

DUP 11

CONFIDENCE TST  
CZDPECO

AH-8589C-MC  
FICHE 1 OF 1

OCT 1983  
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Microfilm frame containing a grid of frames with illegible text.

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#### IDENTIFICATION

PRODUCT CODE: AC-8588C-MC  
PRODUCT NAME: CZDPECO DUP11 CONFIDENCE TST  
DATE: JUNE 1983  
MAINTAINER: MK-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 MODEM 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.

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## 2.0 REQUIREMENTS

### 2.1 EQUIPMENT

- 2.1.1. ANY PDP11 FAMILY CPU (WITH MINIMUM 4K MEMORY)
- 2.1.2. ASR 33 (OR EQUIVALENT)
- 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)

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#### 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

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## 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  |     |

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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 POSSIBLY 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

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### 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 PERFORMED.   |



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**\*\*NOTE\*\***  
IT SHOULD BE REMEMBERED THAT CZDPE IS NOT A DIAGNOSTIC , BUT  
IT 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.

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:\*CZDPECO /<377>/DUP11 CONFIDENCE TST  
:\*COPYRIGHT 1975, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754  
:-----\*

:STARTING PROCEDURE  
:LOAD PROGRAM  
:LOAD ADDRESS 000200  
:PRESS START  
:PROGRAM WILL TYPE "CZDPECO /<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  
040000  
020000  
010000  
004000  
002000  
001000  
000400  
000200  
000100  
000040  
000020  
000010  
  
000004  
000002  
000001

SW15=100000  
SW14=40000  
SW13=20000  
SW12=10000  
SW11=4000  
SW10=2000  
SW09=1000  
SW08=400  
SW07=200  
SW06=100  
SW05=40  
SW04=20  
SW03=10  
  
SW02=4  
SW01=2  
SW00=1

:=1,HALT ON ERROR  
:=1,LOOP ON CURRENT TEST  
:=1,INHIBIT ERROR TYPEOUT  
:=1,DELETE TYPEOUT/BELL ON ERROR.  
:=1,INHIBIT ITERATIONS  
:=1,ESCAPE TO NEXT TEST ON ERROR  
:=1,LOOP WITH CURRENT DATA  
:=1,LOOP ON ERROR  
  
:SELECT DUP'S DESIRED ACTIVE  
:NOTE:THIS MUST NOT EXCEED ORIGINAL COUNT  
:LOCK ON TEST SELECT  
:RESTART PROGRAM AT SELECTED TEST  
:ENTER PARAMETERS

