR     PS                      ;ZERO PSW.
2919  015512  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
2920  015516  012777  002000  171552  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
2921  015524  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
2922  015530  010177  171542                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
2923  015534  012777  000010  171536          MOV     #N$,@MC.LSR             ;SET NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP-
2924  015542  005077  171530                  CLR     @MC.CSR                 ;ZERO CSR
2925  015546  005005                  3$:     CLR     R5                      ;SET EXPECTED
2926  015550  017704  171524                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
2927  015554  117703  171516                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
2928  015560  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
2929  015564  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
2930  015566  001002                          BNE     4$                      ;EXCEPT NEW SYNC (SECTX IF ASYNC LC) FUNCTION FL
2931  015570  012705  000010                  MOV     #N$,R5          ;SET "GOOD"
2932                                                                          ;TO BE SET
2933  015574  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
2934  015576  001401                          BEQ     5$                      ;RESULTS
2935  015600  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
2936  015602  052777  000400  171466  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
2937  015610  005302                          DEC     R2                      ;ALL LINES DONE?
2938  015612  001355                          BNE     3$                      ;BR IF NO
2939  015614  005005                          CLR     R5                      ;CLEAR "GOOD"
2940  015616  010177  171454          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
2941  015622  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
2942  015624  005077  171450                  CLR     @MC.LSR                 ;CLEAR NEW SYNC (SECTX IF ASYNC LC) FLIP FLOP
2943  015630  104414                          DELAY                           ;DELAY FOR CABLE
2944  015632  017704  171442                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
2945  015636  005704                          TST     R4                      ;WAS NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP
2946  015640  001401                          BEQ     .+4                     ;CLEARED
2947  015642  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
2948  015644  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 37 ******************************
                                        ;*VERIFY THAT RING IS SET IF "LINE ENABLE"
                                        ;*AND TERMINAL ARE SET FOR SELECTED LINE.
                                        ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;;*************************************************************

                                        ;  TEST 37
                                        ;--------------
015646  012737  000037  001226  TST37:  MOV     #37,TSTNO
015654  012737  016044  001216          MOV     #TST40,NEXT
015662  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
015666  001005                          BNE     1$                      ;BR IF H325
015670  013737  001216  001214          MOV     NEXT,RETURN
015676  000177  163312                  JMP     @RETURN
015702  005077  171370          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
015706  005037  177776                  CLR     PS                      ;ZERO PSW
015712  013701  007260                  MOV     LINE,R1                 ;LINE NUMBER
015716  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
015722  010177  171350                  MOV     R1,@MC.CSR              ;SELECT A LINE
015726  012777  000003  171344          MOV     #LINENA+TRMRDY,@MC.LSR  ;SET LINE ENABLE +TRMRDY
015734  005077  171336                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
015740  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
015742  017704  171332                  MOV     @MC.LSR,R4              ;READ LINE STATUS
015746  117703  171324                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
015752  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
015756  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
015760  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
015762  012705  000203                  MOV     #LINENA+TRMRDY+RING,R5
                                                                        ;RING IS SET
015766  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
015770  001401                          BEQ     5$                      ;RECEIVED RESULTS
015772  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015774  052777  000400  171274  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
016002  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
016004  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
016006  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
016012  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
016014  010177  171256                  MOV     R1,@MC.CSR              ;SELECT LINE
016020  042777  000002  171252          BIC     #TRMRDY,@MC.LSR         ;CLEAR TERMINAL
016026  104414                          DELAY                           ;DELAY FOR CABLE
016030  017704  171244                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016034  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
016036  001401                          BEQ     .+4                     ;SET ON THIS LINE
016040  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016042  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 40 ******************************
                                        ;*VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF "LINE ENABLE"
                                        ;*AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
                                        ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;;*************************************************************

                                ;  TEST 40
                                ;--------------
016044  012737  000040  001226  TST40:  MOV     #40,TSTNO
016052  012737  016242  001216          MOV     #TST41,NEXT
016060  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016064  001005                          BNE     1$                      ;BR IF H325
016066  013737  001216  001214          MOV     NEXT,RETURN
016074  000177  163114                  JMP     @RETURN
016100  005077  171172          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016104  005037  177776                  CLR     PS                      ;ZERO PSW
016110  013701  007260                  MOV     LINE,R1                 ;LINE NUMBER
016114  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
016120  010177  171152                  MOV     R1,@MC.CSR              ;SELECT A LINE
016124  012777  000005  171146          MOV     #LINENA+RS,@MC.LSR      ;SET LINE ENABLE +RS
016132  005077  171140                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016136  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
016140  017704  171134                  MOV     @MC.LSR,R4              ;READ LINE STATUS
016144  117703  171126                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
016150  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
016154  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
016156  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
016160  012705  000145                  MOV     #LINENA+RS+CC+CS,R5
                                                                        ;CLEAR TO SEND AND CARRIER ARE SET
016164  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
016166  001401                          BEQ     5$                      ;RECEIVED RESULTS
016170  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016172  052777  000400  171076  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
016200  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
016202  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
016204  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
016210  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
016212  010177  171060                  MOV     R1,@MC.CSR              ;SELECT LINE
016216  042777  000004  171054          BIC     #RS,@MC.LSR             ;CLEAR REQUEST TO SEND
016224  104414                          DELAY                           ;DELAY FOR CABLE
016226  017704  171046                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016232  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
016234  001401                          BEQ     .+4                     ;SET ON THIS LINE
016236  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016240  104420                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 41 ******************************
                                        ;*VERIFY THAT DATA SET READY(SECRX IF ASYNC LC) IS SET IF "LINE ENABLE"
                                        ;*AND NEW SYNC (SECTX IF ASYNC LC) ARE SET FOR SELECTED LINE.
                                        ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;;*************************************************************

                                ;  TEST 41
                                ;--------------
016242  012737  000041  001226  TST41:  MOV     #41,TSTNO
016250  012737  016440  001216          MOV     #TST42,NEXT
016256  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016262  001005                          BNE     1$                      ;BR IF H325
016264  013737  001216  001214          MOV     NEXT,RETURN
016272  000177  162716                  JMP     @RETURN
016276  005077  170774          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016302  005037  177776                  CLR     PS                      ;ZERO PSW
016306  013701  007260                  MOV     LINE,R1                 ;LINE NUMBER
016312  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
016316  010177  170754                  MOV     R1,@MC.CSR              ;SELECT A LINE
016322  012777  000011  170750          MOV     #LINENA+NS,@MC.LSR      ;SET LINE ENABLE +NS
016330  005077  170742                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016334  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
016336  017704  170736                  MOV     @MC.LSR,R4              ;READ LINE STATUS
016342  117703  170730                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
016346  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
016352  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
016354  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
016356  012705  000031                  MOV     #LINENA+NS+DSR,R5.
                                                                        ;DATA SET READY(SECRX IF ASYNC LC) IS SET
016362  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
016364  001401                          BEQ     5$                      ;RECEIVED RESULTS
016366  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016370  052777  000400  170700  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
016376  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
016400  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
016402  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
016406  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
016410  010177  170662                  MOV     R1,@MC.CSR              ;SELECT LINE
016414  042777  000010  170656          BIC     #NS,@MC.LSR             ;CLEAR NEW SYNC (SECTX IF ASYNC LC)
016422  104414                          DELAY                           ;DELAY FOR CABLE
016424  017704  170650                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016430  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
016432  001401                          BEQ     .+4                     ;SET ON THIS LINE
016434  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016436  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 42 ******************************
                                        ;*VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
                                        ;*BE SET AND CLEARED FOR SELECTED LINE
                                        ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;:*************************************************************

                                ;  TEST 42
                                ;--------------
016444  012737  000042  001226  TST42:  MOV     #42,TSTNO
016446  012737  016664  001216          MOV     #TST43,NEXT
016454  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016460  001405                          BEQ     1$                      ;BR IF H861
016462  013737  001216  001214          MOV     NEXT,RETURN
016470  000177  162520                  JMP     @RETURN
016474  005077  170576          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
016500  005037  177776                  CLR     PS                      ;ZERO PSW.
016504  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
016510  005001                          CLR     R1
016512  012737  016520  001230          MOV     #2$,LOCK
016520  012777  002000  170550  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
016526  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
016532  010177  170540                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
016536  010137  007260                  MOV     R1,LINE                 ;SET IMAGE
016542  012777  000001  170530          MOV     #LINENA,@MC.LSR         ;SET LINE ENABLE FUNCTION FLIP-FLOP
016550  005077  170522                  CLR     @MC.CSR                 ;ZERO CSR
016554  005005                  3$:     CLR     R5                      ;SET EXPECTED
016556  017704  170516                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016562  117703  170510                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
016566  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
016572  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
016574  001002                          BNE     4$                      ;EXCEPT LINE ENABLE FUNCTION FLIP FLOP
016576  012705  000001                  MOV     #LINENA,R5              ;SET "GOOD"
                                                                        ;TO BE SET
016602  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
016604  001401                          BEQ     5$                      ;RESULTS
016606  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016610  052777  000400  170460  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
016616  005302                          DEC     R2                      ;ALL LINES DONE?
016620  001355                          BNE     3$                      ;BR IF NO
016622  005005                          CLR     R5                      ;CLEAR "GOOD"
016624  010177  170446          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
016630  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
016632  005077  170442                  CLR     @MC.LSR                 ;CLEAR LINE ENABLE FLIP FLOP
016636  104414                          DELAY                           ;DELAY FOR CABLE
016640  017704  170434                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016644  005704                          TST     R4                      ;WAS LINE ENABLE FUNCTION FLIP FLOP
016646  001401                          BEQ     .+4                     ;CLEARED
016650  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016652  104401                          SCOPE1
016654  005201                          INC     R1
016656  005300                          DEC     R0
016660  001317                          BNE     2$
016662  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 43 ******************************
                                        ;*VERIFY THAT TERMINAL READY FUNCTION FLIP-FLOP CAN
                                        ;*BE SET AND CLEARED FOR SELECTED LINE
                                        ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;:*************************************************************

                                ;  TEST 43
                                ;-------------
016664  012737  000043  001226  TST43:  MOV     #43,TSTNO
016672  012737  017110  001216          MOV     #TST44,NEXT
016700  005737  007256                  TST     TURFLG                  ;TURN AROUND H851 OR H325?
016704  001405                          BEQ     1$                      ;BR IF H861
016706  013737  001216  001214          MOV     NEXT,RETURN
016714  000177  162274                  JMP     @RETURN
016720  005077  170352          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
016724  005037  177776                  CLR     PS                      ;ZERO PSW.
016730  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
016734  005001                          CLR     R1
016736  012737  016744  001220          MOV     #2$,LOCK
016744  012777  002000  170324  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
016752  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
016756  010177  170314                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
016762  010137  007260                  MOV     R1,LINE                 ;SET IMAGE
016766  012777  000002  170304          MOV     #TRMRDY,@MC.LSR         ;SET TERMINAL READY FUNCTION FLIP-FLOP
016774  005077  170276                  CLR     @MC.CSR                 ;ZERO CSR
017000  005005                  3$:     CLR     R5                      ;SET EXPECTED
017002  017704  170272                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017006  117703  170264                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
017012  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
017016  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
017020  001002                          BNE     4$                      ;EXCEPT TERMINAL READY FUNCTION FLIP FLOP
017022  012705  000002                  MOV     #TRMRDY,R5              ;SET "GOOD"
                                                                        ;TO BE SET
017026  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
017030  001401                          BEQ     5$                      ;RESULTS
017032  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017034  052777  000400  170234  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
017042  005302                          DEC     R2                      ;ALL LINES DONE?
017044  001355                          BNE     3$                      ;BR IF NO
017046  005005                          CLR     R5                      ;CLEAR "GOOD"
017050  010177  170222          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
017054  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
017056  005077  170216                  CLR     @MC.LSR                 ;CLEAR TERMINAL READY FLIP FLOP
017062  104414                          DELAY                           ;DELAY FOR CABLE
017064  017704  170210                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017070  005704                          TST     R4                      ;WAS TERMINAL READY FUNCTION FLIP FLOP
017072  001401                          BEQ     .+4                     ;CLEARED
017074  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017076  104401                          SCOP1
017100  005201                          INC     R1
017102  005300                          DEC     R0
017104  001317                          BNE     2$
017106  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 44 ******************************
                                        ;*VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
                                        ;*BE SET AND CLEARED FOR SELECTED LINE
                                        ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;;*********************************************************************

                                ;  TEST 44
                                ;--------------
017110  012737  000044  001226  TST44:  MOV     #44,TSTNO
017116  012737  017334  001216          MOV     #TST45,NEXT
017124  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
017130  001405                          BEQ     1$                      ;BR IF H861
017132  013737  001216  001214          MOV     NEXT,RETURN
017140  000177  162050                  JMP     @RETURN
017144  005077  170126          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
017150  005037  177776                  CLR     PS                      ;ZERO PSW.
017154  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
017160  005001                          CLR     R1
017162  012737  017170  001220          MOV     #2$,LOCK
017170  012777  002000  170100  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
017176  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
017202  010177  170070                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
017206  010137  007260                  MOV     R1,LINE                 ;SET IMAGE
017212  012777  000004  170060          MOV     #RS,@MC.LSR             ;SET REQUEST TO SEND FUNCTION FLIP-FLOP
017220  005077  170052                  CLR     @MC.CSR                 ;ZERO CSR
017224  005005                  3$:     CLR     R5                      ;SET EXPECTED
017226  017704  170046                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017232  117703  170040                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
017236  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
017242  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
017244  001002                          BNE     4$                      ;EXCEPT REQUEST TO SEND FUNCTION FLIP FLOP
017246  012705  000004                  MOV     #RS,R5          ;SET "GOOD"
                                                                        ;TO BE SET
017252  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
017254  001401                          BEQ     5$                      ;RESULTS
017256  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017260  052777  000400  170010  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
017266  005302                          DEC     R2                      ;ALL LINES DONE?
017270  001355                          BNE     3$                      ;BR IF NO
017272  005005                          CLR     R5                      ;CLEAR "GOOD"
017274  010177  167776          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
017300  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
017302  005077  167772                  CLR     @MC.LSR                 ;CLEAR REQUEST TO SEND FLIP FLOP
017306  104414                          DELAY                           ;DELAY FOR CABLE
017310  017704  167764                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017314  005704                          TST     R4                      ;WAS REQUEST TO SEND FUNCTION FLIP FLOP
017316  001401                          BEQ     .+4                     ;CLEARED
017320  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017322  104401                          SCOP1
017324  005201                          INC     R1
017326  005300                          DEC     R0
017330  001317                          BNE     2$
017332  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 45 ******************************
                                        ;*VERIFY THAT SECONDARY TRANSMIT FUNCTION FLIP-FLOP CAN
                                        ;*BE SET AND CLEARED FOR SELECTED LINE
                                        ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;;*************************************************************

