DUP11

DUP11 CONFIDENCE TST

CZDPEB0

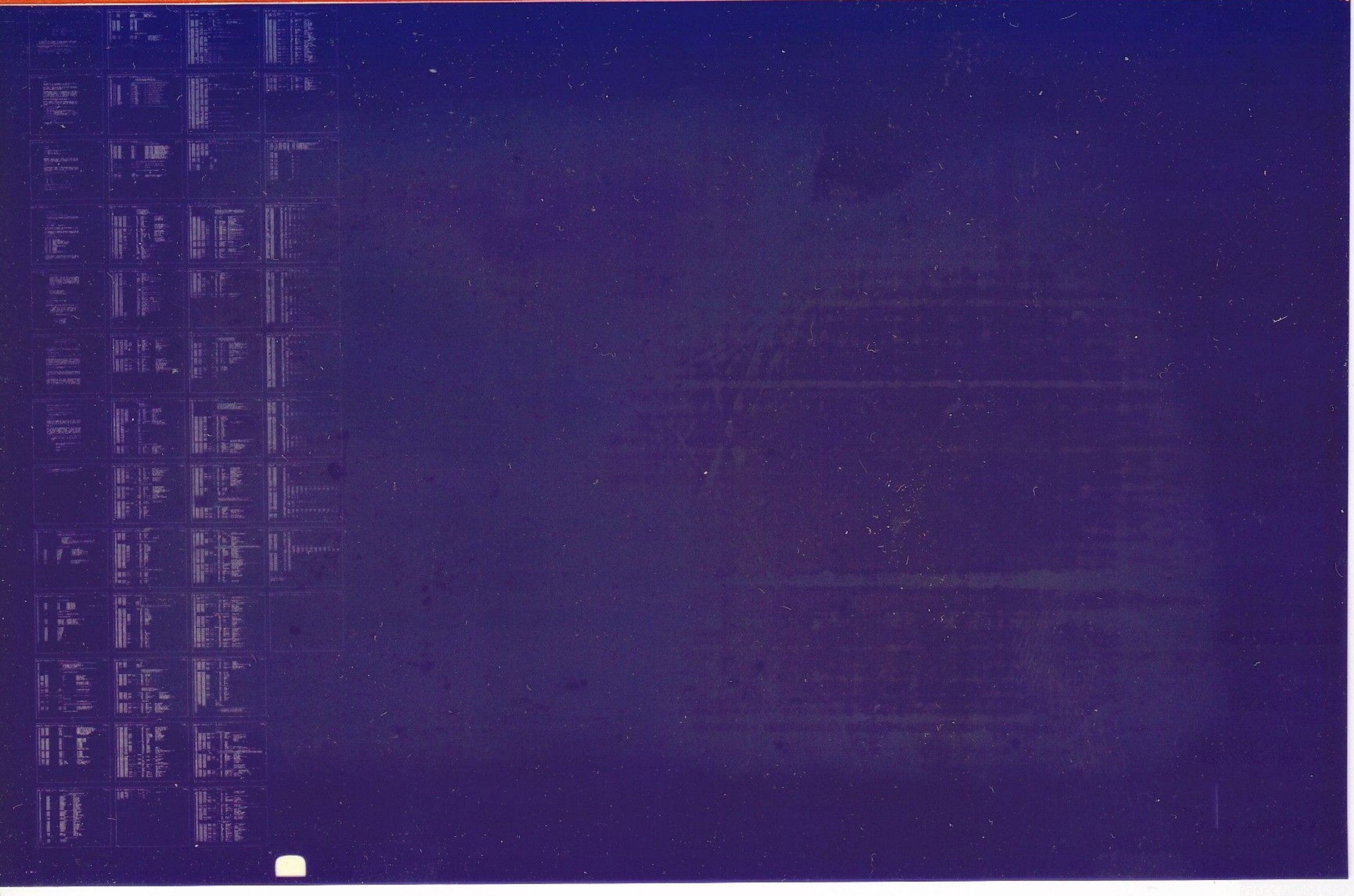
AH-8589B-MC

FICHE 1 OF 1

SEP 1979

digital

MADE IN USA



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.REM @
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IDENTIFICATION

PRODUCT CODE: AC-8588B-MC

PRODUCT NAME: CZDPEB0 DUP11 CONFIDENCE TST

DATE: JANUARY 1979

MAINTAINER: DIAGNOSTICS

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1.0 ABSTRACT

THE FUNCTION OF THE PROGRAM IS TO PROVIDE A LEVEL OF CONFIDENCE IN THE OPERATION OF THE DUP-11 WITHOUT CHANGING JUMPERS OR SWITCHES FROM CUSTOMER CONFIGURATION.

THE OPTION IS TESTED IN SDLC MODE (BIT-STUFFING), THEN IN DEC MODE USING A SIMULATED DDCMP-LINE PROTOCOL WITH AN IMBEDDED CRC CHARACTER. BOTH OF THESE MODES WILL BE TESTED OVER A CABLE IF A TURNAROUND IS POSSIBLE.

THE MODEM CONTROL LEADS WILL ALSO BE TESTED, IF THE H325 TURN-AROUND CONNECTOR IS USED. THE DETERMINATION OF WHAT WILL BE TESTED IS DONE BY ANSWERING A "PARAMETER DIALOG" (LOAD ADDRESS 200, START ADDRESS 0 OR 1.) ALL QUESTIONS MUST BE ANSWERED. IF AN ERROR SHOULD OCCUR, A TYPEOUT WILL EXPLAIN THE FUNCTIONAL AREA OF THE DEVICE WHICH FAILED. TO REPAIR THE OPTION, THE DIAGNOSTICS WILL HAVE TO BE RUN.

ADDITIONALLY THE MODEM DATA LEADS MAY NOW BE TESTED IF A MO-DEM HAS THE ANALOG LOOPBACK FEATURE ENABLED.

CURRENTLY THERE ARE THREE OFF-LINE DIAGNOSTICS THAT ARE TO BE RUN IN SEQUENCE TO ENSURE THAT IF AN ERROR SHOULD OCCUR IT WILL BE DETECTED AT AN EARLY STAGE AND ESTABLISH THAT DIAGNOSIS OF THE ERROR WILL BE IMMEDIATE TO DISCOVERING THE PROBLEM.

NOTE: ADDITIONAL DIAGNOSTICS MAY BE ADDED IN THE FUTURE.

THE THREE DIAGNOSTICS ARE:

1.1 CZDPB [REV] BASIC AND OFFLINE TRANSMITTER TESTS.
1.2 CZDPC [REV] OFFLINE RECEIVER TESTS, MODEM CONTROL AND INTERRUPT TESTS
1.3 CZDPD [REV] OFFLINE SDLC DATA AND FUNCTION OFFLINE DECMODE DATA AND FUNCTION TESTS
1.4 CZDPO [REV] DP11 OVERLAY FOR INTERPROCESSOR TEST PROGRAM

NOTE: THE FOURTH TAPE IS:

1.5 CZDPE [REV] THIS CONFIDENCE TEST.

NOTE

CZDPE WILL ONLY TEST ONE DUP11 AT A TIME. IF TESTING OF ANOTHER DUP11 IS DESIRED, RESTART AT 200 AND ENTER NEW PARAMETERS.

2.0 REQUIREMENTS

2.1 EQUIPMENT

2.1.1. ANY PDP11 FAMILY CPU (WITH MINIMUM 4K MEMORY)
2.1.2. ASR 33 (OR EQUILIVALENT)
2.1.3. DUP11
2.1.4. H325 TEST CONNECTOR
2.1.5. MODEM WITH ANALOG LOOPBACK FEATURE

2.2 STORAGE

PROGRAM WILL USE ALL 4K OF MEMORY EXCEPT WHERE ABS AND BOOTSTRAP LOADER RESIDE. LOCATION 1500 THRU 1560 ARE ESPECIALLY TO BE NOTED AND LEFT UNTOUCHED BY THE OPERATOR AFTER THE DUP11 PARAMETER DIALOG HAS BEEN EXECUTED OR AFTER THE DEFAULT SETUP HAS BEEN DONE.

3.0 LOADING PROCEDURE

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)

4.0 STARTING PROCEEDURE

A. SET SWITCH REGISTER TO 000200

B. DEPRESS 'LOAD ADDRESS' KEY AND RELEASE

C. LEAVE SWR BIT 7=1 TO USE EXISTING PARAMETERS PREVIOUSLY SET UP BY THE DUP11 PARAMETER DIALOG. WHENEVER PROGRAM IS STARTED AT ADR 200 WITH SWR BIT7=0, NEW PARAMETERS MUST BE LOADED.

'EXAMPLE'

'MAP OF DUP11 STATUS'

1500	160050	CSR OF DUP11
1502	000300	VECTOR OF DUP11

THE ABOVE IS ONLY AN EXAMPLE! THIS WOULD INDICATE THE STATUS TABLE STARTING AT ADDRESS 1500 IN THE PROGRAM. THE STATUS TABLE MUST BE VERIFIED BY THE USER.

IT IS POSSIBLE FOR THE OPERATOR TO MANUALLY CHANGE (TOGGLE IN) THE INFORMATION IN THE MAP TO SUIT A SPECIFIC CONFIGURATION, BUT THE RESPONSIBILITY FOR VERIFYING THAT INFORMATION RESTS WITH THE OPERATOR.

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

4.1 CONTROL SWITCH SETTINGS

SW 15	SET:	HALT ON ERROR
SW 14	SET:	LOOP ON CURRENT TEST
SW 13	SET:	INHIBIT ERROR PRINT OUT
SW 12	SET:	INHIBIT TYPE OUT/BELL ON ERROR.
SW 11	SET:	INHIBIT ITERATIONS. (QUICK PASS)
SW 10	SET:	ESCAPE TO NEXT TEST ON ERROR
SW 09	SET:	RESERVED
SW 08	SET:	CATCH ERROR AND LOOP ON IT
SW 07	SET:	USE PREVIOUS STATUS TABLE.
SW 06	SET:	RESERVED
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:	RESERVED

SWITCHES 8 THROUGH 15 ARE DYNAMIC AND SHOULD BE USED AS NEEDED IN THE DIAGNOSTIC. SWITCHES 0 THROUGH 2 ARE STATIC (ONLY ARE OPERABLE WHEN THE MONITOR PORTION OF THE TAPE IS RUNNING) AND SHOULD BE SET UP PRIOR TO STARTING OR RESTARTING THE DIAGNOSTIC.

4.1.2 SWITCH REGISTER RESTRICTIONS

SW 01 RESTART PROGRAM AT SELECTED TEST. IT IS STRONGLY SUGGESTED THAT AT LEAST ONE PASS HAS BEEN MADE BEFORE TRYING TO SELECT A TEST THAT IS NOT IN THE ORDER OF SEQUENCE. THE REASON FOR THIS IS THAT THE PROGRAM HAS TO CLEAR AREAS AND SET UP PARAMETERS IN THE MONITOR PORTION OF THE PROGRAM. IT IS POSSIBLE TO LD200, AND RAISE SW01, THEN START, PROVIDED PARAMETERS HAVE BEEN PREVIOUSLY SET UP AS DESCRIBED IN SECTION 4.0. ALSO, WHEN A TEST IS SELECTED, ALWAYS START AT THE VERY BEGINNING OF THAT TEST.

4.1.3 SWITCH REGISTER PRIORITIES

A) 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).

B) SCOPE SWITCHES

1. SW 14 - LOOP ON TEST. WILL LOOP ON TEST UNTIL SWITCH IS LOWERED.

2. SW 11 - INHIBIT ITERATIONS (QUICK PASS). ALLOWS ONLY ONE PASS THROUGH A TEST.

4.2 STARTING ADDRESS

STARTING ADDRESS IS AT 000200. THERE ARE NO OTHER STARTING ADDRESSES FOR THE DUP11 DIAGNOSTICS OR THIS EXERCISER.

NOTE: IF ADDRESS 000042 IS NON-ZERO THE PROGRAM ASSUMES IT IS UNDER ACT11 OR XXDP CONTROL AND WILL ACT ACCORDINGLY. AFTER DUP11 IS TESTED, THE PROGRAM WILL RETURN TO 'XXDP' OR 'ACT-11'. ALSO, UNDER ''ACT11'' OR 'XXDP'' CONTROL THE FOLLOWING DEFAULT PARAMETERS ARE ASSUMED:

4.2.1. ALL JUMPERS ARE ASSUMED TO BE IN THE FOLLOWING CONFIGURATION:

		IN	OUT
W1 =	SEC REC ENABLE	X	
W2 =	SEC REC DISABLE		X
W3 -	CLEAR OPTION	X	
W4 =	SEE TX ENABLE	X	
W5 =	DSC A CONTROL		X
W6 =	A+B DS CONTROL	X	
W7 -	BUS GRANT CONTROL	X	

4.2.2. H325 TEST CONNECTOR IS ASSUMED TO BE ON.

4.2.3. THE MANUFACTURING OPTION CSR 160050 AND VECTOR OF 770 ARE USED.

4.2.4. THE BR LEVEL IS ASSUMED TO BE 5.

5.0 OPERATING PROCEDURE

WHEN THE PROGRAM IS INITIALLY STARTED MESSAGES AS DESCRIBED IN SECTION FOUR WILL BE PRINTED AND PROGRAM WILL BEGIN RUNNING THE DIAGNOSTIC.

5.1 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

1. HALT ON ERROR (VIA SW 15=1) WHENEVER AN ERROR OCCURS.
2. CLEAR SW 15.

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. IN THIS WAY THE EXACT FUNCTIONING OF THE TEST CAN BE INTERPRETED SINCE THE ERROR PC IS THE HLT+2 LOCATION.

AT THIS POINT IT IS RECOMMENDED THAT THE NORMAL DIAGNOSTICS BE RUN TO ISOLATE THE ERROR CONDITION.

6.0 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). ADDITIONAL INFORMATION WILL BE SUPPLIED TO THE ERROR MESSAGE WHICH IS TO GIVE THE OPERATOR AN INDICATION OF THE ERROR.

6.1 ERROR RECOVERY

IF FOR SOME REASON THE DUP11 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' FOR THE NUMBER OF THE TEST THAT WAS RUNNING AT THE TIME OF THE CATASTROPHIC ERROR. THIS GIVES THE OPERATOR SOME IDEA AS TO WHAT THE DUP11 WAS DOING AT THE TIME OF THE ERROR.

7.0 RESTRICTIONS

7.1 STARTING RESTRICTIONS

SEE SECTION 4 (PLEASE). STATUS TABLE SHOULD BE VERIFIED REGARDLESS OF HOW THE PROGRAM WAS STARTED.

7.2 OPERATING RESTRICTIONS

DUP11 PARAMETER DIALOG MUST BE ANSWERED BEFORE RUNNING THIS PROGRAM.

1. ANSWER THE COMPLETE PARAMETER DIALOG AGAIN.

2. TOGGLE IN THE NEW CSR AT 1500 AND THE VECTOR AT 1502, THEN RESTART THE PROGRAM WITH SW07=1.

8.0 MISCELLANEOUS

8.1 EXECUTION TIME

ALL DUP11 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' UNTIL ALL DUP11'S IN SYSTEM ARE TESTED. WHEN THE DIAGNOSTIC HAS COMPLETED A PASS WITH THE NORMAL ITERATION COUNT (ICOUNT=50), THE FOLLOWING IS AN EXAMPLE OF THE PRINT OUT TO BE EXPECTED.

END PASS CZDPB? CSR:160050 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.

8.3 KEY LOCATIONS

RETURN	CONTAINS THE ADDRESS WHERE PROGRAM WILL RETURN WHEN ITERATION COUNT IS REACHED OR IF LOOP ON TEST IS ASSERTED.
NEXT	CONTAINS THE ADDRESS OF THE NEXT TEST TO BE PERFORMED.
TSTNO	CONTAINS THE NUMBER OF THE TEST NOW BEING PEFORMED.