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```

423
424
425      ;REGISTER DEFINITIONS
426      ;-----
427
428      000000      R0=%0      ;GENERAL REGISTER
429      000001      R1=%1      ;GENERAL REGISTER
430      000002      R2=%2      ;GENERAL REGISTER
431      000003      R3=%3      ;GENERAL REGISTER
432      000004      R4=%4      ;GENERAL REGISTER
433      000005      R5=%5      ;GENERAL REGISTER
434      000006      SP=%6      ;PROCESSOR STACK POINTER
435      000007      PC=%7      ;PROGRAM COUNTER
436
437      ;LOCATION EQUIVALENCIES
438      ;-----
439
440      177776      PS=177776   ;PROCESSOR STATUS WORD
441      001150      STACK=1150  ;START OF PROCESSOR STACK
442
443      ;INSTRUCTION DEFINITIONS
444      ;-----
445
446      005746      PUSH1SP=5746 ;DECREMENT PROCESSOR STACK 1 WORD
447      005726      POP1SP=5726  ;INCREMENT PROCESSOR STACK 1 WORD
448      010046      PUSHRO=10046  ;SAVE R0 ON STACK
449      012600      POPRO=12600   ;RESTORE R0 FROM STACK
450      024646      PUSH2SP=24646 ;DECREMENT STACK TWICE
451      022626      POP2SP=22626  ;INCREMENT STACK TWICE
452      .EQUIV EMT,HLT ;BASIC DEFINITION OF ERROR CALL
453
454      100000      BIT15=100000
455      040000      BIT14=40000
456      020000      BIT13=20000
457      010000      BIT12=10000
458      004000      BIT11=4000
459      002000      BIT10=2000
460      001000      BIT9=1000
461      000400      BIT8=400
462      000200      BIT7=200
463      000100      BIT6=100
464      000040      BIT5=40
465      000020      BIT4=20
466      000010      BIT3=10
467      000004      BIT2=4
468      000002      BIT1=2
469      000001      BIT0=1
470
471

```

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TRAPCATCHER FOR UNEXPECTED INTERRUPTS

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000024 004312

000026 000340

000030 003730

000032 000340

000034 003676

000036 000340

000040 000040

000040 000000

000042 000000

000044 000000

000046 002464

000052 000052

000052 000000

000174

000174 000000

000176 000000

000200 000200

000200 000137 001510

001000 001000

001000 005377 055103 050104

001200

001200 177570

001202 177570

001204 177560

001206 177562

001210 177564

001212 177566

\*\*\*\*\*  
-----  
:TRAPCATCHER FOR ILLEGAL INTERRUPTS  
:THE STANDARD 'TRAP CATCHER' IS PLACED  
:BETWEEN ADDRESS 0 TO ADDRESS 776.  
:IT LOOKS LIKE 'PC+2 HALT'.  
-----  
\*\*\*\*\*

.=0  
:STANDARD INTERRUPT VECTORS  
-----

.=24  
.PFAIL :POWER FAIL HANDLER  
340 :SERVICE AT LEVEL 7  
.HLT :ERROR HANDLER  
340 :SERVICE AT LEVEL 7  
.TRPSRV :GENERAL HANDLER DISPATCH SERVICE  
340 :SERVICE AT LEVEL 7

.=40  
0 :SAVE FOR ACT-11 OR DDP2  
0 :RETURN ADDRESS IF UNDER ACT-11 OR DDP2  
0 :SAVE FOR ACT-11 OR DDP2  
SENDAD :FOR USE WITH ACT-11 OR DDP2

.=52  
0 :ACT-11 PROGRAM CHARACTERISTICS

.=174  
DISPREG: 0 :SOFTWARE DISPLAY REGISTER  
SWREG: 0 :SOFTWARE SWITCH REGISTER

.=200  
JMP .START :GO TO START OF PROGRAM

.=1000  
MTITLE: .ASCIZ <377><12>/CZDPEC0 /<377>/DUP11 CONFIDENCE TST /<377>

.=1200  
:SWR AND LIGHTS  
-----

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

:INDIRECT POINTERS TO TELETYPE VECTORS AND REGISTERS  
-----

TKCSR: 177560 :TELETYPE KEYBOARD CONTROL REGISTER  
TKDBR: 177562 :TELETYPE KEYBOARD DATA BUFFER  
TPCSR: 177564 :TELEPRINTER CONTROL REGISTER  
TPDBR: 177566 :TELEPRINTER DATA BUFFER

:PROGRAM CONTROL PARAMETERS  
-----

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|     |        |        |                    |  |
|-----|--------|--------|--------------------|--|
| 527 | 001214 | 000000 | RETURN: 0          | :SCOPE ADDRESS FOR LOOP ON TEST                          |
| 528 | 001216 | 000000 | NEXT: 0            | :ADDRESS OF NEXT TEST TO BE EXECUTED                     |
| 529 | 001220 | 000000 | LOCK: 0            | :ADDRESS FOR LOCK ON CURRENT DATA                        |
| 530 | 001222 | 000001 | ICOUNT: 1          | :NUMBER OF ITERATIONS THAT CURRENT TEST WILL BE EXECUTED |
| 531 | 001224 | 000000 | LPCNT: 0           | :NUMBER OF ITERATIONS COMPLETED                          |
| 532 | 001226 | 000000 | TSTNO: 0           | :NUMBER OF TEST IN PROGRESS                              |
| 533 | 001230 | 000000 | PASCNT: 0          | :NUMBER OF PASSES COMPLETED                              |
| 534 | 001232 | 000000 | ERRCNT: 0          | :TOTAL NUMBER OF ERRORS                                  |
| 535 | 001234 | 000000 | LSTERR: 0          | :PC OF LAST ERROR CALL                                   |
| 536 |        |        | :PROGRAM VARIABLES |  |
| 537 |        |        | :-----             |  |
| 538 |        |        |                    |  |
| 539 | 001236 | 000000 | TEMP1: 0           | :TEMPORARY STORAGE                                       |
| 540 | 001240 | 000000 | TEMP2: 0           | :TEMPORARY STORAGE                                       |
| 541 | 001242 | 000000 | TEMP3: 0           | :TEMPORARY STORAGE                                       |
| 542 | 001244 | 000000 | TEMP4: 0           | :TEMPORARY STORAGE                                       |
| 543 | 001246 | 000000 | TEMP5: 0           | :TEMPORARY STORAGE                                       |
| 544 | 001250 | 000000 | SAVR0: 0           | :R0 STORAGE  |
| 545 | 001252 | 000000 | SAVR1: 0           | :R1 STORAGE  |
| 546 | 001254 | 000000 | SAVR2: 0           | :R2 STORAGE  |
| 547 | 001256 | 000000 | SAVR3: 0           | :R3 STORAGE  |
| 548 | 001260 | 000000 | SAVR4: 0           | :R4 STORAGE  |
| 549 | 001262 | 000000 | SAVR5: 0           | :R5 STORAGE  |
| 550 | 001264 | 000000 | SAVSP: 0           | :STACK POINTER STORAGE                                   |
| 551 | 001266 | 000000 | SAVPC: 0           | :PROGRAM COUNTER STORAGE                                 |
| 552 |        |        |                    |  |
| 553 | 001270 | 000000 | SAVR0A: 0          | :R0 STORAGE  |
| 554 | 001272 | 000000 | SAVR1A: 0          | :R1 STORAGE  |
| 555 | 001274 | 000000 | SAVR2A: 0          | :R2 STORAGE  |
| 556 | 001276 | 000000 | SAVR3A: 0          | :R3 STORAGE  |
| 557 | 001300 | 000000 | SAVR4A: 0          | :R4 STORAGE  |
| 558 | 001302 | 000000 | SAVR5A: 0          | :R5 STORAGE  |
| 559 | 001304 | 000000 | SAVSPA: 0          | :STACK POINTER STORAGE                                   |
| 560 | 001306 | 000000 | SAVPCA: 0          | :PROGRAM COUNTER STORAGE                                 |
| 561 |        |        |                    |  |
| 562 | 001310 | 000005 | REPEAT: 5          | :REPEAT CTS DLY  |
| 563 | 001312 | 177777 | CTSDLY: -1         | :CTS DELAY   |
| 564 | 001314 | 100000 | DELAY: 100000      | :DELAY FOR DATA LEAD TESTS                               |
| 565 | 001316 | 000001 | DUPACTV: .BLKB 1   | :DUP11'S SELECTED ACTIVE.                                |
| 566 | 001317 | 000001 | DUPNUM: .BLKB 1    | :OCTAL NUMBER OF DUP11'S.                                |
| 567 | 001320 | 000001 | SAVNUM: .BLKB 1    | :WORKABLE NUMBER.  |
| 568 |        | 001322 | .EVEN              |  |

