DV11

CABLE TST+MAN PARAM IN

MD-11-DZDVE-B

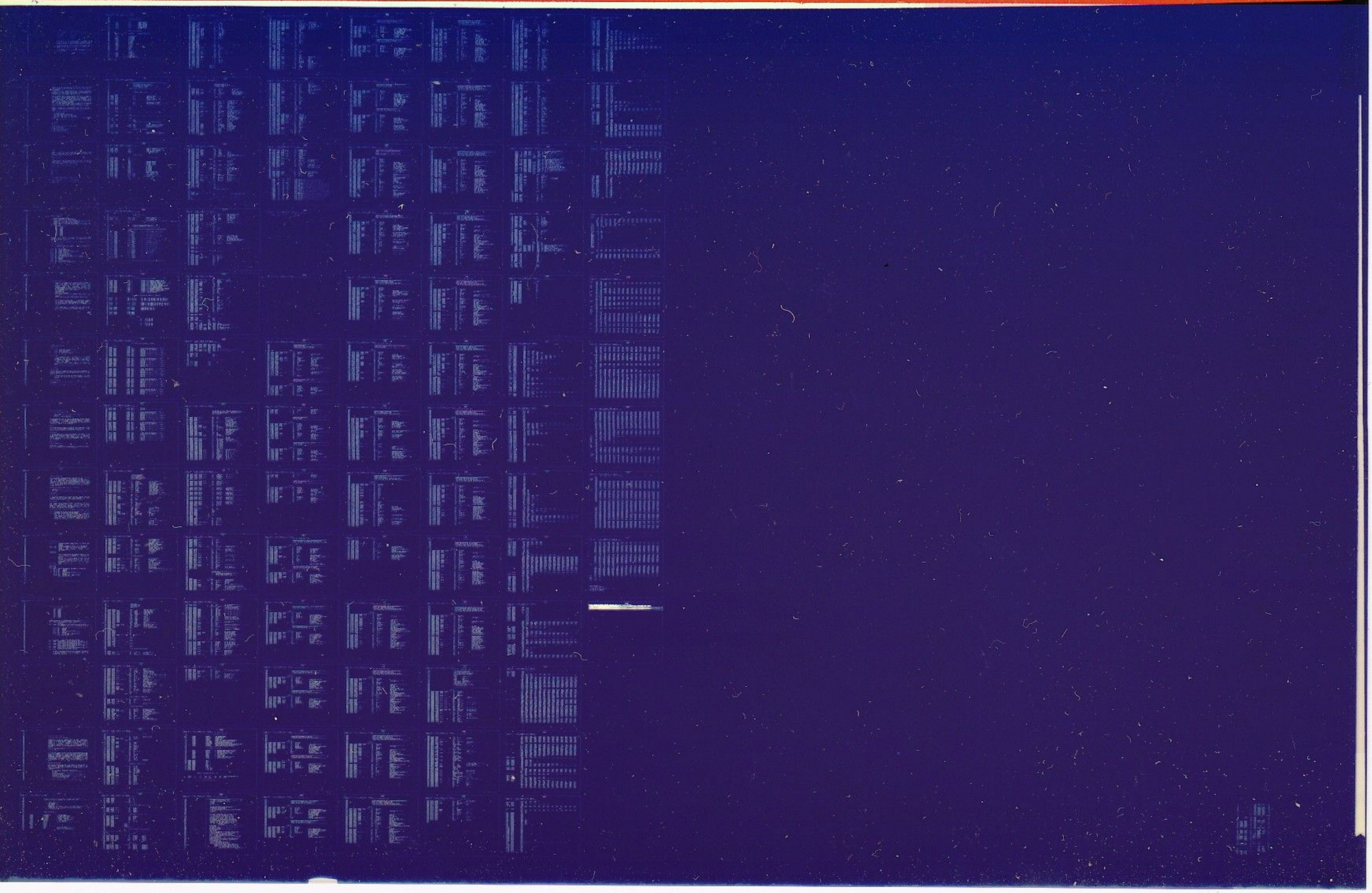
EP-DZDVE-B-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN U.S.A.



.REM $

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDVE-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 ENVIROMENT.
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 8K 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	17
8K	37
12K	57
16K	77
20K	117
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 INTERMITTEMT 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 UNDER 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) WHEN 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
                                ;--------------------

000000                          R0=%0           ;GENERAL REGISTER
000001                          R1=%1           ;GENERAL REGISTER
000002                          R2=%2           ;GENERAL REGISTER
000003                          R3=%3           ;GENERAL REGISTER
000004                          R4=%4           ;GENERAL REGISTER
000005                          R5=%5           ;GENERAL REGISTER
000006                          SP=%6           ;PROCESSOR STACK POINTER
000007                          PC=%7           ;PROGRAM COUNTER

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

177776                          PS=177776       ;PROCESSOR STATUS WORD
001200                          STACK=1200      ;START OF PROCESSOR STACK

100000                          BIT15=100000
040000                          BIT14=40000
020000                          BIT13=20000
010000                          BIT12=10000
004000                          BIT11=4000
002000                          BIT10=2000
001000                          BIT9=1000
000400                          BIT8=400
000200                          BIT7=200
000100                          BIT6=100
000040                          BIT5=40
000020                          BIT4=20
000010                          BIT3=10
000004                          BIT2=4
000002                          BIT1=2
000001                          BIT0=1
                                ;---------------------------------

010000                          ALU=BIT12
020000                          RAM=BIT13
030000                          XFR=BIT13+BIT12
040000                          NPR=BIT14
050000                          S.C=BIT14+BIT12
060000                          BCC=BIT14+BIT13
070000                          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  005377  040515  047111 MTITLE: .ASCIZ  <377><12>/MAINDEC-11-DZDVE-A/<377>/MODEM CONTROL TESTS AND MANUAL PARAME
(2)
                    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                 ;DV11'S SELECTED ACTIVE.
   694  001301  000001                DVNUM:  .BLKB 1                 ;OCTAL NUMBER OF DV11'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 PAST RUNNING DEVICE.
   698          001306                .EVEN
   699  001306  001500                CREAM:  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             SAVO5=TRAP+6             ;CALL TO REGISTER SAVE ROUTINE
001330  003444             .SAVO5
104407             RESO5=TRAP+7             ;CALL TO REGISTER RESTORE ROUTINE
001332  003504             .RESO5
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