NOTE

IT SHOULD BE REMEMBERED THAT CZDPE IS NOT A DIAGNOSTIC , BUT
I' IS A CONFIDENCE TEST DESIGNED TO EVALUATE ONLY THAT THE
DEVICE IS OPERATIONAL. IF THERE IS A FAILURE, THE DUP11 DAGNOSTICS
WILL HAVE TO BE RUN FOR SPECIFIC FAULT DETECTION.

```
                        ;*CZDPEB0 /<377>/DUP11 CONFIDENCE TST
                        ;*COPYRIGHT 1975, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                        ;*-------------------------------------------------------------

                                ;STARTING PROCEDURE
                                ;LOAD PROGRAM
                                ;LOAD ADDRESS 000200
                                ;PRESS START
                                ;PROGRAM WILL TYPE ''CZDPEB0 /<377>/DUP11 CONFIDENCE TST ''
                                ;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
000100                  SW06=100
000040                  SW05=40
000020                  SW04=20
000010                  SW03=10                 ;SELECT DUP'S DESIRED ACTIVE
                                                ;NOTE:THIS MUST NOT EXCEED ORIGINAL COUNT
000004                  SW02=4                  ;LOCK ON TEST SELECT
000002                  SW01=2                  ;RESTART PROGRAM AT SELECTED TEST
000001                  SW 00=1                 ;ENTER PARAMETERS
```

```
                        ;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
001150                  STACK=1150      ;START OF PROCESSOR STACK

                        ;INSTRUCTION DEFINITIONS
                        ;-----------------------

005746                  PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
005726                  POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
010046                  PUSHR0=10046    ;SAVE R0 ON STACK
012600                  POPR0=12600     ;RESTORE R0 FROM STACK
024646                  PUSH2SP=24646   ;DECREMENT STACK TWICE
022626                  POP2SP=22626    ;INCREMENT STACK TWICE
                        .EQUIV  EMT,HLT ;BASIC DEFINITION OF ERROR CALL


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
```

```
                                ;:*****************************************************************************
                                ;-----------------------------------------------------------------------------
                                        ;TRAPCATCHER 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  004312                          .PFAIL                  ;POWER FAIL HANDLER
000026  000340                          340                     ;SERVICE AT LEVEL 7
000030  003730                          .HLT                    ;ERROR HANDLER
000032  000340                          340                     ;SERVICE AT LEVEL 7
000034  003676                          .TRPSRV                 ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                          340                     ;SERVICE AT LEVEL 7
            000040              .=40
000040  000000                          0                       ;SAVE FOR ACT-11 OR DDP2
000042  000000                          0                       ;RETURN ADDRESS IF UNDER ACT-11 OR DDP2
000044  000000                          0                       ;SAVE FOR ACT-11 OR DDP2
000046  002464                          $ENDAD                  ;FOR USE WITH ACT-11 OR DDP2
            000052              .=52
000052  000000                          0                       ;ACT-11 PROGRAM CHARACTERISTICS

            000174              .=174
000174  000000                  DISPREG:        0               ;SOFTWARE DISPLAY REGISTER
000176  000000                  SWREG:  0                       ;SOFTWARE SWITCH REGISTER
            000200              .=200
000200  000137  001510                  JMP     .START          ;GO TO START OF PROGRAM

            001000              .=1000
001000  005377  055103  050104  MTITLE: .ASCIZ  <377><12>/CZDPEB0 /<377>/DUP11 CONFIDENCE TST /<377>
(2)
            001200              .=1200
                                        ;SWR AND LIGHTS
                                        ;--------------

001200  177570                  DISPLAY:        177570          ;11/45 CONSOLE LIGHTS
001202  177570                  SWR:    177570                  ;INDIRECT POINTER TO SWITCH REGISTER

                                        ;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
                                        ;--------------------------
```

```
   518  001214  000000                RETURN: 0                       ;SCOPE ADDRESS FOR LOOP ON TEST
   519  001216  000000                NEXT:   0                       ;ADDRESS OF NEXT TEST TO BE EXECUTED
   520  001220  000000                LOCK:   0                       ;ADDRESS FOR LOCK ON CURRENT DATA
   521  001222  000001                ICOUNT: 1                       ;NUMBER OF ITERATIONS THAT CURRENT TEST WILL BE EXECUTED
   522  001224  000000                LPCNT:  0                       ;NUMBER OF ITEREATIONS COMPLETED
   523  001226  000000                TSTNO:  0                       ;NUMBER OF TEST IN PROGRESS
   524  001230  000000                PASCNT: 0                       ;NUMBER OF PASSES COMPLETED
   525  001232  000000                ERRCNT: 0                       ;TOTAL NUMBER OF ERRORS
   526  001234  000000                LSTERR: 0                       ;PC OF LAST ERROR CALL
   527                                        ;PROGRAM VARIABLES
   528                                        ;----------------
   529
   530  001236  000000                TEMP1:  0                       ;TEMPORARY STORAGE
   531  001240  000000                TEMP2:  0                       ;TEMPORARY STORAGE
   532  001242  000000                TEMP3:  0                       ;TEMPORARY STORAGE
   533  001244  000000                TEMP4:  0                       ;TEMPORARY STORAGE
   534  001246  000000                TEMP5:  0                       ;TEMPORARY STORAGE
   535  001250  000000                SAVR0:  0                       ;R0 STORAGE
   536  001252  000000                SAVR1:  0                       ;R1 STORAGE
   537  001254  000000                SAVR2:  0                       ;R2 STORAGE
   538  001256  000000                SAVR3:  0                       ;R3 STORAGE
   539  001260  000000                SAVR4:  0                       ;R4 STORAGE
   540  001262  000000                SAVR5:  0                       ;R5 STORAGE
   541  001264  000000                SAVSP:  0                       ;STACK POINTER STORAGE
   542  001266  000000                SAVPC:  0                       ;PROGRAM COUNTER STORAGE
   543
   544  001270  000000                SAVR0A: 0                       ;R0 STORAGE
   545  001272  000000                SAVR1A: 0                       ;R1 STORAGE
   546  001274  000000                SAVR2A: 0                       ;R2 STORAGE
   547  001276  000000                SAVR3A: 0                       ;R3 STORAGE
   548  001300  000000                SAVR4A: 0                       ;R4 STORAGE
   549  001302  000000                SAVR5A: 0                       ;R5 STORAGE
   550  001304  000000                SAVSPA: 0                       ;STACK POINTER STORAGE
   551  001306  000000                SAVPCA: 0                       ;PROGRAM COUNTER STORAGE
   552
   553  001310  000005                REPEAT: 5                       ;REPEAT CTSDLY
   554  001312  177777                CTSDLY: -1                      ;CTS DELAY
   555  001314  100000                DELAY:  100000                  ;DELAY FOR DATA LEAD TESTS
   556  001316  000001                DUPACTV: .BLKB  1               ;DUP11'S SELECTED ACTIVE.
   557  001317  000001                DUPNUM: .BLKB   1               ;OCTAL NUMBER OF DUP11'S.
   558  001320  000001                SAVNUM: .BLKB   1               ;WORKABLE NUMBER.
   559          001322                .EVEN
```

```
                                        ;CONTROL REGISTER DEFINITIONS
                                        ;----------------------------
                                ;RXCSR BIT DEFINITIONS
100000                  DSCA=BIT15              ;DATA SET CHANGE A
040000                  RING=BIT14              ;RING
020000                  CTS=BIT13               ;CLR TO SEND
010000                  CARDET=BIT12            ;CARRIER DETECT
004000                  RECACT=BIT11            ;REC ACTIVE
002000                  SRD=BIT10               ;SEC REC DATA
001000                  DSR=BIT9                ;DATA SET RDY
000400                  STPSYN=BIT8             ;STRIP SYNC
000200                  RXDONE=BIT7             ;REC DONE
000100                  RINTEN=BIT6             ;REC INTR ENABLE
000040                  DSINTE=BIT5             ;DSC INTR ENABLE
000020                  RCVEN=BIT4              ;REC ENABLE
000010                  STD=BIT3                ;SEC XMIT DATA
000004                  RTS=BIT2                ;REQ TO SEND
000002                  DTR=BIT1                ;DATA TERM RDY
000001                  DSCB=BIT0               ;DATA SET CHANGE B
                                ;RXDBUF BIT DEFINITIONS
100000                  RXDERR=BIT15            ;REC DATA ERROR
040000                  OVRRUN=BIT14            ;OVERRUN ERROR
010000                  CRCERR=BIT12            ;CRC ERROR
002000                  RABORT=BIT10            ;REC ABORT
001000                  REOM=BIT9               ;REC END OF MESSAGE
000400                  RSOM=BIT8               ;REC STAPT OF MESSAGE
                                ;PARCSR BIT DEFINITIONS
100000                  DECMOD=BIT15            ;DEC MODE (DDCMP)
001000                  CRCEN=BIT9              ;CRC ENABLE
010000                  PRISEC=BIT12            ;PRI/SEC SELECT
                                ;TXCSR BIT DEFINITIONS
100000                  TXDLAT=BIT15            ;TX DATA LATE
040000                  MTDATA=BIT14            ;MAINT DATA OUT
020000                  CLK=BIT13               ;CLK
010000                  MMODEB=BIT12            ;MAINT MODE B
004000                  MMODEA=BIT11            ;MAINT MODE A
002000                  BITW=BIT10              ;BIT WINDOW INPUT
001000                  TXACT=BIT9              ;TX ACTIVE
000400                  MRESET=BIT8             ;MASTER RESET
000200                  TXDONE=BIT7             ;XMIT DONE
000100                  TXINTE=BIT6             ;XMIT DONE INTR ENABLE
000020                  SEND=BIT4               ;SEND
000010                  HDXEN=BIT3              ;HDX/FDX
                                ;TXCSR WRD DEFINITIONS
000000                  USER=0                  ;USER MODE
014000                  MMODE=14000             ;MAINT INT MODE
010000                  MEXT=10000              ;MAINT EXT MODE
004000                  SYSTST=4000             ;SYSTEM TEST MODE

                                ;TXDBUF BIT DEFINITIONS
                                ;----------------------
100000                  RCRC7T=BIT15
040000                  RCRCIN=BIT14
020000                  TCRC7T=BIT13
010000                  TCRCIN=BIT12
```

```
                004000                  TIMER=BIT11             ;MAINTENANCE TIMER
                002000                  TABORT=BIT10            ;TRANSMIT ABORT
                001000                  TEOM=BIT9               ;TRANSMIT END OF MESSAGE
                000400                  TSOM=BIT8               ;TRANSMIT START OF MESSAGE

                                        ;MISC. PROGRAM DEFINITIONS
                                        ;------------------------
001322  000000                          PRIRTY:.WORD 0
001324  000001                          TCNFLG: .BLKB 1
001325  000001                          OPCLRJ: .BLKB 1
001326  000000                          DATA:   .WORD   0
001330  000000                          SHIFTS: .WORD   0
001332  000000                          MIND:   .WORD   0
001334  000000                          FLAG:   .WORD   0
001336  000001                          STJMFL: .BLKW 1
001340  000001                          SRJMFL: .BLKW 1
001342  000000                          MDMFLG: .WORD   0
001344  000000                          ALJMFL: .WORD   0
001346  000000                          DSCFLG: .WORD   0

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

001350      000                         INIFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG
001351      000                         ERRFLG: .BYTE   0               ;ERROR OCCURED FLAG
001352      000                         LOKFLG: .BYTE   0               ;LOCK ON CURRENT TEST FLAG
001353      000                         QV.FLG: .BYTE   0               ;QUICK VERIFY FLAG.
                                                                        ;ON FIRST PASS OF EACH DUP11 ITERATIONS
                                                                        ;WILL BE SUPPRESSED
                                        .EVEN
```

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

001354                                  ;;**********************************************************************
                                        ;----------------------------------------------------------------------
001354                                  .TRPTAB:
        104400                          SCOPE=TRAP+0            ;CALL TO SCOPE LOOP AND ITERATION HANDLER
001354  002540                                  .SCOPE
        104401                          SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
001356  002672                                  .SCOP1
        104402                          TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
001360  002716                                  .TYPE
        104403                          INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
001362  002772                                  .INSTR
        104404                          INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
001364  003076                                  .INSTER
        104405                          PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
001366  003116                                  .PARAM
        104406                          SAV05=TRAP+6            ;CALL TO REGISTER SAVE ROUTINE
001370  003316                                  .SAV05
        104407                          RES05=TRAP+7            ;CALL TO REGISTER RESTORE ROUTINE
001372  003356                                  .RES05
        104410                          CONVRT=TRAP+10          ;CALL TO DATA OUTPUT ROUTINE
001374  003410                                  .CONVRT
        104411                          CNVRT=TRAP+11           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR/LF.
001376  003414                                  .CNVRT
        104412                          SETFLG=TRAP+12          ;CALL TO TELETYPE INPUT ROUTINE
001400  003622                                  .SETFLG