                                ;  TEST 45
                                ;--------------
017334  012737  000045  001226  TST45:  MOV     #45,TSTNO
017342  012737  017560  001216          MOV     #TST46,NEXT
017350  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
017354  001405                          BEQ     1$                      ;BR IF H861
017356  013737  001216  001214          MOV     NEXT,RETURN
017364  000177  161624                  JMP     @RETURN
017370  005077  167702          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
017374  005037  177776                  CLR     PS                      ;ZERO PSW.
017400  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
017404  005001                          CLR     R1
017406  012737  017414  001220          MOV     #2$,LOCK
017414  012777  002000  167654  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
017422  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
017426  010177  167644                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
017432  010137  007260                  MOV     R1,LINE                 ;SET IMAGE
017436  012777  000010  167634          MOV     #SECTX,@MC.LSR          ;SET SECONDARY TRANSMIT FUNCTION FLIP-FLOP
017444  005077  167626                  CLR     @MC.CSR                 ;ZERO CSR
017450  005005                  3$:     CLR     R5                      ;SET EXPECTED
017452  017704  167622                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017456  117703  167614                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
017462  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
017466  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
017470  001002                          BNE     4$                      ;EXCEPT SECONDARY TRANSMIT FUNCTION FLIP FLOP
017472  012705  000010                  MOV     #SECTX,R5               ;SET "GOOD"
                                                                        ;TO BE SET
017476  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
017500  001401                          BEQ     5$                      ;RESULTS
017502  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017504  052777  000400  167554  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
017512  005302                          DEC     R2                      ;ALL LINES DONE?
017514  001355                          BNE     3$                      ;BR IF NO
017516  005005                          CLR     R5                      ;CLEAR "GOOD"
017520  010177  167552          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
017524  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
017526  005077  167546                  CLR     @MC.LSR                 ;CLEAR SECONDARY TRANSMIT FLIP FLOP
017532  104414                          DELAY                           ;DELAY FOR CABLE
017534  017704  167540                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
017540  005704                          TST     R4                      ;WAS SECONDARY TRANSMIT FUNCTION FLIP FLOP
017542  001401                          BEQ     .+4                     ;CLEARED
017544  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017546  104401                          SCOP1
017550  005201                          INC     R1
017552  005300                          DEC     R0
017554  001317                          BNE     2$
017556  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
3306
3307                                    ;************************ TEST 46 ****************************
3308                                    ;*VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF "LINE ENABLE"
3309                                    ;*AND TERMINAL ARE SET FOR SELECTED LINE.
3310                                    ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
3311                                    ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
3312                                    ;;*************************************************************
3313
3314                                ;  TEST 46
3315                                ;--------------
3316  017560  012737  000046  001226 TST46:  MOV     #46,TSTNO
3317  017566  012737  020002  001216         MOV     #TST47,NEXT
3318  017574  005737  007256                 TST     TURFLG                  ;TURN AROUND H861 OR H325?
3319  017600  001405                         BEQ     1$                      ;BR IF H861
3320  017602  013737  001216  001214         MOV     NEXT,RETURN
3321  017610  000177  161400                 JMP     @RETURN
3322  017614  005077  167456          1$:    CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
3323  017620  005037  177776                 CLR     PS                      ;ZERO PSW
3324  017624  013700  007274                 MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
3325  017630  005001                         CLR     R1
3326  017632  012737  017640  001220         MOV     #2$,LOCK
3327  017640  012702  000020          2$:    MOV     #16.,R2                 ;16 LINES
3328  017644  010177  167426                 MOV     R1,@MC.CSR              ;SELECT A LINE
3329  017650  012777  000003  167422         MOV     #LINENA+TRMRDY,@MC.LSR  ;SET LINE ENABLE +TRMRDY
3330  017656  005077  167414                 CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
3331  017662  005005                  3$:    CLR     R5                      ;CLEAR EXPECTED RESULT
3332  017664  017704  167410                 MOV     @MC.LSR,R4              ;READ LINE STATUS
3333  017670  117703  167402                 MOVB    @MC.CSR,R3              ;READ LINE NUMBER
3334  017674  042703  177760                 BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
3335  017700  020103                         CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
3336  017702  001002                         BNE     4$                      ;EXPECT LINE ENABLE AND
3337  017704  012705  000143                 MOV     #LINENA+TRMRDY+CO+CS,R5
3338                                                                          ;CLEAR TO SEND AND CARRIER ARE SET
3339  017710  020405                  4$:    CMP     R4,R5                   ;COMPARE EXPECTED AND
3340  017712  001401                         BEQ     5$                      ;RECEIVED RESULTS
3341  017714  104001                         HLT     1                       ;R5=EXPECTED R4=FOUND
3342  017716  052777  000400  167352  5$:    BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
3343  017724  005302                         DEC     R2                      ;CONTINUE IF ALL CHECKS
3344  017726  001355                         BNE     3$                      ;ARE NOT DONE FOR THIS LINE
3345  017730  012705  000001                 MOV     #LINENA,R5              ;EXPECT LINE ENABLE
3346  017734  010103                  6$:    MOV     R1,R3                   ;ON SELECTED LINE
3347  017736  010177  167334                 MOV     R1,@MC.CSR              ;SELECT LINE
3348  017742  042777  000002  167330         BIC     #TRMRDY,@MC.LSR         ;CLEAR TERMINAL
3349  017750  104414                         DELAY                           ;DELAY FOR CABLE
3350  017752  017704  167322                 MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
3351  017756  020504                         CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
3352  017760  001401                         BEQ     .+4                     ;SET ON THIS LINE
3353  017762  104001                         HLT     1                       ;R5=EXPECTED R4=FOUND
3354  017764  104401                         SCOP1
3355  017766  005201                         INC     R1
3356  017770  005077  167304                 CLR     @MC.LSR
3357  017774  005300                         DEC     R0
3358  017776  001320                         BNE     2$
3359  020000  104400                  7$:    SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
3360
3361                                    ;********************** TEST 47 ****************************
3362                                    ;*VERIFY THAT RING IS SET IF "LINE ENABLE"
3363                                    ;*AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
3364                                    ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
3365                                    ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
3366                                    ;;*************************************************************
3367
3368                                ;  TEST 47
3369                                ;--------------
3370 020002  012737  000047  001226 TST47:  MOV     #47,TSTNO
3371 020010  012737  020224  001216        MOV     #TST50,NEXT
3372 020016  005737  007256                TST     TURFLG                  ;TURN AROUND H861 OR H325?
3373 020022  001405                        BEQ     1$                      ;BR IF H861
3374 020024  013737  001216  001214        MOV     NEXT,RETURN
3375 020032  000177  161156                JMP     @RETURN
3376 020036  005077  167234          1$:   CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
3377 020042  005037  177776                CLR     PS                      ;ZERO PSW
3378 020046  013700  007274                MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
3379 020052  005001                        CLR     R1
3380 020054  012737  020062  001220        MOV     #2$,LOCK
3381 020062  012702  000020          2$:   MOV     #16.,R2                 ;16 LINES
3382 020066  010177  167204                MOV     R1,@MC.CSR              ;SELECT A LINE
3383 020072  012777  000005  167200        MOV     #LINENA+RS,@MC.LSR      ;SET LINE ENABLE +RS
3384 020100  005077  167172                CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
3385 020104  005005                  3$:   CLR     R5                      ;CLEAR EXPECTED RESULT
3386 020106  017704  167166                MOV     @MC.LSR,R4              ;READ LINE STATUS
3387 020112  117703  167160                MOVB    @MC.CSR,R3              ;READ LINE NUMBER
3388 020116  042703  177760                BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
3389 020122  020103                        CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
3390 020124  001002                        BNE     4$                      ;EXPECT LINE ENABLE AND
3391 020126  012705  000205                MOV     #LINENA+RS+RING,R5
3392                                                                        ;RING IS SET
3393 020132  020405                  4$:   CMP     R4,R5                   ;COMPARE EXPECTED AND
3394 020134  001401                        BEQ     5$                      ;RECEIVED RESULTS
3395 020136  104001                        HLT     1                       ;R5=EXPECTED R4=FOUND
3396 020140  052777  000400  167130  5$:   BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
3397 020146  005302                        DEC     R2                      ;CONTINUE IF ALL CHECKS
3398 020150  001355                        BNE     3$                      ;ARE NOT DONE FOR THIS LINE
3399 020152  012705  000001                MOV     #LINENA,R5              ;EXPECT LINE ENABLE
3400 020156  010103                  6$:   MOV     R1,R3                   ;ON SELECTED LINE
3401 020160  010177  167112                MOV     R1,@MC.CSR              ;SELECT LINE
3402 020164  042777  000004  167106        BIC     #RS,@MC.LSR             ;CLEAR REQUEST TO SEND
3403 020172  104414                        DELAY                           ;DELAY FOR CABLE
3404 020174  017704  167100                MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
3405 020200  020504                        CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
3406 020202  001401                        BEQ     .+4                     ;SET ON THIS LINE
3407 020204  104001                        HLT     1                       ;R5=EXPECTED R4=FOUND
3408 020206  104401                        SCOP1
3409 020210  005201                        INC     R1
3410 020212  005077  167062                CLR     @MC.LSR
3411 020216  005300                        DEC     R0
3412 020220  001320                        BNE     2$
3413 020222  104400                  7$:   SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
3414
3415                                    ;************************ TEST 50 ******************************
3416                                    ;*VERIFY THAT SECONDARY RECEIVE IS SET IF "LINE ENABLE"
3417                                    ;*AND SECONDARY TRANSMIT ARE SET FOR SELECTED LINE.
3418                                    ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
3419                                    ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
3420                                    ;:**************************************************************
3421
3422                                ;  TEST 50
3423                                ;-------------
3424  020224  012737  000050  001226  TST50:  MOV     #50,TSTNO
3425  020232  012737  020446  001216          MOV     #TST51,NEXT
3426  020240  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
3427  020244  001405                          BEQ     1$                      ;BR IF H861
3428  020246  013737  001216  001214          MOV     NEXT,RETURN
3429  020254  000177  160734                  JMP     @RETURN
3430  020260  005077  167012          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
3431  020264  005037  177776                  CLR     PS                      ;ZERO PSW
3432  020270  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
3433  020274  005001                          CLR     R1
3434  020276  012737  020304  001220          MOV     #2$,LOCK
3435  020304  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
3436  020310  010177  166762                  MOV     R1,@MC.CSR              ;SELECT A LINE
3437  020314  012777  000011  166756          MOV     #LINENA+SECTX,@MC.LSR   ;SET LINE ENABLE +SECTX
3438  020322  005077  166750                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
3439  020326  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
3440  020330  017704  166744                  MOV     @MC.LSR,R4              ;READ LINE STATUS
3441  020334  117703  166736                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
3442  020340  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
3443  020344  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
3444  020346  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
3445  020350  012705  000031                  MOV     #LINENA+SECTX+SECRX,R5
3446                                                                          ;SECONDARY RECEIVE IS SET
3447  020354  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
3448  020356  001401                          BEQ     5$                      ;RECEIVED RESULTS
3449  020360  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
3450  020362  052777  000400  166706  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
3451  020370  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
3452  020372  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
3453  020374  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
3454  020400  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
3455  020402  010177  166670                  MOV     R1,@MC.CSR              ;SELECT LINE
3456  020406  042777  000010  166664          BIC     #SECTX,@MC.LSR          ;CLEAR SECONDARY TRANSMIT
3457  020414  104414                          DELAY                           ;DELAY FOR CABLE
3458  020416  017704  166656                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
3459  020422  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
3460  020424  001401                          BEQ     .+4                     ;SET ON THIS LINE
3461  020426  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
3462  020430  104401                          SCOP1
3463  020432  005201                          INC     R1
3464  020434  005077  166640                  CLR     @MC.LSR
3465  020440  005300                          DEC     R0
3466  020442  001320                          BNE     2$
3467  020444  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
3468                                            ;********************** TEST 51 ******************************
3469                                            ;*DV11 SINGLE LINE CABLE TEST.
3470                                            ;*TEST TO RUN A 5 BIT BLOCK (000-037)
3471                                            ;*OF DATA FROM THE DV11 TRANSMITTER INTO THE
3472                                            ;*DV11 RECEIVER THROUGH THE CABLE.
3473                                            ;*SETUP:
3474                                            ;*MODE:         EXTERNAL LOOP BACK
3475                                            ;*TXBA:         SYNC
3476                                            ;*TXWC:         -42(8)-BIT15
3477                                            ;*RXBA          RXBA
3478                                            ;*RXWC:         -40(8)-BIT15
3479                                            ;*LINE PROTOCOL TXDDCMP,RXDDCMP,LRC8,STRIP SYNC,IDLE MARK
3480                                            ;*LINE STATE    EXPECT BCC,TX GO
3481                                            ;*LINE PROGRESS SEND BCC
3482                                            ;*NOTE: FOR TEST OF ASYNC LINE CARD:
3483                                            ;* "SYNC 'A'" MUST BE SET TO ALL ZEROS
3484                                            ;* IN SOFTWARE STATUS MAP.
3485                                            ;*
3486                                            ;;*************************************************************************
3487
3488                                    ;  TEST 51
3489                                    ;--------------
3490  020446  012737  000051  001226  TST51:   MOV     #51,TSTNO
3491  020454  012737  010062  001216            MOV     #TESTER,NEXT
3492  020462  005737  007256                    TST     TURFLG
3493  020466  001005                            BNE     88$
3494  020470  013737  001216  001214            MOV     NEXT,RETURN
3495  020476  000177  160512                    JMP     @RETURN
3496  020502  104413                    88$.    RAMCLR                  ;CLEAR DV11
3497  020504  032737  000010  007260            BIT #BIT3,LINE          ;DETERMINE LINE NO.
3498  020512  001414                            BEQ     91$             ;
3499  020514  032737  000004  007260            BIT     #BIT2,LINE      ;
3500  020522  001404                            BEQ     89$             ;
3501  020524  113737  001424  023560            MOVB    L12.15,SYNC     ;SET SYNC FOR 12-15
3502  020532  000417                            BR      100$            ;
3503  020534  113737  001422  023560  89$:      MOVB    L08.11,SYNC     ;SET SYNC FOR 08-11
3504  020542  000413                            BR      100$            ;
3505  020544  032737  000004  007260  91$:      BIT     #BIT2,LINE      ;
3506  020552  001404                            BEQ     90$             ;
3507  020554  113737  001420  023560            MOVB    L04.07,SYNC     ;SET SYNC FOR 04-07
3508  020562  000403                            BR      100$            ;
3509  020564  113737  001416  023560  90$:      MOVB    L00.03,SYNC     ;SET SYNC FOR 00-03
3510  020572  113737  023560  023561  100$:     MOVB    SYNC,SYNC+1     ;MAKE SECOND SYNC
3511  020600  012705  024162                    MOV     #TXTAB,R5       ;GET TABLE POINTER
3512  020604  005004                            CLR     R4              ;
3513  020606  112725  000010          101$:     MOVB    #BIT3,(R5)+     ;"INC/BCC" AND "MODE 0"
3514  020612  105204                            INCB    R4              ;ALL DONE?
3515  020614  001374                            BNE     101$            ;BR IF NO
3516  020616  012705  024162                    MOV     #TXTAB,R5       ;SET POINTER
3517  020622  005004                            CLR     R4              ;
3518  020624  113704  023560                    MOVB    SYNC,R4         ;SET SYNC CNTRL BYTE
3519  020630  001405                            BEQ     102$            ;BR IF ASYNC LINE CARD!
3520  020632  042704  177400                    BIC     #^C<377>,R4     ;
3521  020636  060405                            ADD     R4,R5           ;
3522  020640  112715  000040                    MOVB    #BIT5,(R5)      ;"MODE 1"
3523  020644  012705  023562          102$:     MOV     #TXBAP,R5       ;
```