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

```
                                        ;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$:    CMP     (SP)+,(SP)+             ;
002106  012737  000174  001200          MOV     #LIGHT,LIGHTS           ;
002114  012737  000176  001202          MOV     #SSWR,SWR               ;
002122  012637  000006          81$:    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          16$:    TYPE    ,XHEAD          ;TYPE HEADER
002160  012737  001500  001246          MOV     #DV.MAP,TEMP1           ;SET POINTER
002166  017737  177054  001250  5$:     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    SAVNUM           ;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                      BRX:      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
```

```
 1215  003534  000002                          RTI                     ;LEAVE
 1216
 1217                                          ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
 1218                                          ;-------------------------------------------------------
 1219
 1220  003536  104402  005104          .CONVR: TYPE    ,MCRLF
 1221  003542  010046                  .CNVRT: MOV     R0,-(SP)
 1222  003544  010146                          MOV     R1,-(SP)
 1223  003546  010346                          MOV     R3,-(SP)
 1224  003550  010446                          MOV     R4,-(SP)
 1225  003552  010546                          MOV     R5,-(SP)
 1226  003554  017601  000012                  MOV     @12(SP),R1
 1227  003560  062766  000002  000012          ADD     #2,12(SP)
 1228  003566  012137  003742                  MOV     (R1)+,WRDCNT
 1229  003572  112137  003744          1$:     MOVB    (R1)+,CHRCNT
 1230  003576  112137  003745                  MOVB    (R1)+,SPACNT
 1231  003602  013137  003746                  MOV     @(R1)+,BINWRD
 1232  003606  013704  003746          2$:     MOV     BINWRD,R4
 1233  003612  113705  003744                  MOVB    CHRCNT,R5
 1234  003616  012700  005562                  MOV     #TEMP,R0
 1235  003622  010403                  3$:     MOV     R4,R3
 1236  003624  042703  177770                  BIC     #177770,R3
 1237  003630  062703  000060                  ADD     #060,R3
 1238  003634  110320                          MOVB    R3,(R0)+
 1239  003636  000241                          CLC
 1240  003640  006004                          ROR     R4
 1241  003642  000241                          CLC
 1242  003644  006004                          ROR     R4
 1243  003646  000241                          CLC
 1244  003650  006004                          ROR     R4
 1245  003652  005305                          DEC     R5
 1246  003654  001362                          BNE     3$
 1247  003656  012703  005624                  MOV     #MDATA,R3
 1248  003662  114023                  4$:     MOVB    -(R0),(R3)+
 1249  003664  105337  003744                  DECB    CHRCNT
 1250  003670  001374                          BNE     4$
 1251  003672  105737  003745                  TSTB    SPACNT
 1252  003676  001405                          BEQ     6$
 1253  003700  112723  000040          5$:     MOVB    #040,(R3)+
 1254  003704  105337  003745                  DECB    SPACNT
 1255  003710  001373                          BNE     5$
 1256  003712  105013                  6$:     CLRB    (R3)
 1257  003714  104402  005624                  TYPE    ,MDATA
 1258  003720  005337  003742                  DEC     WRDCNT
 1259  003724  001322                          BNE     1$
 1260  003726  012605                          MOV     (SP)+,R5
 1261  003730  012604                          MOV     (SP)+,R4
 1262  003732  012603                          MOV     (SP)+,R3
 1263  003734  012601                          MOV     (SP)+,R1
 1264  003736  012600                          MOV     (SP)+,R0
 1265  003740  000002                          RTI
 1266  003742  000000          WRDCNT: 0
 1267  003744  000000          CHRCNT: 0
 1268          003745          SPACNT=CHRCNT+1
 1269  003746  000000          BINWRD: 0
 1270
```

```
1271
1272                                    ;TRAP DISPATCH SERVICE
1273                                    ;ARGUMENT OF TRAP IS EXTRACTED
1274                                    ;AND USED AS OFFSET TO OBTAIN POINTER
1275                                    ;TO SELECTED SUBROUTINE
1276
1277  003750  011646            .TRPSR: MOV     (SP),-(SP)          ;GET PC OF RETURN
1278  003752  162716  000002            SUB     #2,(SP)             ;=PC OF TRAP
1279  003756  017616  000000            MOV     @(SP),(SP)          ;GET TRP
1280  003762  006316            TRPOK:  ASL     (SP)                ;MULTIPLY TRAP ARG BY 2
1281  003764  042716  177001            BIC     #177001,(SP)        ;CLEAR UNWANTED BITS
1282  003770  062716  001314            ADD     #.TRPTAB,(SP)       ;POINTER TO SUBROUTINE ADDRESS
1283  003774  017616  000000            MOV     @(SP),(SP)          ;SUBROUTINE ADDRESS
1284  004000  000136                    JMP     @(SP)+              ;GO TO SUBROUTINE
1285
1286                                    ;ERROR HANDLER
1287                                    ;-------------
1288
1289  004002                    .HLT:
1290  004002  022737  177570  001202    CMP     #177570,SWR         ;IS THERE A REAL SWR?
1291  004010  001411                    BEQ     64$                 ;BR IF YES
1292  004012  017746  175170            MOV     @TKDBR,-(SP)        ;SAVE KEYBOARD CHAR
1293  004016  042716  000200            BIC     #BIT7,(SP)          ;CLEAR PARITY BIT
1294  004022  122726  000007            CMPB    #7,(SP)+            ;WAS IT CNTRL 'G' ?
1295  004026  001002                    BNE     .+6                 ;BR IF NO.
1296  004030  004737  004640            JSR     PC,SERV.G           ;SERVICE "CNTRL 'G'".
1297  004034  032777  010000  175140 64$:  BIT   #SW12,@SWR          ;BELL ON ERROR?
1298  004042  001406                    BEQ     XBX                 ;BR IF NO BELL
1299  004044  105777  175140            TSTB    @TPCSR              ;TTY READY.
1300  004050  100003                    BPL     XBX                 ;DON'T WAIT IF TTY NOT READY.
1301  004052  112777  000207  175132    MOVB    #207,@TPDBR         ;PUSH A BELL AT THE TTY.
1302  004060  032777  020000  175114 XBX:  BIT   #SW13,@SWR          ;DELETE ERROR PRINT OUT?
1303  004066  001105                    BNE     HALTS               ;BR IF NO PRINT OUT WANTED.
1304  004070  021637  001234            CMP     (SP),LSTERR         ;WAS THIS ERROR FOUND LAST TIME?
1305  004074  001404                    BEQ     1$                  ;BR IF YES
1306  004076  011637  001234            MOV     (SP),LSTERR         ;RECORD BEING HERE
1307  004102  105037  001311            CLRB    ERRFLG              ;PREPARE HEADER
1308  004106  104406            1$:     SAVD5                       ;SAVE ALL PROC REGISTERS
1309  004110  011605                    MOV     (SP),R5             ;GET THE PC OF ERROR
1310  004112  162705  000002            SUB     #2,R5               ;GET ADDRESS OF TRAP CALL
1311  004116  011504                    MOV     (R5),R4             ;GET HLT INSTRUCTION
1312  004120  006304                    ASL     R4                  ;MULT BY TWO
1313  004122  061504                    ADD     (R5),R4             ;DOUBLE IT
1314  004124  006304                    ASL     R4                  ;MULT AGAIN
1315  004126  042704  177001            BIC     #177001,R4          ;CLEAR JUNK
1316  004132  062704  025662            ADD     #.ERRTAB,R4         ;GET POINTER
1317  004136  012437  004252            MOV     (R4)+,ERRMSG        ;GET ERROR MESSAGE
1318  004142  012437  004264            MOV     (R4)+,DATAHD        ;GET DATA HEADRER
1319  004146  011437  004276            MOV     (R4),DATABP         ;GET DATA TABLE
1320  004152  105737  001311            TSTB    ERRFLG              ;TYPE HEADREER
1321  004156  001403                    BEQ     TYPMSG              ;BR IF YES
1322  004160  005737  004276            TST     DATABP              ;DOES DATA TABLE EXIST?
1323  004164  001040                    BNE     TYPDAT              ;BR IF YES.
1324  004166  104402  005104 TYPMSG:  TYPE    ,MCRLF
1325  004172  104402  005104           TYPE    ,MCRLF
1326  004176  005737  001220           TST     LOCK
```

```
 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: RESO5                   ;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  004464  000177  174524                  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$:     CLR     (R4)            ;ZERO THE SECONDARY REGISTER.
1412  004542  062711  170361                  ADD     #^C<BIT11+BIT10+BIT9+BIT8+BIT3+BIT2+BIT1+BIT0>+BIT0,(R1)
1413  004546  001374                          BNE     1$
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
```

```
 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     #^C<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  /  ?/
  (2)  005104  005015     000          MCRLF:  .ASCIZ  <15><12>
  (2)  005107     377  053520  020122  MPFAIL: .ASCIZ  <377>/PWR FAILED. RESTART AT TEST /
  (2)  005145     377  047105  020104  MEPASS: .ASCIZ  <377>/END PASS DZDVE-B  /
  (2)  005171     377  000122          MR:     .ASCIZ  <377>/R/
  (2)  005174  050377  047522  051107  MERR2:  .ASCIZ  <377>/PROGRAM INDICATES NO DEVICES PRESENT./
  (2)  005243     377  047111  052523  MERR3:  .ASCIZ  <377>/INSUFFICIENT DATA!/
  (2)  005267     377  042524  052123  MTSTPC: .ASCIZ  <377>/TEST PC-/
  (2)  005301     377  047514  045503  MLOCK:  .ASCIZ  <377>/LOCK ON SELECTED TEST/
```

```
    (2)  005330  051503  035122  000040  MCSRX:  .ASCIZ   /CSR: /
    (2)  005336  042526  035103  000040  MVECX:  .ASCIZ  /VEC: /
    (2)  005344  040520  051523  051505  MPASSX: .ASCIZ  /PASSES: /
    (2)  005355     105  051122  051117  MERRX:  .ASCIZ  /ERRORS: /
    (2)  005366  042524  052123  047040  MTSTN:  .ASCIZ  /TEST NO: /
    (2)  005400  000052                  MASTEK: .ASCIZ  /*/
    (2)  005402  051777  052105  051440  MNEW:   .ASCIZ  <377>/SET SWITCH REG TO DV11'S DESIRED ACTIVE./
    (2)  005454  041520  020072     000  MERRPC: .ASCIZ  /PC: /
    (2)  005461     377  040515  020120  XHEAD:  .ASCIZ  <377>/MAP OF DV11 STATUS/<377>
    (2)                                  .EVEN
    (2)  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               MDATA:  0
 1500            005666               .=.+40
```

```
1501
1502                                            ;
1503                                            ;ROUTINE USED TO "CYCLE" THROUGH UP TO EIGHT DV11'S
1504                                            ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
1505                                            ;AND RUNS THE SPECIFIED DV11'S.   THIS ROUTINE *MUST*
1506                                            ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
1507                                            ;SETUP NECESSARY.
1508                                            ;
1509
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[illegible]          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    ,MCRLF
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
```

```
                                ;CONTROL STATUS REGISTER BIT FUNCTIONS

               000020           BUSY=20         ;LINE SCANNER RUNNING
               000040           SCNENA=40       ;LINE SCANNER ENABLE