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

```
                                        ;DUP11 VECTOR AND REGISTER INDIRECT POINTERS

001402  000000                DUPRVC: 0               ;POINTER TO DUP11 RECEIVER INTERRUPT VECTOR
001404  000000                DUPRPS: 0               ;POINTER TO DUP11 RECEIVER INTERRUPT SERVICE PS
001406  000000                DUPTVC: 0               ;POINTER TO DUP11 TRANSMITTER INTERRUPT VECTOR
001410  000000                DUPTPS: 0               ;POINTER TO DUP11 TRANSMITTER INTERRUPT SERVICE PS
001412  000000                RXCSR: 0                ;POINTER TO DUP11 RECEIVER STATUS REGISTER
001414  000000                RXDBUF: 0               ;POINTER TO DUP11 RECEIVER DATA BUFFER
001416  000000                PARCSR: 0               ;POINTER TO DUP11 PARAMETER STATUS REGISTER
001420  000000                TXCSR: 0                ;POINTER TO DUP11 TRANSMITTER STATUS REGISTER
001422  000000                TXDBUF: 0               ;POINTER TO DUP11 TRANSMITTER DATA BUFFER
001424  000000                DUPSEC: 0               ;POINTER TO DUP11 SECONDARY REGISTER SELECT REGISTER
001426  000000                HUPPSR: 0               ;POINTER TO PARAMETER STATUS HIGH BYTE
001430  000000                HUPRBF: 0               ;POINTER TO RECEIVER BUFFER HIGH BYTE
001432  000000                HUPRCR: 0               ;POINTER TO RECEIVER CONTROL REG HIGH BYTE
001434  000000                HUPTBF: 0               ;POINTER TO TRANSMITTER BUFFER HIGH BYTE
001436  000000                HUPTCR: 0               ;POINTER TO TRANSMITTER CONTROL REG HIGH BYTE


                                        ;DUP11 CONTROL INDICATORS FOR CURRENT DUP11 UNDER TEST
                                        ;-----------------------------------------------

001440      000               MASK.A: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK

001441      010               CLK.A:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR

001442  000000                L00.00: 000000          ;PARAMETERS


                                        ;DUP11 STATUS TABLE AND ADDRESS ASSIGNMENTS
                                        ;-----------------------------------------

        001500                  .=1500
001500                          DUP.MAP:
001500  000001                  DUPCR0: .BLKW 1         ;CONTROL STATUS REGISTER FOR DUP11 NUMBER 0
001502  000001                  DUPTR0: .BLKW 1         ;VECTOR "A" FOR DUP11 NUMBER 0
001504  000001                  DUP0.A: .BLKW 1         ;PARAMETER  FOR DUP11 NUMBER 0

001506  000000                  DUP.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

001510  012737  000340  177776  .START: MOV     #340,PS                 ;LOCK OUT INTERRUPTS
001516  012706  001150                  MOV     #STACK,SP               ;SET UP STACK
001522  012737  004312  000024          MOV     #.PFAIL,@#24            ;SET UP POWER FAIL VECTOR
001530  005037  001230                  CLR     PASCNT                  ;CLEAR PASS COUNT
001534  105037  001351                  CLRB    ERRFLG                  ;CLEAR ERROR FLAG
001540  105037  001353                  CLRB    QV.FLG                  ;ZERO QUICK VERIFY FLAG
001544  105037  001317                  CLRB    DUPNUM
001550  105037  001320                  CLRB    SAVNUM
001554  105037  001316                  CLRB    DUPACTV
001560  005037  001232                  CLR     ERRCNT                  ;CLEAR ERROR COUNT
001564  005037  001234                  CLR     LSTERR                  ;CLEAR LAST ERROR POINTER
001570  012737  000001  001226          MOV     #1,TSTNO                ;SET UP FOR TEST 1
001576  012737  001510  001214          MOV     #.START,RETURN          ;SET UP FOR POWER FAIL BEFORE
                                                                        ;TESTING STARTS
001604  013746  000006                  MOV     @#6,-(SP)               ;SAVE CURRENT VECTORS
001610  013746  000004                  MOV     @#4,-(SP)               ;
001614  012737  001630  000004          MOV     #12$,@#4                ;SETUP FOR TIMEOUT
001622  005777  177354                  TST     @SWR                    ;REFERENCE HARDWARE SWITCH REG
001626  000407                          BR      13$                     ;BR IF IT EXISTS
001630  012737  000176  001202  12$:    MOV     #SWREG,SWR              ;POINT TO SOFT SWR
001636  012737  000174  001200          MOV     #DISPREG,DISPLAY        ;POINT TO SOFT DISPLAY REG
001644  022626                          CMP     (SP)+,(SP)+             ;ADJUST STACK
001646  012637  000004          13$:    MOV     (SP)+,@#4               ;RESTORE VECTORS
001652  012637  000006                  MOV     (SP)+,@#6
001656  005737  000042          11$:    TST     @#42                    ;IF ACT11 OUTO MODE
001662  001123                          BNE     66$                     ;DON'T TYPE ID
001664  104402  001000                  TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
001670  105777  177306          6$:     TSTB    @SWR                    ;USE SAME PARAMETERS?
001674  100002                          BPL     10$                     ;IF NO, BR AND INPUT NEW PARAMETERS
001676  000137  002246                  JMP     .BEGIN                  ;IF YES, GO.
001702                          10$:
001702  012700  001500                  MOV     #DUP.MAP,R0     ;CLR MAP
001706  005020                  68$:    CLR     (R0)+
001710  020027  001506                  CMP     R0,#DUP.END     ;DONE WITH MAP?
001714  001374                          BNE     68$             ;BR IF NO
001716  105037  001342                  CLRB    MDMFLG
001722  105037  001344                  CLRB    ALJMFL
001726  104403                          INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
001730  004707                          MCSR    ;MESSAGE
001732  104405                          PARAM   ;CONVERT STRING
001734  160000                          160000  ;LOW LIMIT
001736  175500                          175500  ;HIGH LIMIT
001740  001500                          DUPCR0  ;STORE AT THIS LOCATION
001742     001                  .BYTE   1       ;MASK
001743     001                  .BYTE   1       ;HOW MANY TIMES + 2
001744  104403                          INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
001746  004726                          MVEC    :MESSAGE
001750  104405                          PARAM   ;CONVERT STRING
```

```
778  001752  000300                        300       ;LOW LIMIT
779  001754  000770                        770       ;HIGH LIMIT
780  001756  001502                        DUPTR0    ;STORE AT THIS LOCATION
781  001760     001              .BYTE     1         ;MASK
782  001761     001              .BYTE     1         ;HOW MANY TIMES + 2
783  001762  104403                        INSTR     ;OUTPUT MESSAGE & GET INPUT STRING
784  001764  004741                        MMODEM    ;MESSAGE
785  001766  104412                        SETFLG    ;SET FLAG BASED UPON INPUT STRING
786  001770  001342                        MDMFLG    ;THIS FLAG
787  001772  105737  001342               TSTB      MDMFLG          ;MODEM FLAG SET?
788  001776  001405                        BEQ       71$             ;IF BR.
789  002000  105037  001324               CLRB      TCNFLG
790  002004  105037  001344               CLRB      ALJMFL
791  002010  000436                        BR        70$
792  002012                         71$:
793  002012  104403                        INSTR     ;OUTPUT MESSAGE & GET INPUT STRING
794  002014  005112                        MTCN      ;MESSAGE
795  002016  104412                        SETFLG    ;SET FLAG BASED UPON INPUT STRING
796  002020  001324                        TCNFLG    ;THIS FLAG
797  002022  105737  001324               TSTB      TCNFLG
798  002026  001427                        BEQ       70$
799  002030  104403                        INSTR     ;OUTPUT MESSAGE & GET INPUT STRING
800  002032  005321                        MALLJM    ;MESSAGE
801  002034  104412                        SETFLG    ;SET FLAG BASED UPON INPUT STRING
802  002036  001344                        ALJMFL    ;THIS FLAG
803  002040  105737  001344               TSTB      ALJMFL
804  002044  001020                        BNE       70$
805  002046  104403                        INSTR     ;OUTPUT MESSAGE & GET INPUT STRING
806  002050  005037                        MJMPR     ;MESSAGE
807  002052  104412                        SETFLG    ;SET FLAG BASED UPON INPUT STRING
808  002054  001325                        OPCLRJ    ;THIS FLAG
809  002056  104403                        INSTR     ;OUTPUT MESSAGE & GET INPUT STRING
810  002060  005205                        MSTJM     ;MESSAGE
811  002062  104412                        SETFLG    ;SET FLAG BASED UPON INPUT STRING
812  002064  001336                        STJMFL    ;THIS FLAG
813  002066  104403                        INSTR     ;OUTPUT MESSAGE & GET INPUT STRING
814  002070  005240                        MSRJM     ;MESSAGE
815  002072  104412                        SETFLG    ;SET FLAG BASED UPON INPUT STRING
816  002074  001340                        SRJMFL    ;THIS FLAG
817  002076  104403                        INSTR     ;OUTPUT MESSAGE & GET INPUT STRING
818  002100  005375                        MDSC      ;MESSAGE
819  002102  104412                        SETFLG    ;SET FLAG BASED UPON INPUT STRING
820  002104  001346                        DSCFLG    ;THIS FLAG
821  002106  105237  001317        70$:    INCB      DUPNUM
822  002112  105237  001320               INCB      SAVNUM
823  002116  105237  001316               INCB      DUPACTV
824  002122  012700  001500               MOV       #DUPCR0,R0
825  002126  000137  002246               JMP       .BEGIN          ;LET'S GO.
826  002132                         66$:
```

```
827                                     ;** FOLLOWING PARAMETERS ARE LOADED IF UNDER ACT11 OR XXDP CONTROL.**
828
829  002132  012700  001500               MOV     #DUP.MAP,R0             ;SET UP POINTER
830  002136  105237  001316               INCB    DUPACTV                 ;DEVICE  ACTIVE FOR TESTING
831  002142  012710  160050               MOV     #160050,(R0)            ;CSR
832  002146  012760  000770  000002       MOV      #770,2(R0)             ;VECTOR
833  002154  012760  140026  000004       MOV     #140026,4(R0)           ;STATUS AND SYNC
834  002162  112737  000005  001322       MOVB    #5,PRIRTY               ;PRIORTY
835  002170  113737  001236  001324       MOVB    TEMP1,TCNFLG            ;TURN-AROUND-CONNECTER FLAG
836  002176  113737  001236  001325       MOVB    TEMP1,OPCLRJ            ;OPTIONAL CLEAR JUMPER
837  002204  105037  001342               CLRB    MDMFLG                  ;MODEM FLAG
838  002210  104402  005273               TYPE    ,XHEAD                  ;TYPE HEADER
839  002214  012737  001500  001236       MOV     #DUP.MAP,TEMP1          ;SET POINTER
840  002222  017737  177010  001240  5$:  MOV     @TEMP1,TEMP2            ;SET DATA
841  002230  001406                       BEQ     .BEGIN                  ;ALL DONE WITH DATA
842  002232  104410                       CONVRT
843  002234  005442                       XSTATQ
844  002236  062737  000002  001236       ADD     #2,TEMP1                ;UPDATE POINTER
845  002244  000766                       BR      5$
846
847                                     ;TEST START AND RESTART
848                                     ;----------------------
849
850  002246  012737  000340  177776  .BEGIN: MOV  #340,PS                 ;LOCK OUT INTERRUPTS
851  002254  012706  001150               MOV     #STACK,SP               ;SET UP STACK
852  002260  005737  000042               TST     @#42                    ;IS PROGRAM UNDER MONITOR CONTROL
853  002264  001023                       BNE     2$                      ;BR IF YES
854  002266  032777  000004  176706       BIT     #BIT2,@SWR              ;CHECK FOR LOCK ON TEST
855  002274  001411                       BEQ     1$                      ;BR IF NO LOCK DESIRED.
856  002276  104402  004526               TYPE    ,MLOCK                  ;TYPE LOCK SELECTED.
857  002302  012737  000240  002554       MOV     #NOP,TTST               ;ADJUST SCOPE ROUTINE.
858  002310  012737  000240  002556       MOV     #NOP,TTST+2             ;SET UP TO LOCK
859  002316  000406                       BR      2$                      ;CONTINUE ALONG.
860  002320  013737  002666  002554  1$:  MOV     BRW,TTST                ;PREPARE NORMAL SCOPE ROUTINE
861  002326  013737  002670  002556       MOV     BRX,TTST+2              ;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOP
862  002334  012737  005624  001214  2$:  MOV     #CYCLE,RETURN           ;START AT "CYCLE" FIND WHICH DEVICE TO TEST
863  002342  104402  004416               TYPE    ,MR                     ;TYPE R
864  002346  000177  176642               JMP     @RETURN                 ;START TESTING
```

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

002352  005037  001234          .EOP:   CLR     LSTERR          ;CLEAR LAST ERROR PC
002356  105037  001351                  CLRB    ERRFLG          ;CLEAR ERROR FLAG
002362  005237  001230                  INC     PASCNT          ;UPDATE PASS COUNT
002366  013777  001230  176604          MOV     PASCNT,@DISPLAY ;DISPLAY PASS COUNT
002374  104402  004373                  TYPE    ,MEPASS         ;TYPE END PASS
002400  104402  004555                  TYPE    ,MCSRX          ;TYPE CSR
002404  104411  002510                  CNVRT   ,XCSR           ;SHOW IT
002410  104402  004563                  TYPE    ,MVECX          ;TYPE VECTOR
002414  104411  002516                  CNVRT   ,XVEC           ;SHOW IT
002420  104402  004571                  TYPE    ,MPASSX         ;TYPE PASSES
002424  104411  002524                  CNVRT   ,XPASS          ;SHOW IT
002430  104402  004602                  TYPE    ,MERRX          ;TYPE ERRORS
002434  104411  002532                  CNVRT   ,XERR           ;SHOW IT
002440  112737  000377  001353          MOVB    #377,@V.FLG     ;SET THE QUICK VERIFY FLAG.
002446  113737  001317  001320          MOVB    DUPNUM,SAVNUM   ;RESTORE THE COUNT
002454  013701  000042                  MOV     @#42,R1         ;CHECK FOR ACT-11 OR DDP
002460  001406                          BEQ     RESTRT          ;IF NOT, CONTINUE TESTING
002462  000005                          RESET                   ;STOP THE SHOW--CLEAR THE WORLD
002464                          $ENDAD:
002464  004711                          JSR     PC,(R1)
002466  000240                          NOP
002470  000240                          NOP
002472  000240                          NOP
002474  000240                          NOP
002476  012737  005624  001214  RESTRT: MOV     #CYCLE,RETURN
002504  000137  005624                  JMP     CYCLE
002510  000001                  XCSR:   1
002512      006     002                 .BYTE   6,2
002514  001412                          RXCSR
002516  000001                  XVEC:   1
002520      003     002                 .BYTE   3,2
002522  001402                          DUPRVC
002524  000001                  XPASS:  1
002526      006     002                 .BYTE   6,2
002530  001230                          PASCNT
002532  000001                  XERR:   1
002534      006     002                 .BYTE   6,2
002536  001232                          ERRCNT

                                        ;SCOPE LOOP AND INTERATION HANDLER

002540  005037  001234          .SCOPE: CLR     LSTERR          ;CLEAR LAST ERROR PC
002544  010016                          MOV     R0,(SP)         ;SAVE R0 ON STACK
002546  032777  040000  176426          BIT     #BIT14,@SWR     ;LOOP ON TEST?
002554  001407                  TTST:   BEQ     1$              ;BR IF NO (IF LOCK SW01 = 1;THIS LOCATION  = 240)
002556  000437                          BR      3$              ;GO TO 3$       (DITTO)
002560  105777  176420                  TSTB    @TKCSR          ;KYBD DONE?
002564  100034                          BPL     3$              ;BR IF NO (LOCK:  HIT A KEY ON TTY TO GO TO NEXT TEST)
002566  017700  176414                  MOV     @TKDBR,R0       ;CLR DONE BIT
002572  000415                          BR      2$              ;CONTINUE
```

```
 921  002574  032777  004000  176400  1$:     BIT     #SW11,@SWR      ;DELETE ITERATION (QUICK PASS)?
 922  002602  001011                          BNE     2$              ;BR IF YES
 923  002604  105737  001353                  *STB    QV.FLG          ;HAS FIRST PASS BEEN COMPLETED?
 924  002610  001406                          BEQ     2$              ;BR IF QUICK VERIFY
 925  002612  005237  001224                  INC     LPCNT           ;UPDATE ITERATION COUNTER
 926  002616  023737  001224  001222          CMP     LPCNT,ICOUNT    ;ALL ITERATIONS DONE?
 927  002624  001014                          BNE     3$              ;BR IF NOT YET
 928  002626  105037  001351          2$:     CLRB    ERRFLG          ,PREPARE FOR NEW TEST
 929  002632  005037  001224                  CLR     LPCNT           ,START ICOUNT AT ZERO
 930  002636  005037  001220                  CLR     LOCK
 931  002642  012737  000050  001222          MOV     #50,ICOUNT      ;RESET ITERATIONS
 932  002650  013737  001216  001214          MOV     NEXT,RETURN     ;GET NEXT TEST
 933  002656  011600                  3$:     MOV     (SP),R0         ;POP R0 OFF STACK
 934  002660  022626                          POP2SP                  ;FAKE AN RTI
 935  002662  000177  176326                  JMP     @RETURN         ;GO DO THE TEST
 936  002666  001407                  BRW:    1407
 937  002670  000437                  BRX:    437
 938                                          ;TELETYPE OUTPUT ROUTINE
 939                                          ;-----------------------
 940
 941  002716  010546                  .TYPE:  MOV     R5,-(SP)        ;SAVE R5 ON THE STACK.
 942  002720  017605  000002                  MOV     @2(SP),R5       ;GET ADDRESS OF MESSAGE.
 943  002724  062766  000002  000002          ADD     #2,2(SP)        ;POP OVER ADDRESS.
 944  002732  032777  010000  176242  1$:     BIT     #SW12,@SWR      ;INHIBIT ALL PRINT OUT??
 945  002740  001012                          BNE     3$              ;BR IF NO PRINT OUT WANTED (SW12=1)
 946  002742  105715                          TSTB    (R5)            ;IS NUMBER MINUS? (MSB=1(BIT7))
 947  002744  100002                          BPL     2$              ;BR IF NUMBER IS PLUS
 948  002746  104402  004352                  TYPE    ,MCRLF          ;TYPE A CR/LF!
 949  002752  105777  176232          2$:     TSTB    @TPCSR          ;TTY READY?
 950  002756  100375                          BPL     2$              ;BR IF NO.
 951  002760  112577  176226                  MOVB    (R5)+,@TPDBR    ;PRINT CURRENT CHAR.
 952  002764  001362                          BNE     1$              ;IF NOT ZERO KEEP PRINTING!
 953  002766  012605                  3$:     MOV     (SP)+,R5        ;END OF OUTPUT. RESTORE R5
 954  002770  000002                          RTI                     ;GO HOME
 955                                          ;-----------------------
 956
 957  002772  010346                  .INSTR: MOV     R3,-(SP)        ;SAVE R3 ON STACK
 958  002774  010446                          MOV     R4,-(SP)        ;SAVE R4 ON STACK
 959  002776  017637  000004  003014          MOV     @4(SP),.MSG
 960  003004  062766  000002  000004          ADD     #2,4(SP)
 961  003012  104402                  .INST1: TYPE
 962  003014  000000                  .MSG:   0
 963  003016  012704  005560                  MOV     #INBUF,R4
 964  003022  012703  000007                  MOV     #7,R3
 965  003026  105777  176152          1$:     TSTB    @TKCSR
 966  003032  100375                          BPL     1$
 967  003034  117714  176146                  MOVB    @TKDBR,(R4)
 968  003040  142714  000200                  BICB    #200,(R4)
 969  003044  122427  000015                  CMPB    (R4)+,#15
 970  003050  001417                          BEQ     INSTR2
 971  003052  105777  176132          2$:     TSTB    @TPCSR
 972  003056  100375                          BPL     2$
 973  003060  017777  176122  176124          MOV     @TKDBR,@TPDBR
 974  003066  005303                          DEC     R3
 975  003070  001356                          BNE     1$
 976  003072  012604                          MOV     (SP)+,R4
```