```

569
570                                     :CONTROL REGISTER DEFINITIONS
571                                     :-----
572                                     :RXCSR BIT DEFINITIONS
573         100000      DSCA=BIT15      :DATA SET CHANGE A
574         040000      RING=BIT14      :RING
575         020000      CTS=BIT13       :CLR TO SEND
576         010000      CARDET=BIT12    :CARRIER DETECT
577         004000      RECACT=BIT11    :REC ACTIVE
578         002000      SRD=BIT10       :SEC REC DATA
579         001000      DSR=BIT9        :DATA SET RDY
580         000400      STPSYN=BIT8     :STRIP SYNC
581         000200      RXDONE=BIT7     :REC DONE
582         000100      RINTEN=BIT6     :REC INTR ENABLE
583         000040      DSINTE=BIT5     :DSC INTR ENABLE
584         000020      RCVEN=BIT4      :REC ENABLE
585         000010      STD=BIT3        :SEC XMIT DATA
586         000004      RTS=BIT2        :REQ TO SEND
587         000002      DTR=BIT1       :DATA TERM RDY
588         000001      DSCB=BIT0      :DATA SET CHANGE B
589                                     :RXDBUF BIT DEFINITIONS
590         100000      RXDERR=BIT15     :REC DATA ERROR
591         040000      OVRUN=BIT14     :OVERRUN ERROR
592         010000      CRCERR=BIT12    :CRC ERROR
593         002000      RABORT=BIT10    :REC ABORT
594         001000      REOM=BIT9       :REC END OF MESSAGE
595         000400      RSOM=BIT8       :REC START OF MESSAGE
596                                     :PARCSR BIT DEFINITIONS
597         100000      DECMOD=BIT15     :DEC MODE (DDCMP)
598         001000      CRCEN=BIT9      :CRC ENABLE
599         010000      PRISEC=BIT12    :PRI/SEC SELECT
600                                     :TXCSR BIT DEFINITIONS
601         100000      TXDLAT=BIT15    :TX DATA LATE
602         040000      MTDATA=BIT14    :MAINT DATA OUT
603         020000      CLK=BIT13      :CLK
604         010000      MMODEB=BIT12   :MAINT MODE B
605         004000      MMODEA=BIT11   :MAINT MODE A
606         002000      BITW=BIT10     :BIT WINDOW INPUT
607         001000      TXACT=BIT9     :TX ACTIVE
608         000400      MRESET=BIT8    :MASTER RESET
609         000200      TXDONE=BIT7    :XMIT DONE
610         000100      TXINTE=BIT6   :XMIT DONE INTR ENABLE
611         000020      SEND=BIT4      :SEND
612         000010      HDXEN=BIT3     :HDX/FDX
613                                     :TXCSR WRD DEFINITIONS
614         000000      USER=0          :USER MODE
615         014000      MMODE=14000    :MAINT INT MODE
616         010000      MEXT=10000    :MAINT EXT MODE
617         004000      SYSTST=4000    :SYSTEM TEST MODE
618
619                                     :TXDBUF BIT DEFINITIONS
620                                     :-----
621         100000      RCRC7T=BIT15    :RCRC7T=BIT15
622         040000      RCRCIN=BIT14    :RCRCIN=BIT14
623         020000      TCRC7T=BIT13    :TCRC7T=BIT13
624         010000      TCRCIN=BIT12    :TCRCIN=BIT12
    