               000100           INTENA=100      ;INTERRUPT ENABLE
               000200           DONE=200        ;SCANNER DONE
               000400           STEP=400        ;CAUSES LINE COUNTER TO BE INCREMENTED BY 1 COUNT
               001000           MAINT=1000      ;FORCES 1S TO INPUT OF SCRATCH PAD MEMORY
               002000           CLRMUX=2000     ;CLEAR MULTIPLEXER FUNCTION FLIPFLOPS
               004000           CLRSCN=4000     ;CLEARS SCANNER SCRATCHPAD MEMORY
               010000           SECRXF=10000    ;SECONDARY RECEIVE TRANSITION WAS DETECTED BY SCANNER
               020000           CSF=20000       ;CLEAR TO SEND TRANSITION WAS DETECTED BY SCANNER
               040000           COF=40000       ;CARRIER TRANSITION WAS DETECTED BY SCANNER
               100000           RINGF=100000    ;RING SIGNAL WAS DETECTED BY SCANNER

                                ;LINE REGISTER BIT FUNCTIONS

               000001           LINENA=BIT0     ;=1, RECOGNIZE TRANSITIONS ON THIS LINE
               000010           SECTX=10        ;=1, SEND SECONDARY TRANSMIT TO MODEM
               000020           SECRX=20        ;=1, SECONDARY RECEIVE TURNED ON BY MODEM
               000002           TRMRDY=BIT1     ;=1, SEND TERMINAL READY TO MODEM
               000004           RS=BIT2         ;=1, SEND REQUEST TO SEND TO MODEM
               000010           NS=BIT3         ;=1,  NEW SYNC LEAD.
               000020           DSR=BIT4        ;=1, DATA SET READY.
               000040           CS=BIT5         ;=1, CLEAR TO SEND TURNED ON BY MODEM
               000100           CO=BIT6         ;=1, CARRIER TURNED ON BY MODEM
               000200           RING=BIT7       ;=1, RING TURNED ON BY MODEM

       007256  000000           TURFLG: 0
       007260  000000           LINE:   0
       007262  000000           POINTER:        0
       007264  000000           CHAR:   0
       007266  000000           COUNT:  0
       007270  000000           SELECT: 0
       007272  000000           EXERCISE:       0
       007274  000000           TOTAL:  0
       007276  000001           MC.CSR: .BLKW 1
       007300  000001           MC.LSR: .BLKW 1
       007302  000300           MC.VEC: 300             ;DEFAULT VECTOR!!
       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):  XXXXXXXXXXXXXXX
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                    ;*****************************************************************
```

```
1847                                        ;  TEST 1
1848                                        ;--------------
1849  007306  012737  000001  001226  TST1:  MOV   #1,TSTNO
1850  007314  012737  010766  001216         MOV   #TST2,NEXT
1851  007322  005037  177776               CLR   PS                ;CLEAR CPU STATUS
1852  007326  013737  001362  007276         MOV   DVSCR,MC.CSR      ;GET MODEM CSR
1853  007334  062737  000020  007276         ADD   #20,MC.CSR        ;IT HAS TO BE 20(8) MORE THAN DVSCR.
1854  007342  013737  007276  007300         MOV   MC.CSR,MC.LSR     ;GET MODEM LSR
1855  007350  062737  000002  007300         ADD   #2,MC.LSR         ;MUST BE 2 MORE THAN CSR
1856  007356  012737  010274  000060         MOV   #KBISR,@#60       ;SET KEYBOARD INTERUPT VEC
1857  007364  012737  000340  000062         MOV   #340,@#62         ;SET LEV TO 7
1858  007372  012777  000100  171604         MOV   #100,@TKCSR       ;SET INTERUPT ENABLE
1859  007400  012737  000340  177776         MOV   #340,PS           ;LOCK OUT TTY
1860  007406  005737  000042               TST   @#42
1861  007412  001020                       BNE   44$
1862  007414  104402  023247         1$:   TYPE   ,MTURN
1863  007420  004737  023334               JSR   PC,TKRDY
1864  007424  122737  000101  001272       CMPB  #101,SAVR5
1865  007432  001004                       BNE   70$
1866  007434  012737  000377  007256       MOV   #377,TURFLG
1867  007442  000412                       BR    71$
1868  007444  122737  000102  001272  70$: CMPB  #102,SAVR5
1869  007452  001360                       BNE   1$
1870  007454  005037  007256         44$:  CLR   TURFLG
1871  007460  012737  000001  007270       MOV   #1,SELECT
1872  007466  000523                       BR    68$
1873  007470  032777  000100  171504  71$: BIT   #SW06,@SWR
1874  007476  001421                       BEQ   72$
1875          007500                 MAR18=.
1876  007500  104403  022240               INSTR ,MSING
1877  007504  104405                       PARAM
1878  007506  000000                       00
1879  007510  000017                       17
1880  007512  007260                       LINE
1881  007514     000     001               .BYTE 0,1
1882  007516  012737  000001  007270       MOV   #1,SELECT
1883  007524  005337  007260         74$:  DEC   LINE
1884  007530  100502                       BMI   68$
1885  007532  000241                       CLC
1886  007534  006137  007270               ROL   SELECT
1887  007540  000771                       BR    74$
1888  007542  104402  022125         72$:  TYPE   ,MSEL              ;ASK FOR LINES
1889  007546  013737  007270  001252       MOV   SELECT,TEMP3      ;GET PREVIOUS LINE SELECT
1890  007554  005037  007270               CLR   SELECT            ;MAKE IT 0
1891  007560  105777  171420         2$:   TSTB  @TKCSR            ;READY?
1892  007564  100375                       BPL   2$                ;BR IF NO
1893  007566  017700  171414               MOV   @TKDBR,R0         ;READ CHAR
1894  007572  010077  171414               MOV   R0,@TPDBR         ;ECHO CHAR
1895  007576  042700  177600               BIC   #^C<177>,R0       ;STRIP ALL BUT DATA
1896  007602  022700  000123               CMP   #123,R0           ;WAS IT "S(AME)"
1897  007606  001004                       BNE   .+12              ;BR IF NO
1898  007610  013737  001252  007270       MOV   TEMP3,SELECT      ;RESTORE PREVIOUS LINES SELECTED
1899  007616  000415                       BR    4$                ;GO ON
1900  007620  022700  000015               CMP   #15,R0            ;WAS IT "<CR>"
1901  007624  001412                       BEQ   4$                ;BR IF YES
1902  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$:    CLR     @#PS            ;HE SELECTED
1915  007700  006005                  5$:     ROR     R5              ;
1916  007702  103002                          BCC     6$              ;
1917  007704  104411  023420                  CNVRT   ,XXLIN          ;
1918  007710  005237  001266          6$:     INC     $AVR3           ;
1919  007714  022737  000020  001266          CMP     #16.,SAVR3      ;
1920  007722  001366                          BNE     5$              ;
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  104402  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,@V.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
```

```
1959  010142  000177  171046                    JMP     @RETURN
1960  010146  012737  010326  007262            MOV     #TABLE,POINTER  ;
1961  010154  117737  177102  007266            MOVB    @POINTER,COUNT  ;
1962  010162  005237  007262          4$:       INC     POINTER         ;
1963  010166  117737  177070  007264            MOVB    @POINTER,CHAR
1964  010174  005237  007262                    INC     POINTER         ;
1965  010200  013737  007270  007272  3$:       MOV     SELECT,EXERCISE ;
1966  010206  012737  000020  007260            MOV     #20,LINE        ;
1967  010214  000722                            BR      TESTER          ;
1968  010216  012737  010766  001214  2$:       MOV     #TST2,RETURN    ;
1969  010224  013737  001214  001216            MOV     RETURN,NEXT     ;
1970  010232  005046                            CLR     -(SP)           ;SET FOR FAKE INTR
1971  010234  012746  010270                    MOV     #5$,-(SP)       ;SET FAKE PC OF INTR
1972  010240  032777  004000  170736            BIT     #BIT11,@TKCSR   ;TTY ACTIVE?
1973  010246  001374                            BNE     .-6             ;YES WAIT TILL DONE.
1974  010250  017746  170732                    MOV     @TKDBR,-(SP)
1975  010254  042716  000200                    BIC     #BIT7,(SP)      ;CLEAR PARITY
1976  010260  122726  000001                    CMPB    #1,(SP)+        ;WAS ↑A (CHANGE LINES) HIT?
1977  010264  001403                            BEQ     KBISR           ;BR IF YES
1978  010266  022626                            CMP     (SP)+,(SP)+     ;BR TO KBISR NOT TAKEN
1979                                                                    ;POP FAKE INTR OFF STACK
1980  010270  000177  170720          5$:       JMP     @RETURN         ;
1981
1982  010274  010046                  KBISR:    MOV     R0,-(SP)        ;
1983  010276  017700  170704                    MOV     @TKDBR,R0       ;SAVE CHAR IN R0
1984  010302  042700  177600                    BIC     #↑C<177>,R0     ;CLEAR ALL BUT DATA
1985  010306  022700  000001                    CMP     #1,R0           ;WAS IT <↑A> (CNTRL A)?
1986  010312  001003                            BNE     1$              ;BR IF NO
1987  010314  012766  007500  000002            MOV     #MAR18,2(SP)    ;SET RETURN
1988  010322  012600                  1$:       MOV     (SP)+,R0        ;RESTORE R0
1989  010324  000002                            RTI                     ;CONT.
1990
1991  010326      001      015      002  TABLE:    .BYTE 1,15,2,12
      010332      010      040      012            .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
      010352      001      015      001            .BYTE 1,15,1,12
      010356      010      040      012            .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
      010376      001      015      001            .BYTE 1,15,1,12
      010402      010      040      002            .BYTE 8.,40,2,105,12.,40,2,116,6,40,2,116,4,40,2,104,6,40,2,104
      010426      001      015      001            .BYTE 1,15,1,12
      010432      010      040      002            .BYTE 8.,40,2,105,12.,40,2,116,6,40,2,116,4,40,2,104,6,40,2,104
      010456      001      015      001            .BYTE 1,15,1,12
      010462      010      040      002            .BYTE 8.,40,2,105,12.,40,4,116,4,40,2,116,4,40,2,104,6,40,2,104
      010506      001      015      001            .BYTE 1,15,1,12
      010512      010      040      002            .BYTE 8.,40,2,105,12.,40,4,116,4,40,2,116,4,40,2,104,6,40,2,104
      010536      001      015      001            .BYTE 1,15,1,12
      010542      010      040      010            .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
      010572      001      015      001            .BYTE 1,15,1,12
      010576      010      040      010            .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
      010626      001      015      001            .BYTE 1,15,1,12
      010632      010      040      002            .BYTE 8.,40,2,105,12.,40,2,116,4,40,4,116,4,40,2,104,6,40,2,104
      010656      001      015      001            .BYTE 1,15,1,12
      010662      010      040      002            .BYTE 8.,40,2,105,12.,40,2,116,4,40,4,116,4,40,2,104,6,40,2,104
      010706      001      015      001            .BYTE 1,15,1,12
      010712      010      040      012            .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
      010732      001      015      001            .BYTE 1,15,1,12
      010736      010      040      012            .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
```