```
3524
3525  020650  005004                          CLR     R4              ;
3526  020652  110425                  1$:     MOVB    R4,(R5)+        ;LOAD DATA
3527  020654  105204                          INCB    R4              ;ALL DONE?
3528  020656  022704  000040                  CMP     #40,R4          ;
3529  020662  001373                          BNE     1$              ;
3530  020664  013777  007260  160500          MOV     LINE,@DVSRS     ;LOAD LINE NO
3531  020672  105737  023560                  TSTB    SYNC            ;IS THIS AN ASYNC CARD?
3532  020676  001006                          BNE     65$             ;BR IF NO
3533  020700  004537  023454                  PERFORM ,SETREG         ;
3534  020704     000     001                  .BYTE   000,001         ;TXBAP, BYTE CNT
3535  020706  023562                          TXBAP                   ;
3536  020710  077740                          <-40>-BIT15             ;
3537  020712  000405                          BR      66$             ;
3538  020714  004537  023454          65$:    PERFORM ,SETREG         ;
3539  020720     000     001                  .BYTE   000,001         ;TX BA, TX BC
3540  020722  023560                          SYNC                    ;SYNC
3541  020724  077736                          <-42>-BIT15             ;MARKED BYTE COUNT
3542  020726  004537  023454          66$:    PERFORM ,SETREG         ;
3543  020732     004     005                  .BYTE   004,005         ;RX BA,BC
3544  020734  024562                          RXBA                    ;
3545  020736  077740                          <-40>-BIT15             ;
3546  020740  004537  023454                  PERFORM ,SETREG         ;
3547  020744     012     013                  .BYTE   012,013         ;
3548  020746  000143                          BIT6+BIT5+BIT1+BIT0     ;
3549  020750  002004                          BIT10+BIT2              ;
3550  020752  004537  023454                  PERFORM ,SETREG         ;
3551  020756     016     014                  .BYTE   016,014         ;
3552  020760  002000                          BIT10                   ;
3553  020762  000001                          001                     ;IF SYNC LINE CARD; START IN MODE 1
3554  020764  105737  023560                  TSTB    SYNC            ;IF ASYNC LINE CARD;
3555  020770  001002                          BNE     .+6             ;SET TX TO MODE 0
3556  020772  005077  160400                  CLR     @DVSRA          ;WHICH IS TRUE DDCMP MODE!
3557  020776  004537  023454                  PERFORM ,SETREG         ;
3558  021002     010     010                  .BYTE   010,010         ;
3559  021004  023562                          TXTAB-400               ;
3560  021006  023562                          TXTAB-400               ;
3561  021010  105737  023560                  TSTB    SYNC            ;ASYNC LINE CARD?
3562  021014  001012                          BNE     67$             ;BR IF NOT ASYNC
3563  021016  004537  023520                  PERFORM ,LOAD.MODE      ;
3564  021022  015000                          <BIT12+BIT11>+BIT9      ;8 BITS/PER/CHAR.
3565  021024  004537  023520                  PERFORM ,LOAD.MODE      ;
3566  021030  020000                          BIT13                   ;RX ENABLE
3567  021032  004537  023520                  PERFORM ,LOAD.MODE      ;
3568  021036  072000                          <BIT14+BIT13+BIT12>+BIT10 ;9600 BAUD.
3569  021040  000403                          BR      68$             ;
3570  021042  004537  023520          67$:    PERFORM ,LOAD.MODE      ;MODE FOR CABLE TESTING
3571  021046  030000                          BIT13+BIT12             ;
3572  021050  005277  160306          68$:    INC     @DVSCR          ;SET GO
3573  021054  005005                          CLR     R5              ;
3574  021056  105777  160300          2$:     TSTB    @DVSCR          ;RX BIT7=1?
3575  021062  100404                          BMI     3$              ;YES
3576  021064  104414                          DELAY                   ;WASTE TIME
3577  021066  005205                          INC     R5              ;DELAY
3578  021070  001372                          BNE     2$              ;
3579  021072  104000                          HLT                     ;NO SCR BIT7=1
```

```
3580  021074  013705  007260          3$:     MOV     LINE,R5         ;GET LINE NUMBER
3581  021100  000305                          SWAB    R5              ;PUT IN HIGH BYTE
3582  021102  052705  050000                  BIS     #BIT14+BIT12,R5 ;
3583  021106  017704  160254                  MOV     @DVRIC,R4       ;READ RIC
3584  021112  020504                          CMP     R5,R4           ;OK?
3585  021114  001401                          BEQ     4$              ;YES
3586  021116  104000                          HLT                     ;
3587  021120  005005                  4$:     CLR     R5              ;
3588  021122  005004                          CLR     R4              ;
3589  021124  012701  023562                  MOV     #TXBAP,R1       ;CHECK DATA!!
3590  021130  012700  024562                  MOV     #RXBA,R0        ;
3591  021134  012702  000040                  MOV     #40,R2          ;
3592  021140  112004                  5$:     MOVB    (R0)+,R4        ;GET RX DATA
3593  021142  042704  177740                  BIC     #^C<37>,R4      ;
3594  021146  112105                          MOVB    (R1)+,R5        ;GET TX DATA
3595  021150  020504                          CMP     R5,R4           ;OK?
3596  021152  001401                          BEQ     6$              ;
3597  021154  104000                          HLT                     ;RX DATA BAD!!
3598  021156  005302                  6$:     DEC     R2              ;DONE?
3599  021160  001367                          BNE     5$              ;
3600  021162  104412                          MSTCLR                  ;INIT DV11
3601  021164  104400                          SCOPE                   ;SCOPE TEST.
3602
3603
3604
```

```
 3605            021166                          LOVE=.
 3606            000210                          .=210
 3607  000210    000137  021166                  JMP     MANUAL
 3608            021166                          .=LOVE
 3609  021166    012706  001200          MANUAL: MOV     #STACK,SP
 3610  021172    012700  001500                  MOV     #DV.MAP,R0
 3611  021176    005020                  1$:     CLR     (R0)+
 3612  021200    022700  001740                  CMP     #DV.END,R0
 3613  021204    001374                          BNE     1$
 3614  021206    104402  022257                  TYPE    ,MXTITLE
 3615  021212    004737  023334                  JSR     PC,TKRDY
 3616  021216    113737  001272  001301          MOVB    SAVR5,DVNUM
 3617  021224    142737  177760  001301          BICB    #^C<17>,DVNUM
 3618  021232    112737  000001  001303          MOVB    #1,SAVNUM
 3619  021240    012700  001500                  MOV     #DV.MAP,R0
 3620  021244    012705  000001          2$:     MOV     #1,R5
 3621  021250    104402  022440                  TYPE    ,MXGIVE
 3622  021254    113737  001303  001266          MOVB    SAVNUM,SAVR3
 3623  021262    104411  023420                  CNVRT   ,XXLIN
 3624  021266    104403  022477                  INSTR   ,MXSCR
 3625  021272    104405                          PARAM
 3626  021274    175000                          175000
 3627  021276    175400                          175400
 3628  021300    001256                          TEMP5
 3629  021302      007     001                   .BYTE   7,1
 3630  021304    013720  001256                  MOV     TEMP5,(R0)+
 3631  021310    104403  022630                  INSTR   ,MXVEC
 3632  021314    104405                          PARAM
 3633  021316    000300                          300
 3634  021320    000770                          770
 3635  021322    001256                          TEMP5
 3636  021324      007     001                   .BYTE   7,1
 3637  021326    013720  001256                  MOV     TEMP5,(R0)+
 3638  021332    113746  001303          65$:    MOVB    SAVNUM,-(SP)
 3639  021336    110537  001303                  MOVB    R5,SAVNUM
 3640  021342    104402  023000                  TYPE    ,MXGV
 3641  021346    113737  001303  001266          MOVB    SAVNUM,SAVR3
 3642  021354    104411  023420                  CNVRT   ,XXLIN
 3643  021360    112637  001303                  MOVB    (SP)+,SAVNUM
 3644  021364    104402  023050                  TYPE    ,MXINST
 3645  021370    004737  023334                  JSR     PC,TKRDY
 3646  021374    042737  000040  001272          BIC     #40,SAVR5
 3647  021402    022737  000131  001272          CMP     #131,SAVR5
 3648  021410    001402                          BEQ     .+6
 3649  021412    052710  100000                  BIS     #BIT15,(R0)
 3650  021416    112710  000226                  MOVB    #226,(R0)
 3651  021422    112760  000062  000002          MOVB    #62,2(R0)
 3652  021430    005710                          TST     (R0)
 3653  021432    100515                          BMI     70$
 3654  021434    104402  023117                  TYPE    ,MASYNC
 3655  021440    004737  023334                  JSR     PC,TKRDY
 3656  021444    042737  000040  001272          BIC     #40,SAVR5
 3657  021452    022737  000116  001272          CMP     #116,SAVR5
 3658  021460    001405                          BEQ     66$
 3659  021462    012710  004000                  MOV     #ASYNC,(R0)
 3660  021466    005060  000002                  CLR     2(R0)
```

```
 3661  021472  000475                          BR      70$
 3662  021474  104403  022566          65$:    INSTR   .MXSY1A
 3663  021500  104405                          PARAM
 3664  021502  000001                          001
 3665  021504  000376                          376
 3666  021506  001256                          TEMP5
 3667  021510     000     001                  .BYTE   0,1
 3668  021512  113710  001256                  MOVB    TEMP5,(R0)
 3669  021516  104403  022667                  INSTR   .MXSY1B
 3670  021522  104405                          PARAM
 3671  021524  000001                          001
 3672  021526  000376                          376
 3673  021530  001256                          TEMP5
 3674  021532     000     001                  .BYTE   0,1
 3675  021534  113760  001256  000002          MOVB    TEMP5,2(R0)
 3676  021542  104402  022731                  TYPE    ,MXBITS
 3677  021546  004737  023334                  JSR     PC,TKRDY
 3678  021552  042737  177770  001272          BIC     #^C<7>,SAVR5
 3679  021560  032737  000007  001272  3$:     BIT     #7,SAVR5
 3680  021566  001422                          BEQ     4$
 3681  021570  062710  000400                  ADD     #400,(R0)
 3682  021574  005237  001272                  INC     SAVR5
 3683  021600  000767                          BR      3$
 3684  021602  104402  023050                  TYPE    ,MXINST
 3685  021606  004737  023334                  JSR     PC,TKRDY
 3686  021612  042737  000040  001272          BIC     #40,SAVR5
 3687  021620  022737  000131  001272          CMP     #131,SAVR5
 3688  021626  001402                          BEQ     .+6
 3689  021630  052710  100000                  BIS     #BIT15,(R0)
 3690  021634  104402  023174          4$:     TYPE    ,MXSYN
 3691  021640  004737  023334                  JSR     PC,TKRDY
 3692  021644  042737  000040  001272          BIC     #40,SAVR5
 3693  021652  022737  000131  001272          CMP     #131,SAVR5
 3694  021660  001402                          BEQ     .+6
 3695  021662  052710  010000                  BIS     #BIT12,(R0)
 3696  021666  022020                  70$:    CMP     (R0)+,(R0)+
 3697  021670  005205                          INC     R5
 3698  021672  022705  000005                  CMP     #5,R5
 3699  021676  001215                          BNE     65$
 3700  021700  105237  001303                  INCB    SAVNUM
 3701  021704  123737  001303  001301          CMPB    SAVNUM,DVNUM
 3702  021712  101002                          BHI     .+6
 3703  021714  000137  021244                  JMP     2$
 3704  021720  105037  001300                  CLRB    DVACTV
 3705  021724  113737  001301  001303          MOVB    DVNUM,SAVNUM
 3706  021732  113701  001301                  MOVB    DVNUM,R1
 3707  021736  000241                          CLC
 3708  021740  106137  001300                  ROLB    DVACTV
 3709  021744  105237  001300                  INCB    DVACTV
 3710  021750  105301                          DECB    R1
 3711  021752  001371                          BNE     .-14
 3712  021754  113737  001300  001302          MOVB    DVACTV,SAVACT
 3713  021762  012710  177777                  MOV     #177777,(R0)
 3714  021766  104402  021774                  TYPE    ,MXFIN
 3715  021772  000000                          HALT
 3716  021774                          MXFIN:
```