```
  977  003074  012603                    MOV     (SP)+,R3
  978  003076  010346                .INSTE: MOV     R3,-(SP)
  979  003100  010446                    MOV     R4,-(SP)
  980  003102  104402  004346           TYPE    ,MQM
  981  003106  000741                    BR      .INST1
  982  003110  012604                INSTR2: MOV     (SP)+,R4        ;RESTORE R4
  983  003112  012603                    MOV     (SP)+,R3        ;RESTORE R3
  984  003114  000002                    RTI
  985
  986                                    ;CONVERT ASCII STRING TO OCTAL
  987                                    ;----------------------------
  988
  989  003116  010546                .PARAM: MOV     R5,-(SP)
  990  003120  010446                    MOV     R4,-(SP)
  991  003122  016605  000004            MOV     4(SP),R5
  992  003126  012537  003306            MOV     (R5)+,LOLIM
  993  003132  012537  003310            MOV     (R5)+,HILIM
  994  003136  012537  003312            MOV     (R5)+,DEVADR
  995  003142  112537  003314            MOVB    (R5)+,LOBITS
  996  003146  112537  003315            MOVB    (R5)+,ADRCNT
  997  003152  010566  000004            MOV     R5,4(SP)
  998  003156  005005                PARAM1: CLR     R5
  999  003160  012704  005560            MOV     #INBUF,R4
 1000  003164  122714  000015            CMPB    #15,(R4)
 1001  003170  001420                    BEQ     PARERR
 1002  003172  121427  000060        1$: CMPB    (R4),#60
 1003  003176  002415                    BLT     PARERR
 1004  003200  121427  000067            CMPB    (R4),#67
 1005  003204  003012                    BGT     PARERR
 1006  003206  142714  000060            BICB    #60,(R4)
 1007  003212  152405                    BISB    (R4)+,R5
 1008  003214  122714  000015            CMPB    #15,(R4)
 1009  003220  001406                    BEQ     LIMITS
 1010  003222  006305                    ASL     R5
 1011  003224  006305                    ASL     R5
 1012  003226  006305                    ASL     R5
 1013  003230  000760                    BR      1$
 1014  003232  104404                PARERR: INSTER
 1015  003234  000750                    BR      PARAM1
 1016
 1017                                   ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
 1018                                   ;--------------------------------------
 1019
 1020  003236  020537  003310        LIMITS: CMP     R5,HILIM
 1021  003242  101373                    BHI     PARERR
 1022  003244  020537  003306            CMP     R5,LOLIM
 1023  003250  103770                    BLO     PARERR
 1024  003252  133705  003314            BITB    LOBITS,R5
 1025  003256  001365                    BNE     PARERR
 1026
 1027                                   ;STORE NUMBER AT SPECIFIED ADDRESS
 1028
 1029  003260  013704  003312            MOV     DEVADR,.4
 1030  003264  010524                1$: MOV     R5,(R4)+
 1031  003266  062705  000002            ADD     #2,R5
 1032  003272  105337  003315            DECB    ADRCNT
```

```
1033  003276  001372                          BNE     1$
1034  003300  012604                          MOV     (SP)+,R4
1035  003302  012605                          MOV     (SP)+,R5
1036  003304  000002                          RTI
1037  003306  000000                  LOLIM:  0
1038  003310  000000                  HILIM:  0
1039  003312  000000                  DEVADR: 0
1040  003314  000000                  LOBITS: 0
1041          003315                  ADRCNT=LOBITS+1
1042                                  ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
1043                                  ;-----------------------------------------------------
1044
1045  003410  104402  004352          .CONVR: TYPE    ,MCRLF
1046  003414  010046                  .CNVRT: MOV     R0,-(SP)
1047  003416  010146                          MOV     R1,-(SP)
1048  003420  010346                          MOV     R3,-(SP)
1049  003422  010446                          MOV     R4,-(SP)
1050  003424  010546                          MOV     R5,-(SP)
1051  003426  017601  000012                  MOV     @12(SP),R1
1052  003432  062766  000002  000012          ADD     #2,12(SP)
1053  003440  012137  003614                  MOV     (R1)+,WRDCNT
1054  003444  112137  003616          1$:     MOVB    (R1)+,CHRCNT
1055  003450  112137  003617                  MOVB    (R1)+,SPACNT
1056  003454  013137  003620                  MOV     @(R1)+,BINWRD
1057  003460  013704  003620          2$:     MOV     BINWRD,R4
1058  003464  113705  003616                  MOVB    CHRCNT,R5
1059  003470  012700  005454                  MOV     #TEMP,R0
1060  003474  010403                  3$:     MOV     R4,R3
1061  003476  042703  177770                  BIC     #177770,R3
1062  003502  062703  000060                  ADD     #060,R3
1063  003506  110320                          MOVB    R3,(R0)+
1064  003510  000241                          CLC
1065  003512  006004                          ROR     R4
1066  003514  000241                          CLC
1067  003516  006004                          ROR     R4
1068  003520  000241                          CLC
1069  003522  006004                          ROR     R4
1070  003524  005305                          DEC     R5
1071  003526  001362                          BNE     3$
1072  003530  012703  005516                  MOV     #MDATA,R3
1073  003534  114023                  4$:     MOVB    -(R0),(R3)+
1074  003536  105337  003616                  DECB    CHRCNT
1075  003542  001374                          BNE     4$
1076  003544  105737  003617                  TSTB    SPACNT
1077  003550  001405                          BEQ     6$
1078  003552  112723  000040          5$:     MOVB    #040,(R3)+
1079  003556  105337  003617                  DECB    SPACNT
1080  003562  001373                          BNE     5$
1081  003564  105013                  6$:     CLRB    (R3)
1082  003566  104402  005516                  TYPE    ,MDATA
1083  003572  005337  003614                  DEC     WRDCNT
1084  003576  001322                          BNE     1$
1085  003600  012605                          MOV     (SP)+,R5
1086  003602  012604                          MOV     (SP)+,R4
1087  003604  012603                          MOV     (SP)+,R3
1088  003606  012601                          MOV     (SP)+,R1
```

```
1089  003610  012600                          MOV     (SP)+,R0
1090  003612  000002                          RTI
1091  003614  000000                  WRDCNT: 0
1092  003616  000000                  CHRCNT: 0
1093          003617                  SPACNT=CHRCNT+1
1094  003620  000000                  BINWRD: 0
1095
1096
1097                                          ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
1098                                          ;BUFFER TO THE CHARACTERS 'N' AND 'Y'.
1099                                          ;IF THE CHARACTER IS 'N' CLEAR THE FLAG
1100                                          ;IF THE CHARACTER IS 'Y' SET THE FLAG
1101
1102  003622  017605  000000          .SETFLG:MOV     @(SP),R5
1103  003626  042737  000040  005560          BIC     #40,INBUF
1104  003634  122737  000116  005560          CMPB    #'N,INBUF       ;IS IT 'N' ?
1105  003642  001002                          BNE     1$
1106  003644  105015                          CLRB    (R5)    ;000
1107  003646  000406                          BR      2$
1108  003650  122737  000131  005560  1$:     CMPB    #'Y,INBUF       ;IS IT 'Y' ?
1109  003656  001005                          BNE     3$
1110  003660  112715  177777                  MOVB    #-1,(R5)        ;377
1111  003664  062716  000002          2$:     ADD     #2,(SP)
1112  003670  000002                          RTI
1113  003672  104404                  3$:     INSTER  ;RETRY
1114  003674  000752                          BR      .SETFLG
1115
1116
1117                                          ;TRAP DISPATCH SERVICE
1118                                          ;ARGUMENT OF TRAP IS EXTRACTED
1119                                          ;AND USED AS OFFSET TO OBTAIN POINTER
1120                                          ;TO SELECTED SUBROUTINE
1121
1122  003676  011646                  .TRPSR: MOV     (SP),-(SP)              ;GET PC OF RETURN
1123  003700  162716  000002                  SUB     #2,(SP)                 ;=PC OF TRAP
1124  003704  017616  000000                  MOV     @(SP),(SP)              ;GET TRP
1125  003710  006316                  TRPOK:  ASL     (SP)                    ;MULTIPLY TRAP ARG BY 2
1126  003712  042716  177001                  BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
1127  003716  062716  001354                  ADD     #.TRPTAB,(SP)           ;POINTER TO SUBROUTINE ADDRESS
1128  003722  017616  000000                  MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
1129  003726  000136                          JMP     @(SP)+                  ;GO TO SUBROUTINE
1130
1131                                          ;ERROR HANDLER
1132                                          ;-------------
1133
1134  003730  032777  010000  175244  .HLT:   BIT     #SW12,@SWR      ;BELL ON ERROR?
1135  003736  001406                          BEQ     XBX             ;BR IF NO BELL
1136  003740  105777  175244                  TSTB    @TPCSR          ;TTY READY.
1137  003744  100003                          BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
1138  003746  112777  000207  175236          MOVB    #207,@TPDBR     ;PUSH A BELL AT THE TTY.
1139  003754  032777  020000  175220  XBX:    BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
1140  003762  001105                          BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
1141  003764  021637  001234                  CMP     (SP),LSTERR     ;WAS THIS ERROR FOUND LAST TIME?
1142  003770  001404                          BEQ     1$              ;BR IF YES
1143  003772  011637  001234                  MOV     (SP),LSTERR     ;RECORD BEING HERE
1144  003776  105037  001351                  CLRB    ERRFLG          ;PREPARE HEADER
```

```
1145  004002  104406                  1$:     SAV05                   ;SAVE ALL PROC REGISTERS
1146  004004  011605                          MOV     (SP),R5         ;GET THE PC OF ERROR
1147  004006  162705  000002                  SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
1148  004012  011504                          MOV     (R5),R4         ;GET HLT INSTRUCTION
1149  004014  006304                          ASL     R4              ;MULT BY TWO
1150  004016  061504                          ADD     (R5),R4         ;DOUBLE IT
1151  004020  006304                          ASL     R4              ;MULT AGAIN
1152  004022  042704  177001                  BIC     #177001,R4      ;CLEAR JUNK
1153  004026  062704  011550                  ADD     #.ERRTAB,R4     ;GET POINTER
1154  004032  012437  004146                  MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
1155  004036  012437  004160                  MOV     (R4)+,DATAHD    ;GET DATA HEADRER
1156  004042  011437  004172                  MOV     (P4),DATABP     ;GET DATA TABLE
1157  004046  105737  001351                  TSTB    ERRFLG          ;TYPE HEADREER
1158  004052  001403                          BEQ     TYPMSG          ;BR IF YES
1159  004054  005737  004172                  TST     DATABP          ;DOES DATA TABLE EXIST?
1160  004060  001040                          BNE     TYPDAT          ;BR IF YES.
1161  004062  104402  004352          TYPMSG: TYPE    ,MCRLF
1162  004066  104402  004352                  TYPE    ,MCRLF
1163  004072  005737  001220                  TST     LOCK
1164  004076  001402                          BEQ     1$
1165  004100  104402  004625                  TYPE    ,MASTEK
1166  004104  104402  004613          1$:     TYPE    ,MTSTN
1167  004110  104411  004300                  CNVRT   ,XTSTN          ;SHOW IT
1168  004114  104402  004702                  TYPE    ,MERRPC         ;TYPE PC.
1169  004120  104411  004272                  CNVRT   ,ERTABO         ;SHOW IT
1170  004124  104402  004352                  TYPE    ,MCRLF          ;GIVE A CR/LF
1171  004130  112737  177777  001351          MOVB    #-1,ERRFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
1172  004136  005737  004146                  TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
1173  004142  001402                          BEQ     WRKO.FM         ;BR IF NO.
1174  004144  104402                          TYPE                    ;TYPE
1175  004146  000000          ERRMSG: 0                               ;    ERROR MESSAGE
1176  004150                  WRKO.FM:                                ;
1177  004150  005737  004160                  TST     DATAHD          ;DATA HEADER?
1178  004154  001402                          BEQ     TYPDAT          ;BR IF NO
1179  004156  104402                          TYPE                    ;TYPE
1180  004160  000000          DATAHD: 0                               ;    DATA HEADER
1181  004162  005737  004172  TYPDAT: TST     DATABP          ;DATA TABLE?
1182  004166  001402                          BEQ     RESREG          ;BR IF NO.
1183  004170  104410                          CONVRT                  ;SHOW
1184  004172  000000          DATABP: 0                               ;    DATA TABLE
1185  004174  104407          RESREG: RES05                           ;RESTORE PROC REGISTERS
1186  004176  022737  002464  000042  HALTS:  CMP     #$ENDAD,@#42    ;IF ACT-11 AUTO MODE--HALT!!
1187  004204  001403                          BEQ     1$
1188  004206  005777  174770                  TST     @SWR            ;HALT ON ERROR?
1189  004212  100005                          BPL     EXITER          ;BR IF NO HALT ON ERROR
1190  004214  010046                  1$:     PUSHR0                  ;SAVE R0
1191  004216  016600  000002                  MOV     2(SP),R0        ;SHOW ERROR PC IN DATA LIGHTS
1192  004222  000000                          HALT                    ;HALT
1193  004224  012600                          POPR0                   ;GET R0
1194  004226  005237  001232          EXITER: INC     ERRCNT          ;UPDATE ERROR COUNT
1195  004232  032777  000400  174742          BIT     #SW08,@SWR      ;GOTO TOP OF TEST?
1196  004240  001007                          BNE     1$              ;BR IF YES
1197  004242  032777  002000  174732          BIT     #SW10,@SWR      ;GOTO NEXT TEST?
1198  004250  001407                          BEQ     2$              ;BR IF NO
1199  004252  013737  001216  001214          MOV     NEXT,RETURN     ;SET FOR NEXT TEST
1200  004260  012706  001150          1$:     MOV     #STACK,SP       ;RESET SP
```

```
 1201  004264  000177  174724                JMP     @RETURN         ;GOTO SPECIFIED TEST
 1202  004270  000002              2$:       RTI                     ;RETURN
 1203  004272  000001              ERTABO: 1
 1204  004274     006     002                .BYTE   6,2
 1205  004276  001266                        SAVPC
 1206  004300  000001              XTSTN:  1
 1207  004302     003     002                .BYTE   3,2
 1208  004304  001226                        TSTNO
 1209
```

```
1210                                        ;WAIT ROUTINE
1211  004306  000240                       SMALL:  NOP                     ;STALL
1212  004310  000207                               RTS     PC              ;RETURN
1213
1214
1215                                        ;POWER FAIL ROUTINE
1216
1217  004312  012737  004322  000024      .PFAIL: MOV     #PWRUP,24       ;LOAD PFAIL VECTOR FOR POWER UP
1218  004320  000000                               HALT                    ;
1219  004322  000005                       PWRUP:  RESET                   ;WAIT TTY TO COME UP
1220  004324  012706  001150                       MOV     #STACK,SP       ;REINIT STACK POINTER
1221  004330  012737  004312  000024              MOV     #.PFAIL,24      ;LOAD PFAIL VECTOR FOR POWER DOWN
1222  004336  104402                               TYPE
1223  004340  004355                               MPOWER
1224  004342  000177  174646                       JMP     @RETURN
1225
1226  004346  020040  000077               MQM:    .ASCIZ  /  ?/
1227  004352  005015     000               MCRLF:  .ASCIZ   <15><12>
1228  004355     377  053520  020122       MPOWER: .ASCIZ  <377>/PWR FAILED. /
1229  004362  040506  046111  042105
1230  004370  020056     000
1231  004373     015  042777  042116       MEPASS: .ASCIZ  <15><377>/END PASS CZDPEB /
1232  004400  050040  051501  020123
1233  004406  055103  050104  041105
1234  004414  000040
1235  004416  051377     000               MR:     .ASCIZ  <377>/R/
1236  004421     377  051120  043517       MERR2:  .ASCIZ  <377>/PROGRAM INDICATES NO DEVICES PRESENT./
1237  004426  040522  020115  047111
1238  004434  044504  040503  042524
1239  004442  020123  047516  042040
1240  004450  053105  041511  051505
1241  004456  050040  042522  042523
1242  004464  052116  000056
1243  004470  044777  051516  043125       MERR3:  .ASCIZ  <377>/INSUFFICIENT DATA!/
1244  004476  044506  044503  047105
1245  004504  020124  040504  040524
1246  004512  000041
1247  004514  052377  051505  020124       MTSTPC: .ASCIZ  <377>/TEST PC-/
1248  004522  041520  000055
1249  004526  046377  041517  020113       MLOCK:  .ASCIZ  <377>/LOCK ON SELECTED TEST/
1250  004534  047117  051440  046105
1251  004542  041505  042524  020104
1252  004550  042524  052123     000
1253  004555     103  051123  020072       MCSRX:  .ASCIZ   /CSR: /
1254  004562     000
1255  004563     126  041505  020072       MVECX:  .ASCIZ  /VEC: /
1256  004570     000
1257  004571     120  051501  042523       MPASSX: .ASCIZ  /PASSES: /
1258  004576  035123  000040
1259  004602  051105  047522  051522       MERRX:  .ASCIZ  /ERRORS: /
1260  004610  020072     000
1261  004613     124  051505  020124       MTSTN:  .ASCIZ  /TEST NO: /
1262  004620  047516  020072     000
1263  004625     052     000               MASTEK: .ASCIZ  /*/
1264  004627     377  042523  020124       MNEW:   .ASCIZ  <377>/SET SWITCH REG TO DUP11'S DESIRED ACTIVE./
1265  004634  053523  052111  044103
```