```

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625 004000 TIMER=BIT11 ;MAINTENANCE TIMER  
626 002000 TABORT=BIT10 ;TRANSMIT ABORT  
627 001000 TEOM=BIT9 ;TRANSMIT END OF MESSAGE  
628 000400 TSOM=BIT8 ;TRANSMIT START OF MESSAGE

629 ;MISC. PROGRAM DEFINITIONS  
630 -----

631  
632 001322 000000 PRIRTY: .WORD 0  
633 001324 000001 TCNFLG: .BLKB 1  
634 001325 000001 OPCLRJ: .BLKB 1  
635 001326 000000 DATA: .WORD 0  
636 001330 000000 SHIFTS: .WORD 0  
637 001332 000000 MIND: .WORD 0  
638 001334 000000 FLAG: .WORD 0  
639 001336 000001 STJMFL: .BLKW 1  
640 001340 000001 SRJMFL: .BLKW 1  
641 001342 000000 MDMFLG: .WORD 0  
642 001344 000000 ALJMFL: .WORD 0  
643 001346 000000 DSCFLG: .WORD 0

644  
645  
646 ;PROGRAM CONTROL FLAGS  
647 -----

648  
649 001350 000 INIFLG: .BYTE 0 ;PROGRAM INITIALIZATION FLAG  
650 001351 000 ERRFLG: .BYTE 0 ;ERROR OCCURED FLAG  
651 001352 000 LOKFLG: .BYTE 0 ;LOCK ON CURRENT TEST FLAG  
652 001353 000 QV.FLG: .BYTE 0 ;QUICK VERIFY FLAG.  
653 ;ON FIRST PASS OF EACH DUP11 ITERATIONS  
654 ;WILL BE SUPPRESSED  
655 .EVEN

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PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

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

656  
657  
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001354 104400  
001354 002540 104401  
001356 002672 104402  
001360 002716 104403  
001362 002772 104404  
001364 003076 104405  
001366 003116 104406  
001370 003316 104407  
001372 003356 104410  
001374 003410 104411  
001376 003414 104412  
001400 003622 104412

:\*\*\*\*\*  
:-----  
:TRPTAB:  
SCOPE=TRAP+0 :CALL TO SCOPE LOOP AND ITERATION HANDLER  
 :SCOPE  
SCOPE1=TRAP+1 :CALL TO LOOP ON CURRENT DATA HANDLER  
 :SCOPE1  
TYPE=TRAP+2 :CALL TO TELETYPE OUTPUT ROUTINE  
 :TYPE  
INSTR=TRAP+3 :CALL TO ASCII STRING INPUT ROUTINE  
 :INSTR  
INSTER=TRAP+4 :CALL TO INPUT ERROR HANDLER  
 :INSTER  
PARAM=TRAP+5 :CALL TO NUMERICAL DATA INPUT ROUTINE  
 :PARAM  
SAV05=TRAP+6 :CALL TO REGISTER SAVE ROUTINE  
 :SAV05  
RES05=TRAP+7 :CALL TO REGISTER RESTORE ROUTINE  
 :RES05  
CONVRT=TRAP+10 :CALL TO DATA OUTPUT ROUTINE  
 :CONVRT  
CNVRT=TRAP+11 :CALL TO DATA OUTPUT ROUTINE WITHOUT CR/LF.  
 :CNVRT  
SETFLG=TRAP+12 :CALL TO TELETYPE INPUT ROUTINE  
 :SETFLG  
:-----  
:\*\*\*\*\*



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```

688                                     :DUP11 VECTOR AND REGISTER INDIRECT POINTERS
689
690 001402 000000 DUPRVC: 0           ;POINTER TO DUP11 RECEIVER INTERRUPT VECTOR
691 001404 000000 DUPRPS: 0           ;POINTER TO DUP11 RECEIVER INTERRUPT SERVICE PS
692 001406 000000 DUPTVC: 0           ;POINTER TO DUP11 TRANSMITTER INTERRUPT VECTOR
693 001410 000000 DUPTPS: 0           ;POINTER TO DUP11 TRANSMITTER INTERRUPT SERVICE PS
694 001412 000000 RXCSR: 0            ;POINTER TO DUP11 RECEIVER STATUS REGISTER
695 001414 000000 RXDBUF: 0           ;POINTER TO DUP11 RECEIVER DATA BUFFER
696 001416 000000 PARCSR: 0           ;POINTER TO DUP11 PARAMETER STATUS REGISTER
697 001420 000000 TXCSR: 0            ;POINTER TO DUP11 TRANSMITTER STATUS REGISTER
698 001422 000000 TXDBUF: 0           ;POINTER TO DUP11 TRANSMITTER DATA BUFFER
699 001424 000000 DUPSEC: 0           ;POINTER TO DUP11 SECONDARY REGISTER SELECT REGISTER
700 001426 000000 HUPPSR: 0           ;POINTER TO PARAMETER STATUS HIGH BYTE
701 001430 000000 HUPRBF: 0           ;POINTER TO RECEIVER BUFFER HIGH BYTE
702 001432 000000 HUPRCR: 0           ;POINTER TO RECEIVER CONTROL REG HIGH BYTE
703 001434 000000 HUPTBF: 0           ;POINTER TO TRANSMITTER BUFFER HIGH BYTE
704 001436 000000 HUPTCR: 0           ;POINTER TO TRANSMITTER CONTROL REG HIGH BYTE
705
706                                     :DUP11 CONTROL INDICATORS FOR CURRENT DUP11 UNDER TEST
707                                     :-----
708
709
710 001440 000 MASK.A: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK
711
712 001441 010 CLK.A: .BYTE 8.         ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR
713
714 001442 000000 L00.00: 000000       ;PARAMETERS
715
716                                     :DUP11 STATUS TABLE AND ADDRESS ASSIGNMENTS
717                                     :-----
718
719
720                                     .=1500
721 001500 001500 DUP.MAP:
722 001500 000001 DUPCR0: .BLKW 1       ;CONTROL STATUS REGISTER FOR DUP11 NUMBER 0
723 001502 000001 DUPTR0: .BLKW 1       ;VECTOR 'A' FOR DUP11 NUMBER 0
724 001504 000001 DUPO.A: .BLKW 1       ;PARAMETER FOR DUP11 NUMBER 0
725
726 001506 000000 DUP.END: 000000
727
728
729
730