```
 3717  021774  177777  044124  047101            .ASCII  <377><377>/THANKS FOR THE INFORMATION./
       022031     377  042522  042515            .ASCII  <377>/REMEMBER TO START DIAGNOSTIS WITH SW07=1!/
       022103     377  042522  040507            .ASCIZ  <377>/REGARDS,  JOHN./<212>
       022125     377  042523  042514  MSEL:     .ASCII  <377>/SELECT LINE(S) XXXXXXXXXXXXXXXX/"
       022165     377  020040  020040            .ASCIZ  <377>/                 /
       022206  046377  047111  051505  MLINE:    .ASCIZ  <377>/LINES SELECTED(8):  /<377>
       022235     056  000377          M.CRLF:   .ASCIZ  /./<377>
       022240  051777  047111  046107  MSING:    .ASCIZ  <377>/SINGLE LINE: /
       022257                          MXTITLE:
       022257     212  053104  030461            .ASCII  <212>/DV11 MANUAL PARAMETER INPUT PROGRAM./
       022324  050377  042514  051501            .ASCII  <377>/PLEASE ANSWER ALL QUESTIONS./
       022361     377  054524  042520            .ASCIZ  <377>/TYPE IN NUMBER OF DV11'S IN SYSTEM (1 TO 8): /
       022440  043612  053111  020105  MXGIVE:   .ASCIZ  <212>/GIVE INFORMATION ON DV11 NO. /
       022477     377  054524  042520  MXSCR:    .ASCIZ  <377>/TYPE IN THE ADDRESS OF DV11 SYSTEM CONTROL REGISTER:
       022566  052377  050131  020105  MXSY1A:   .ASCIZ  <377>/TYPE IN SYNC "A" FOR LINE CARD: /
       022630  052377  050131  020105  MXVEC:    .ASCIZ  <377>/TYPE IN VECTOR "A" FOR DV11: /
       022667     377  054524  042520  MXSY1B:   .ASCIZ  <377>/TYPE IN SYNC "B" FOR LINE CARD: /
       022731     377  054524  042520  MXBITS:   .ASCIZ  <377>/TYPE IN BITS-PER-CHAR FOR LINE CARD: /
       023000  043612  053111  020105  MXGV:     .ASCIZ  <212>/GIVE INFORMATION FOR LINE CARD NUMBER /
       023050  044777  020123  044124  MXINST:   .ASCIZ  <377>/IS THIS LINE CARD INSTALLED?(Y OR N) /
       023117     377  051511  052040  MASYNC:   .ASCIZ  <377>/IS THIS AN ASYNCHRONOUS LINE CARD?(Y OR N) /
       023174  040777  042522  054440  MXSYN:    .ASCIZ  <377>/ARE YOU JUMPERED FOR TWO SYNCS? (Y OR N) /
       023247     377  040450  020051  MTURN:    .ASCIZ  <377>/(A) H325/<377>/(B) H861/<377>/TYPE "A" OR "B": /
       023314  046777  042117  046505  MVECZ:    .ASCIZ  <377>/MODEM VECTOR: /
                                       .EVEN
       023334  105777  155644          TKRDY:    TSTB    @TKCSR
       023340  100375                            BPL     .-4
       023342  017746  155640                    MOV     @TKDBR,-(SP)
       023346  042716  000200                    BIC     #BIT7,(SP)
       023352  032716  000100                    BIT     #BIT6,(SP)      ;CHAR OR NUMBER
       023356  001402                            BEQ     .+6             ;BR IF NUMBER
       023360  042716  000040                    BIC     #BIT5,(SP)      ;MAKE UPPER CASE
       023364  022716  000015                    CMP     #15,(SP)
       023370  001411                            BEQ     1$
       023372  011637  001272                    MOV     (SP),SAVR5
       023376  105777  155606                    TSTB    @TPCSR
       023402  100375                            BPL     .-4
       023404  011677  155602                    MOV     (SP),@TPDBR
       023410  005726                            TST     (SP)+
       023412  000750                            BR      TKRDY
       023414  005726                  1$:       TST     (SP)+
       023416  000207                            RTS     PC
       023420  000001                  YX_IN:    1
 3718  023422     002     001                    .BYTE   2,1
 3719  023424  001266                            SAVR3
 3720
 3721  023426                          CKBIT15:
 3722  023426  010046                            MOV     R0,-(SP)
 3723  023430  005000                            CLR     R0
 3724  023432  005777  155732          64$:      TST     @DVLCR
 3725  023436  100004                            BPL     65$
 3726  023440  104414                            DELAY
 3727  023442  005200                            INC     R0
 3728  023444  001372                            BNE     64$
 3729  023446  104000                            HLT     0               ;BIT 15 FAILED TO CLEAR
 3730  023450  012600                  65$:      MOV     (SP)+,R0
```

```
3731  023452  000207                          RTS     PC
3732  023454  010046                SETREG:   MOV     R0,-(SP)
3733  023456  010146                          MOV     R1,-(SP)
3734  023460  112500                          MOVB    (R5)+,R0
3735  023462  112501                          MOVB    (R5)+,R1
3736  023464  110077  155704                  MOVB    R0,@DVSRSH
3737  023470  012577  155702                  MOV     (R5)+,@DVSRA
3738  023474  042777  000060  155650          BIC     #BIT5!BIT4,@DVSCR
3739  023502  110177  155666                  MOVB    R1,@DVSRSH
3740  023506  012577  155664                  MOV     (R5)+,@DVSRA
3741  023512  012601                          MOV     (SP)+,R1
3742  023514  012600                          MOV     (SP)+,R0
3743  023516  000205                          EXIT
3744
3745  023520                        LOAD.MODE:
3746  023520  012577  155644                  MOV     (R5)+,@DVLCR
3747  023524  052777  100000  155636          BIS     #BIT15,@DVLCR
3748  023532  010046                          MOV     R0,-(SP)
3749  023534  005000                          CLR     R0
3750  023536  005777  155626          1$:     TST     @DVLCR
3751  023542  100004                          BPL     2$
3752  023544  104414                          DELAY
3753  023546  005200                          INC     R0
3754  023550  001372                          BNE     1$
3755  023552  104000                          HLT     0                       ;BIT 15 FAILED TO CLEAR
3756  023554  012600                  2$:     MOV     (SP)+,R0
3757  023556  000205                          EXIT
3758  023560  000001                SYNC:     .BLKW   1
3759  023562  000400                TXBAP:    .BLKB   400
3760  024162  000400                TXTAB:    .BLKB   400
3761  024562  000400                RXBA:     .BLKB   400
3762  025162  051777  047111  046107  EM1:    .ASCIZ  <377>/SINGLE LINE CABLE TESTS(DV11 ERROR)/
      025227     377  040503  046102  EM2:    .ASCIZ  <377>/CABLE TURN AROUND TESTS (MODEM CONTROL ERROR)
      025306  046777  042117  046505  EM3:    .ASCIZ  <377>/MODEM CONTROL ERROR/
      025333     377  054105  042520  DH4:    .ASCIZ  <377>/EXPECTED  FOUND  REGISTER/
      025366  052777  042516  050130  EM4:    .ASCIZ  <377>/UNEXPECTED MODEM CONTROL INTERUPT./
      025432  046777  042117  046505  EM5:    .ASCIZ  <377>/MODEM CONTROL FAILED TO INTERUPT/
      025474  051377  040505  044504  EM6:    .ASCIZ  <377>/READING MODEM CONTROL CAUSED AT TRAP TO 4./
      025550  042777  050130  041505  DH1:    .ASCIZ  <377>/EXPECTED  FOUND  LINE  DVSCR  MC.CSR
                                              .EVEN
      025616  000005                  DT1:    5
3763  025620     006      004                 .BYTE 6,4
3764  025622  001272                          SAVR5
3765  025624     006      001                 .BYTE   6,1
3766  025626  001270                          SAVR4
3767  025630     002      004                 .BYTE   2,4
3768  025632  007260                          LINE
3769  025634     006      001                 .BYTE   6,1
3770  025636  001362                          DVSCR
3771  025640     006      001                 .BYTE 6,1
3772  025642  007276                          MC.CSR
3773  025644  000003                  DT2:    3
3774  025646     006      004                 .BYTE   6,4
3775  025650  001272                          SAVR5
3776  025652     006      001                 .BYTE   6,1
3777  025654  001270                          SAVR4
```

F07


```
3778  025656  006      001                .BYTE   6,1
3779  025660  001266                     SAVR3
3780  025662                    .ERRTAB:
3781  025662  025162                     EM1
3782  025664  025550                     DH1
3783  025666  025616                     DT1
3784  025670  025227                     EM2
3785  025672  025550                     DH1
3786  025674  025616                     DT1
3787  025676  025306                     EM3
3788  025700  025333                     DH4
3789  025702  025644                     DT2
3790  025704  025366                     EM4
3791  025706  000000                     0
3792  025710  000000                     0
3793  025712  025432                     EM5
3794  025714  000000                     0
3795  025716  000000                     0
3796  025720  025474                     EM6
3797  025722  000000                     0
3798  025724  000000                     0
3799  025726  000000                     0
3800  025730  000000                     0
3801  025732  000000                     0
3802          000001                .END
```

```
ADRCNT= 003443          1145*   1181*   1190#
ALU   = 010000           601#
ASYNC = 004000           609#   3659
AUTO.S  006622          1655#
BCC   = 060000           606#
BINWRD  003746          1231*   1232    1269#
BIT0  = 000001           599#   1411    1756    3548
BIT1  = 000002           598#   1412    1423    1759    3548
BIT10 = 002000           589#   1412    3549    3552    3568
BIT11 = 004000           588#   1412    1972    3564
BIT12 = 010000           587#    601     603     605     607    3564    3568    3571    3582    3695
BIT13 = 020000           586#    602     603     606     607    3566    3568    3571
BIT14 = 040000           585#    604     605     606     607    1052    3568    3582
BIT15 = 100000           584#   3536    3541    3545    3649    3689    3747
BIT2  = 000004           597#    979    1412    1760    3499    3505    3549
BIT3  = 000010           596#   1412    1761    3497    3513
BIT4  = 000020           595#   1762    3738
BIT5  = 000040           594#   1763    3522    3548    3717    3739
BIT6  = 000100           593#   1723    1764    3548    3717
BIT7  = 000200           592#   1046    1293    1450    1471    1723    1765    1975    3717
BIT8  = 000400           591#   1412    1425
BIT9  = 001000           590#   1412    1723    1728    3564
BSB   = 070000           607#
BRW     003014           985    1074#
BRX     003016           986    1075#
BUSY  = 000020          1741#   2149    2158    2485    2517    2726
CHAR    007264          1770#   1942*   1951    1963*
CHRCNT  003744          1229*   1233    1249*   1267#   1268
CKBIT1  023426          3721#
CLKX    001242           678#
CLK.A   001412           778#   1573
CLK.B   001413           779#   1578
CLK.C   001414           780#   1583
CLK.D   001415           781#   1588
CLRMUX= 002000          1747#   2463    2608    2641    2718    2779    2926    2973    2920    3110    3164    3218    3372
CLRSCN= 004000          1748#   2484    2516    2725
CNVRT = 104411           737#   1004    1006    1008    1010    1330    1332    1368    1445    1917    3623    3642
CC    = 000100          1764#   3025    3337
COF   = 040000          1751#
CONVRT= 104410           735#    944    1346
COUNT   007266          1771#   1940*   1952*   1954*   1961*
CREAM   001306           699#    913*   1520*   1521    1523*   1528    1529*   1530    1533*
CS    = 000040          1763#   3025    3337
CSF   = 020000          1750#
CSRMAP  006624           938    1657#
CYCLE   005666           988    1024    1025    1510#
DATABP  004276          1313*   1322    1344    1347#
DATACL= 104416           747#
DATAHD  004264          1318*   1340    1343#
DELAY = 104414           743#   2439    2474    2491    2528    2572    2661    2739    2802    2849    2896    2943    2990
                        3037    3084    3134    3188    3242    3296    3349    3403    3457    3576    3726    3752
DEVADR  003440          1143*   1178    1188#
DH1     025550          3762#   3782    3785
DH4     025333          3762#   3788
DONE  = 000200          1744#   2066    2068    2069    2073    2074    2076    2177    2221    2243    2264    2295    2305
                        2327    2348    2369    2390    2678    2756
```

DZDVEB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

```
DSR    = 000020          1762*   3072
DT1      025616          3762*   3783    3796
DT2      025644          3773*   3789
DVACTV   001300           693*    960*    961    1510    1515    1689*   1695*   1696*   1700    1719    3704*   3709*   3733*
                         3712
DVCR00   001500           909*
DVCR01   001524           820*
DVCR02   001550           831*
DVCR03   001574           842*
DVCR04   001620           853*
DVCR05   001644           864*
DVCR06   001670           875*
DVCR07   001714           886*
DVLCR    001370           761*   1429*   1430    1549*   1550*   1551    3724    3746*   3747*   3750
DVNSR    001402           766*   1559*   1560*   1561
DVNUM    001301           694*    909    1014    1661*   1682*   1683    1690    1692    3616*   3617*   3701    3705    3706
DVRIC    001366           760*   1547*   1548*   1549    3583
DVRLVL   001354           755*   1564*   1565*   1566
DVRVEC   001352           754*   1031    1535*   1564
DVSCR    001362           758*   1028    1406*   1419*   1423*   1534*   1545    1852    1929    1936    3572*   3574    3738*
                         3770
DVSCRH   001364           759*   1545*   1546*   1547
DVSFR    001400           765*   1557*   1558*   1559
DVSRA    001376           764*   1410    1555*   1556*   1557    3556*   3737*   3740*
DVSRS    001372           762*   1409    1551*   1552*   1553    3530*
DVSRSH   001374           763*   1553*   1554*   1555    3736*   3739*
DVTLVL   001360           757*   1568*   1569*
DVTR00   001502           810*
DVTR01   001526           821*
DVTR02   001552           832*
DVTR03   001576           843*
DVTR04   001622           854*
DVTR05   001646           865*
DVTR06   001672           876*
DVTR07   001716           887*
DVTVEC   001356           756*   1566*   1567*   1568
DV.END   001740           897*   1521    1530    1659    3612
DV.MAP   001500           699     808*    913     940    1523    1533    1657    1662    1711    3610    3619
DV00.A   001504           811*
DV00.B   001510           813*
DV00.C   001514           815*
DV00.D   001520           817*
DV01.A   001530           822*
DV01.B   001534           824*
DV01.C   001540           826*
DV01.D   001544           828*
DV02.A   001554           833*
DV02.B   001560           835*
DV02.C   001564           837*
DV02.D   001570           839*
DV03.A   001600           844*
DV03.B   001604           846*
DV03.C   001610           848*
DV03.D   001614           850*
DV04.A   001624           855*
DV04.B   001630           857*
```

```
DV04.C  001634          959*
DV04.D  001640          861*
DV05.A  001650          966*
DV05.B  001654          968*
DV05.C  001660          970*
DV05.D  001664          872*
DV06.A  001674          877*
DV06.B  001700          879*
DV06.C  001704          981*
DV06.D  001710          883*
DV07.A  001720          888*
DV07.B  001724          890*
DV07.C  001730          892*
DV07.D  001734          894*
EM1     025162         3762*   3781
EM2     025227         3762*   3784
EM3     025306         3762*   3787
EM4     025366         3762*   3790
EM5     025432         3762*   3793
EM6     025474         3762*   3796
ERRCNT  001232          670*    915*   1037    1355*
ERRFLG  001311          705*    911*    999*   1066*   1307*   1320    1334*   1389*
ERRMSG  004252         1317*   1335    1338*
ERTABO  004366         1332    1364*
EXERCI  007272         1773*   1944*   1947*   1965*
EXIT  = 000205          609*   3743    3757
EXITER  004322         1350    1355*
FIX.00  006516         1574    1579    1584    1589    1623*
HALTS   004302         1303    1349*
HILIM   003436         1142*   1169    1187*
ICOUNT  001222          666*   1064    1069*
INBUF   005520         1112    1148    1495*
INIFLG  001310          704*    920     935*
INSTER= 104404          727*   1163
INSTR = 104403          725*   1596    1876    1930    3624    3631    3662    3669
INSTR2  003236         1119    1131*
INTENA= 000100         1743*   2039    2041    2042    2046    2047    2049    2198    2218    2242    2263    2284    2305
                       2326    2347    2368    2389    2654    2732
KBISR   010274         1855    1977    1982*
LIGHT   000174          638*    930
LIGHTS  001200          643*    930*   1001*
LIMITS  003364         1158    1169*
LINE    007260         1768*   1880    1883*   1945*   1946*   1966*   2778    2825    2872    2919    2967    3014    3061
                       3113*   3167*   3221*   3275*   3497    3499    3505    3530    3580    3768
LINENA= 000001         1756*   2617    2647    2782    2790    2970    2978    2986    3017    3025    3033    3064    3072
                       3080    3114    3122    3329    3337    3345    3383    3391    3399    3437    3445    3453
LOAD.M  023520         3563    3565    3567    3570    3745*
LOBITS  003442         1144*   1173    1189*   1190
LOCK    001220          665*   1068*   1082    1084    1326    2405*   2431*   2461*   2483*   2510*   2554*   2597*   2639*
                       2694*   3109*   3163*   3217*   3271*   3326*   3380*   3434*
LOGICA  002560          635    1018*
LOKFLG  001312          706*
LOLIM   003434         1141*   1171    1186*
LOVE  = 021166         3605*   3608
LPCNT   001224          667*   1063*   1064    1067*
LSTERR  001234          671*    916*    938*   1050*   1304    1306*   1390*
```