```
1266  004642  051040  043505  052040
1267  004650  020117  052504  030520
1268  004656  023461  020123  042504
1269  004664  044523  042522  020104
1270  004672  041501  044524  042526
1271  004700  000056
1272  004702  041520  020072     000  MERRPC: .ASCIZ  /PC: /
1273  004707     377  042522  020103  MCSR:   .ASCIZ  <377>/REC CSR ADRS /
1274  004714  051503  020122  042101
1275  004722  051522  000040
1276  004726  053377  041505  040440  MVEC:   .ASCIZ  <377>/VEC ADRS /
1277  004734  051104  020123     000
1278  004741     377  051511  040440  MMODEM: .ASCIZ  <377>/IS A MODEM WITH ANALOG LOOPBACK ENABLED CONNECTED? (Y OR N)
1279  004746  046440  042117  046505
1280  004754  053440  052111  020110
1281  004762  047101  046101  043517
1282  004770  046040  047517  041120
1283  004776  041501  020113  047105
1284  005004  041101  042514  020104
1285  005012  047503  047116  041505
1286  005020  042524  037504  024040
1287  005026  020131  051117  047040
1288  005034  004451     000
1289  005037     377  051511  052040  MJMPR:  .ASCIZ  <377>/IS THE OPTIONAL CLR JMPR IN?  (Y OR N)   /
1290  005044  042510  047440  052120
1291  005052  047511  040516  020114
1292  005060  046103  020122  046512
1293  005066  051120  044440  037516
1294  005074  020040  054450  047440
1295  005102  020122  024516  020040
1296  005110  000040
1297  005112  044777  020123  044124  MTCN:   .ASCIZ  <377>/IS THE H325 CONNECTOR ON? (Y OR N)   /
1298  005120  020105  031510  032462
1299  005126  041440  047117  042516
1300  005134  052103  051117  047440
1301  005142  037516  024040  020131
1302  005150  051117  047040  020051
1303  005156  020040     000
1304  005161     377  051120  047511  MPAR:   .ASCIZ  <377>/PRIORITY (4 TO 7) /
1305  005166  044522  054524  024040
1306  005174  020064  047524  033440
1307  005202  020051     000
1308  005205     377  042523  020103  MSTJM:  .ASCIZ  <377>/SEC TX JMPR IN? (Y OR N) /
1309  005212  054124  045040  050115
1310  005220  020122  047111  020077
1311  005226  054450  047440  020122
1312  005234  024516  000040
1313  005240  051777  041505  051040  MSRJM:  .ASCIZ  <377>/SEC RX JMPR IN? (Y OR N) /
1314  005246  020130  046512  051120
1315  005254  044440  037516  024040
1316  005262  020131  051117  047040
1317  005270  020051     000
1318  005273     377  040515  020120  XHEAD:  .ASCIZ  <377>/MAP OF DUP11 STATUS/<377>
1319  005300  043117  042040  050125
1320  005306  030461  051440  040524
1321  005314  052524  177523     000
```

```
 1322  005321     377  051101  020105  MALLJM: .ASCIZ  <377>/ARE THE DEFAULT JUMPERS ALL IN? (Y OR N)  /
 1323  005326  044124  020105  042504
 1324  005334  040506  046125  020124
 1325  005342  052512  050115  051105
 1326  005350  020123  046101  020114
 1327  005356  047111  020077  054450
 1328  005364  047440  020122  024516
 1329  005372  020040     000
 1330  005375     377  051101  020105  MDSC:   .ASCIZ  <377>/ARE DSC 1 AND 2 BOTH IN? (Y OR N)  /
 1331  005402  051504  020103  020061
 1332  005410  047101  020104  020062
 1333  005416  047502  044124  044440
 1334  005424  037516  024040  020131
 1335  005432  051117  047040  020051
 1336  005440  000040
 1337                                  .EVEN
 1338  005442  000002                  XSTATQ: 2
 1339  005444     006     003                  .BYTE   6,3
 1340  005446  001236                          TEMP1
 1341  005450     006     002                  .BYTE   6,2
 1342  005452  001240                          TEMP2
 1343                                  .EVEN
 1344
 1345  005454  000000                  TEMP:   0
 1346          005516                  .=.+40
 1347  005516  000000                  MDATA:  0
 1348          005560                  .=.+40
 1349  005560  000000                  INBUF:  0
 1350          005622                  .=.+40
 1351  005622  000001                  TRP.PC: .BLKW 1
 1352
```

```
1353
1354                                            ;
1355                                            ;ROUTINE USED TO ''CYCLE'' THROUGH UP TO EIGHT DUP11'S
1356                                            ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
1357                                            ;AND RUNS THE SPECIFIED DUP11'S.   THIS ROUTINE *MUST*
1358                                            ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
1359                                            ;SETUP NECESSARY.
1360                                            ;
1361
1362  005624  105737  001316          CYCLE:  TSTB    DUPACTV         ;ARE ANY DUP11'S TO BE TESTED?
1363  005630  001004                          BNE     1$              ;BR IF OK.
1364  005632  104402  004421                  TYPE    ,MERR2          ;NO DUP11'S SELECTED!!
1365  005636  000000                          HALT                    ;STOP THE SHOW.
1366  005640  000776                          BR      .-2             ;DISQUALIFY CONT. SW.
1367  005642  012700  001500          1$:     MOV     #DUP.MAP,R0     ;RESTORE POINTER.
1368  005646  012037  001412                  MOV     (R0)+,RXCSR     ;LOAD SYSTEM CTRL. REG
1369  005652  012037  001402                  MOV     (R0)+,DUPRVC    ;LOAD VECTOR
1370  005656  012037  001442                  MOV     (R0)+,L00.00    ;GET PARAMETERS
1371  005662  012700  000002                  MOV     #2,R0           ;SAVE CORE THIS WAY!
1372  005666  013737  001412  001432          MOV     RXCSR,HUPRCR    ;GET CONTROL REG HIGH BYTE
1373  005674  005237  001432                  INC     HUPRCR          ;GOT IT
1374  005700  013737  001432  001414          MOV     HUPRCR,RXDBUF   ;GET RX CONTROL REG BUFFER
1375  005706  005237  001414                  INC     RXDBUF          ;GOT IT
1376  005712  013737  001414  001424          MOV     RXDBUF,DUPSEC   ;GOT SECONDARY REG SELECT REG
1377  005720  013737  001414  001416          MOV     RXDBUF,PARCSR   ;GOT PARAMETER STATUS REGISTER
1378  005726  013737  001414  001430          MOV     RXDBUF,HUPRBF   ;GET RX BUFFER HIGH BYTE
1379  005734  005237  001430                  INC     HUPRBF          ;GOT IT
1380  005740  013737  001430  001426          MOV     HUPRBF,HUPPSR   ;GOT PAR STATUS REG HIGH BYTE
1381  005746  013737  001426  001420          MOV     HUPPSR,TXCSR    ;GET TX CONTROL REGISTER
1382  005754  005237  001420                  INC     TXCSR           ;GOT IT
1383  005760  013737  001420  001436          MOV     TXCSR,HUPTCR    ;GET TX CONTROL REG HIGH BYTE
1384  005766  005237  001436                  INC     HUPTCR          ;GOT IT
1385  005772  013737  001436  001422          MOV     HUPTCR,TXDBUF   ;BET TX BUFFER
1386  006000  005237  001422                  INC     TXDBUF          ;GOT IT
1387  006004  013737  001422  001434          MOV     TXDBUF,HUPTBF   ;GET TX BUFFER HIGH BYTE
1388  006012  005237  001434                  INC     HUPTBF          ;GOT IT
1389
1390  006016  013737  001402  001404          MOV     DUPRVC,DUPRPS   ;RX VECTOR
1391  006024  060037  001404                  ADD     R0,DUPRPS       ;RX PRIORITY LEVEL
1392  006030  013737  001404  001406          MOV     DUPRPS,DUPTVC
1393  006036  060037  001406                  ADD     R0,DUPTVC       ;TX VECTOR
1394  006042  013737  001406  001410          MOV     DUPTVC,DUPTPS
1395  006050  060037  001410                  ADD     R0,DUPTPS       ;TX PRIORITY LEVEL
1396
1397
1398  006054  012700  001442                  MOV     #L00.00,R0      ;LOAD STAUS 00-00
1399  006060  012701  001440                  MOV     #MASK.A,R1      ;PREPARE MASK.
1400  006064  012702  001441                  MOV     #CLK.A,R2       ;PREPARE CLOCKS
1401  006070  004737  006234                  JSR     PC,FIX.00       ;GO AND CALCULATE CONFIGURATION.
1402  006074  005737  000042                  TST     @#42
1403  006100  001050                          BNE     4$
1404  006102  032777  000002  173072          BIT     #SW01,@SWR      ;IF SW01=1,GET STARTING TEST #
1405  006110  001444                          BEQ     4$
1406  006112  104402  004352          7$:     TYPE    ,MCRLF
1407  006116  104403                          INSTR   ;OUTPUT MESSAGE & GET INPUT STRING
1408  006120  004613                          MTSTN   ;MESSAGE
```

```
 1409  006122  104405                          PARAM   ;CONVERT STRING
 1410  006124  000001                          1       ;LOW LIMIT
 1411  006126  001000                          1000    ;HIGH LIMIT
 1412  006130  001226                          TSTNO   ;STORE AT THIS LOCATION
 1413  006132     000                  .BYTE   0       ;MASK
 1414  006133     001                  .BYTE   1       ;HOW MANY TIMES * 2
 1415  006134  012700  006364                  MOV     #TST1,R0
 1416  006140  022710  012737          5$:     CMP     #12737,(R0)
 1417  006144  001017                          BNE     6$
 1418  006146  023760  001226  000002          CMP     TSTNO,2(R0)
 1419  006154  001013                          BNE     6$
 1420  006156  022760  001226  000004          CMP     #TSTNO,4(R0)
 1421  006164  001007                          BNE     6$
 1422  006166  010037  001214                  MOV     R0,RETURN       ;SAVE PC
 1423  006172  104402  004352                  TYPE    ,MCRLF
 1424  006176  104402  004416                  TYPE    ,MR
 1425  006202  000412                          BR      8$
 1426  006204  005720                  6$:     TST     (R0)+
 1427  006206  020027  010040                  CMP     R0,#TLAST+10
 1428  006212  001352                          BNE     5$
 1429  006214  104402  004346                  TYPE    ,MQM
 1430  006220  000734                          BR      7$
 1431
 1432  006222  012737  006364  001214  4$:     MOV     #TST1,RETURN    ;PREPARE RETURN ADDRESS
 1433  006230  000177  172760          8$:     JMP     @RETURN         ;GO START TESTING.
 1434
 1435  006234  011003                  FIX.00: MOV     (R0),R3         ;GET PARAMETERS.
 1436  006236  000207                  5$:     RTS     PC              ;
```

```
                                        ;THIS ROUTINE PICKS UP THE ADDRESS OF
                                        ;THE JUMPER TABLE AND LOADS R5 WITH
                                        ;THE CORRECT DATA BASED ON THE STATE
                                        ;OF THE JUMPER AND CONNECTOR FLAGS.
                                        ;-----------------------------------

006240  012100          JUMPER: MOV     (R1)+,R0        ;GET THE TABLE ADDRESS
006242  105737  001324          TSTB    TCNFLG          ;TEST THE TURN AROUND CONNECTOR FLAG
006246  001406                  BEQ     2$              ;BRANCH IF CONNECTOR IS MISSING
006250  105737  001325          TSTB    OPCLRJ          ;TEST CLEAR JMPER FLAG
006254  001403                  BEQ     2$              ;BRANCH IF JMPER IS MISSING
006256  011005                  MOV     (R0),R5         ;MOVE THE DATA TO R5, BOTH JUMPER
                                                        ;AND CONNECTOR ARE THERE
006260  000137  006304          JMP     5$
006264  022020          2$:     CMP     (R0)+,(R0)+     ;POP POINTER
006266  105737  001325          TSTB    OPCLRJ          ;TEST CLEAR JMPER FLAG
006272  001403                  BEQ     3$              ;BRANCH IF MISSING
006274  011005                  MOV     (R0),R5         ;MOVE DATA- JUMPER IN, CONNECTOR OFF
006276  000137  006304          JMP     5$
006302  012005          3$:     MOV     (R0)+,R5        ;NO CONNECTOR OR JUMPER
006304  000201          5$:     RTS     R1              ;RETURN

006306  012100          OJUMPER:MOV     (R1)+,R0        ;GET THE POINTER ADDRESS
006310  105737  001324          TSTB    TCNFLG          ;CHECK FOR TURNAROUND CONNECTOR
006314  001403                  BEQ     4$              ;BR IF MISSING
006316  011005                  MOV     (R0),R5         ;MOVE THE INFO TO R5
006320  000137  006330          JMP     6$              ;GO BACK
006324  022020          4$:     CMP     (R0)+,(R0)+     ;POP POINTER
006326  011005                  MOV     (R0),R5         ;LOAD DATA TO R5
006330  000201          6$:     RTS     R1              ;RETUN


                                ;ROUTINE TO SET UP INTERRUPT VECTORS
006332  012577  173044  SETVEC: MOV     (R5)+,@DUPRVC
006336  012577  173044          MOV     (R5)+,@DUPTVC
006342  112577  173036          MOVB    (R5)+,@DUPRPS
006346  112577  173036          MOVB    (R5)+,@DUPTPS
006352  000205                  RTS     R5
006354                  NO.ATRAP:
006354  104001                  HLT     1
006356  000002                  RTI

006360                  NO.BTRAP:
006360  104002                  HLT     2
006362  000002                  RTI
```

```
                                        ;*************************** TEST 1 ****************************
                                        ;*THIS TEST PROVES THE INTERACTION OF DTR!RTS!STD
                                        ;*WITH RING,DSR,CTS,CARDET,STD,SRD
                                        ;*AND DATA SET CHANGE ONE AND DATA SET CHANGE TWO.
                                        ;*SET THE BIT AND VERIFY THE OTHER BITS ARE SET. CLEAR
                                        ;*THE BIT AND VERIFY CLEAR. REPEAT FOR MRESET.
                                        ;:************************************************************************

                                ;:************
                                ;            *
                                ; TEST 1
                                ;            *
                                ;:************
                                ;:************************************************************************
006364  012737  000001  001226  TST1:   MOV     #1,@#TSTNO
006372  012737  006744  001216          MOV     #TST2,NEXT
006400  012746  173017                  MOV     #173017,-(SP)           ;SAVE
006404  012746  173001                  MOV     #173001,-(SP)
006410  012746  001016                  MOV     #1016,-(SP)
006414  012746  000000                  MOV     #0,-(SP)
006420  105737  001324                  TSTB    TCNFLG          ;H325 TEST CONNECTOR ON?
006424  001532                          BEQ     6$              ;IF NO, SKIP TEST.
006426  105737  001344          100$:   TSTB    ALJMFL
006432  001034                          BNE     12$
006434  012701  002010                  MOV     #STD!SRD,R1
006440  105737  001336                  TSTB    STJMFL
006444  001007                          BNE     101$
006446  040137  006734                  BIC     R1,7$
006452  040137  006736                  BIC     R1,7$+2
006456  040137  006740                  BIC     R1,7$+4
006462  000411                          BR      102$
006464  105737  001340          101$:   TSTB    SRJMFL
006470  001006                          BNE     102$
006472  040137  006734                  BIC     R1,7$
006476  040137  006736                  BIC     R1,7$+2
006502  040137  006740                  BIC     R1,7$+4
006506  105737  001346          102$:   TSTB    DSCFLG
006512  001004                          BNE     12$
006514  005337  006734                  DEC     7$
006520  005337  006736                  DEC     7$+2
006524  004137  006306          12$:    JSR     R1,OJUMPER      ;THIS CALL DETERMINES IF TURNAROUND CONNECTOR
006530  006734                  7$              ;AND OPTIONAL JUMPER ARE USED
                                                ;AND LOADS R5 (EXPECTED) ACCORDINGLY.
006532  005077  172654                  CLR     @RXCSR
006536  052777  000400  172654          BIS     #MRESET,@TXCSR  ;RESET THE DEVICE
006544  004737  004306                  JSR     PC,SMALL        ;WAIT FOR RESET TO FINISH
006550  013703  001412                  MOV     RXCSR,R3        ;LOAD THE RECEIVER CONTROL REGISTER TO R3.
006554  052777  010000  172636          BIS     #MEXT,@TXCSR    ;ENTER EXTERNAL MAINT. MODE
006562  052713  000016          1$:     BIS     #DTR!RTS!STD,(R3)       ;TURN ON DTR!RTS!STD
006566  012737  000110  006616          MOV     #110,68$                ;LOAD THE NUMBER
006574  032777  004000  172620  66$:    BIT     #TIMER,@TXDBUF  ;CHECK THE TIMER BIT
006602  001374                          BNE     66$             ;BR IF SET
006604  032777  004000  172610  67$:    BIT     #TIMER,@TXDBUF  ;CHECK THE BIT
006612  001774                          BEQ     67$             ;BR IF CLEAR
006614  005327                          DEC     (PC)+           ;DECREMENT THE NUMBER
```