```

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```

731
732      :PROGRAM INITIALIZATION
733      :LOCK OUT INTERRUPTS
734      :SET UP PROCESSOR STACK
735      :SET UP POWER FAIL VECTOR
736      :CLEAR PROGRAM CONTROL FLAGS AND COUNTS
737      :TYPE TITLE MESSAGE
738
739 001510 012737 000340 177776 .START: MOV #340,PS ;LOCK OUT INTERRUPTS
740 001516 012706 001150 MOV #STACK,SP ;SET UP STACK
741 001522 012737 004312 000024 MOV #.PFAIL,@#24 ;SET UP POWER FAIL VECTOR
742 001530 005037 001230 CLR PASCNT ;CLEAR PASS COUNT
743 001534 105037 001351 CLRB ERRFLG ;CLEAR ERROR FLAG
744 001540 105037 001353 CLRB QV.FLG ;ZERO QUICK VERIFY FLAG
745 001544 105037 001317 CLRB DUPNUM
746 001550 105037 001320 CLRB SAVNUM
747 001554 105037 001316 CLRB DUPACTV
748 001560 005037 001232 CLR ERRCNT ;CLEAR ERROR COUNT
749 001564 005037 001234 CLR LSTERR ;CLEAR LAST ERROR POINTER
750 001570 012737 000001 001226 MOV #1,TSTNO ;SET UP FOR TEST 1
751 001576 012737 001510 001214 MOV #.START,RETURN ;SET UP FOR POWER FAIL BEFORE
752 ;TESTING STARTS
753 001604 013746 000006 MOV @#6,-(SP) ;SAVE CURRENT VECTORS
754 001610 013746 000004 MOV @#4,-(SP) ;
755 001614 012737 001630 000004 MOV #12$,@#4 ;SETUP FOR TIMEOUT
756 001622 005777 177354 TST @SWR ;REFERENCE HARDWARE SWITCH REG
757 001626 000407 BR 13$ ;BR IF IT EXISTS
758 001630 012737 000176 001202 12$: MOV #SWREG,SWR ;POINT TO SOFT SWR
759 001636 012737 000174 001200 MOV #DISPREG,DISPLAY ;POINT TO SOFT DISPLAY REG
760 001644 022626 CMP (SP)+,(SP)+ ;ADJUST STACK
761 001646 012637 000004 13$: MOV (SP)+,@#4 ;RESTORE VECTORS
762 001652 012637 000006 MOV (SP)+,@#6
763 001656 005737 000042 11$: TST @#42 ;IF ACT11 AUTO MODE
764 001662 001123 BNE 66$ ;DON'T TYPE ID
765 001664 104402 001000 TYPE ,MTITLE ;TYPE TITLE MESSAGE
766 001670 105777 177306 6$: TSTB @SWR ;USE SAME PARAMETERS?
767 001674 100002 BPL 10$ ;IF NO, BR AND INPUT NEW PARAMETERS
768 001676 000137 002246 JMP .BEGIN ;IF YES, GO.
769 001702 10$:
770 001702 012700 001500 MOV #DUP.MAP,RO ;CLR MAP
771 001706 005020 68$: CLR (RO)+
772 001710 020027 001506 CMP RO,#DUP.END ;DONE WITH MAP?
773 001714 001374 BNE 68$ ;BR IF NO
774 001716 105037 001342 CLRB MDMFLG
775 001722 105037 001344 CLRB ALJMFL
776 001726 104403 INSTR ;OUTPUT MESSAGE & GET INPUT STRING
777 001730 004707 MCSR ;MESSAGE
778 001732 104405 PARAM ;CONVERT STRING
779 001734 160000 160000 ;LOW LIMIT
780 001736 175500 175500 ;HIGH LIMIT
781 001740 001500 DUPCRO ;STORE AT THIS LOCATION
782 001742 001 .BYTE 1 ;MASK
783 001743 001 .BYTE 1 ;HOW MANY TIMES + 2
784 001744 104403 INSTR ;OUTPUT MESSAGE & GET INPUT STRING
785 001746 004726 MVEC ;MESSAGE
786 001750 104405 PARAM ;CONVERT STRING

```

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|     |        |        |        |        |                                    |
|-----|--------|--------|--------|--------|------------------------------------|
| 787 | 001752 | 000300 |        | 300    | :LOW LIMIT                         |
| 788 | 001754 | 000770 |        | 770    | :HIGH LIMIT                        |
| 789 | 001756 | 001502 |        | DUPTR0 | :STORE AT THIS LOCATION            |
| 790 | 001760 | 001    | .BYTE  | 1      | :MASK                              |
| 791 | 001761 | 001    | .BYTE  | 1      | :HOW MANY TIMES + 2                |
| 792 | 001762 | 104403 |        | INSTR  | :OUTPUT MESSAGE & GET INPUT STRING |
| 793 | 001764 | 004741 |        | MMODEM | :MESSAGE                           |
| 794 | 001766 | 104412 |        | SETFLG | :SET FLAG BASED UPON INPUT STRING  |
| 795 | 001770 | 001342 |        | MDMFLG | :THIS FLAG                         |
| 796 | 001772 | 105737 | 001342 | TSTB   | MDMFLG :MODEM FLAG SET?            |