```
L00.03  001416          783*  1536*  1571  2696  3509
L04.07  001420          784*  1538*  1576  2699  3507
L08.11  001422          785*  1540*  1581  2702  3503
L12.15  001424          786*  1542*  1586  2705  3501
MAINT =  001000        1746*  2093   2095  2096  2100  2101  2103  2466  2519  2522  2561  2645
MANUAL  021166         3607   3609*
MAR18 =  007500        1875*  1987
MASKX   001244          679*
MASK.A  001406          773*  1572
MASK.B  001407          774*  1577
MASK.C  001410          775*  1582
MASK.D  001411          776*  1587
MASTEK  005400         1328   1486*
MASYNC  023117         3654   3717*
MCRLF   005104         1097   1220   1324  1325  1333  1474  1486*  1595  1613
MCSRX   005330         1003   1486*
MC.CSR  007276         1775*  1852*  1853*  1854  2014  2038  2065  2092  2119  2145  2174*  2177*  2195*
                       2198*  2216*  2218*  2221*  2239*  2242*  2243*  2259*  2263*  2264*  2280*  2284*  2285*
                       2301*  2305*  2306*  2322*  2326*  2327*  2343*  2347*  2348*  2364*  2368*  2369*  2385*
                       2389*  2390*  2406   2432   2462   2511   2555   2598   2640   2716   2776*  2779*  2781*
                       2783*  2786   2795*  2799*  2823*  2826*  2828*  2830*  2833   2842*  2846*  2870*  2873*
                       2875*  2877*  2880   2889*  2893*  2917*  2920*  2922*  2924*  2927   2936*  2940*  2965*
                       2969*  2971*  2974   2983*  2935*  3012*  3016*  3018*  3021   3030*  3035*  3059*  3063*
                       3065*  3068   3077*  3082*  3105*  3110*  3112*  3115*  3118   3127*  3131*  3159*  3164*
                       3166*  3169*  3172   3181*  3185*  3213*  3218*  3220*  3223*  3226   3235*  3239*  3267*
                       3272*  3274*  3277*  3280   3289*  3293*  3322*  3328*  3330*  3333   3342*  3347*  3376*
                       3382*  3384*  3387   3396*  3401*  3430*  3436*  3438*  3441   3450*  3455*  3772
MC.LSR  007300         1776*  1854*  1855*  2018   2602*  2610   2617*  2618   2624*  2647*  2721*  2782*  2785
                       2801*  2803   2829*  2832   2848*  2850   2876*  2879   2895*  2897   2923*  2926   2942*
                       2944   2970*  2973   2989*  2991   3017*  3020   3036*  3038   3064*  3067   3083*  3085
                       3114*  3117   3133*  3135   3168*  3171   3187*  3189   3222*  3225   3241*  3243   3276*
                       3279   3295*  3297   3329*  3332   3348*  3350   3356*  3383*  3386   3402*  3404   3410*
                       3437*  3440   3456*  3458   3464*
MC.LVL  007304         1778*  1937*  1938*  2176*  2197*  2219*  2241*  2262*  2283*  2304*  2324*  2345*  2366*
                       2387*  2652*  2731*
MC.VEC  007302         1777*  1934   1937   2175*  2196*  2217*  2240*  2261*  2282*  2303*  2323*  2344*  2365*
                       2386*  2651*  2730*
MDATA   005624         1247   1257   1499*
MEPASS  005145         1002   1486*
MERRPC  005454         1331   1486*
MERRX   005355         1009   1486*
MERR2   005174         1486*  1512   1702
MERR3   005243          957   1486*
MLINE   022206         1913   3717*
MLOCK   005301          981   1486*
MNEW    005402          952   1486*
MPASSX  005344         1007   1486*
MPFAIL  005107         1387   1486*
MQM     005100         1127   1486*  1618
MR      005171          989   1486*
MRESET=  004000         609*  1406   1419
MSEL    022125         1888   3717*
MSING   022240         1876   3717*
MSTCLR=  104412         739*  1391   3600
MTITLE  001000          647*   924
MTSTN   005366         1329   1486*  1597
```

```
MTSTPC  005267          1486#
MTURN   023247          1862    3717#
MVECX   005336          1005    1486#
MVECZ   023314          1930    3717#
MXBITS  022731          3676    3717#
MXFIN   021774          3714    3716#
MXGIVE  022440          3621    3717#
MXGV    023000          3640    3717#
MXINST  023050          3644    3684    3717#
MXSCR   022477          3624    3717#
MXSYN   023174          3690    3717#
MXSY1A  022566          3662    3717#
MXSY1B  022667          3669    3717#
MXTITL  022257          3614    3717#
MXVEC   022630          3631    3717#
M.CRLF  022235          1921    3717#
NEXT    001216           664#   1070    1360    1850*   1969*   2001*   2037*   2064*   2091*   2118*   2144*   2172*   2193*
                        2214*   2237*   2258*   2279*   2300*   2321*   2342*   2363*   2384*   2404*   2430*   2460*   2509*
                        2553*   2596*   2638*   2693*   2714    2771*   2774    2818*   2821    2865*   2868    2912*   2915
                        2960*   2963    3007*   3010    3054*   3057    3100*   3103    3154*   3157    3208*   3211    3262*
                        3265    3317*   3320    3371*   3374    3425*   3428    3491*   3494
NPR     = 040000         604#
NS      = 000010        1761#   2923    2931    3064    3072    3083
PARAM   = 104405         729#   1598    1877    1931    3625    3632    3663    3670
PARAM1  003304          1147#   1164
PARBIT= 040000           609#   1642
PARERR  003360          1150    1152    1154    1163#   1170    1172    1174
PASCNT  001230           669#    910*   1000*   1001    1034
PC     =%000007          576#    938*   1019*   1049*   1296*   1475*   1574*   1579*   1584*   1589*   1605    1606*   1645*
                        1737*   1863*   1926    3615*   3645*   3655*   3677*   3685*   3691*   3717*   3731*
PERFOR= 004537           609#   3533    3538    3542    3546    3550    3557    3563    3565    3567    3570
PFTAB   004470          1388    1394#
POINTE  007262          1769#   1939*   1940    1941*   1942    1943*   1954    1960*   1961    1962*   1963    1964*
POPRO = 012600           583#   1354
POP1SP= 005726           583#
POP2SP= 022526           583#   1072    2181    2202    2225    2246    2267    2288    2309    2331    2352    2373    2394
                        2672    2750
PS     = 177776          581#    906*    975*   1722*   1851*   1859*   1914*   2173*   2178*   2194*   2199*   2215*   2220*
                        2239*   2260*   2281*   2302*   2325*   2346*   2367*   2388*   2408*   2433*   2464*   2513*   2557*
                        2600*   2643*   2652    2655*   2657*   2667*   2720*   2731    2733*   2735*   2745*   2777*   2824*
                        2871*   2918*   2966*   3013*   3060*   3106*   3160*   3214*   3268*   3323*   3377*   3431*
PUSHRO= 010046           583#   1351
PUSH1S= 005746           583#
PUSH2S= 024646           583#
QV.FLG  001313           707#    912*   1013*   1061    1950*
RAM     = 020000         602#
RAMCLR= 104413           741#   1392    3496
RESREG  004300          1345    1348#
RESTAR  004414          1375    1381#
RESTRT  002572          1012    1016    1024#
RESV16  001404           767#   1561*   1562*
RESOS = 104407           733#   1348
RETURN  001214           663#    918*    988*    990    1024*   1070*   1073    1360*   1362    1393    1612*   1620*   1621
                        1958*   1959    1968*   1969    1980    2026    2714*   2715    2774*   2775    2821*   2922    2969*
                        2869    2915*   2916    2963*   2964    3010*   3011    3057*   3058    3103*   3104    3157*   3158
                        3211*   3212    3265*   3266    3320*   3321    3374*   3375    3429*   3429    3494*   3495
```

```
RING  = 000200          1765*   2978    3391
RINGF = 100000          1752*
ROMCLK= 104415           745*
RS    = 000004          1760*   2876    2884    3017    3025    3036    3222    3230    3383    3391    3402
RUN     001304           697*    914*   1515    1518*   1519*   1526*   1527*
RXBA    024562          3544    3590    3761*
R0    =%000000           569*    953*    961*    962*    964*    966*    968     969     1051    1057*   1071*   1204    1209*
                        1221    1234*   1238*   1248    1264*   1352*   1397    1398*   1399*   1401*   1427    1428*   1433*
                        1436*   1528*   1534    1535    1536    1537    1538    1539    1540    1541    1542    1543    1544*
                        1550    1552    1558    1560    1562    1565    1567    1569    1571*   1576*   1581*   1586*   1604*
                        1605    1608    1610    1612    1615    1616    1623    1642    1703*   1712*   1714*   1716    1724*
                        1725*   1893*   1894    1895*   1896    1900    1902    1904    1906*   1922    1982    1983*   1984*
                        1985    1988*   2013*   2410*   2418*   2436*   2446*   2465*   2468*   2470*   2481*   2487*   2499*
                        2514*   2541*   2558*   2585*   2601*   2604*   2607*   2625*   2644*   2648*   2653*   2680*   2695*
                        2698*   2701*   2704*   2707*   2708    2711    2717*   2723*   2728*   2758*   3107*   3141*   3161*
                        3195*   3215*   3249*   3269*   3303*   3324*   3357*   3378*   3411*   3432*   3465*   3590*   3592
                        3610*   3611*   3612    3619*   3630*   3637*   3649*   3650*   3651*   3652    3659*   3660*   3668*
                        3675*   3681*   3689*   3695*   3696    3713*   3722    3723*   3727*   3730*   3732    3734*   3736
                        3742*   3748    3749*   3753*   3756*
R1    =%000001           570*    965*    966     967*    968     1015*   1019    1203    1210*   1222    1226*   1228    1229
                        1230    1231    1263*   1407    1409*   1412*   1415*   1572*   1577*   1582*   1587*   1627*   1632*
                        1637*   1640*   1663*   1665    1667    1669    1672    1685*   1686    1692*   1693    1697*   1713*
                        1714    1715*   1716    1717    2526*   2530    2538*   2570*   2574    2582*   2778*   2781    2788
                        2799    2800    2825*   2828    2835    2846    2847    2872*   2875    2882    2893    2894    2919*
                        2922    2929    2940    2941    2967*   2969    2976    2987    2988    3014*   3016    3023    3034
                        3035    3061*   3063    3070    3081    3082    3108*   3112    3113    3120    3131    3132    3140*
                        3162*   3166    3167    3174    3185    3186    3194*   3216*   3220    3221    3228    3239    3240
                        3248*   3270*   3274    3275    3282    3293    3294    3302*   3325*   3328    3335    3346    3347
                        3355*   3379*   3382    3389    3400    3401    3409*   3433*   3436    3443    3454    3455    3463*
                        3589*   3594    3706*   3710*   3733    3735*   3739    3741*
R2    =%000002           571*    1202    1211*   1573*   1578*   1583*   1588*   1628*   1633*   1638*   1641*   1644*   1657*
                        1658*   1659    1662*   1672*   1673    1674*   1675*   1676*   1677*   1678*   1679*   1680*   1681*
                        1688*   1711*   1723*   1727*   1728*   1729*   1730*   1732*   1733*   2008*   2011*   2515*   2520
                        2525*   2531    2559*   2565    2569*   2575    2780*   2796*   2827*   2843*   2874*   2890*   2921*
                        2937*   2968*   2984*   3015*   3031*   3062*   3078*   3111*   3128*   3165*   3182*   3219*   3236*
                        3273*   3290*   3327*   3343*   3381*   3397*   3435*   3451*   3591*   3598*
R3    =%000003           572*    1106    1113*   1123*   1126*   1128    1132*   1201    1212*   1223    1235*   1236*   1237*
                        1238    1247*   1248*   1253*   1256*   1262*   1623*   1624*   1625    1630    1635    2014*   2015
                        2018*   2019    2038*   2039*   2040    2047*   2048    2065*   2066*   2067    2074*   2075    2092*
                        2093*   2094    2101*   2102    2119*   2120*   2121    2128*   2129    2145*   2146*   2147    2153*
                        2156    2406*   2407*   2411*   2412    2432*   2434*   2437*   2438*   2440    2462*   2463*   2466*
                        2467*   2472*   2473*   2475    2484*   2485    2489*   2490*   2492    2511*   2512*   2516*   2517
                        2519*   2520*   2521*   2522*   2524*   2527*   2529    2555*   2556*   2561*   2562*   2565*   2566*
                        2568*   2571*   2573    2598*   2599*   2603*   2608*   2609*   2640*   2641*   2642*   2645*   2646*
                        2654*   2656*   2659    2668    2673    2678*   2716*   2718*   2719*   2722*   2725*   2726    2732*
                        2734*   2737    2746    2751    2756*   2786*   2787*   2788    2800*   2833*   2834*   2835    2847*
                        2880*   2881*   2882    2894*   2927*   2928*   2929    2941*   2974*   2975*   2976    2987*   3021*
                        3022*   3023    3034*   3068*   3069*   3070    3081*   3118*   3119*   3120    3132*   3172*   3173*
                        3174    3186*   3226*   3227*   3228    3240*   3280*   3281*   3292    3294*   3333*   3334*   3335
                        3346*   3387*   3388*   3389    3400*   3441*   3442*   3443    3454*
R4    =%000004           573*    1107    1112*   1116*   1117*   1118    1125*   1129    1131*   1139    1148*   1149    1151
                        1153    1155*   1156    1157    1178*   1179*   1183*   1200    1213*   1224    1232*   1235    1240*
                        1242*   1244*   1261*   1311*   1312*   1313*   1314*   1315*   1316*   1317    1318    1319    1408
                        1410*   1411*   1414*   2015*   2019*   2040*   2041*   2043    2048*   2049*   2050    2067*   2068*
                        2070    2075*   2076*   2077    2094*   2095*   2097    2102*   2103*   2104    2121*   2122*   2124
                        2129*   2130*   2131    2147*   2148    2150    2156*   2157    2159    2412*   2413    2440*   2441
```