```
1539  006616  000110                    68$:    110                     ;OF TIMES TO REPEAT
1540  006620  001365                            BNE     66$             ;BR IF MORE TO GO
1541  006622  011304                            MOV     (R3),R4         ;GET THE BITS FROM THE RXCSR
1542  006624  020504                            CMP     R5,R4           ;R5=GOOD R4=?
1543  006626  001401                            BEQ     2$              ;BRANCH IF THEY MATCH
1544  006630  104003                            HLT     3               ;NO MATCH - SHOW OPR.
1545  006632  012737  006644  001220    2$:     MOV     #3$,LOCK        ;SW09 SETUP
1546  006640  042705  073016                    BIC     #RING!CTS!CARDET!SRD!DSR!STD!RTS!DTR,R5         ;CLEAR OUT UNWANTED BITS
1547  006644  005013                    3$:     CLR     (R3)            ;CLEAR OUT THE REGISTER
1548  006646  012737  000005  006676            MOV     #5,73$          ;LOAD THE NUMBER
1549  006654  032777  004000  172540  71$:     BIT     #TIMER,@TXDBUF  ;CHECK T   TIMER BIT
1550  006662  001374                            BNE     71$             ;BR IF SE
1551  006664  032777  004000  172530  72$:     BIT     #TIMER,@TXDBUF  ;CHECK THE BIT
1552  006672  001774                            BEQ     72$             ;BR IF CLEAR
1553  006674  005327                            DEC     (PC)+           ;DECREMENT THE NUMBER
1554  006676  000005                    73$:    5                       ;OF TIMES TO REPEAT
1555  006700  001365                            BNE     71$             ;BR IF MORE TO GO
1556  006702  011304                            MOV     (R3),R4         ;READ BACK THE REGISTER
1557  006704  020504                            CMP     R5,R4           ;R5=GOOD R4=?
1558  006706  001401                            BEQ     6$              ;BRANCH IF ONLY THE DSC BITS ARE SET
1559  006710  104003                            HLT     3               ;NO-GO TELL OPR
1560  006712                            6$:
1561  006712  012637  006742                    MOV     (SP)+,7$+6              ;RESTORE
1562  006716  012637  006740                    MOV     (SP)+,7$+4
1563  006722  012637  006736                    MOV     (SP)+,7$+2
1564  006726  012637  006734                    MOV     (SP)+,7$
1565  006732  104400                            SCOPE                   ;SCOPE THE WHOLE TEST
1566  006734  173017                    7$:     .WORD   173017
1567  006736  173001                            .WORD   173001
1568  006740  001016                            .WORD   1016
1569  006742  000000                            .WORD   0
1570
1571
1572                                            ;*************************** TEST 2 ****************************
1573                                            ;*TEST OF THE DUP RUNNING A BINARY COUNT
1574                                            ;*PATTERN WITH A CRC CALCULATION AS A SECONDARY STATION
1575                                            ;:************************************************************************
1576
1577                                    ;:************
1578                                    ;            *
1579                                    ; TEST 2
1580                                    ;            *
1581                                    ;:************
1582                                    ;:************************************************************************
1583  006744  012737  000002  001226    TST2:   MOV     #2,@#TSTNO
1584  006752  012737  010030  001216            MOV     #TST3,NEXT
1585  006760  052777  000400  172432            BIS     #MRESET,@TXCSR  ;RESET THE DEVICE
1586  006766  004737  004306                    JSR     PC,SMALL        ;WAIT FOR RESET TO FINISH
1587  006772  105737  001324                    TSTB    TCNFLG          ;H325 TEST CONNECTOR ON?
1588  006776  001403                            BEQ     102$            ;IF NO, BR.
1589  007000  012737  010000  007104            MOV     #MEXT,103$+2    ;IF YES, SET MAINT
1590  007006  012737  000005  001244  102$:     MOV     #5,TEMP4
1591  007014  005001                            CLR     R1              ;CLEAR OUT DATA
1592  007016  012737  102010  010022            MOV     #CRC.CCITT,XPOLY;SET UP THE POLYNOMIAL
1593  007024  012737  177777  010026            MOV     #-1,CALBCC      ;SETUP FOR THE FIRST TIME
1594  007032  013737  010026  007054  16$:     MOV     CALBCC,20$      ;ALLOW FOR THE NEXT CHARACTER
```

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 1595  007040  010137  007052                    MOV     R1,17$          ;LOAD DATA
 1596  007044  004537  007650                    JSR     R5,SIMBCC       ;GO CALCULATE SOFTWARE BCC
 1597  007050  000010                            8.                      ;BASED ON THESE PARAMETERS
 1598  007052  000001                  17$:      .BLKW   1       ;DATA
 1599  007054  000001                  20$:      .BLKW   1       ;PREVIOUS BCC
 1600  007056  105201                            INCB    R1              ;INCREMENT DATA
 1601  007060  001364                            BNE     16$             ;BR IF MORE TO GO
 1602  007062  012737  000001  001236            MOV     #1,TEMP1        ;LOAD DATA
 1603  007070  005037  001240                    CLR     TEMP2           ;CLEAR EXPECTED
 1604  007074  012737  000340  177776            MOV     #340,PS         ;PS = 7
 1605  007102  052777  004000  172310  103$:     BIS     #SYSTST,@TXCSR  ;ENTER SYSTEM TEST MODE
 1606  007110  004537  006332                    JSR     R5,SETVEC       ;LOAD INTERRUPT VECTORS
 1607  007114  007404                            11$                     ;RECEIVER
 1608  007116  007452                            12$                     ;TRANSMITER
 1609  007120     340     340                    .BYTE   340,340         ;LEVEL
 1610                                  ;*********************************************************************************************
 1611                                  ;**FOLLOWING CODE FOR TESTING DUP11 CONNECTED TO MODEM WITH ANALOG LOOPBACK ENABLED**
 1612                                  ;*********************************************************************************************
 1613  007122  105737  001342                    TSTB    MDMFLG          ;MODEM CONNECTED?
 1614  007126  001430                            BEQ     104$            ;IF NO, BR.
 1615  007130  013703  001310                    MOV     REPEAT,R3       ;REPEAT CTSDLY
 1616  007134  012777  010000  172256            MOV     #MEXT,@TXCSR    ;SET EXTERNAL MAINTENANCE
 1617  007142  013737  001314  007374            MOV     DELAY,73$       ;SET TIMER
 1618  007150  052777  000006  172234            BIS     #DTR!RTS,@RXCSR ;ENABLE MODEM.
 1619  007156  013702  001312          106$:     MOV     CTSDLY,R2       ;WAIT FOR CTS
 1620  007162  032777  020000  172222  105$:     BIT     #CTS,@RXCSR     ;CLEAR TO SEND UP?
 1621  007170  001007                            BNE     104$            ;IF YES, BR.
 1622  007172  005302                            DEC     R2              ;STEP COUNTER IF NO.
 1623  007174  001372                            BNE     105$            ;IF NO TRY AGAIN.
 1624  007176  104006                            HLT     6
 1625  007200  005303                            DEC     R3              ;ALLOW CTSDLY TO REPEAT
 1626  007202  001365                            BNE     106$            ;BR IF NOT COMPLETE
 1627  007204  104007                            HLT     7               ;CTS STILL NOT ACTIVE
 1628  007206  000475                            BR      6$              ;DO NOT CONTINUE TEST
 1629                                  ;*********************************************************************************************
 1630  007210  052777  000020  172174  104$:     BIS     #RCVEN,@RXCSR   ;TURN ON THE RECEIVER
 1631  007216  052777  000100  172166            BIS     #RINTEN,@RXCSR  ;TURN ON REC INTERRUPT ENABLE
 1632  007224  105777  172170          1$:       TSTB    @TXCSR          ;TEST FOR TX DONE
 1633  007230  100375                            BPL     1$              ;BR IF NOT SET
 1634  007232  052777  000020  172160  2$:       BIS     #SEND,@TXCSR    ;TURN ON SEND
 1635  007240  012777  000400  172154            MOV     #TSOM,@TXDBUF   ;TURN ON START OF MESSAGE
 1636  007246                          101$:
 1637  007246  012737  000005  007276            MOV     #5,68$          ;LOAD THE NUMBER
 1638  007254  032777  004000  172140  66$:      BIT     #TIMER,@TXDBUF  ;CHECK THE TIMER BIT
 1639  007262  001374                            BNE     66$             ;BR IF SET
 1640  007264  032777  004000  172130  67$:      BIT     #TIMER,@TXDBUF  ;CHECK THE BIT
 1641  007272  001774                            BEQ     67$             ;BR IF CLEAR
 1642  007274  005327                            DEC     (PC)+           ;DECREMENT THE NUMBER
 1643  007276  000005                  68$:      5                       ;OF TIMES TO REPEAT
 1644  007300  001365                            BNE     66$             ;BR IF MORE TO GO
 1645  007302  005337  001244                    DEC     TEMP4
 1646  007306  001001                            BNE     3$
 1647  007310  104004                            HLT     4
 1648  007312  105777  172102          3$:       TSTB    @TXCSR          ;WAIT FOR DONE
 1649  007316  100353                            BPL     101$            ;BR IF NOT SET
 1650  007320  005077  172076          4$:       CLR     @TXDBUF         ;PUSH OUT DATA
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1651  007324  052777  000100  172066          BIS     #TXINTE,@TXCSR  ;TURN ON TRANSMITTER INT ENABLE
1652  007332  005037  177776                  CLR     PS              ;LOWER PROCESOR STATUS
1653  007336                          5$:
1654                                  ;;**************************************************************************************
1655  007336  105737  001342                  TSTB    MDMFLG          ;MODEM FLAG SET?
1656  007342  001003                          BNE     71$             ;IF YES, BR
1657                                  ;;**************************************************************************************
1658  007344  012737  000040  007374          MOV     #32.,73$                ;LOAD THE NUMBER
1659  007352  032777  004000  172042  71$:     BIT     #TIMER,@TXDBUF  ;CHECK THE TIMER BIT
1660  007360  001374                          BNE     71$             ;BR IF SET
1661  007362  032777  004000  172032  72$:     BIT     #TIMER,@TXDBUF  ;CHECK THE BIT
1662  007370  001774                          BEQ     72$             ;BR IF CLEAR
1663  007372  005327                          DEC     (PC)+           ;DECREMENT THE NUMBER
1664  007374  000040                  73$:    32.                     ;OF TIMES TO REPEAT
1665  007376  001365                          BNE     71$             ;BR IF MORE TO GO
1666  007400  104004                          HLT     4       ;FAILED TO INTERRUPT IN TIME
1667  007402  104400                  6$:     SCOPE                   ;SCOPE THIS TEST
1668
1669                                  ;INTERRUPT SERVICE ROUTINES
1670                                  ;-------------------------
1671                                  ;RECEIVER:
1672  007404  017737  172004  001326  11$:     MOV     @RXDBUF,DATA    ;GET THE REGISTER AND DATA
1673  007412  123737  001240  001326          CMPB    TEMP2,DATA      ;CHECK IT
1674  007420  001401                          BEQ     .+4             ;BR IF OK
1675  007422  104004                          HLT     4               ;COMPARISON ERROR
1676  007424  105237  001240                  INCB    TEMP2           ;COUNT UP EXPECTED
1677  007430  105737  001240                  TSTB    TEMP2           ;CHECK TO SEE IF DONE
1678  007434  001005                          BNE     7$              ;BR IF NO
1679  007436  004537  006332                  JSR     R5,SETVEC       ;YES--RESET THE VECTORS
1680  007442  007556                          14$                     ;RECEIVER
1681  007444  007452                          12$                     ;TRANSMITTER
1682  007446     340     340                  .BYTE   340,340         ;LEVEL
1683  007450  000002                  7$:     RTI                     ;RETURN
1684                                  ;TRANSMITTER:
1685  007452  113777  001236  171742  12$:     MOVB    TEMP1,@TXDBUF   ;LOAD THE TRANSMITTER BUFFER
1686  007460  105237  001236                  INCB    TEMP1           ;UP THE COUNT
1687  007464  122737  000377  001236          CMPB    #377,TEMP1      ;ARE WE DONE
1688  007472  001026                          BNE     13$             ;BR IF NO
1689  007474  012777  007504  171704          MOV     #21$,@DUPTVC    ;SETUP FOR NEXT PART
1690  007502  000422                          BR      13$             ;LEAVE
1691  007504  012777  000377  171710  21$:     MOV     #377,@TXDBUF    ;LOAD BUFFER
1692  007512  012777  007522  171666          MOV     #22$,@DUPTVC    ;SETUP NEXT PART
1693  007520  000413                          BR      13$             ;LEAVE
1694  007522  012777  001000  171672  22$:     MOV     #TEOM,@TXDBUF   ;SET END OF MSG
1695  007530  000240                          NOP                     ;STALL
1696  007532  000240                          NOP                     ;DITTO
1697  007534  042777  000120  171656          BIC     #SEND!TXINTE,@TXCSR ;TURN OFF TRANSMITTER
1698  007542  012777  006360  171636          MOV     #NO.BTRAP,@DUPTVC ;LOAD VECTOR
1699  007550  012716  007336          13$:    MOV     #5$,(SP)        ;CRUNCH STACK
1700  007554  000002                          RTI                     ;RETURNS
1701                                  ;CRC CATCH INT SVC
1702  007556  117737  171632  001326  14$:     MOVB    @RXDBUF,DATA    ;GET FIRST PART OF CRC
1703  007564  105777  171622                  TSTB    @RXCSR          ;WAIT FOR SECOND PART
1704  007570  100375                          BPL     .-4             ;DITTO
1705  007572  117737  171616  001327          MOVB    @RXDBUF,DATA+1  ;GET THE REST OF THE CRC
1706  007600  012716  007606                  MOV     #15$,(SP)       ;SETUP FOR RETURN
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```
1707  007604  000002                          RTI             ;RETURN
1708  007606  012737  000340  177776  15$:    MOV     #340,PS         ;RAISE PS
1709  007614  005137  010026                  COM     CALBCC          ;INVERT BCC
1710  007620  023737  010026  001326          CMP     CALBCC,DATA     ;COMPARE SOFTWARE AND HARDWARE BCC
1711  007626  001401                          BEQ     .+4             ;BR IF OK
1712  007630  104004                          HLT     4               ;BCC COMPARISON ERROR
1713  007632  052777  000400  171560          BIS     #MRESET,@TXCSR  ;RESET THE DEVICE
1714  007640  004737  004306                  JSR     PC,SMALL        ;WAIT FOR RESET TO FINISH
1715  007644  000137  007402                  JMP     6$              ;LEAVE
1716
1717
1718  007650  010046                  SIMBCC: MOV     R0,-(SP)
1719  007652  010146                          MOV     R1,-(SP)
1720  007654  010246                          MOV     R2,-(SP)
1721  007656  012537  001236                  MOV     (R5)+,TEMP1
1722  007662  012537  001240                  MOV     (R5)+,TEMP2
1723  007666  012537  001242                  MOV     (R5)+,TEMP3
1724  007672  005037  010024          1$:     CLR     BCCFBK
1725  007676  013700  001242                  MOV     TEMP3,R0
1726  007702  006037  001240                  ROR     TEMP2
1727  007706  005500                          ADC     R0
1728  007710  032700  000001                  BIT     #BIT0,R0
1729  007714  001402                          BEQ     2$
1730  007716  005137  010024                  COM     BCCFBK
1731  007722  013700  010022          2$:     MOV     XPOLY,R0
1732  007726  005100                          COM     R0
1733  007730  040037  010024                  BIC     R0,BCCFBK
1734  007734  000241                          CLC
1735  007736  006037  001242                  ROR     TEMP3
1736  007742  013700  010024                  MOV     BCCFBK,R0
1737  007746  013701  001242                  MOV     TEMP3,R1
1738  007752  010102                          MOV     R1,R2
1739  007754  040100                          BIC     R1,R0
1740  007756  043702  010024                  BIC     BCCFBK,R2
1741  007762  050200                          BIS     R2,R0
1742  007764  043737  010022  001242          BIC     XPOLY,TEMP3
1743  007772  050037  001242                  BIS     R0,TEMP3
1744  007776  005337  001236                  DEC     TEMP1
1745  010002  001333                          BNE     1$
1746  010004  013737  001242  010026          MOV     TEMP3,CALBCC
1747  010012  012602                          MOV     (SP)+,R2
1748  010014  012601                          MOV     (SP)+,R1
1749  010016  012600                          MOV     (SP)+,R0
1750  010020  000205                          RTS     R5
1751  010022  000000                  XPOLY:  0
1752  010024  000000                  BCCFBK: 0
1753  010026  000000                  CALBCC: 0
1754          120001                  CRC16=120001
1755          102010                  CRC.CCITT=102010
1756
1757
1758                                  ;************************** TEST 3 **************************
1759                                  ;*THIS TEST PROVES THE DEVICE WILL HANDLE THE
1760                                  ;*DDCMP PROTOCALL.  SEND AND RECEIVE SYNCS,
1761                                  ;*FOLLOWED BY DATA,BCC,DATA AND FINAL BCC.
1762                                  ;************************************************************
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 1763
 1764                                   ;:************
 1765                                   ;             *
 1766                                   ; TEST 3      
 1767                                   ;             *
 1768                                   ;:************
 1769                                   ;:*****************************************************************************
 1770  010030  012737  000003  001226  TST3:   MOV     #3,@#TSTNO
 1771  010036  012737  002352  001216          MOV     #.EOP,NEXT
 1772  010044  105737  001324                  TSTB    TCNFLG          ;H325 TEST CONNECTOR ON?
 1773  010050  001403                          BEQ     101$            ;IF NO, BRF
 1774  010052  012737  010000  010146          MOV     #MEXT,102$+2    ;IF YES, SET MAINTENANCE
 1775  010060  012737  000340  177776  101$:   MOV     #340,PS         ;RAISE PROCESSOR STATUS
 1776  010066  004537  006332                  JSR     R5,SETVEC       ;SET UP VECTORS
 1777  010072  010632                          10$                     ;BASED ON
 1778  010074  010454                          2$                      ;THESE
 1779  010076     340     340                  .BYTE   340,340         ;PARAMETERS
 1780  010100  005037  001236                  CLR     TEMP1
 1781  010104  005037  001240                  CLR     TEMP2
 1782  010110  005037  001242                  CLR     TEMP3
 1783  010114  005037  001244                  CLR     TEMP4
 1784  010120  005037  001246                  CLR     TEMP5
 1785  010124  052777  000400  171266          BIS     #MRESET,@TXCSR  ;RESET THE DEVICE
 1786  010132  004737  004306                  JSR     PC,SMALL        ;WAIT FOR RESET TO FINISH
 1787  010136  012777  100026  171252          MOV     #DECMOD!26,@PARCSR      ;LOAD THE MODE AND SYNC CHARACTER
 1788  010144                          102$:
 1789  010144  052777  004000  171246          BIS     #SYSTST,@TXCSR          ;ENTER SYSTEM TEST MODE
 1790                                   ;*****************************************************************************
 1791                                   ;**FOLLOWING CODE FOR TESTING DUP11 CONNECTED TO MODEM WITH ANALOG LOOPBACK ENABLED**
 1792                                   ;;****************************************************************************
 1793  010152  105737  001342                  TSTB    MDMFLG          ;MODEM CONNECTED?
 1794  010156  001430                          BEQ     103$            ;IF NO, BR.
 1795  010160  013703  001310                  MOV     REPEAT,R3       ;REPEAT CTSDLY
 1796  010164  012777  010000  171226          MOV     #MEXT,@TXCSR    ;SET EXTERNAL MAINTENIANCE
 1797  010172  013737  001314  010426          MOV     DELAY,74$       ;SET TIMER.
 1798  010200  052777  000006  171204          BIS     #DTR!RTS,@RXCSR ;ENABLE MODEM.
 1799  010206  013702  001312          105$:   MOV     CTSDLY,R2       ;WAIT FOR CTS
 1800  010212  032777  020000  171172  104$:   BIT     #CTS,@RXCSR     ;CLEAR TO SEND UP?
 1801  010220  001007                          BNE     103$            ;IF YES,BR.
 1802  010222  005302                          DEC     R2              ;STEP COUNT IF NO.
 1803  010224  001372                          BNE     104$            ;TRY AGAIN.
 1804  010226  104006                          HLT     6
 1805  010230  005303                          DEC     R3              ;ALLOW CTSDLY TO REPEAT
 1806  010232  001365                          BNE     105$            ;BR IF NOT COMPLETE
 1807  010234  104007                          HLT     7               ;CTS STILL NOT ACTIVE
 1808  010236  000476                          BR      1$              ;DO NOT CONTINUE TEST.
 1809                                   ;*****************************************************************************
 1810  010240                          103$:
 1811  010240  052777  000420  171144          BIS     #RCVEN!STPSYN,@RXCSR    ;LOAD RCVEN!STPSYN
 1812  010246  052777  000020  171144          BIS     #SEND,@TXCSR            ;TURN ON TRANSMITTER
 1813  010254  012777  000426  171140          MOV     #TSOM!26,@TXDBUF        ;OUTPUT A SYNC CHAR
 1814  010262  012737  000005  010312          MOV     #5,68$          ;LOAD THE NUMBER
 1815  010270  032777  004000  171124  66$:    BIT     #TIMER,@TXDBUF  ;CHECK THE TIMER BIT
 1816  010276  001374                          BNE     66$             ;BR IF SET
 1817  010300  032777  004000  171114  67$:    BIT     #TIMER,@TXDBUF  ;CHECK THE BIT
 1818  010306  001774                          BEQ     67$             ;BR IF CLEAR
```

```
 1819  010310  005327                          DEC     (PC)+           ;DECREMENT THE NUMBER
 1820  010312  000005                  68$:    5                       ;OF TIMES TO REPEAT
 1821  010314  001365                          BNE     66$             ;BR IF MORE TO GO
 1822  010316  105777  171076                  TSTB    @TXCSR
 1823  010322  100401                          BMI     .+4
 1824  010324  104005                          HLT     5               ;EXTERNAL CLOCKING STOPPED
 1825  010326  012777  000426  171066          MOV     #TSOM!26,@TXDBUF
 1826  010334  105777  171060          69$:    TSTB    @TXCSR          ;CHECK DONE
 1827  010340  100375                          BPL     69$             ;BR IF NOT SET
 1828  010342  012777  000426  171052          MOV     #TSOM!26,@TXDBUF    ;SEND SYNC
 1829  010350  052777  000100  171034          BIS     #RINTEN,@RXCSR  ;TURN ON INTERRUPTS
 1830  010356  052777  000100  171034          BIS     #TXINTE,@TXCSR  ;DITTO
 1831  010364  005037  177776                  CLR     PS              ;LOWER PROCESSOR STATUS
 1832  010370                          100$:
 1833                                  ;;*************************************************************************
 1834  010370  105737  001342                  TSTB    MDMFLG          ;MODEM FLAG SET?
 1835  010374  001003                          BNE     72$             ;IF YES, BR
 1836                                  ;;*************************************************************************
 1837  010376  012737  000144  010426          MOV     #100.,74$               ;LOAD THE NUMBER
 1838  010404  032777  004000  171010  72$:    BIT     #TIMER,@TXDBUF  ;CHECK THE TIMER BIT
 1839  010412  001374                          BNE     72$             ;BR IF SET
 1840  010414  032777  004000  171000  73$:    BIT     #TIMER,@TXDBUF  ;CHECK THE BIT
 1841  010422  001774                          BEQ     73$             ;BR IF CLEAR
 1842  010424  005327                          DEC     (PC)+           ;DECREMENT THE NUMBER
 1843  010426  000144                  74$:    100.                    ;OF TIMES TO REPEAT
 1844  010430  001365                          BNE     72$             ;BR IF MORE TO GO
 1845  010432  104005                          HLT     5               ;FAILED TO FINISH TEST
 1846  010434                          1$:
 1847  010434  052777  000400  170756          BIS     #MRESET,@TXCSR  ;RESET THE DEVICE
 1848  010442  004737  004306                  JSR     PC,SMALL        ;WAIT FOR RESET TO FINISH
 1849  010446  012706  001150                  MOV     #STACK,SP       ;RESET THE STACK
 1850  010452  104400                          SCOPE                   ;SCOPE THIS TEST
 1851
 1852                                  ;INTERRUPT SERVICE ROUTINES
 1853                                          ;TRANSMITTER
 1854
 1855  010454  012777  000252  170740  2$:     MOV     #252,@TXDBUF    ;LOAD FIRST DATA CHAR
 1856  010462  012737  000026  001236          MOV     #26,TEMP1               ;LOAD DATA
 1857  010470  012777  010500  170710          MOV     #3$,@DUPTVC     ;RELOAD VECTOR
 1858  010476  000452                          BR      7$              ;LEAVE
 1859  010500  013777  001236  170714  3$:     MOV     TEMP1,@TXDBUF   ;MOV DATA TO BUFFER
 1860  010506  105237  001236                  INCB    TEMP1           ;UPDATE DATA
 1861  010512  122737  000032  001236          CMPB    #32,TEMP1               ;CHECK FOR DONE
 1862  010520  001041                          BNE     7$              ;BR IF MORE TO SEND
 1863  010522  012777  010532  170656          MOV     #4$,@DUPTVC     ;RELOAD VECTOR
 1864  010530  000435                          BR      7$              ;RETURN
 1865  010532  012777  001000  170662  4$:     MOV     #TEOM,@TXDBUF   ;PUT OUT BCC
 1866  010540  012777  010550  170640          MOV     #5$,@DUPTVC     ;RELOAD VECTOR
 1867  010546  000426                          BR      7$              ;RETURN
 1868  010550  013777  001240  170644  5$:     MOV     TEMP2,@TXDBUF   ;LOAD DATA
 1869  010556  105237  001240                  INCB    TEMP2           ;UPDATE DATA
 1870  010562  122737  000100  001240          CMPB    #100,TEMP2      ;CHECK FOR FINISH
 1871  010570  001015                          BNE     7$              ;BR IF MORE TO GO
 1872  010572  012777  010602  170606          MOV     #6$,@DUPTVC     ;RELOAD VECTOR
 1873  010600  000411                          BR      7$              ;RETURN
 1874  010602  012777  001000  170612  6$:     MOV     #TEOM,@TXDBUF   ;PUSH OUT DATA BCC
```

```
1875  010610  042777  000120  170602          BIC     #SEND!TXINTE,@TXCSR     ;SHUT DOWN TRANSMITTER
1876  010616  012777  006360  170562          MOV     #NO.BTRAP,@DUPTVC       ;RESET VECTOR
1877  010624  012716  010370          7$:     MOV     #100$,(SP)              ;SETUP RETURN
1878  010630  000002                          RTI                             ;RETURN
1879
1880                                          ;RECEIVER
1881
1882  010632  017737  170554  001242  10$:    MOV     @RXCSR,TEMP3    ;SAVE CSR
1883  010640  017737  170550  001244          MOV     @RXDBUF,TEMP4   ;SAVE BUFFER
1884  010646  105737  001242                  TSTB    TEMP3           ;CHECK FOR DONE
1885  010652  100401                          BMI     11$             ;BR IF SFT
1886  010654  104005                          HLT     5               ;FALSE INTERRUPT
1887  010656  005737  001244          11$:    TST     TEMP4           ;CHECK FOR ERROR
1888  010662  100001                          BPL     12$             ;BR IF NO ERROR
1889  010664  104005                          HLT     5               ;RECEIVER ERROR
1890  010666  122737  000252  001244  12$:    CMPB    #252,TEMP4      ;CHECK DATA
1891  010674  001401                          BEQ     13$             ;BR IF A MATCH
1892  010676  104005                          HLT     5               ;DATA COMPARE ERROR
1893  010700  012737  000026  001246  13$:    MOV     #26,TEMP5               ;LOAD NEXT EXPECTED
1894  010706  012777  010716  170466          MOV     #14$,@DUPRVC    ;RELOAD VECTOR
1895  010714  000531                          BR      26$             ;LEAVE
1896  010716  017737  170472  001244  14$:    MOV     @RXDBUF,TEMP4   ;GET DATA
1897  010724  005737  001244                  TST     TEMP4           ;CHECK FOR ERROR
1898  010730  100001                          BPL     15$             ;BR IF NO ERROR
1899  010732  104005                          HLT     5               ;DATA ERROR
1900  010734  123737  001246  001244  15$:    CMPB    TEMP5,TEMP4             ;CHECK DATA
1901  010742  001401                          BEQ     16$             ;BR IF A MATCH
1902  010744  104005                          HLT     5               ;DATA COMPARE ERROR
1903  010746  105237  001246          16$:    INCB    TEMP5                   ;UPDATE DATA
1904  010752  122737  000032  001246          CMPB    #32,TEMP5               ;CHECK FOR FIRST PART FINISH
1905  010760  001107                          BNE     26$             ;BP IF MORE TO GO
1906  010762  012777  010772  170412          MOV     #17$,@DUPRVC    ;SET UP NEXT VECTOR
1907  010770  000503                          BR      26$             ;LEAVE
1908  010772  017737  170416  001244  17$:    MOV     @RXDBUF,TEMP4   ;GET THE BUFFER
1909  011000  005737  001244                  TST     TEMP4           ;TEST FOR ERROR
1910  011004  100001                          BPL     .+4             ;BR IF OK
1911  011006  104005                          HLT     5               ;RECEIVER ERROR
1912  011010  012777  011020  170364          MOV     #18$,@DUPRVC    ;RELOAD THE VECTOR
1913  011016  000470                          BR      26$             ;LEAVE
1914  011020  017737  170370  001326  18$:    MOV     @RXDBUF,DATA    ;GET DATA
1915  011026  032737  010000  001326          BIT     #CRCERR,DATA    ;CHECK FOR CRC ERROR
1916  011034  001001                          BNE     19$             ;BR IF OK
1917  011036  104005                          HLT     5               ;CRC ERROR!!!!!
1918  011040  012777  011054  170334  19$:    MOV     #20$,@DUPRVC    ;SET UP VECTOR
1919  011046  005037  001332                  CLR     MIND            ;SETUP FOR NEXT DATA
1920  011052  000452                          BR      26$             ;LEAVE
1921  011054  017737  170334  001244  20$:    MOV     @RXDBUF,TEMP4   ;GET DATA
1922  011062  005737  001244                  TST     TEMP4           ;CHECK FOR ERROR
1923  011066  100001                          BPL     21$             ;BR IF NO ERROR
1924  011070  104005                          HLT     5               ;RECEIVER ERROR
1925  011072  123737  001332  001244  21$:    CMPB    MIND,TEMP4              ;CHECK DATA
1926  011100  001401                          BEQ     22$             ;BR IF A MATCH
1927  011102  104005                          HLT     5               ;DATA ERROR
1928  011104  105237  001332          22$:    INCB    MIND            ;UPDATE SOFTWARE DATA
1929  011110  122737  000100  001332          CMPB    #100,MIND               ;CHECK FOR FINISH
1930  011116  001030                          BNE     26$             ;BR IF MORE TO GO
```

```
 1931  011120  012777  011130  170254          MOV     #23$,@DUPRVC    ;RELOAD FINAL VECTOR
 1932  011126  000424                          BR      26$             ;LEAVE
 1933  011130  017737  170260  001244  23$:    MOV     @RXDBUF,TEMP4   ;GET DATA
 1934  011136  005737  001244                  TST     TEMP4           ;CHECK FOR ERROR
 1935  011142  100001                          BPL     24$             ;BR IF OK
 1936  011144  104005                          HLT     5               ;RECEIVER ERROR ON FIRST OCTET
 1937                                                                  ;OF SECOND BCC
 1938  011146  105777  170240          24$:    TSTB    @RXCSR          ;TEST DONE
 1939  011152  100375                          BPL     24$             ;BR IF NOT SET
 1940  011154  017737  170234  001326          MOV     @RXDBUF ,DATA   ;GET SECOND BCC OCTET
 1941  011162  032737  010000  001326          BIT     #CRCERR,DATA    ;CHECK FOR BCC ERROR
 1942  011170  001001                          BNE     25$             ;BR IF OK
 1943  011172  104005                          HLT     5               ;BCC ERROR ON SECOND PART OF MSG
 1944  011174  012716  010434          25$:    MOV     #1$,(SP)        ;SETUP TO FINISH TEST
 1945  011200  000002                  26$:    RTI                     ;RETURN
 1946
 1947
```

```
 1948  011202  052777  042516  050130  EM1:    .ASCIZ  <377>/UNEXPECTED INTERRUPT ON VECTOR ''A'' /
  (1)  011247     377  047125  054105  EM2:    .ASCIZ  <377>/UNEXPECTED INTERRUPT ON VECTOR 'B'' /
  (1)  011314  042777  051122  051117  EM3:    .ASCIZ  <377>/ERROR WHEN USING MODEM LEADS /
  (1)  011353     377  051105  047522  EM4:    .ASCIZ  <377>/ERROR IN SDLC /
  (1)  011373     377  051105  047522  EM5:    .ASCIZ  <377>/ERROR IN DECMODE /
  (1)  011416  051377  047125  042040  EM6:    .ASCIZ  <377>/RUN DIAGNOSTICS /
  (1)  011440  041777  042514  051101  EM7:    .ASCIZ  <377>/CLEAR TO SEND NOT ACTIVE/
  (1)  011472  041777  042514  051101  EM8:    .ASCIZ  <377>/CLEAR TO SEND STILL NOT ACTIVE-TEST ABORTED/
  (1)          011550                 .EVEN
  (1)
  (1)  011550                         .ERRTAB:
  (1)  011550  000000                         0
  (1)  011552  000000                         0
  (1)  011554  000000                         0
  (1)  011556  011202                         EM1
  (1)  011560  011416                         EM6     ;HALT 1
  (1)  011562  000000                         0
  (1)
  (1)  011564  011247                         EM2
  (1)  011566  011416                         EM6     ;HALT 2
  (1)  011570  000000                         0
  (1)
  (1)  011572  011314                         EM3
  (1)  011574  011416                         EM6     ;HALT 3
  (1)  011576  000000                         0
  (1)
  (1)  011600  011353                         EM4
  (1)  011602  011416                         EM6     ;HALT 4
  (1)  011604  000000                         0
  (1)
  (1)  011606  011373                         EM5
  (1)  011610  011416                         EM6     ;HALT 5
  (1)  011612  000000                         0
  (1)  011614  011440                         EM7
  (1)  011616  000000                         0       ;HALT 6
  (1)  011620  000000                         0
  (1)
  (1)  011622  011472                         EM8
  (1)  011624  000000                         0       ;HALT 7
  (1)  011626  000000                         0
  (1)  011630                         CORMAX:
 1949          000001                 .END
```

```
ADRCNT= 003315   996* 1032* 1041#
ALJMFL  001344   633# 766* 790* 802 803 1506
BCCFBK  010024  1724* 1730* 1733* 1736 1740 1752#
BINWRD  003620  1056* 1057 1094#
BITW  = 002000   597#
BIT0  = 000001   460# 579 1728
BIT1  = 000002   459# 578
BIT10 = 002000   450# 569 584 597 617
BIT11 = 004000   449# 568 596 616
BIT12 = 010000   448# 567 583 590 595 615
BIT13 = 020000   447# 566 594 614
BIT14 = 040000   446# 565 582 593 613 914
BIT15 = 100000   445# 564 581 588 592 612
BIT2  = 000004   458# 577 854
BIT3  = 000010   457# 576 603
BIT4  = 000020   456# 575 602
BIT5  = 000040   455# 574
BIT6  = 000100   454# 573 601
BIT7  = 000200   453# 572 600
BIT8  = 000400   452# 571 586 599 619
BIT9  = 001000   451# 570 585 589 598 618
BRW     002666   860 936#
BRX     002670   861 937#
CALBCC  010026  1593* 1594 1709* 1710 1746* 1753#
CARDET= 010000   567# 1546
CHRCNT  003616  1054* 1058 1074* 1092# 1093
CLK   = 020000   594#
CLK.A   001441   703# 1400
CNVRT = 104411   672# 877 879 881 883 1167 1169
CONVRT= 104410   670# 842 1183
CORMAX  011630  1948# 1949
CRCEN = 001000   589#
CRCERR= 010000   583# 1915 1941
CRC.CC= 102010  1592 1755#
CRC16 = 120001  1754#
CTS   = 020000   566# 1546 1620 1800
CTSDLY  001312   554# 1619 1799
CYCLE   005624   862 895 896 1362#
DATA    001326   626# 1672* 1673 1702* 1705* 1710 1914* 1915 1940* 1941
DATABP  004172  1156* 1159 1181 1184#
DATAHD  004160  1155* 1177 1180#
DECMOD= 100000   588# 1787
DELAY   001314   555# 1617 1797
DEVADR  003312   994* 1029 1039#
DISPLA  001200   504# 750* 874*
DISPRE  000174   492# 750
DSCA  = 100000   564#
DSCB  = 000001   579#
DSCFLG  001346   634# 820 1520
DSINTE= 000040   574#
DSR   = 001000   570# 1546
DTR   = 000002   578# 1532 1546 1618 1798
DUPACT  001316   556# 738* 823* 830* 1362
DUPCRO  001500   713# 772 824
DUPNUM  001317   557# 736* 821* 885
DUPRPS  001404   682# 1390* 1391* 1392 1472*
```