E04


```
010756  001  015  001          .BYTE 1.15,1.12
010762  000  000  000          .BYTE 0.0.0
        010766                  .EVEN
```



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

                                ;  TEST 2
                                ;--------------
001226  TST2:   MOV     #2,TSTNO
001216          MOV     #TST3,NEXT
                TSTB    @TPCSR                  ;WAIT FOR TTY READY
                BPL     .-4                     ;BR IF NOT READY
                RESET                           ;INIT
                CLR     R5
000100  170162  BIS     #100,@TKCSR             ;SET TTY INTERUPT ENABLE
000004          MOV     #1$,@#4                 ;SET FOR NON-EX DEVICE.
000010          MOV     #8.,R2                  ;SET COUNTER
170144  170142  65$:    CMP     @TKCSR,@TKCSR   ;WASTE TIME
170136  170134          CMP     @TKCSR,@TKCSR   ;WASTE TIME
                DEC     R2                      ;DELAY DONE?
                BNE     65$                     ;BR IF NO
                INC     R0                      ;FLASH LIGHTS
007276          MOV     MC.CSR,R3               ;SET MC.CSR POINTER
                MOV     (R3),R4                 ;READ REGISTER
                BEQ     .+4
                HLT     2                       ;CONTROL STATUS NOT CLEARED, ERROR
007300          MOV     MC.LSR,R3               ;SET POINTER
                MOV     (R3),R4                 ;READ MC.LSR
                BEQ     .+4
                HLT     2                       ;LINE STATUS NOT CLEARED, ERROR
000006  000004  MOV     #6,@#4                  ;RESET TRAP CATCHER
                SCOPE                           ;CHECK FOR LOOP
                HLT     5                       ;SHOULD NOT TRAP.
001200  1$:     MOV     #STACK,SP               ;
170070          JMP     @RETURN


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

                ;  TEST 3
                ;--------------
001226  TST3:   MOV     #3,TSTNO
001216          MOV     #TST4,NEXT
007276          MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
000100          MOV     #INTENA,(R3)            ;LOAD FUNCTION
                MOV     (R3),R4                 ;READ RESULTS
177677          BIC     #^C<INTENA>,R4          ;MASK OFF ALL OTHER BITS.
000100          MOV     #INTENA,R5                      ;MAKE R5=GOOD
                CMP     R5,R4                   ;RESULTS OK?
                BEQ     .+4                     ;BR IF YES
                HLT     2                       ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
000100          BIC     #INTENA,R5
000100          BIC     #INTENA,(R3)            ;CLEAR BIT
```

```
011200  011304                          MOV     (R3),R4                 ;READ REGISTER
011202  042704  177677                  BIC     #↑C<INTENA>,R4          ;MASK OFF ALL OTHER BITS.
011206  020504                          CMP     R5,R4                   ;REGISTER OK?
011210  001401                          BEQ     .+4                     ;BR IF YES
011212  104002                          HLT     2                       ;BIT FAILED TO CLEAR
011214  104400                          SCOPE                           ;SCOPE TEST.


                                        ;************************ TEST 4 ******************************
                                        ;*VERIFY THAT "DONE" CAN BE
                                        ;*SET AND CLEARED.
                                        ;;**************************************************************


                                ;  TEST 4
                                ;--------------
011216  012737  000004  001226  TST4:   MOV     #4,TSTNO
011224  012737  011310  001216          MOV     #TST5,NEXT
011232  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
011236  012713  000200                  MOV     #DONE,(R3)              ;LOAD FUNCTION
011242  011304                          MOV     (R3),R4                 ;READ RESULTS
011244  042704  177577                  BIC     #↑C<DONE>,R4            ;MASK OFF ALL OTHER BITS.
011250  012705  000200                  MOV     #DONE,R5                        ;MAKE R5=GOOD
011254  020504                          CMP     R5,R4                   ;RESULTS OK?
011256  001401                          BEQ     .+4                     ;BR IF YES
011260  104002                          HLT     2                       ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
011262  042705  000200                  BIC     #DONE,R5
011266  042713  000200                  BIC     #DONE,(R3)              ;CLEAR BIT
011272  011304                          MOV     (R3),R4                 ;READ REGISTER
011274  042704  177577                  BIC     #↑C<DONE>,R4            ;MASK OFF ALL OTHER BITS.
011300  020504                          CMP     R5,R4                   ;REGISTER OK?
011302  001401                          BEQ     .+4                     ;BR IF YES
011304  104002                          HLT     2                       ;BIT FAILED TO CLEAR
011306  104400                          SCOPE                           ;SCOPE TEST.


                                        ;************************ TEST 5 ******************************
                                        ;*VERIFY THAT "MAINTENANCE MODE" CAN BE
                                        ;*SET AND CLEARED.
                                        ;;**************************************************************


                                ;  TEST 5
                                ;--------------
011310  012737  000005  001226  TST5:   MOV     #5,TSTNO
011316  012737  011402  001216          MOV     #TST6,NEXT
011324  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
011330  012713  001000                  MOV     #MAINT,(R3)             ;LOAD FUNCTION
011334  011304                          MOV     (R3),R4                 ;READ RESULTS
011336  042704  176777                  BIC     #↑C<MAINT>,R4           ;MASK OFF ALL OTHER BITS.
011342  012705  001000                  MOV     #MAINT,R5                       ;MAKE R5=GOOD
011346  020504                          CMP     R5,R4                   ;RESULTS OK?
011350  001401                          BEQ     .+4                     ;BR IF YES
011352  104002                          HLT     2                       ;ERROR. R5=GOOD,R4=BAD,R3=REGISTER
011354  042705  001000                  BIC     #MAINT,R5
011360  042713  001000                  BIC     #MAINT,(R3)             ;CLEAR BIT
011364  011304                          MOV     (R3),R4                 ;READ REGISTER
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  104400                        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  104400                         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
```

```
2228
2229                                    ;********************** TEST 13 ****************************
2230                                    ;*VERIFY THAT NO INTERRUPT OCCURS WITH
2231                                    ;*"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 7.
2232                                    ;:**********************************************************
2233
2234                                ;  TEST 13
2235                                ;--------------
2236  012046  012737  000013  001226 TST13:  MOV     #13,TSTNO
2237  012054  012737  012136  001216         MOV     #TST14,NEXT
2238  012062  005077  175210                 CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
2239  012066  012737  000340  177776         MOV     #340,PS                 ;TO LEVEL 7.
2240  012074  012777  012130  175200         MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
2241  012102  012777  000340  175174         MOV     #340,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
2242  012110  012777  000100  175160         MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
2243  012116  052777  000200  175152         BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
2244  012124  000240                         NOP                             ;DELAY FOR INTERRUPT
2245  012126  000402                         BR      2$                      ;NO INTERRUPT, CONTINUE
2246  012130  022626                 1$:     POP2SP                          ;RESTORE STACK
2247  012132  104003                         HLT     3                       ;INTERRUPT OCCURED, ERROR
2248  012134  104400                 2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
2249
2250                                    ;********************** TEST 14 ****************************
2251                                    ;*VERIFY THAT NO INTERRUPT OCCURS WITH
2252                                    ;*"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 6.
2253                                    ;:**********************************************************
2254
2255                                ;  TEST 14
2256                                ;--------------
2257  012136  012737  000014  001226 TST14:  MOV     #14,TSTNO
2258  012144  012737  012226  001216         MOV     #TST15,NEXT
2259  012152  005077  175120                 CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
2260  012156  012737  000300  177776         MOV     #300,PS                 ;TO LEVEL 6.
2261  012164  012777  012220  175110         MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
2262  012172  012777  000300  175104         MOV     #300,@MC.LVL            ;SET UP INTERRUPT SERVICE LEVEL
2263  012200  012777  000100  175070         MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
2264  012206  052777  000200  175062         BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
2265  012214  000240                         NOP                             ;DELAY FOR INTERRUPT
2266  012216  000402                         BR      2$                      ;NO INTERRUPT, CONTINUE
2267  012220  022626                 1$:     POP2SP                          ;RESTORE STACK
2268  012222  104003                         HLT     3                       ;INTERRUPT OCCURED, ERROR
2269  012224  104400                 2$:     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
```

```
                                        ;********************** TEST 17 ******************************
                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
                                        ;*ENABLE" SET AND "DONE" SET AT PRIORITY 0.
                                        ;:************************************************************

                                ;  TEST 17
                                ;--------------
012406  012737  000017  001226  TST17:  MOV     #17,TSTNO
012414  012737  012474  001216          MOV     #TST20,NEXT
012422  005077  174650                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012426  012777  012470  174646          MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012434  005077  174644                  CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
012440  012737  000000  177776          MOV     #0,PS                   ;SET PROCESSOR PRIORITY TO LEVEL 0.
012446  012777  000100  174622          MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012454  052777  000200  174614          BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012462  000240                          NOP                             ;WAIT FOR INTERRUPT
012464  104004                          HLT     4                       ;NO INTERRUPT, ERROR.
012466  000401                          BR      2$                      ;CONTINUE
012470  022626                  1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
012472  104400                  2$:     SCOPE                           ;CHECK FOR INTERATIONS, LOOP.