```
                        2475*   2476    2492*   2493    2529*   2531    2534    2573*   2575    2578    2610*   2612    2618*
                        2619    2668*   2673*   2674    2746*   2751*   2752    2785*   2792    2803*   2804    2832*   2839
                        2850*   2851    2879*   2886    2997*   2898    2926*   2933    2944*   2945    2973*   2980    2991*
                        2992    3020*   3027    3038*   3039    3067*   3074    3085*   3086    3117*   3124    3135*   3136
                        3171*   3178    3189*   3190    3225*   3232    3243*   3244    3279*   3286    3297*   3298    3332*
                        3339    3350*   3351    3386*   3393    3404*   3405    3440*   3447    3458*   3459    3512*   3514*
                        3517*   3518*   3520*   3521    3525*   3526    3527*   3528    3583*   3584    3588*   3592*   3593*
                        3595
R5      =%000005         574*   1090    1091*   1095    1100    1102*   1138    1140*   1141    1142    1143    1144    1145
                        1146    1147*   1156*   1159*   1160*   1161*   1169    1171    1173    1179    1180*   1184*   1199
                        1214*   1225    1233*   1245*   1260*   1309*   1310*   1311    1313    1912*   1915*   2005*   2042*
                        2043    2046*   2050    2069*   2070    2073*   2077    2096*   2097    2100*   2104    2123*   2124
                        2127*   2131    2148*   2149*   2150    2157*   2158*   2159    2409*   2411    2413    2417*   2435*
                        2441    2445*   2471*   2476    2480*   2488*   2493    2497*   2530*   2533*   2534    2574*   2577*
                        2578    2611*   2616*   2619    2650*   2674    2679*   2729*   2752    2757*   2784*   2790*   2792
                        2798*   2831*   2837*   2839    2845*   2878*   2884*   2886    2892*   2925*   2931*   2933    2939*
                        2972*   2978*   2980    2986*   2992    3019*   3025*   3027    3033*   3039    3066*   3072*   3074
                        3080*   3086    3116*   3122*   3124    3130*   3170*   3176*   3178    3184*   3224*   3230*   3232
                        3238*   3278*   3284*   3286    3292*   3331*   3337*   3339    3345*   3351    3385*   3391*   3393
                        3399*   3405    3439*   3445*   3447    3453*   3459    3511*   3513*   3516*   3521*   3522*   3523*
                        3526*   3573*   3577*   3580*   3581*   3582*   3584    3587*   3594*   3595    3620*   3639    3697*
                        3698    3734    3735    3737    3740    3746
SAVACT  001302           695*    955    1700*   3712*
SAVNUM  001303           696*    909*   1011*   1014*   1693*   3618*   3622    3638    3639*   3641    3643*   3700*   3701
                        3705*
SAVPC   001276           692*   1195*   1366
SAVR0   001260           685*   1204*   1209
SAVR1   001262           686*   1203*   1210
SAVR2   001264           687*   1202*   1211
SAVR3   001266           688*   1201*   1212    1911*   1918*   1919    3622*   3641*   3719    3779
SAVR4   001270           689*   1200*   1213    2658*   2664*   2736*   2742*   3766    3777
SAVR5   001272           690*   1199*   1214    1864    1868    3616    3646*   3647    3656*   3657    3678*   3679    3682*
                        3686*   3687    3692*   3693    3717*   3764    3775
SAVSP   001274           691*
SAVOS = 104406           731*   1308
SCNENA= 000040          1742*   2120    2122    2123    2127    2128    2130    2146    2153    2656    2678    2734    2756
SCOPE = 104400           719*   2023    2053    2080    2107    2134    2162    2183    2204    2226    2248    2269    2290
                        2311    2332    2353    2374    2395    2420    2448    2500    2543    2587    2627    2682    2760
                        2807    2854    2901    2948    2995    3042    3089    3143    3197    3251    3305    3359    3413
                        3467    3601
SCOP1 = 104401           721*   2416    2444    2479    2496    2537    2581    2615    2622    2670    2677    2748    2755
                        3139    3193    3247    3301    3354    3408    3462
SECRX = 000020          1758*   3445
SECRXF= 010000          1749*
SECTX = 000010          1757*   3276    3284    3437    3445    3456
SELECT  007270          1772*   1871*   1882*   1886*   1889    1890*   1898*   1907*   1909    1912    1944    1965
SERV.G  004640          1049    1296    1440*   1441
SETREG  023454          3533    3538    3542    3546    3550    3557    3732*
SP      =%000006         575*    907*    922*    923*    929     932     933     976*   1045*   1046*   1047    1051*   1071
                        1084*   1090*   1091    1092*   1102    1106*   1107*   1108    1109*   1125    1126    1128*   1129*
                        1131    1132    1138*   1139*   1140    1146*   1183    1184    1195    1221*   1222*   1223*   1224*
                        1225*   1226    1227*   1260    1261    1262    1263    1264    1277*   1278*   1279*   1280*   1281*
                        1282*   1283*   1284    1292*   1293*   1294    1304    1306    1309    1352    1361*   1383*   1397*
                        1401    1407*   1408*   1414    1415    1427*   1436    1449*   1450*   1451    1456    1462    1464
                        1466*   1467    1470*   1471*   1472    1706*   1732    1734    1735*   1970*   1971*   1974*   1975*
                        1976    1978    1982*   1987*   1989    2025*   3609*   3638*   3643    3717*   3722*   3730    3732*
```

```
                    3733*   3741    3742    3748*   3756
SPACNT= 003745      1230*   1251    1254*   1268#
SSWR    000176       640#    931
STACK = 001200       582#    907     976    1361    1383    2025    3609
STAT    001236       676#
STEP  = 000400      1745#   2438    2467    2473    2490    2521    2527    2562    2566    2571    2603    2646    2722
                    2795    2842    2889    2936    2983    3030    3077    3127    3181    3235    3289    3342    3396
                    3450
SV05    003452      1199#
SWR     001202       651#    926     931*    936     950     955     960     979    1043    1052    1059    1080    1093
                    1290    1297    1302    1349    1356    1358    1442    1443*   1453*   1458*   1459*   1460*   1467*
                    1590    1873
SW00  = 000001       562#    950
SW01  = 000002       561#   1590
SW02  = 000004       560#
SW03  = 000010       559#
SW04  = 000020       558#
SW05  = 000040       557#
SW06  = 000100       556#   1873
SW07  = 000200       555#
SW08  = 000400       554#   1356
SW09  = 001000       553#   1080
SW10  = 002000       552#   1358
SW11  = 004000       551#   1059
SW12  = 010000       550#   1093    1297
SW13  = 020000       549#   1302
SW14  = 040000       548#
SW15  = 100000       547#
SYNA00  001506       812#
SYNA01  001532       823#
SYNA02  001556       834#
SYNA03  001602       845#
SYNA04  001626       856#
SYNA05  001652       867#
SYNA06  001676       878#
SYNA07  001722       889#
SYNB00  001512       814#
SYNB01  001536       825#
SYNB02  001562       836#
SYNB03  001606       847#
SYNB04  001632       858#
SYNB05  001656       869#
SYNB06  001702       880#
SYNB07  001726       891#
SYNC    023560      3501*   3503*   3507*   3509*   3510*   3518    3531    3540    3554    3561    3759#
SYNCX   001240       677#
SYNC00  001516       816#
SYNC01  001542       827#
SYNC02  001566       838#
SYNC03  001612       849#
SYNC04  001636       860#
SYNC05  001662       871#
SYNC06  001706       882#
SYNC07  001732       893#
SYNC2A  001426       788#   1537*
SYNC2B  001430       799#   1539*
```

B08

```
DDDVE   MACY11 27.732  17-SEP-76  14:10  PAGE 94
DDDVEB.P11     CROSS REFERENCE TABLE -- USER SYMBOLS

SYN020    001432        790#   1541*
SYN020    001434        791#   1543*
SYND00    001522        918#
SYND01    001546        929#
SYND02    001572        940#
SYND03    001616        951#
SYND04    001642        862#
SYND05    001666        873#
SYND06    001712        884#
SYND07    001736        895#
S.. =     050000        605#
TABLE     010326       1939   1960   1991#
TEMP      005562       1234   1384*  1385*  1497#
TEMP1     001246        680#   940*   941    946*  1488   1719*  1720*
TEMP2     001250        681#   941*   942   1490
TEMP3     001252        682#  1889*  1898   2523*  2539*  2560*  2563*  2567*  2593*  2606*  2609   2623*
TEMP4     001254        683#
TEMP5     001256        684#  3628   3630   3635   3637   3666   3668   3673   3675
TESTER    010062       1946#  1949   1967   3491
TKCSR     001204        655#  1055   1114   1440   1447   1468   1858*  1891   1972   2006*  2009   2010   3717
TKDBR     001206        656#  1045   1057   1116   1122   1292   1449   1470   1993   1974   1983   3717
TKRDY     023334       1863   3615   3645   3655   3677   3685   3691   3717#
TLAST =   020446       1616   3797#
TOTAL     007274       1774#  2711*  2729   3107   3161   3215   3269   3324   3378   3432
TPCSR     001210        657#  1098   1120   1299   1454   2002   3717
TPDBR     001212        658#  1100*  1122*  1301*  1456*  1894*  3717*
TRMRDY=   000002       1759#  2829   2837   2970   2978   2989   3168   3176   3329   3337   3348
TRPOK     003762       1280#
TSTNO     001226        669#   917*  1369   1396   1601   1609   1610   1949*  2000*  2036*  2063*  2090*  2117*
                       2143*  2171*  2192*  2213*  2236*  2257*  2278*  2299*  2320*  2341*  2362*  2393*  2403*
                       2429*  2459*  2508*  2552*  2595*  2637*  2692*  2770*  2817*  2864*  2911*  2959*  3006*
                       3053*  3099*  3153*  3207*  3261*  3316*  3370*  3424*  3490*
TST1      007306       1604   1620   1849#
TST10     011576       2144   2171#
TST11     011664       2172   2192#
TST12     011752       2193   2213#
TST13     012046       2214   2236#
TST14     012136       2237   2257#
TST15     012226       2258   2278#
TST16     012316       2279   2299#
TST17     012406       2300   2320#
TST2      010766       1850   1968   2000#
TST20     012474       2321   2341#
TST21     012562       2342   2362#
TST22     012650       2363   2383#
TST23     012736       2384   2403#
TST24     013024       2404   2429#
TST25     013122       2430   2459#
TST26     013324       2460   2508#
TST27     013506       2509   2552#
TST3      011124       2001   2036#
TST30     013672       2553   2595#
TST31     014050       2596   2637#
TST32     014302       2638   2692#
TST33     014646       2693   2770#
TST34     015046       2771   2817#
```

```
TST35   015246          2818    2964#
TST36   015446          2865    2911#
TST37   015646          2912    2959#
TST4    011216          2003    2063#
TST40   016044          2960    3006#
TST41   016242          3007    3053#
TST42   016440          3054    3099#
TST43   016664          3100    3153#
TST44   017110          3154    3207#
TST45   017334          3208    3261#
TST46   017560          3262    3316#
TST47   020002          3317    3370#
TSTS    011310          2064    2090#
TSTSO   020224          3371    3424#
TSTSS1  020446          3425    3490#   3787
TSTS    011402          2091    2117#
TST     011476          2118    2143#
TTST    002702           982*    983*    985*    986*   1053#
TURFLG  007256          1767#   1866*   1870*   2712    2772    2819    2966    2913    2961    3009    3055    3101    3155
                        3209    3263    3318    3372    3426    3492
TWOSYN= 010000           609#
TXBAP   023562          3523    3535    3599    3759#
TXTAB   024162          3511    3516    3559    3560    3760#
TYPDAT  004266          1323    1341    1344#
TYPE  = 104402           723#    934     939     952     957     981     989     1002    1003    1005    1007    1009    1097
                        1115    1127    1220    1257    1324    1325    1328    1329    1331    1333    1337    1342    1387
                        1444    1446    1474    1512    1595    1613    1619    1702    1962    1889    1913    1921    1951
                        3614    3621    3640    3644    3654    3676    3684    3690    3714
TYPMSG  004166          1321    1324#
VECMAP  007102          1701    1709#
WRDCNT  003742          1228*   1258*   1266#
WRKC.F  004254          1335    1339#
XBX     004060          1298    1300    1302#
XCSR    002604          1004    1026#
XERR    002626          1010    1035#
XFR   = 030000           503#
XHEAD   005461           939    1486#
XPASS   002620          1008    1032#
XSTATQ  005506           945    1486#
XTSTN   004374          1330    1367#
XVEC    002612          1006    1029#
XXLIN   023420          1917    3623    3642    3717#
$CRAP = 177777             1#    1992#   1996#   2029#   2032#   2056#   2059#   2083#   2086#   2110#   2113#   2136#   2139#
                        2164#   2167#   2185#   2188#   2206#   2209#   2229#   2232#   2250#   2253#   2271#   2294#   2298#
                        2295#   2313#   2316#   2334#   2337#   2355#   2359#   2376#   2379#   2396#   2399#   2422#   2425#
                        2449#   2455#   2501#   2504#   2544#   2548#   2588#   2591#   2629#   2633#   2693#   2699#   2751#
                        2766#   2808#   2813#   2855#   2860#   2902#   2907#   2950#   2955#   2997#   3002#   3044#   3049#
                        3090#   3095#   3144#   3149#   3198#   3203#   3252#   3257#   3307#   3312#   3361#   3366#   3415#
                        3420#   3468#   3486#
$E      = 000053           1#   1850    1851#   2001    2002#   2037    2038#   2064    2065#   2091    2092#   2119    2119#
                        2144    2145#   2172    2173#   2193    2194#   2214    2215#   2237    2238#   2258    2259#   2279
                        2280#   2300    2301#   2321    2322#   2342    2343#   2363    2364#   2384    2385#   2404    2406#
                        2430    2432#   2460    2462#   2509    2511#   2553    2555#   2596    2598#   2638    2640#   2683
                        2695#   2771    2772#   2818    2819#   2865    2866#   2912    2913#   2960    2961#   3007    3008#
                        3054    3055#   3100    3101#   3154    3155#   3208    3209#   3262    3263#   3317    3319#   3371
                        3372#   3425    3426#   3492#
```