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DUPRVC  001402  681#  902   1369*  1390  1470*  1894*  1906*  1912*  1918*  1931*
DUPSEC  001424  690#  1376*
DUPTPS  001410  684#  1394*  1395*  1473*
DUPTRO  001502  714#  780
DUPTVC  001406  683#  1392*  1393*  1394  1471*  1689*  1692*  1698*  1857*  1863*  1866*  1872*  1876*
DUP.EN  001506  717#  763
DUP.MA  001500  712#  761  829  839  1367
DUPO.A  001504  715#
EM1     011202  1948#
EM2     011247  1948#
EM3     011314  1948#
EM4     011353  1948#
EM5     011373  1948#
EM6     011416  1948#
EM7     011440  1948#
EM8     011472  1948#
ERRCNT  001232  525#  739*  908  1194*
ERRFLG  001351  641#  734*  872*  928*  1144*  1157  1171*
ERRMSG  004146  1154*  1172  1175#
ERTABO  004272  1169  1203#
EXIT =  000000  461#
EXITER  004226  1189  1194#
FIX.00  006234  1401  1435#
FLAG    001334  629#
HALTS   004176  1140  1186#
HDXEN = 000010  603#
HILIM   003310  993*  1020  1038#
HUPPSR  001426  691#  1380*  1381
HUPRBF  001430  692#  1378*  1379*  1380
HUPRCR  001432  693#  1372*  1373*  1374
HUPTBF  001434  694#  1387*  1388*
HUPTCR  001436  695#  1383*  1384*  1385
ICOUNT  001222  521#  926  931*
INBUF   005560  963  999  1103*  1104  1108  1349#
INIFLG  001350  640#
INSTER= 104404  662#  1014  1113
INSTR = 104403  660#  767  775  783  793  799  805  809  813  817  1407
INSTR2  003110  970  982#
JUMPER  006240  1443#
LIMITS  003236  1009  1020#
LOBITS  003314  995*  1024  1040#  1041
LOCK    001220  520#  930*  938  1163  1545*
LOKFLG  001352  642#
LOLIM   003306  992*  1022  1037#
LPCNT   001224  522#  925*  926  929*
LSTERR  001234  526#  740*  871*  912*  1141  1143*
LOO.OO  001442  705#  1370*  1398
MALLJM  005321  800  1322#
MASK.A  001440  701#  1399
MASTEK  004625  1165  1263#
MCRLF   004352  948  1045  1161  1162  1170  1227#  1406  1423
MCSR    004707  768  1273#
MCSRX   004555  876  1253#
MDATA   005516  1072  1082  1347#
MDMFLG  001342  632#  765*  786  787  837*  1613  1655  1793  1834
MDSC    005375  818  1330#
```