                                        ;********************** TEST 20 ******************************
                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
                                        ;*ENABLE" SET AND "DONE" SET AT PRIORITY 1.
                                        ;:************************************************************

                                ;  TEST 20
                                ;--------------
012474  012737  000020  001226  TST20:  MOV     #20,TSTNO
012502  012737  012562  001216          MOV     #TST21,NEXT
012510  005077  174562                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
012514  012777  012556  174560          MOV     #1$,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012522  005077  174556                  CLR     @MC.LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
012526  012737  000040  177776          MOV     #40,PS                  ;SET PROCESSOR PRIORITY TO LEVEL 1.
012534  012777  000100  174534          MOV     #INTENA,@MC.CSR         ;SET INTERRUPT ENABLE
012542  052777  000200  174526          BIS     #DONE,@MC.CSR           ;GENERATE INTERRUPT
012550  000240                          NOP                             ;WAIT FOR INTERRUPT
012552  104004                          HLT     4                       ;NO INTERRUPT, ERROR.
012554  000401                          BR      2$                      ;CONTINUE
012556  022626                  1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
012560  104400                  2$:     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  TST21:  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  TST22:  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$:         SCOP1                           ;CHECK FOR DATA FREEZE
013014  005205                              INC     R5                      ;UPDATE LINE COUNT
013016  005300                              DEC     R0                      ;UPDATE LINE NUMBER
013020  001367                              BNE     1$                      ;CONTINUE
013022  104400                              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  104400                              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$:     BIS     #STEP,(R3)              ;SET LINE COUNTER THRU ALL
013174  005300                  DEC     R0                      ;STATES, WRITING 1'S INTO
013176  001374                  BNE     2$                      ;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$:     SCOP1                           ;CHECK FOR DATA FREEZE
013234  005205                  INC     R5                      ;UPDATE EXPECTED STATUS
013236  005300                  DEC     R0                      ;UPDATE LINE COUNT
013240  001365                  BNE     3$                      ;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                  SCOP1                           ;CHECK FOR DATA FREEZE
013314  005205          7$:     INC     R5                      ;UPDATE EXPECTED DATA
013316  005300                  DEC     R0                      ;UPDATE LINE COUNT
013320  001365                  BNE     6$                      ;CONTTINUE
013322  104400                  SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 26 ********************************
                                        ;*WRITE 1'S INTO SELECTED SCANNER MEMORY LOCATION.
                                        ;*VERIFY THAT ONLY SELECTED LOCATION WAS WRITTEN INTO.
                                        ;;*************************************************************

                                ;  TEST 26
                                ;--------------
                                ;
013324  012737  000026  001226  TST26:  MOV     #26,TSTNO
013332  012737  013506  001216          MOV     #TST27,NEXT
013340  012737  013352  001220          MOV     #1$,LOCK
013346  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER
013352  005013                  1$:     CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
013354  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
013360  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 ADDRESSES
013364  012702  000017                  MOV     #17,R2                  ;FIRST ADDRESS TO BE TESTED=0
013370  012713  004000          2$:     MOV     #CLRSCN,(R3)            ;CLEAR ACANNER MEMORY
013374  032713  000020                  BIT     #BUSY,(R3)              ;WAIT FOR CLEAR CYCLE
013400  001375                          BNE     .-4
013402  012713  001000                  MOV     #MAINT,(R3)             ;SET "MAINTENANCE MODE"
013406  050213                          BIS     R2,(R3)                 ;SET LINE COUNTER TO TEST ADDRESS-1
013410  052713  000400                  BIS     #STEP,(R3)              ;WRITE 1'S INTO TEST ADDRESS
013414  042713  001000                  BIC     #MAINT,(R3)             ;CLEAR "MAINTENANCE MODE"
013420  012737  000020  001252          MOV     #16.,TEMP3              ;SET UP TO TEST ALL 16
013426  012713  000017                  MOV     #17,(R3)                ;SCANNER MEMORY LOCATIONS
013432  005202                          INC     R2
013434  005001                          CLR     R1
013436  052713  000400          3$:     BIS     #STEP,(R3)              ;ACCESS SCANNER MEMORY
013442  104414                          DELAY
013444  111304                          MOVB    (R3),R4                 ;READ CONPENTS OF MEMORY
013446  010105                          MOV     R1,R5                   ;SET UP EXPECTED CONTENTS
013450  120402                          CMPB    R4,R2                   ;OF SCANNER MEMORY
013452  001002                          BNE     4$
013454  052705  070000                  BIS     #70000,R5
013460  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND RECEIVED
013462  001402                          BEQ     5$                      ;VALUES
013464  104002                          HLT     2                       ;SCANNER MEMORY ERROR
013466  104401                          SCOP1                           ;CHECK FOR DATA FREEZE
013470  005201                  5$:     INC     R1
013472  005337  001252                  DEC     TEMP3                   ;TEST NEXT SCANNEB LOCATION
013476  001357                          BNE     3$
013500  005300                          DEC     R0                      ;UPDATE LINE COUNT
013502  001332                          BNE     2$
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                         SCOP1                           ;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$:    MOV     #17,@MC.LSR             ;WRITE 1S INTO  ALL MULTIPLEXER
013740  052713  000400                 BIS     #STEP,(R3)              ;FUNCTION FLIPFLOPS
013744  005300                         DEC     R0
013746  001371                         BNE     2$
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                  1$:     CLR     (R3)                    ;CLEAR CONTROL REGISTER
014104  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
014110  012700  000020                  MOV     #16.,R0                 ;SET UP TO WRITE 1'S INTO
014114  012713  001017                  MOV     #MAINT+17,(R3)          ;ALL SCANNER MEMORY LOCATION
014120  052713  000400          2$:     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"+"COF"+"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
```

```
                                        ;************************ TEST 32 *******************************
                                        ;*WRITE 1'S INTO ALL MULTIPLEXER FUNCTION FLIP-FLOPS
                                        ;*CLEAR SCANNER MEMORY
                                        ;*VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE
                                        ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                        ;*************************************************************