```
$N      = 000051          1#   1847   1851#   1992   1998   2002#   2029   2034   2038#   2056   2061   2065#   2083
                       2089   2092#   2110   2115   2119#   2136   2141   2145#   2164   2169   2173#   2185   2190
                       2194#   2206   2211   2215#   2229   2234   2238#   2250   2255   2259#   2271   2276   2280#
                       2292   2297   2301#   2313   2318   2322#   2334   2339   2343#   2355   2360   2364#   2376
                       2391   2385#   2396   2401   2406#   2422   2427   2432#   2449   2457   2462#   2501   2506
                       2511#   2544   2550   2555#   2588   2593   2598#   2629   2635   2640#   2683   2690   2695#
                       2761   2768   2772#   2808   2815   2819#   2855   2862   2866#   2902   2909   2913#   2950
                       2957   2961#   2997   3004   3008#   3044   3051   3055#   3090   3097   3101#   3144   3157
                       3155#   3199   3205   3209#   3252   3259   3263#   3307   3314   3319#   3361   3368   3372#
                       3415   3422   3426#   3468   3488   3492#   3787#
$T      = 000017          1#   710#   719   721#   723#   725#   727#   729#   731#   733#   735#   737#   739#
                       741#   743#   745#   747#   749#
.       = 025734        620#   621   624#   631#   632#   633#   634#   637#   639#   642#   646#   648#   693#
                       694#   695#   696#   697#   698#   807#   809#   810#   811#   812#   813#   814#   815#
                       816#   817#   818#   820#   821#   822#   823#   824#   825#   826#   827#   828#   829#
                       831#   832#   833#   834#   835#   836#   837#   838#   839#   840#   842#   843#   844#
                       845#   846#   847#   848#   849#   850#   851#   853#   854#   855#   856#   857#   859#
                       859#   860#   861#   862#   864#   865#   866#   867#   868#   869#   870#   871#   872#
                       873#   875#   876#   877#   878#   879#   880#   881#   882#   883#   884#   886#   887#
                       888#   889#   890#   891#   892#   893#   894#   895#   959   1048   1295   1377   1396
                      1400   1438#   1446   1455   1469   1496#   1498#   1500#   1514   1705   1726   1775#   1775#
                      1778#   1875   1897   1957   1973   1991#   2003   2016   2020   2044   2051   2071   2078
                      2098   2105   2125   2132   2151   2160   2486   2518   2660   2665   2709   2727   2739
                      2743   2805   2852   2899   2946   2993   3040   3087   3137   3191   3245   3299   3355
                      3406   3460   3555   3605   3606#   3608#   3648   3688   3694   3702   3711   3719   3759
                      3759#   3760#   3761#
.BEGIN  002332        975#
.CNVRT  003542        738   1221#
.CONVR  003536        736   1220#
.DATAC  004576        748   1426#
.DELAY  004476        744   1397#
.EOF    002436        997#   1958
.ERRTA  025662       1316   3780#
.HLT    004002        627   1289#
.INSTE  003224        728   1127#
.INSTR  003120        726   1106#
.INSTI  003140       1110#   1130
.MSG    003142       1108#   1111#
.MSTCL  004556        740   1418#
.PARAM  003244        730   1138#
.PFAIL  004402        625    908   1374#   1382
.RAMCL  004516        742   1405#
.RESOS  003504        734   1209#
.RCMCL  004566        746   1422#
.SAVOS  003444        732   1195#
.SCOPE  002634        720   1042#
.SCOP1  003020        722   1080#
.START  001742        643    906#    918
.TRPSR  003750        629   1277#
.TRPTA  001314       1218#   1282
.TYPE   003044        724   1090#
```

```
$VEND          1#     991
$VERNT         1#     529
$$             583#   1435  2017  2021  2024  2045  2052  2072  2079  2099  2106  2126  2133  2152  2161
               2182   2203  2223  2247  2268  2289  2310  2329  2350  2371  2392  2415  2443  2478  2495
               2536   2580  2614  2621  2666  2669  2676  2744  2747  2754  2794  2906  2941  2953  2980
               2990   3036  3046  3082  3094  3029  3041  3076  3088  3126  3138  3.90  3132  3234  3245
               3288   3300  3341  3353  3395  3407  3449  3461  3579  3586  3597  3729  3755
INTS           1991#  2312  2333  2354  2375
MUXSI          529#   2761  2808  2855  2902  3090  3144  3198  3252
MUXSO          529#   2949  2996  3043  3306  3360  3414
NOINT          1992#  2226  2249  2270  2291
$BLFFE         1#     1482
$CK15          1#
$CK150         1#     3721
$CLR.          1#
$CYCLE         1#     1501
$EGOLF         2028#  2055  2082  2109
$EOF           1#     991
$FINI          1#     3787
$GETF          1#
$GETPA         1#     1596
$HEADE         1#     5330
$MSG           1#     1486
$PFAIL         1#     1376
$RAMCL         1#     1397
$RXSHI         1#
$SCOPE         1#     1038
$SETLI         1#
$SETSC         1#
$SETSY         1#
$SGET          1#
$SSCLO         1#
$SSIMBC        1#
$TRPDE         1#     719   721   723   725   727   729   731   733   735   737   739   741   743   745
                747
$TSTN          1#     1947  1998  2034  2061  2088  2115  2141  2169  2190  2211  2234  2255  2276  2297
                2318   2339  2360  2381  2401  2427  2457  2506  2553  2593  2635  2690  2769  2815  2863
                2909   2957  3004  3051  3097  3151  3205  3259  3314  3368  3422  3498
$TXSHI         1#
$VARIM         1#     595
$XD            1#     1992  1996  2029  2032  2056  2059  2083  2086  2110  2113  2136  2139  2164  2187
                2185   2188  2206  2209  2229  2232  2250  2253  2271  2274  2292  2295  2313  2316  2334
                2337   2365  2368  2376  2379  2396  2399  2422  2425  2449  2455  2503  2544  2547  2549
                2588   2591  2629  2633  2683  2688  2761  2766  2808  2813  2855  2860  2902  2944  2950
                2985   2997  3002  3044  3049  3090  3095  3144  3149  3198  3203  3252  3257  3305  3312
                3361   3365  3415  3420  3468  3486
```

F08


```
ADDB    1519    1527
ADS      946    1092    1109    1180    1227    1237    1282    1313    1316    1412    1520    1529    1550    1552    1558
        1560    1562    1565    1567    1569    1695    1730    1853    1855    1938    2664    2698    2701    2704    2707
        3442    3521    3681
ASL     1159    1160    1161    1280    1312    1314    1947
BBB     1432    1721    1916
BBS     1461    1948
BEQ      943     951     980    1016    1044    1053    1062    1081    1083    1119    1150    1158    1252    1291    1298
        1305    1321    1327    1336    1341    1345    1359    1452    1591    1643    1684    1691    1874    1901    1903
        1910    1923    1929    1957    1977    2016    2020    2044    2051    2071    2078    2098    2105    2125    2132
        2151    2160    2414    2442    2477    2494    2535    2579    2613    2620    2675    2713    2753    2793    2905
        2840    2852    2887    2899    2934    2946    2981    2993    3028    3040    3075    3087    3102    3125    3137
        3156    3179    3191    3210    3233    3245    3264    3287    3299    3319    3340    3352    3373    3394    3406
        3427    3448    3460    3498    3500    3506    3519    3585    3596    3648    3658    3680    3698    3694    3717
BGT     1154    1465
BHIS    1170    3702
BIC      962    1046    1236    1281    1293    1315    1450    1466    1471    1624    1729    1733    1895    1975    1984
        2041    2046    2047    2049    2068    2073    2074    2078    2095    2100    2101    2103    2122    2127    2138
        2130    2153    2158    2522    2678    2756    2787    2834    2881    2928    2975    2999    3022    3036    3069
        3083    3119    3173    3227    3281    3334    3346    3388    3402    3442    3456    3520    3593    3646    3656
        3678    3686    3692    3717    3738
BICB    1117    1155    3617
BIS     1423    1429    1467    1674    1675    1676    1677    1678    1679    1680    1681    1727    1732    2006    2149
        2177    2198    2221    2243    2264    2295    2306    2327    2348    2369    2390    2439    2466    2467    2473
        2460    2520    2521    2527    2533    2562    2566    2571    2577    2603    2617    2646    2656    2722    2734
        2795    2942    2889    2936    2983    3030    3077    3127    3191    3235    3289    3342    3396    3453    3582
        3649    3689    3695    3747
BISB    1156
BIT      950     979    1052    1059    1080    1093    1297    1302    1356    1359    1440    1590    1642    1873    1972
        2485    2517    2726    3497    3499    3505    3679    3717
BITB    1173    1515
BLO     1172
BLOS     956    1718
BLT     1152    1463
BMI      937    1884    2660    2697    2700    2703    2706    2738    3575    3553
BNE      921     949     970     978    1012    1048    1060    1065    1094    1101    1124    1174    1182    1246    1250
        1255    1259    1295    1303    1323    1357    1386    1400    1413    1434    1441    1473    1511    1516    1523
        1532    1594    1607    1609    1611    1617    1626    1631    1636    1660    1666    1668    1670    1687    1698
        1726    1861    1865    1869    1897    1905    1920    1925    1949    1953    1955    1973    1986    2012    2413
        2447    2469    2482    2486    2499    2518    2532    2540    2542    2564    2576    2584    2586    2605    2626
        2649    2665    2681    2709    2724    2727    2743    2759    2773    2789    2797    2820    2836    2844    2867
        2883    2891    2914    2930    2938    2962    2977    2985    3009    3024    3032    3056    3071    3079    3121
        3129    3142    3175    3183    3196    3229    3237    3250    3283    3291    3304    3336    3344    3358    3390
        3398    3412    3444    3452    3466    3493    3515    3529    3532    3555    3562    3578    3599    3613    3699
        3711    3728    3754
BPL     1056    1096    1099    1115    1121    1300    1350    1448    1455    1469    1892    2003    3717    3725    3751
BR       928     947     959     984    1054    1058    1130    1162    1164    1377    1514    1524    1614    1619    1629
        1634    1639    1705    1731    1867    1872    1887    1899    1908    1967    2180    2201    2224    2245    2266
        2287    2308    2330    2351    2372    2393    2671    2749    3502    3504    3508    3537    3569    3661    3693
        3717
BLO     1239    1241    1243    1457    1517    1525    1694    1885    3707
BLR      910     915     916     924     953     967     998    1050    1067    1068    1147    1384    1390    1411    1429
        1453    1658    1703    1722    1724    1729    1851    1870    1890    1911    1914    1970    2005    2174    2178
        2195    2199    2216    2220    2238    2259    2280    2301    2322    2324    2343    2345    2364    2365    2395
        2387    2407    2408    2409    2433    2434    2435    2464    2488    2512    2513    2526    2556    2557    2575
        2599    2600    2626    2611    2624    2642    2643    2657    2658    2695    2719    2720    2735    2736    2745
```

```
            2777  2783  2784  2798  2801  2823  2824  2830  2831  2845  2848  2970  2871  2877  2879
            2892  2895  2917  2918  2924  2925  2939  2942  2965  2966  2971  2972  3012  3013  3018
            3019  3059  3060  3065  3066  3105  3106  3108  3115  3116  3130  3133  3159  3160  3162
            3169  3170  3184  3187  3213  3214  3216  3223  3224  3238  3241  3267  3268  3270  3277
            3278  3292  3295  3322  3323  3325  3330  3331  3356  3376  3377  3379  3384  3385  3410
            3430  3431  3433  3438  3439  3464  3512  3517  3525  3556  3573  3597  3588  3611  3650
            3723  3749
CLRB         911   912   999  1066  1256  1307  1389  1627  1661  1689  3704
CMP          929   942   968   969  1043  1064  1169  1171  1290  1304  1462  1464  1521  1530  1625
            1608  1610  1616  1630  1635  1659  1667  1686  1716  1717  1734  1896  1900  1902  1904
            1919  1922  1926  1978  1985  2009  2010  2043  2050  2070  2077  2097  2104  2124  2131
            2150  2154  2155  2159  2413  2441  2476  2493  2534  2578  2619  2674  2752  2788  2792
            2835  2839  2882  2886  2929  2933  2976  2980  2992  3023  3027  3039  3070  3074  3086
            3120  3124  3174  3178  3228  3232  3282  3286  3335  3339  3351  3389  3393  3405  3443
            3447  3459  3528  3584  3595  3612  3647  3657  3687  3693  3696  3698  3717
CMPB         955  1047  1118  1149  1151  1153  1157  1294  1451  1472  1683  1864  1868  1976  2531
            2575  3701
COMB         935
DEC         1123  1245  1258  1399  1697  1883  1946  1952  2011  2418  2446  2469  2481  2499  2533
            2541  2563  2583  2585  2604  2625  2646  2680  2723  2758  2796  2843  2890  2937  2984
            3031  3079  3128  3141  3182  3195  3236  3249  3290  3303  3343  3357  3397  3411  3451
            3465  3598
DECB        1011  1181  1249  1254  3710
EMT          583
HALT         522   954   959   963  1353  1376  1513  1704  2710  3715
INC         1000  1063  1355  1385  1433  1546  1548  1554  1556  1725  1918  1941  1943  1962  1964
            2013  2417  2445  2490  2497  2525  2538  2569  2582  2616  2623  2679  2757  3140  3194
            3348  3382  3355  3409  3463  3572  3577  3682  3697  3727  3753
INCB        1544  1682  1696  3514  3527  3700  3709
JMP          543   990  1025  1073  1284  1362  1393  1621  1701  1959  1980  2026  2715  2775  2822
            2869  2916  2964  3011  3058  3104  3158  3212  3265  3321  3375  3429  3495  3607  3703
            3938  1019  1049  1296  1574  1579  1584  1589  1863  3615  3645  3655  3677  3685  3691
            9006  9007  9008   913   917   918   922   923   925   930   931   932   933   940   941
            9664   965   966   975   976   982   983   985   986   988  1001  1015  1024  1045  1051
            1057  1069  1070  1071  1084  1090  1091  1102  1106  1107  1108  1112  1113  1122  1125
            1126  1128  1129  1131  1132  1138  1139  1140  1141  1142  1143  1146  1148  1178  1179
            1193  1194  1195  1199  1200  1201  1202  1203  1204  1209  1210  1211  1212  1213  1214
            1221  1222  1223  1224  1225  1226  1229  1231  1232  1234  1235  1247  1260  1261  1262
            1263  1264  1277  1279  1283  1292  1306  1309  1311  1317  1318  1319  1352  1360  1361
            1375  1382  1383  1397  1398  1401  1406  1407  1408  1409  1410  1414  1415  1419  1427
            1430  1436  1442  1443  1449  1456  1470  1523  1528  1533  1534  1535  1536  1537  1538
            1539  1540  1541  1542  1543  1544  1545  1547  1549  1551  1553  1555  1557  1559  1561
            1564  1566  1568  1571  1572  1573  1576  1577  1579  1581  1582  1583  1586  1587  1589
            1604  1606  1612  1620  1623  1657  1662  1663  1664  1672  1688  1699  1706  1709  1710
            1711  1712  1713  1714  1715  1723  1735  1849  1850  1852  1854  1856  1857  1858  1859
            1866  1871  1882  1889  1893  1894  1898  1912  1936  1937  1939  1944  1945  1959  1962
            1965  1966  1968  1969  1971  1974  1982  1983  1987  1988  2000  2001  2007  2008  2014
            2015  2016  2019  2022  2025  2036  2037  2038  2039  2040  2042  2048  2063  2064  2065
            2066  2069  2069  2075  2090  2091  2092  2093  2094  2096  2102  2117  2118  2119  2120
            2121  2123  2129  2143  2144  2145  2146  2147  2148  2156  2157  2171  2172  2173  2175
            2176  2193  2193  2194  2196  2197  2213  2214  2215  2217  2218  2219  2236  2237  2238
            2240  2241  2242  2257  2258  2260  2261  2262  2263  2279  2280  2281  2282  2283  2284
            2299  2300  2302  2303  2304  2305  2320  2321  2323  2325  2326  2341  2342  2344  2345
            2347  2362  2363  2365  2367  2368  2383  2384  2396  2388  2399  2403  2404  2405  2406
            2410  2411  2412  2429  2430  2431  2432  2436  2437  2440  2459  2460  2461  2462  2463
            2465  2470  2471  2472  2475  2483  2484  2487  2489  2492  2509  2509  2510  2511  2512
```

H08