| 797 | 001776 | 001405 |        | BEQ    | 71\$ :IF BR.                       |
| 798 | 002000 | 105037 | 001324 | CLRB   | TCNFLG                             |
| 799 | 002004 | 105037 | 001344 | CLRB   | ALJMFL                             |
| 800 | 002010 | 000436 |        | BR     | 70\$                               |
| 801 | 002012 |        |        |        |                                    |
| 802 | 002012 | 104403 | 71\$:  | INSTR  | :OUTPUT MESSAGE & GET INPUT STRING |
| 803 | 002014 | 005112 |        | MTCN   | :MESSAGE                           |
| 804 | 002016 | 104412 |        | SETFLG | :SET FLAG BASED UPON INPUT STRING  |
| 805 | 002020 | 001324 |        | TCNFLG | :THIS FLAG                         |
| 806 | 002022 | 105737 | 001324 | TSTB   | TCNFLG                             |
| 807 | 002026 | 001427 |        | BEQ    | 70\$                               |
| 808 | 002030 | 104403 |        | INSTR  | :OUTPUT MESSAGE & GET INPUT STRING |
| 809 | 002032 | 005321 |        | MALLJM | :MESSAGE                           |
| 810 | 002034 | 104412 |        | SETFLG | :SET FLAG BASED UPON INPUT STRING  |
| 811 | 002036 | 001344 |        | ALJMFL | :THIS FLAG                         |
| 812 | 002040 | 105737 | 001344 | TSTB   | ALJMFL                             |
| 813 | 002044 | 001020 |        | BNE    | 70\$                               |
| 814 | 002046 | 104403 |        | INSTR  | :OUTPUT MESSAGE & GET INPUT STRING |
| 815 | 002050 | 005037 |        | MJMPR  | :MESSAGE                           |
| 816 | 002052 | 104412 |        | SETFLG | :SET FLAG BASED UPON INPUT STRING  |
| 817 | 002054 | 001325 |        | OPCLRJ | :THIS FLAG                         |
| 818 | 002056 | 104403 |        | INSTR  | :OUTPUT MESSAGE & GET INPUT STRING |
| 819 | 002060 | 005205 |        | MSTJM  | :MESSAGE                           |
| 820 | 002062 | 104412 |        | SETFLG | :SET FLAG BASED UPON INPUT STRING  |
| 821 | 002064 | 001336 |        | STJMFL | :THIS FLAG                         |
| 822 | 002066 | 104403 |        | INSTR  | :OUTPUT MESSAGE & GET INPUT STRING |
| 823 | 002070 | 005240 |        | MSRJM  | :MESSAGE                           |
| 824 | 002072 | 104412 |        | SETFLG | :SET FLAG BASED UPON INPUT STRING  |
| 825 | 002074 | 001340 |        | SRJMFL | :THIS FLAG                         |
| 826 | 002076 | 104403 |        | INSTR  | :OUTPUT MESSAGE & GET INPUT STRING |
| 827 | 002100 | 005375 |        | MDSC   | :MESSAGE                           |
| 828 | 002102 | 104412 |        | SETFLG | :SET FLAG BASED UPON INPUT STRING  |
| 829 | 002104 | 001346 |        | DSCFLG | :THIS FLAG                         |
| 830 | 002106 | 105237 | 001317 | INCB   | DUPNUM                             |
| 831 | 002112 | 105237 | 001320 | INCB   | SAVNUM                             |
| 832 | 002116 | 105237 | 001316 | INCB   | DUPACTV                            |
| 833 | 002122 | 012700 | 001500 | MOV    | #DUPCRO,RO                         |
| 834 | 002126 | 000137 | 002246 | JMP    | .BEGIN :LET'S GO.                  |
| 835 | 002132 |        |        | 66\$:  |                                    |

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```

836                                     ;** FOLLOWING PARAMETERS ARE LOADED IF UNDER ACT11 OR XXDP CONTROL.**
837
838 002132 012700 001500      MOV      #DUP.MAP,R0      ;SET UP POINTER
839 002136 105237 001316      INCB     DUPACTV      ;DEVICE ACTIVE FOR TESTING
840 002142 012710 160050      MOV      #160050,(R0) ;CSR
841 002146 012760 000770 000002  MOV      #770,2(R0)   ;VECTOR
842 002154 012760 140026 000004  MOV      #140026,4(R0) ;STATUS AND SYNC