                                ;  TEST 32
                                ;--------------
014302  012737  000032  001226  TST32:  MOV     #32,TSTNO
014310  012737  014646  001216          MOV     #TST33,NEXT
014316  012737  014434  001220          MOV     #1$,LOCK
014324  005000                          CLR     R0
014326  005737  001416                  TST     L00.03
014332  100402                          BMI     68$
014334  062700  000004                  ADD     #4,R0
014340  005737  001420          68$:    TST     L04.07
014344  100402                          BMI     69$
014346  062700  000004                  ADD     #4,R0
014352  005737  001422          69$:    TST     L08.11
014356  100402                          BMI     70$
014360  062700  000004                  ADD     #4,R0
014364  005737  001424          70$:    TST     L12.15
014370  100402                          BMI     71$
014372  062700  000004                  ADD     #4,R0
014376  005700                  71$:    TST     R0
014400  001001                          BNE     .+4
014402  000000                          HALT                    ;TEST CAN NOT RUN WITH NO LINE CARDS!!
014404  010037  007274                  MOV     R0,TOTAL
014410  005737  007256                  TST     TURFLG
014414  001405                          BEQ     65$
014416  013737  001216  001214          MOV     NEXT,RETURN
014424  000177  164564                  JMP     @RETURN
014430  013703  007276          65$:    MOV     MC.CSR,R3               ;SET POINTER
014434  012700  000020          1$:     MOV     #16.,R0                 ;WRITE 1S INTO ALL
014440  012713  002000                  MOV     #CLRMUX,(R3)            ;CLEAR MULTIPLEXER
014444  005013                          CLR     (R3)                    ;MULTIPLEXER FUNCTION
014446  005037  177776                  CLR     PS                      ;ENABLE TELETYPE INTERRUPTS
014452  012777  000017  172620  2$:     MOV     #17,@MC.LSR             ;FLIPFLOPS
014460  052713  000400                  BIS     #STEP,(R3)
014464  005300                          DEC     R0
014466  001371                          BNE     2$
014470  012713  004000                  MOV     #CLRSCN,(R3)            ;CLEAR SCANNER MEMORY
014474  032713  000020                  BIT     #BUSY,(R3)              ;WAIT FOR CLEAR CYCLE TO COMPLETE
014500  001375                          BNE     .-4
014502  013700  007274                  MOV     TOTAL,R0
014506  012705  170340                  MOV     #170340,R5              ;FIRST EXPECTED RESULT
014512  012777  014616  172562          MOV     #4$,@MC.VEC             ;SET UP LOCAL INTERRUPT RETURN
014520  013777  177776  172556          MOV     PS,@MC.LVL
014526  012713  000117                  MOV     #INTENA+17,(R3)         ;SET INTERRUPT ENABLE
014532  012737  000340  177776  3$:     MOV     #340,PS                 ;LOCK OUT INTERRUPTS
014540  052713  000040                  BIS     #SCNENA,(R3)            ;START SCANNER
014544  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
014550  005037  001270                  CLR     SAVR4
014554  105713                          TSTB    (R3)                    ;WAIT FOR DONE
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  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
2761                                    ;************************ TEST 33 ******************************
2762                                    ;*VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
2763                                    ;*BE SET AND CLEARED FOR SELECTED LINE
2764                                    ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
2765                                    ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
2766                                    ;*************************************************** ***************
2767
2768                                    ;  TEST 33
2769                                    ;--------------
2770  014646  012737  000033  001226  TST33:  MOV     #33,TSTNO
2771  014654  012737  015046  001216          MOV     #TST34,NEXT
2772  014662  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
2773  014666  001005                          BNE     1$                      ;BR IF H325
2774  014670  013737  001216  001214          MOV     NEXT,RETURN
2775  014676  000177  164312                  JMP     @RETURN
2776  014702  005077  172370          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
2777  014706  005037  177776                  CLR     PS                      ;ZERO PSW.
2778  014712  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
2779  014716  012777  002000  172352  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
2780  014724  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
2781  014730  010177  172342                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
2782  014734  012777  000001  172336          MOV     #LINENA,@MC.LSR         ;SET LINE ENABLE FUNCTION FLIP-FLOP
2783  014742  005077  172330                  CLR     @MC.CSR                 ;ZERO CSR
2784  014746  005005                  3$:     CLR     R5                      ;SET EXPECTED
2785  014750  017704  172324                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
2786  014754  117703  172316                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
2787  014760  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
2788  014764  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
2789  014766  001002                          BNE     4$                      ;EXCEPT LINE ENABLE FUNCTION FLIP FLOP
2790  014770  012705  000001                  MOV     #LINENA,R5              ;SET "GOOD"
2791                                                                          ;TO BE SET
2792  014774  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
2793  014776  001401                          BEQ     5$                      ;RESULTS
2794  015000  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
2795  015002  052777  000400  172266  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
2796  015010  005302                          DEC     R2                      ;ALL LINES DONE?
2797  015012  001355                          BNE     3$                      ;BR IF NO
2798  015014  005005                          CLR     R5                      ;CLEAR "GOOD"
2799  015016  010177  172254          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
2800  015022  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
2801  015024  005077  172250                  CLR     @MC.LSR                 ;CLEAR LINE ENABLE FLIP FLOP
2802  015030  104414                          DELAY                           ;DELAY FOR CABLE
2803  015032  017704  172242                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
2804  015036  005704                          TST     R4                      ;WAS LINE ENABLE FUNCTION FLIP FLOP
2805  015040  001401                          BEQ     .+4                     ;CLEARED
2806  015042  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
2807  015044  104400                  7$:     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  015246  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     NEXT,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
```

```
                                        ;************************ TEST 36 ******************************
                                        ;*VERIFY THAT NEW SYNC (SECTX IF ASYNC LC) 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 36
                                ;--------------
015446  012737  000036  001226  TST36:  MOV     #36,TSTNO
015454  012737  015646  001216          MOV     #TST37,NEXT
015462  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
015466  001005                          BNE     1$                      ;BR IF H325
015470  013737  001216  001214          MOV     NEXT,RETURN
015476  000177  163512                  JMP     @RETURN
015502  005077  171570          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
015506  005037  177776                  CLR     PS                      ;ZERO PSW.
015512  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
015516  012777  002000  171552  2$:     MOV     #CLRMUX,@MC.CSR         ;CLEAR MUX
015524  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
015530  010177  171542                  MOV     R1,@MC.CSR              ;SELECT LINE TO BE TESTED
015534  012777  000010  171536          MOV     #NS,@MC.LSR             ;SET NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP-
015542  005077  171530                  CLR     @MC.CSR                 ;ZERO CSR
015546  005005                  3$:     CLR     R5                      ;SET EXPECTED
015550  017704  171524                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
015554  117703  171516                  MOVB    @MC.CSR,R3              ;READ CONTROL STATUS REGISTER
015560  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
015564  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
015566  001002                          BNE     4$                      ;EXCEPT NEW SYNC (SECTX IF ASYNC LC) FUNCTION FL
015570  012705  000010                  MOV     #NS,R5          ;SET "GOOD"
                                                                        ;TO BE SET
015574  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
015576  001401                          BEQ     5$                      ;RESULTS
015600  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015602  052777  000400  171466  5$:     BIS     #STEP,@MC.CSR           ;EXAMINE NEXT LINE
015610  005302                          DEC     R2                      ;ALL LINES DONE?
015612  001355                          BNE     3$                      ;BR IF NO
015614  005005                          CLR     R5                      ;CLEAR "GOOD"
015616  010177  171454          6$:     MOV     R1,@MC.CSR              ;LOAD LINE
015622  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
015624  005077  171450                  CLR     @MC.LSR                 ;CLEAR NEW SYNC (SECTX IF ASYNC LC) FLIP FLOP
015630  104414                          DELAY                           ;DELAY FOR CABLE
015632  017704  171442                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
015636  005704                          TST     R4                      ;WAS NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP
015640  001401                          BEQ     .+4                     ;CLEARED
015642  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015644  104400                  7$:     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+CO+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$:     MOV     R1,R3                   ;ON SELECTED LINE
016212  010177  171060                  MOV     R1,@MC.CSR              ;SELECT LINE
016216  042777  000004  171054          BIC     #RS,@MC.LSR             ;CLEAR REQUEST TO SEND
016224  104414                          DELAY                           ;DELAY FOR CABLE
016226  017704  171046                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016232  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
016234  001401                          BEQ     .+4                     ;SET ON THIS LINE
016236  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016240  104400                  7$:     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
                                ;--------------
016440  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$:     CLR     @MC.CSR                 ;CLEAR CONTROL STATUS REGISTER
016500  005037  177776                  CLR     PS                      ;ZERO PSW.
016504  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
016510  005001                          CLR     R1
016512  012737  016520  001220          MOV     #2$,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$:     MOV     R1,@MC.CSR              ;LOAD LINE
016630  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
016632  005077  170442                  CLR     @MC.LSR                 ;CLEAR LINE ENABLE FLIP FLOP
016636  104414                          DELAY                           ;DELAY FOR CABLE
016640  017704  170434                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016644  005704                          TST     R4                      ;WAS LINE ENABLE FUNCTION FLIP FLOP
016646  001401                          BEQ     .+4                     ;CLEARED
016650  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016652  104401                          SCOP1
016654  005201                          INC     R1
016656  005300                          DEC     R0
016660  001317                          BNE     2$
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 H861 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  167564  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
```

```
                                        ;********************** TEST 47 ******************************
                                        ;*VERIFY THAT RING IS SET IF "LINE ENABLE"
                                        ;*AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
                                        ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;*************************************************************