```
            2515    2516    2519    2523    2524    2530    2552    2553    2554    2555    2558    2559    2560    2561    2565
            2566    2568    2574    2595    2596    2597    2598    2601    2602    2607    2608    2609    2610    2618    2637
            2638    2639    2640    2641    2644    2645    2647    2650    2651    2652    2653    2654    2655    2667    2668
            2672    2692    2693    2694    2711    2714    2716    2717    2718    2721    2725    2728    2729    2730    2731
            2732    2733    2745    2746    2751    2770    2771    2774    2778    2779    2780    2781    2782    2785    2790
            2799    2800    2803    2817    2818    2821    2825    2826    2827    2828    2829    2832    2837    2846    2847
            2850    2864    2865    2868    2872    2873    2874    2875    2876    2879    2884    2893    2894    2897    2911
            2912    2915    2919    2920    2921    2922    2923    2926    2931    2940    2941    2944    2959    2960    2963
            2967    2968    2969    2970    2973    2978    2986    2987    2988    2991    3006    3007    3010    3014    3015
            3016    3017    3020    3025    3033    3034    3035    3038    3053    3054    3057    3061    3062    3063    3064
            3067    3072    3080    3081    3082    3085    3099    3100    3103    3107    3109    3110    3111    3112    3113
            3114    3117    3122    3131    3132    3135    3153    3154    3157    3161    3163    3164    3165    3166    3167
            3168    3171    3176    3185    3186    3189    3207    3208    3211    3215    3217    3218    3219    3220    3221
            3222    3225    3230    3239    3240    3243    3261    3262    3265    3269    3271    3272    3273    3274    3275
            3276    3279    3284    3293    3294    3297    3316    3317    3320    3324    3326    3327    3328    3329    3332
            3337    3345    3346    3347    3350    3370    3371    3374    3378    3380    3381    3382    3383    3386    3391
            3399    3400    3401    3404    3424    3425    3428    3432    3434    3435    3436    3437    3440    3445    3453
            3454    3455    3458    3490    3491    3494    3511    3516    3523    3530    3580    3583    3589    3590    3591
            3609    3610    3619    3620    3630    3637    3659    3713    3717    3722    3730    3732    3733    3737    3740
            3741    3742    3746    3748    3756
MOVB         909     914     960     961    1013    1014    1100    1116    1144    1145    1229    1230    1233    1238    1248
            1253    1301    1334    1628    1632    1633    1637    1638    1640    1641    1692    1693    1700    1719    1940
            1942    1950    1954    1961    1963    2529    2573    2786    2833    2880    2927    2974    3021    3068    3115
            3172    3226    3280    3333    3387    3441    3501    3503    3507    3509    3510    3513    3518    3522    3526
            3592    3594    3616    3618    3622    3638    3639    3641    3643    3650    3651    3668    3675    3705    3706
            3712    3734    3735    3736    3739
NCP          927     982     983    1020    1021    1022    1023    2179    2200    2222    2244    2265    2286    2307    2329
            2349    2370    2391    2662    2663    2740    2741
RESET        997    1017    1656    2004
ROL         1458    1459    1460    1886    1907
ROLB        1518    1526    1695    3708
ROR         1240    1242    1244    1720    1906    1915
RORB        1431
RTI         1085    1103    1133    1185    1205    1215    1265    1363    1402    1416    1420    1424    1437    1707    1736
            1989
RTS         1475    1645    1737    3717    3731
SUB         1278    1310
SWAB        3581
TRAP         719     721     723     725     727     729     731     733     735     737     739     741     743     745     747
TST          926     948     977    1082    1322    1326    1335    1340    1344    1349    1593    1615    1625    1665    1669
            1673    1860    1909    1924    1956    2612    2696    2699    2702    2705    2708    2712    2772    2804    2819
            2851    2866    2898    2913    2945    2961    3008    3055    3101    3136    3155    3190    3209    3244    3263
            3298    3318    3372    3426    3492    3652    3717    3724    3750
TSTB         920     936    1055    1061    1095    1098    1114    1120    1251    1299    1320    1447    1454    1468    1510
            1690    1991    2002    2659    2737    3531    3554    3561    3574    3717
.ASCII      3717
.ASCIZ       647    1477    1484    1486    3717    3762
.BLKB        693     694     695     696     697    3759    3760    3761
.BLKW        632     633     634     809     810     811     812     813     814     815     816     817     818     820     821
             822     823     824     825     826     827     828     829     831     832     833     834     835     836     837
             838     839     840     842     843     844     845     846     847     848     849     850     851     853     854
             855     856     857     858     859     860     861     862     864     865     866     867     868     869     870
             871     872     873     875     876     877     878     879     880     881     882     883     884     886     887
             888     889     890     891     892     893     894     895    1438    1775    1776    1778    3758
.BYTE        704     705     706     707     773     774     775     776     778     779     780     781    1027    1030    1033
            1036    1365    1368    1395    1481    1487    1489    1602    1603    1891    1935    1991    3534    3539    3543
```

```
            3547  3551  3559  3629  3636  3667  3674  3718  3763  3765  3767  3769  3771  3774  3776
            3779
.ENABL       543
.END        3802
.ENDC       1851  1993  1997  2002  2030  2033  2038  2057  2060  2065  2084  2087  2092  2111  2114
            2119  2137  2140  2145  2165  2168  2173  2186  2189  2194  2207  2210  2215  2230  2233
            2238  2251  2254  2259  2272  2275  2280  2293  2296  2301  2314  2317  2322  2335  2338
            2343  2356  2359  2364  2377  2380  2385  2397  2400  2405  2423  2426  2431  2450  2455
            2461  2502  2505  2510  2545  2549  2554  2589  2592  2597  2630  2634  2639  2684  2689
            2694  2762  2767  2772  2808  2809  2814  2819  2855  2856  2861  2866  2902  2903  2908
            2913  2949  2951  2955  2961  2996  2998  3003  3008  3043  3045  3050  3055  3090  3091
            3095  3101  3144  3145  3150  3155  3198  3199  3204  3209  3252  3253  3258  3263  3306
            3308  3313  3318  3360  3362  3367  3372  3414  3416  3421  3426  3468  3469  3487  3492
.EQUIV       583
.ERROR       698   709  1479  1485  1486  1491  1991  3717  3762
.IF         1850  1992  1996  2001  2029  2032  2037  2055  2059  2064  2083  2086  2091  2110  2113
            2118  2136  2139  2144  2164  2167  2172  2185  2188  2193  2206  2209  2214  2229  2232
            2237  2250  2253  2258  2271  2274  2279  2292  2295  2300  2313  2316  2321  2334  2337
            2342  2355  2358  2363  2376  2379  2384  2396  2399  2404  2422  2425  2430  2449  2455
            2460  2501  2504  2509  2544  2548  2553  2588  2591  2596  2629  2633  2638  2683  2688
            2693  2761  2766  2771  2772  2808  2813  2818  2819  2855  2860  2865  2866  2902  2907
            2912  2913  2950  2955  2960  2961  2997  3002  3007  3008  3044  3049  3054  3055  3090
            3095  3100  3101  3144  3149  3154  3155  3198  3203  3208  3209  3252  3257  3262  3263
            3307  3312  3317  3318  3361  3366  3371  3372  3415  3420  3425  3426  3468  3486  3491
            3492
.IFF         1850  1851  1993  1996  2001  2002  2030  2032  2037  2038  2057  2059  2064  2065  2084
            2085  2091  2092  2111  2113  2118  2119  2137  2139  2144  2145  2165  2167  2172  2173
            2186  2188  2193  2194  2207  2209  2214  2215  2230  2232  2237  2238  2251  2253  2259
            2259  2272  2274  2279  2280  2293  2295  2300  2301  2314  2316  2321  2322  2335  2337
            2342  2343  2356  2358  2363  2364  2377  2379  2384  2385  2397  2399  2404  2405  2423
            2425  2430  2431  2450  2455  2460  2461  2502  2504  2509  2510  2545  2548  2553  2554
            2559  2591  2596  2597  2630  2633  2638  2639  2684  2689  2693  2694  2762  2766  2771
            2772  2774  2779  2807  2809  2813  2818  2819  2821  2826  2854  2856  2860  2865  2866
            2868  2873  2901  2903  2907  2912  2913  2915  2920  2948  2951  2955  2960  2961  2963
            2968  2995  2998  3002  3007  3008  3010  3015  3042  3045  3049  3054  3055  3057  3062
            3089  3091  3095  3100  3101  3102  3107  3139  3145  3149  3154  3155  3156  3161  3193
            3199  3203  3208  3209  3210  3215  3247  3253  3257  3262  3263  3264  3269  3301  3308
            3312  3317  3318  3319  3324  3354  3362  3366  3371  3372  3373  3378  3408  3416  3420
            3425  3426  3427  3432  3462  3469  3486  3492
.IFT         1992  1996  2029  2032  2056  2059  2083  2086  2110  2113  2136  2139  2164  2167  2185
            2188  2206  2209  2229  2232  2250  2253  2271  2274  2292  2295  2313  2316  2334  2337
            2355  2358  2376  2379  2396  2399  2422  2425  2449  2455  2501  2504  2544  2548  2598
            2591  2629  2633  2683  2688  2761  2766  2773  2779  2808  2813  2820  2825  2855  2860
            2867  2872  2902  2907  2914  2919  2950  2955  2962  2967  2997  3002  3009  3014  3044
            3049  3056  3061  3090  3095  3102  3107  3144  3149  3156  3161  3198  3203  3210  3215
            3252  3257  3264  3269  3307  3312  3319  3324  3361  3366  3373  3378  3415  3420  3427
            3432  3468  3486
.IFTF        2772  2774  2779  2807  2819  2821  2826  2854  2866  2868  2873  2901  2913  2915  2920
            2948  2961  2963  2968  2995  3008  3010  3015  3042  3055  3057  3062  3089  3101  3103
            3110  3143  3155  3157  3164  3197  3209  3211  3218  3251  3263  3265  3272  3305  3319
            3320  3327  3359  3372  3374  3381  3413  3426  3428  3435  3467
.IIF         1850  1851  2001  2002  2037  2038  2064  2065  2091  2092  2118  2119  2144  2145  2172
            2173  2193  2194  2214  2215  2237  2238  2258  2259  2279  2280  2300  2301  2321  2322
            2342  2343  2363  2364  2384  2385  2404  2405  2430  2431  2460  2461  2509  2510  2553
            2554  2596  2597  2638  2639  2693  2694  2764  2765  2771  2772  2782  2811  2912  2919
            2219  2829  2858  2859  2865  2866  2876  2905  2906  2912  2913  2923  2953  2954  2963
```

```
DZDVE  MACY11 27(732)  17-SEP-76  14:10  PAGE 104
DZDVEB.P11      CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

            2961    3000    3001    3007    3008    3047    3048    3054    3055    3093    3100    3101    3113    3147    3154
            3155    3167    3201    3208    3209    3221    3255    3262    3263    3275    3310    3317    3318    3364    3371
            3372    3418    3425    3426    3491    3492
.IRP         719     721     723     725     727     729     731     733     735     737     739     741     743     745     747
             909    1847    1850    1992    1998    2001    2029    2034    2037    2056    2061    2064    2083    2088    2091
            2110    2115    2118    2136    2141    2144    2164    2169    2172    2185    2190    2193    2206    2211    2214
            2229    2234    2237    2250    2255    2258    2271    2276    2279    2292    2297    2300    2313    2318    2321
            2334    2339    2342    2355    2360    2363    2376    2381    2384    2396    2401    2404    2422    2427    2430
            2449    2457    2460    2501    2506    2509    2544    2550    2553    2588    2593    2596    2629    2635    2638
            2683    2690    2693    2761    2768    2771    2808    2815    2819    2855    2862    2865    2902    2903    2912
            2950    2957    2960    2997    3004    3007    3044    3051    3054    3090    3097    3100    3144    3151    3154
            3198    3205    3208    3252    3259    3262    3307    3314    3317    3361    3368    3371    3415    3422    3425
            3468    3488    3787
.LIST          1     529     543     564     583     609     611     621     645     647     721     723     725     727     729
             731     733     735     737     739     741     743     745     747     749     804     898     991    1039    1486
            1739    1779    1793    1851    1991    1992    1996    2002    2029    2032    2038    2056    2059    2065    2093
            2086    2092    2110    2113    2119    2136    2139    2145    2164    2167    2173    2185    2188    2194    2206
            2209    2215    2229    2232    2238    2250    2253    2259    2271    2274    2280    2292    2295    2301    2313
            2316    2322    2334    2337    2343    2355    2358    2364    2376    2379    2385    2396    2399    2406    2422
            2425    2432    2449    2455    2462    2501    2504    2511    2544    2548    2555    2588    2591    2598    2629
            2633    2640    2683    2688    2695    2761    2766    2772    2808    2813    2819    2855    2860    2866    2902
            2907    2913    2950    2955    2961    2997    3002    3008    3044    3049    3055    3090    3095    3101    3144
            3149    3155    3198    3203    3209    3252    3257    3263    3307    3312    3318    3361    3366    3372    3415
            3420    3426    3468    3486    3492    3717    3762    3787
.MACRO         1     529    1991    1992    2028
.NLIST         1     529     543     564     583     609     611     621     645     647     721     723     725     727     729
             731     733     735     737     739     741     743     745     747     749     804     898     991    1039    1486
            1739    1779    1793    1851    1991    1992    1996    2002    2029    2032    2038    2056    2059    2065    2093
            2086    2092    2110    2113    2119    2136    2139    2145    2164    2167    2173    2185    2188    2194    2206
            2209    2215    2229    2232    2238    2250    2253    2259    2271    2274    2280    2292    2295    2301    2313
            2316    2322    2334    2337    2343    2355    2358    2364    2376    2379    2385    2396    2399    2406    2422
            2425    2432    2449    2455    2462    2501    2504    2511    2544    2548    2555    2588    2591    2598    2629
            2633    2640    2683    2688    2695    2761    2766    2772    2808    2813    2819    2855    2860    2866    2902
            2907    2913    2950    2955    2961    2997    3002    3008    3044    3049    3055    3090    3095    3101    3144
            3149    3155    3198    3203    3209    3252    3257    3263    3307    3312    3318    3361    3366    3372    3415
            3420    3426    3468    3486    3492    3717    3762    3787
.PAGE        564     611     700     752     804     898     991    1501    1739    1793    1847    2228    2270    2312    2354
            2808    2855    2902    2949    2996    3043    3090    3144    3198    3252    3306    3360    3414    3468    3605
.REM           1     898
.REPT        621
.SBTTL       529     564     611     645     898     991    1039    1739
.TITLE       543
.WORD       1483    1927


 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 *,DZDVEB.SEQ/SOL/CRF/DS:ERFZ=DZDVEB.MAC,DZDVEB.P11
 RUN-TIME: 27 42 7 SECONDS
 RUN-TIME RATIO: 338/78=4.3
 CORE USED:  19K  (37 PAGES)
```

Spooler runtime 16 Seconds, 483 KCS, 441 disk reads, 3 disk writes, 100 pages