843 002162 112737 000005 001322  MOVB     #5,PRIPTY   ;PRIORITY
844 002170 113737 001236 001324  MOVB     TEMP1,TCNFG ;TURN-AROUND-CONNECTER FLAG
845 002176 113737 001236 001325  MOVB     TEMP1,OPCLRJ ;OPTIONAL CLEAR JUMPER
846 002204 105037 001342      CLRB    MDMFLG      ;MODEM FLAG
847 002210 104402 005273      TYPE    ,XHEAD     ;TYPE HEADER
848 002214 012737 001500 001236  MOV      #DUP.MAP,TEMP1 ;SET POINTER
849 002222 017737 177010 001240 5$:  MOV      @TEMP1,TEMP2  ;SET DATA
850 002230 001406      BEQ     .BEGIN      ;ALL DONE WITH DATA
851 002232 104410      CONVRT
852 002234 005442      XSTATQ
853 002236 062737 000002 001236  ADD      #2,TEMP1    ;UPDATE POINTER
854 002244 000766      BR      5$
855
856                                     ;TEST START AND RESTART
857                                     ;-----
858
859 002246 012737 000340 177776 .BEGIN: MOV      #340,PS      ;LOCK OUT INTERRUPTS
860 002254 012706 001150      MOV      #STACK,SP   ;SET UP STACK
861 002260 005737 000042      TST     @#42         ;IS PROGRAM UNDER MONITOR CONTROL
862 002264 001023      BNE     2$          ;BR IF YES
863 002266 032777 000004 176706  BIT      #BIT2,@SWR   ;CHECK FOR LOCK ON TEST
864 002274 001411      BEQ     1$          ;BR IF NO LOCK DESIRED.
865 002276 104402 004526      TYPE    ,MLOCK      ;TYPE LOCK SELECTED.
866 002302 012737 000240 002554  MOV      #NOP,TTST    ;ADJUST SCOPE ROUTINE.
867 002310 012737 000240 002556  MOV      #NOP,TTST+2  ;SET UP TO LOCK
868 002316 000406      BR      2$          ;CONTINUE ALONG.
869 002320 013737 002666 002554 1$:  MOV      BRW,TTST     ;PREPARE NORMAL SCOPE ROUTINE
870 002326 013737 002670 002556  MOV      BRX,TTST+2   ;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOP
871 002334 012737 005624 001214 2$:  MOV      #CYCLE,RETURN ;START AT 'CYCLE' FIND WHICH DEVICE TO TEST
872 002342 104402 004416      TYPE    ,MR         ;TYPE R
873 002346 000177 176642      JMP     @RETURN      ;START TESTING

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```

874                                     :END OF PASS
875                                     :TYPE NAME OF TEST
876                                     :UPDATE PASS COUNT
877                                     :CHECK FOR EXIT TO ACT-11
878                                     :RESTART TEST
879
880 002352 005037 001234      .EOP: CLR      LSTERR      :CLEAR LAST ERROR PC
881 002356 105037 001351      CLR RB   ERRFLG      :CLEAR ERROR FLAG
882 002362 005237 001230      INC      PASCNT      :UPDATE PASS COUNT
883 002366 013777 001230 176604 MOV      PASCNT,@DISP :DISPLAY PASS COUNT
884 002374 104402 004373      TYPE     ,MEPASS     :TYPE END PASS
385 002400 104402 004555      TYPE     ,MCSRX      :TYPE CSR
886 002404 104411 002510      CNVRT    ,XCSR       :SHOW IT
887 002410 104402 004563      TYPE     ,MVECX      :TYPE VECTOR
888 002414 104411 002516      CNVRT    ,XVEC       :SHOW IT
889 002420 104402 004571      TYPE     ,MPASSX     :TYPE PASSES
890 002424 104411 002524      CNVRT    ,XPASS      :SHOW IT
891 002430 104402 004602      TYPE     ,MERRX      :TYPE ERRORS
892 002434 104411 002532      CNVRT    ,XERR       :SHOW IT
893 002440 112737 000377 001353 MOV B    #377,QV.FLG  :SET THE QUICK VERIFY FLAG.
894 002446 113737 001317 001320 MOV B    DUPNUM,SAVNUM :RESTORE THE COUNT
895 002454 013701 000042      MOV      @#42,R1     :CHECK FOR ACT-11 OR DDP
896 002460 001406      BEQ     RESTRT      :IF NOT, CONTINUE TESTING
897 002462 000005      RESET
898                                     SENDAD:
899 002464 004711      JSR     PC,(R1)
900 002466 000240      NOP
901 002470 000240      NOP
902 002472 000240      NOP
903 002474 000240      NOP