                                ;  TEST 47
                                ;--------------
020002  012737  000047  001226  TST47:  MOV     #47,TSTNO
020010  012737  020224  001216          MOV     #TST50,NEXT
020016  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
020022  001405                          BEQ     1$                      ;BR IF H861
020024  013737  001216  001214          MOV     NEXT,RETURN
020032  000177  161156                  JMP     @RETURN
020036  005077  167234          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
020042  005037  177776                  CLR     PS                      ;ZERO PSW
020046  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
020052  005001                          CLR     R1
020054  012737  020062  001220          MOV     #2$,LOCK
020062  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
020066  010177  167204                  MOV     R1,@MC.CSR              ;SELECT A LINE
020072  012777  000005  167200          MOV     #LINENA+RS,@MC.LSR      ;SET LINE ENABLE +RS
020100  005077  167172                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
020104  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
020106  017704  167166                  MOV     @MC.LSR,R4              ;READ LINE STATUS
020112  117703  167160                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
020116  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
020122  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
020124  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
020126  012705  000205                  MOV     #LINENA+RS+RING,R5
                                                                        ;RING IS SET
020132  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
020134  001401                          BEQ     5$                      ;RECEIVED RESULTS
020136  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
020140  052777  000400  167130  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
020146  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
020150  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
020152  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
020156  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
020160  010177  167112                  MOV     R1,@MC.CSR              ;SELECT LINE
020164  042777  000004  167106          BIC     #RS,@MC.LSR             ;CLEAR REQUEST TO SEND
020172  104414                          DELAY                           ;DELAY FOR CABLE
020174  017704  167100                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
020200  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
020202  001401                          BEQ     .+4                     ;SET ON THIS LINE
020204  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
020206  104401                          SCOP1
020210  005201                          INC     R1
020212  005077  167062                  CLR     @MC.LSR
020216  005300                          DEC     R0
020220  001320                          BNE     2$
020222  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

```
                                        ;************************ TEST 50 ******************************
                                        ;*VERIFY THAT SECONDARY RECEIVE IS SET IF "LINE ENABLE"
                                        ;*AND SECONDARY TRANSMIT ARE SET FOR SELECTED LINE.
                                        ;*THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
                                        ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
                                        ;:*************************************************************

                                ;  TEST 50
                                ;--------------
020224  012737  000050  001226  TST50:  MOV     #50,TSTNO
020232  012737  020446  001216          MOV     #TST51,NEXT
020240  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
020244  001405                          BEQ     1$                      ;BR IF H861
020246  013737  001216  001214          MOV     NEXT,RETURN
020254  000177  160734                  JMP     @RETURN
020260  005077  167012          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
020264  005037  177776                  CLR     PS                      ;ZERO PSW
020270  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
020274  005001                          CLR     R1
020276  012737  020304  001220          MOV     #2$,LOCK
020304  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
020310  010177  166762                  MOV     R1,@MC.CSR              ;SELECT A LINE
020314  012777  000011  166756          MOV     #LINENA+SECTX,@MC.LSR   ;SET LINE ENABLE +SECTX
020322  005077  166750                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
020326  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
020330  017704  166744                  MOV     @MC.LSR,R4              ;READ LINE STATUS
020334  117703  166736                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
020340  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
020344  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
020346  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
020350  012705  000031                  MOV     #LINENA+SECTX+SECRX,R5
                                                                        ;SECONDARY RECEIVE IS SET
020354  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
020356  001401                          BEQ     5$                      ;RECEIVED RESULTS
020360  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
020362  052777  000400  166706  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
020370  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
020372  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
020374  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
020400  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
020402  010177  166670                  MOV     R1,@MC.CSR              ;SELECT LINE
020406  042777  000010  166664          BIC     #SECTX,@MC.LSR          ;CLEAR SECONDARY TRANSMIT
020414  104414                          DELAY                           ;DELAY FOR CABLE
020416  017704  166656                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
020422  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
020424  001401                          BEQ     .+4                     ;SET ON THIS LINE
020426  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
020430  104401                          SCOP1
020432  005201                          INC     R1
020434  005077  166640                  CLR     @MC.LSR
020440  005300                          DEC     R0
020442  001320                          BNE     2$
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          66$:        INSTR   ,MXSY1A
 3663  021500  104405                              PARAM
 3664  021502  000001                              001
 3665  021504  000376                              376
 3666  021506  001256                              TEMP5
 3667  021510     000     001                      .BYTE   0,1
 3668  021512  113710  001256                      MOVB    TEMP5,(R0)
 3669  021516  104403  022667                      INSTR   ,MXSY1B
 3670  021522  104405                              PARAM
 3671  021524  000001                              001
 3672  021526  000376                              376
 3673  021530  001256                              TEMP5
 3674  021532     000     001                      .BYTE   0,1
 3675  021534  113760  001256  000002              MOVB    TEMP5,2(R0)
 3676  021542  104402  022731                      TYPE    ,MXBITS
 3677  021546  004737  023334                      JSR     PC,TKRDY
 3678  021552  042737  177770  001272              BIC     #^C<7>,SAVR5
 3679  021560  032737  000007  001272  3$:         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$:       TST     (SP)+
       023416  000207                            RTS     PC
       023420  000001                  XXLIN:    1
 3718  023422     002      001                   .BYTE   2,1
 3719  023424  001266                            SAVR3
 3720
 3721  023426                          CKBIT15:
 3722  023426  010046                            MOV     R0,-(SP)
 3723  023430  005000                            CLR     R0
 3724  023432  005777  155732          64$:      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
```

```
023452  000207                                    RTS     PC
023454  010046                          SETREG:  MOV     R0,-(SP)
023456  010146                                   MOV     R1,-(SP)
023460  112500                                   MOVB    (R5)+,R0
023462  112501                                   MOVB    (R5)+,R1
023464  110077  155704                           MOVB    R0,@DVSRSH
023470  012577  155702                           MOV     (R5)+,@DVSRA
023474  042777  000060  155660                   BIC     #BIT5+BIT4,@DVSCR
023502  110177  155666                           MOVB    R1,@DVSRSH
023506  012577  155664                           MOV     (R5)+,@DVSRA
023512  012601                                   MOV     (SP)+,R1
023514  012600                                   MOV     (SP)+,R0
023516  000205                                   EXIT

023520                                  LOAD.MODE:
023520  012577  155644                           MOV     (R5)+,@DVLCR
023524  052777  100000  155636                   BIS     #BIT15,@DVLCR
023532  010046                                   MOV     R0,-(SP)
023534  005000                                   CLR     R0
023536  005777  155626                  1$:      TST     @DVLCR
023542  100004                                   BPL     2$
023544  104414                                   DELAY
023546  005200                                   INC     R0
023550  001372                                   BNE     1$
023552  104000                                   HLT     0                   ;BIT 15 FAILED TO CLEAR
023554  012600                          2$:      MOV     (SP)+,R0
023556  000205                                   EXIT
023560  000001                          SYNC:    .BLKW 1
023562  000400                          TXBAP:   .BLKB   400
024162  000400                          TXTAB:   .BLKB   400
024562  000400                          RXBA:    .BLKB   400
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
025620     006     004                           .BYTE 6,4
025622  001272                                   SAVR5
025624     006     001                           .BYTE   6,1
025626  001270                                   SAVR4
025630     002     004                           .BYTE   2,4
025632  007260                                   LINE
025634     006     001                           .BYTE   6,1
025636  001362                                   DVSCR
025640     006     001                           .BYTE 6,1
025642  007276                                   MC.CSR
025644  000003                          DT2:     3
025646     006     004                           .BYTE   6,4
025650  001272                                   SAVR5
025652     006     001                           .BYTE   6,1
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#   1412    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    3738
BIT6  = 000100           593#   1723    1764    3548    3717
BIT7  = 000200           592#   1046    1293    1450    1471    1723    1765    1975    3717
BIT8  = 000400           591#   1412    1429
BIT9  = 001000           590#   1412    1723    1728    3564
BRB   = 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    2826    2873    2920    3110    3164    3218    3272
CLRSCN= 004000          1748#   2484    2516    2725
CNVRT = 104411           737#   1004    1006    1008    1010    1330    1332    1388    1445    1917    3623    3642
CO    = 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          1319*   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    2306
                        2327    2348    2369    2390    2678    2756
```

DZDVEB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

```
DSR    = 000020            1762*   3072
DT1      025616            3762*   3783    3786
DT2      025644            3773*   3787
DVACTV   001300             693*    960*    961    1510    1515    1689*   1695*   1696*   1700    1719    3704*   3708*   3709*
                           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    1928    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           870#
DV05.D  001664           872#
DV06.A  001674           877#
DV06.B  001700           879#
DV06.C  001704           881#
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          1856    1977    1982#
LIGHT   000174           638#    930
LIGHTS  001200           649#    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*    998*   1050*   1304    1306*   1390*
```

```
LOO.03  001416          783#  1536*  1571  2696  3509
LO4.07  001420          784#  1538*  1576  2699  3507
LO8.11  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*  2238*  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*  2988*  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#   934
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= 022626            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*   2924*
                        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*
RESO5  = 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    2869*
                        2869    2915*   2916    2963*   2964    3010*   3011    3057*   3058    3103*   3104    3157*   3158
                        3211*   3212    3265*   3266    3320*   3321    3374*   3375    3428*   3429    3494*   3495
```