```
MEPASS  004373            875    1231#
MERRPC  004702           1168    1272#
MERRX   004602            882    1259#
MERR2   004421           1236#   1364
MERR3   004470           1243#
MEXT  = 010000            607#   1531    1589    1616    1774    1796
MIND    001332            628#   1919*   1925    1928*   1929
MJMPR   005037            806    1289#
MLOCK   004526            856    1249#
MMODE = 014000            606#
MMODEA= 004000            596#
MMODEB= 010000            595#
MMODEM  004741            784    1278#
MNEW    004627           1264#
MPAR    005161           1304#
MPASSX  004571            880    1257#
MPOWER  004355           1223    1228#
MQM     004346            980    1226#   1429
MR      004416            863    1235#   1424
MRESET= 000400            461#    599#   1528    1585    1713    1785    1847
MSRJM   005240            814    1313#
MSTJM   005205            810    1308#
MTCN    005112            794    1297#
MTDATA= 040000            593#
MTITLE  001000            499#    756
MTSTN   004613           1166    1261#   1408
MTSTPC  004514           1247#
MVEC    004726            776    1276#
MVECX   004563            878    1255#
NEXT    001216            519#    932    1199    1499*   1584*   1771*
NO.ATR  006354           1475#
NO.BTR  006360           1479#   1698    1876
OJUMPE  006306           1459#   1524
OPCLRJ  001325            625#    808     836*   1446    1452
OVRRUN= 040000            582#
PARAM = 104405            664#    769     777    1409
PARAM1  003156            998#   1015
PARBIT= 000000            461#
PARCSR  001416            687#   1377*   1787*
PARERR  003232           1001    1003    1005    1014#   1021    1023    1025
PASCNT  001230            524#    733*    873*    874     905
PERFOR= 000000            461#
POPRO = 012600            439#   1193
POP1SP= 005726            437#
POP2SP= 022626            441#    934
PRIRTY  001322            623#    834*
PRISEC= 010000            590#
PS    = 177776            430#    730*    850*   1604*   1652*   1708*   1775*   1831*
PUSHRO= 010046            438#   1190
PUSH1S= 005746            436#
PUSH2S= 024646            440#
PWRUP   004322           1217    1219#
QV.FLG  001353            643#    735*    884*    923
RABORT= 002000            584#
RCRCIN= 040000            613#
RCRCNT= 100000            612#
```

```
RCVEN = 000020            575#   1630   1811
RECACT= 004000            568#
REQM  = 001000            585#
REPEAT  001310            553#   1615   1795
RESREG  004174           1182    1185#
RESTRT  002476            887     895#
RESO5 = 104407            668#   1185
RFTURN  001214            518#    742*    862*    864     895*    932*    935     1199*   1201    1224    1422*   1432*   1433
RING  = 040000            565#   1546
RINTEN= 000100            573#   1631   1829
RSQM  = 000400            586#
RTS   = 000004            577#   1532   1546   1618   1798
RXCSR   001412            685#    899   1368*  1372   1527*  1530   1618*  1620   1630*  1631*  1703   1798*  1800
                         1811*   1829*  1882   1938
RXDBUF  001414            686#   1374*  1375*  1376   1377   1378   1672   1702   1705   1883   1896   1908   1914
                         1921    1933   1940
RXDERR= 100000            581#
RXDONE= 000200            572#
SAVNUM  001320            558#    737*    822*    885*
SAVPC   001266            542#   1042*  1205
SAVPCA  001306            551#
SAVR0   001250            535#   1042*
SAVR0A  001270            544#
SAVR1   001252            536#   1042*
SAVR1A  001272            545#
SAVR2   001254            537#   1042*
SAVR2A  001274            546#
SAVR3   001256            538#   1042*
SAVR3A  001276            547#
SAVR4   001260            539#   1042*
SAVR4A  001300            548#
SAVR5   001262            540#   1042*
SAVR5A  001302            549#
SAVSP   001264            541#
SAVSPA  001304            550#
SAVO5 = 104406            666#   1145
SCOPE = 104400            654#   1565   1667   1850
SCOP1 = 104401            656#
SEND  = 000020            602#   1634   1697   1812   1875
SETFLG= 104412            674#    785    795    801    807    811    815    819
SETVEC  006332           1470#   1606   1679   1776
SHIFTS  001330            627#
SIMBCC  007650           1596    1718#
SMALL   004306           1211#   1529   1586   1714   1786   1848
SPACNT= 003617           1055*   1076   1079*  1093#
SRD   = 002000            569#   1508   1546
SRJMFL  001340            631#    816   1515
STACK = 001150            431#    731    851   1200   1220   1849
STD   = 000010            576#   1508   1532   1546
STJMFL  001336            630#    812   1509
STPSYN= 000400            571#   1811
SVO5    003324           1042#
SWR     001202            505#    747    749*    757    854    914    921    938    944   1134   1139   1188   1195
                         1197    1404
SWREG   000176            493#    749
SWOO  = 000001            412#
```

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SW01  = 000002            411#  1404
SW02  = 000004            410#
SW03  = 000010            408#
SW04  = 000020            407#
SW05  = 000040            406#
SW06  = 000100            405#
SW07  = 000200            404#
SW08  = 000400            403#  1195
SW09  = 001000            402#   938
SW10  = 002000            401#  1197
SW11  = 004000            400#   921
SW12  = 010000            399#   944   1134
SW13  = 020000            398#  1139
SW14  = 040000            397#
SW15  = 100000            396#
SYSTST= 004000            608#  1605  1789
TABORT= 002000            617#
TCNFLG  001324            624#   789*   796   797   835*  1444  1460  1504  1587  1772
TCRCIN= 010000            615#
TCRC7T= 020000            614#
TEMP    005454           1059   1345#
TEMP1   001236            530#   835   836   839*  840   844*  1340  1602*  1685  1686*  1687  1721*  1744*
                         1780*  1856*  1859  1860*  1861
TEMP2   001240            531#   840*  1342  1603*  1673  1676*  1677  1722*  1726*  1781*  1868  1869*  1870
TEMP3   001242            532#  1723*  1725  1735*  1737  1742*  1743*  1746  1782*  1882*  1884
TEMP4   001244            533#  1590*  1645*  1783*  1883*  1887  1890  1896*  1897  1900  1908*  1909  1921*
                         1922   1925  1933*  1934
TEMP5   001246            534#  1784*  1893*  1900  1903*  1904
TEOM  = 001000            618#  1694   1865   1874
TIMER = 004000            616#  1534   1536   1549  1551  1638  1640  1659  1661  1815  1837  1838  1840
TKCSR   001204            510#   917   965
TKDBR   001206            511#   919   967   973
TLAST = 010030           1427   1948#
TPCSR   001210            512#   949   971   1136
TPDBR   001212            513#   951*  973*  1138*
TRPOK   003710           1125#
TRP.PC  005622           1351#
TSOM  = 000400            619#  1635  1813  1825  1828
TSTNO   001226            523#   741*  1208  1412  1418  1420  1498*  1583*  1770*
TST1    006364           1415   1432  1498#
TST2    006744           1499   1583#
TST3    010030           1584   1770#  1948
TST4  = ****** U         1771
TTST    002554            857*   858*  860*  861*  915#
TWOSYN= 000000            461#
TXACT = 001000            598#
TXCSR   001420            688#  1381*  1382*  1383  1528*  1531*  1585*  1605*  1616*  1632  1634*  1648  1651*
                         1697*  1713*  1785*  1789*  1796*  1812*  1822  1826  1830*  1847*  1875*
TXDBUF  001422            689#  1385*  1386*  1387  1534  1536  1549  1551  1635*  1638  1640  1650*  1659
                         1661   1685*  1691*  1694*  1813*  1815  1817  1825*  1828*  1838  1840  1855*  1859*
                         1865*  1868*  1874*
TXDLAT= 100000            592#
TXDONE= 000200            600#
TXINTE= 000100            601#  1651  1697  1830  1875
TYPDAT  004162           1160   1178  1181#
TYPE  - 104402            658#   756   838   856   863   875   876   878   880   882   948   961   980
```

```
                        1045    1082    1161    1162    1165    1166    1168    1170    1174    1179    1222    1364    1406
                        1423    1424    1429
TYPMSG  004062          1158    1161#
USER  = 000000           605#
WRDCNT  003614          1053*   1083*   1091#
WRKO.F  004150          1173    1176#
XBX     003754          1135    1137    1139#
XCSR    002510           877     897#
XERR    002532           883     906#
XHEAD   005273           838    1318#
XPASS   002524           881     903#
XPOLY   010022          1592*   1731    1742    1751#
XSTATQ  005442           843    1338#
XTSTN   004300          1167    1206#
XVEC    002516           879     900#
$E    = 000005             1#    1499    1500#   1584    1585#   1771    1772#
$ENDAD  002464           487     889#    1186
$N    = 000003             1#    1484    1492    1500#   1572    1577    1585#   1758    1764    1772#   1948#
$RAYO = 177777             1#    1484#   1485    1490#   1572#   1573    1575#   1758#   1759    1762#
$Y    = 000013           647#    654     656#    658#    660#    662#    664#    666#    668#    670#    672#    674#    676#
.     = 011630           472#    473     476#    483#    488#    491#    494#    498#    500#    556#    557#    558#    559#
                         624#    625#    630#    631#    711#    713#    714#    715#   1346#   1348#   1350#   1351#   1366
                        1598#   1599#   1674    1704    1711    1823    1910    1948#
.BEGIN  002246           759     825     841     850#
.CNVRT  003414           673    1046#
.CONVR  003410           671    1045#
.EOP    002352           871#   1771
.ERRTA  011550          1153    1948#
.HLT    00373C           479    1134#
.INSTE  003076           663     978#
.INSTR  002772           661     957#
.INST1  003012           961#    981
.MSG    003014           959*    962#
.PARAM  003116           665     989#
.PFAIL  004312           477     732    1217#   1221
.RES05  003356           669    1042#
.SAV05  003316           667    1042#
.SCOPE  002540           655     912#
.SCOP1  002672           657     938#
.SETFL  003622           675    1102#   1114
.START  001510           495     730#    742
.TRPSR  003676           481    1122#
.TRPTA  001354           653#   1127
.TYPE   002716           659     941#


. ABS.  011630      000

ERRORS DETECTED:  0

DSKZ:CZDPEB,DSKZ:CZDPEB.SEQ=DSKZ:CZDPEB.MAC,DSKZ:CZDPEB.P11
RUN-TIME:  5  7  .6 SECONDS
RUN-TIME RATIO: 29/13=2.2
CORE USED:  17K  (33 PAGES)
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