DZDVEB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

```
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*  2498*
                        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*  3282   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
```

```
                    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
SVOS    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    3758#
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       789#    1539*
```

```
SYNC2C  001432            790#   1541*
SYNC2D  001434            791#   1543*
SYND00  001522            918#
SYND01  001546            929#
SYND02  001572            940#
SYND03  001616            951#
SYND04  001642            962#
SYND05  001666            973#
SYND06  001712            984#
SYND07  001736            995#
S.CA    =  050000         605#
TABLE   010336           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*   2583*   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    1458    1858*   1891    1972    2006*   2009    2010    3717
TKDBR   001206            656#   1045    1057     1116   1122    1292    1449    1470    1893    1974    1983    3717
TKRDY   023334           1863    3615    3645     3655   3677    3685    3691    3717#
TLAST   =  020446        1616    3787#
TOTAL   007274           1774#   2711*   2728     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             668#   917*   1369     1396   1601    1608    1610    1849*   2000*   2036*   2063*   2090*   2117*
                          2143*  2171*   2192*    2213*  2236*   2257*   2278*   2299*   2320*   2341*   2362*   2383*   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    2864#
TST36   015446          2865    2911#
TST37   015646          2912    2959#
TST4    011216          2037    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#
TST5    011310          2064    2090#
TST50   020224          3371    3424#
TST51   020446          3425    3490#   3787
TST6    011402          2091    2117#
TST7    011474          2118    2143#
TTST    002702           982*    983*    985*    986*   1053#
TURFLG  007256          1767#   1866*   1870*   2712    2772    2819    2866    2913    2961    3008    3055    3101    3155
                        3209    3263    3318    3372    3426    3492
TWOSYN= 010000           609#
TXBAP   023562          3523    3535    3589    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
                        1110    1127    1220    1257    1324    1325    1328    1329    1331    1333    1337    1342    1387
                        1444    1446    1474    1512    1595    1613    1618    1702    1962    1888    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#
WRKO.F  004254          1335    1339#
XBX     004060          1298    1300    1302#
XCSR    002604          1004    1026#
XERR    002626          1010    1035#
XFR   = 030000           603#
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#   2274#   2292#
                        2295#   2313#   2316#   2334#   2337#   2355#   2358#   2376#   2379#   2396#   2399#   2422#   2425#
                        2449#   2455#   2501#   2504#   2544#   2548#   2588#   2591#   2629#   2633#   2683#   2689#   2761#
                        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#   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    2406#
                        2430    2432#   2460    2462#   2509    2511#   2553    2555#   2596    2598#   2638    2640#   2693
                        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
                      2088   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   3151
                      3155#  3198   3205   3209#  3252   3259   3263#  3307   3314   3318#  3361   3368   3372#
                      3415   3422   3426#  3468   3488   3492#  3787#
$Y     = 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#   990#   991#   892#   893#   894#   895#   959    1048   1295   1377   1386
                      1400   1438#  1448   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   3353
                      3406   3460   3555   3605   3606#  3608#  3648   3688   3694   3702   3711   3717   3759#
                      3759#  3760#  3761#
.BEGIN 002332          975#
.CNVRT 003542          738    1221#
.CONVR 003536          736    1220#
.DATAC 004576          748    1426#
.DELAY 004476          744    1397#
.EOP   002436          997#   1958
.ERRTA 025662         1316    3780#
.HLT   004002          627    1289#
.INSTE 003224          728    1127#
.INSTR 003120          726    1106#
.INST1 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#
.ROMCL 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          718#   1282
.TYPE  003044          724    1090#
```

```
DVEND        1#     991
DVFRNT       1#     529
HLT        583#    1435    2017    2021    2024    2045    2052    2072    2079    2039    2106    2126    2133    2152    2161
          2182     2203    2223    2247    2268    2289    2310    2329    2350    2371    2392    2415    2443    2478    2496
          2536     2580    2614    2621    2666    2669    2676    2744    2747    2754    2794    2806    2841    2853    2880
          2900     2936    2947    2982    2994    3029    3041    3076    3088    3126    3138    3190    3192    3234    3246
          3288     3300    3341    3353    3395    3407    3449    3461    3579    3586    3597    3729    3755
INTS.     1991#    2312    2333    2354    2375
MUXS1      529#    2761    2808    2855    2902    3090    3144    3198    3252
MUXS2      529#    2949    2996    3043    3306    3360    3414
NOINT     1992#    2226    2249    2270    2291
$BUFFE       1#    1492
$CK15        1#
$CK150       1#    3721
$CLR.T       1#
$CYCLE       1#    1501
$EGOLF    2028#    2055    2082    2109
$EOP         1#     991
$FINI        1#    3787
$GETFL       1#
$GETPA       1#    1596
$HEADE       1#     529
$MSG         1#    1486
$PFAIL       1#    1370
$RAMCL       1#    1397
$RXSHI       1#
$SCOPE       1#    1038
$SETLI       1#
$SETSC       1#
$SETSY       1#
$SET.T       1#
$SILOI       1#
$SIMBC       1#
$TRPDE       1#     719     721     723     725     727     729     731     733     735     737     739     741     743     745
           747
$TSTN        1#    1847    1998    2034    2061    2088    2115    2141    2169    2190    2211    2234    2255    2276    2297
          2318     2339    2360    2381    2401    2427    2467    2506    2550    2593    2635    2690    2768    2815    2862
          2909     2957    3004    3051    3097    3151    3205    3259    3314    3368    3422    3488
$TXSHI       1#
$VARIA       1#     645
$XZ          1#    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
          2588     2591    2629    2633    2683    2688    2761    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
```

F08


```
ADCB    1519    1527
ADD      946    1092    1109    1180    1227    1237    1282    1313    1316    1412    1520    1529    1550    1552    1558
        1560    1562    1565    1567    1569    1685    1730    1853    1855    1938    2664    2698    2701    2704    2707
        2742    3521    3681
ASL     1159    1160    1161    1280    1312    1314    1947
BCC     1432    1721    1916
BCS     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    2805
        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    3688    3694    3717
BGT     1154    1465
BHI     1170    3702
BIC      962    1046    1236    1281    1293    1315    1450    1466    1471    1624    1728    1733    1895    1975    1984
        2041    2046    2047    2049    2068    2073    2074    2076    2095    2100    2101    2103    2122    2127    2138
        2130    2153    2158    2522    2678    2756    2787    2834    2881    2928    2975    2989    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    2285    2306    2327    2348    2369    2390    2438    2466    2467    2473
        2490    2520    2521    2527    2533    2562    2566    2571    2577    2603    2617    2646    2656    2722    2734
        2795    2842    2889    2936    2983    3030    3077    3127    3181    3235    3289    3342    3396    3450    3582
        3649    3689    3695    3747
BISB    1156
BIT      950     979    1052    1059    1080    1093    1297    1302    1356    1358    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    3653
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    1522
        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    2419
        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    3563    3661    3683
        3717
CLC     1239    1241    1243    1457    1517    1525    1694    1885    3707
CLR      910     915     916     924     953     967     998    1050    1067    1068    1147    1384    1390    1411    1428
        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    2366    2385
        2387    2407    2408    2409    2433    2434    2435    2464    2488    2512    2513    2526    2556    2557    2570
        2599    2600    2606    2611    2624    2642    2643    2657    2658    2695    2719    2720    2735    2736    2775
```

DZDVEB.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

```
        2777  2783  2784  2798  2801  2823  2824  2830  2831  2845  2848  2870  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  3660
        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  1605
        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  2468  2481  2498  2539
        2541  2563  2583  2585  2604  2625  2648  2680  2723  2758  2796  2843  2890  2937  2984
        3031  3078  3128  3141  3182  3195  3236  3249  3290  3303  3343  3357  3397  3411  3451
        3465  3598
DECB    1011  1181  1249  1254  3710
EMT      583
HALT     621   954   958   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  2480  2497  2525  2538  2569  2582  2616  2623  2679  2757  3140  3194
        3248  3302  3355  3409  3463  3572  3577  3682  3697  3727  3753
INCB    1644  1682  1696  3514  3527  3700  3709
JMP      643   990  1025  1073  1284  1362  1393  1621  1701  1959  1980  2026  2715  2775  2822
        2869  2916  2964  3011  3058  3104  3158  3212  3266  3321  3375  3429  3495  3607  3703
JSR      938  1019  1049  1296  1574  1579  1584  1589  1863  3615  3645  3655  3677  3685  3691
MOV      906   907   908   913   917   918   922   923   925   930   931   932   933   940   941
         964   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
        1183  1184  1195  1199  1200  1201  1202  1203  1204  1209  1210  1211  1212  1213  1214
        1221  1222  1223  1224  1225  1226  1228  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  1578  1581  1582  1583  1586  1587  1588
        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  1958  1960
        1965  1966  1968  1969  1971  1974  1982  1983  1987  1988  2000  2001  2007  2008  2014
        2015  2018  2019  2022  2025  2036  2037  2038  2039  2040  2042  2048  2063  2064  2065
        2066  2067  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  2192  2193  2194  2196  2197  2213  2214  2215  2217  2218  2219  2236  2237  2239
        2240  2241  2242  2257  2258  2260  2261  2262  2263  2278  2279  2281  2282  2283  2284
        2299  2300  2302  2303  2304  2305  2320  2321  2323  2325  2326  2341  2342  2344  2346
        2347  2362  2363  2365  2367  2368  2383  2384  2386  2388  2389  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  2508  2509  2510  2511  2514
```

CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

```
                2515    2516    2519    2523    2524    2530    2552    2553    2554    2555    2558    2559    2560    2561    2565
                2567    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
                2673    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    3118
                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
NOP              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             715     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    1891    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     949     850     951     853     954
                 855     856     857     858     859     960     861     862     864     865     866     867     968     869     970
                 871     872     873     875     876     877     878     879     880     881     882     883     994     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    1881    1935    1991    3534    3539    3543
```

```
                3547    3551    3558    3629    3636    3667    3674    3718    3763    3765    3767    3769    3771    3774    3776
                3778
.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    2456
                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    2956    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
.EVEN            698     709    1479    1485    1486    1491    1991    3717    3762
.IF             1850    1992    1996    2001    2029    2032    2037    2056    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
                2086    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    2258
                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
                2589    2591    2596    2597    2630    2633    2638    2639    2684    2688    2693    2694    2762    2766    2771
                2772    2774    2779    2807    2809    2813    2818    2819    2821    2826    2854    2855    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    2589
                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    3318
                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    2812    2819
                2219    2829    2858    2859    2865    2866    2876    2905    2906    2912    2913    2923    2953    2954    2960
```

```
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
                 809    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    2818    2855    2862    2865    2902    2909    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    2083
                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    2083
                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)
```

K08

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

[redacted] Date 14-Oct-76 16:16:54 Monitor IPC-D [103] [redacted]