904 002476 012737 005624 001214 RESTRT: MOV     #CYCLE,RETURN
905 002504 000137 005624      JMP     CYCLE
906 002510 000001      XCSR:  1
907 002512      006      002      .BYTE  6.2
908 002514 001412      RXCSR
909 002516 000001      XVEC:  1
910 002520      003      002      .BYTE  3.2
911 002522 001402      DUPRVC
912 002524 000001      XPASS: 1
913 002526      006      002      .BYTE  6.2
914 002530 001230      PASCNT
915 002532 000001      XERR:  1
916 002534      006      002      .BYTE  6.2
917 002536 001232      ERRCNT
918
919                                     :SCOPE LOOP AND ITERATION HANDLER
920
921 002540 005037 001234      .SCOPE: CLR     LSTERR      :CLEAR LAST ERROR PC
922 002544 010016 000000      MOV     R0,(SP)     :SAVE R0 ON STACK
923 002546 032777 040000 176426 BIT     #BIT14,@SWR  :LOOP ON TEST?
924 002554 001407      TTST:  BEQ     1$      :BR IF NO (IF LOCK SW01 = 1;THIS LOCATION = 240)
925 002556 000437      BR      3$          :GO TO 3$ (DITTO)
926 002560 105777 176420      TSTB   @TKCSR      :KYBD DONE?
927 002564 100034      BPL     3$          :BR IF NO (LOCK: HIT A KEY ON TTY TO GO TO NEXT TEST)
928 002566 017700 176414      MOV     @TKDBR,R0  :CLR DONE BIT
929 002572 000415      BR      2$          :CONTINUE
    
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```

930 002574 032777 004000 176400 1$: BIT #SW11,@SWR ;DELETE ITERATION (QUICK PASS)?
931 002602 001011 BNE 2$ ;BR IF YES
932 002604 105737 001353 TSTB QV.FLG ;HAS FIRST PASS BEEN COMPLETED?
933 002610 001406 BEQ 2$ ;BR IF QUICK VERIFY
934 002612 005237 001224 INC LPCNT ;UPDATE ITERATION COUNTER
935 002616 023737 001224 001222 CMP LPCNT,ICOUNT ;ALL ITERATIONS DONE?
936 002624 001014 BNE 3$ ;BR IF NOT YET
937 002626 105037 001351 2$: CLRB ERRFLG ;PREPARE FOR NEW TEST
938 002632 005037 001224 CLR LPCNT ;START ICOUNT AT ZERO
939 002636 005037 001220 CLR LOCK
940 002642 012737 000050 001222 MOV #50,ICOUNT ;RESET ITERATIONS
941 002650 013737 001216 001214 MOV NEXT,RETURN ;GET NEXT TEST
942 002656 011600 3$: MOV (SP),R0 ;POP R0 OFF STACK
943 002660 022626 POP2SP ;FAKE AN RTI
944 002662 000177 176326 JMP @RETURN ;GO DO THE TEST
945 002666 001407 BRW: 1407
946 002670 000437 BRX: 437
947 ;TELETYPE OUTPUT ROUTINE
948 ;-----
949
950 002716 010546 .TYPE: MOV R5,-(SP) ;SAVE R5 ON THE STACK.
951 002720 017605 000002 MOV @2(SP),R5 ;GET ADDRESS OF MESSAGE.
952 002724 062766 000002 000002 ADD #2,2(SP) ;POP OVER ADDRESS.
953 002732 032777 010000 176242 1$: BIT #SW12,@SWR ;INHIBIT ALL PRINT OUT??
954 002740 001012 BNE 3$ ;BR IF NO PRINT OUT WANTED (SW12=1)
955 002742 105715 TSTB (R5) ;IS NUMBER MINUS? (MSB=1(BIT7))
956 002744 100002 BPL 2$ ;BR IF NUMBER IS PLUS
957 002746 104402 004352 TYPE ,MCRLF ;TYPE A CR/LF!
958 002752 105777 176232 2$: TSTB @TPCSR ;TTY READY?
959 002756 100375 BPL 2$ ;BR IF NO.
960 002760 112577 176226 MOVB (R5)+,@TPDBR ;PRINT CURRENT CHAR.
961 002764 001362 BNE 1$ ;IF NOT ZERO KEEP PRINTING!
962 002766 012605 3$: MOV (SP)+,R5 ;END OF OUTPUT. RESTORE R5
963 002770 000002 RTI ;GO HOME
964 ;-----
965
966 002772 010346 .INSTR: MOV R3,-(SP) ;SAVE R3 ON STACK
967 002774 010446 MOV R4,-(SP) ;SAVE R4 ON STACK
968 002776 017637 000004 003014 MOV @4(SP),MSG
969 003004 062766 000002 000004 ADD #2,4(SP)
970 003012 104402 .INST1: TYPE
971 003014 000000 .MSG: 0
972 003016 012704 005560 MOV #INBUF,R4
973 003022 012703 000007 MOV #7,R3
974 003026 105777 176152 1$: TSTB @TKCSR
975 003032 100375 BPL 1$
976 003034 117714 176146 MOVB @TKDBR,(R4)
977 003040 142714 000200 BICB #200,(R4)
978 003044 122427 000015 CMPB (R4)+,#15
979 003050 001417 BEQ INSTR2
980 003052 105777 176132 2$: TSTB @TPCSR
981 003056 100375 BPL 2$
982 003060 017777 176122 176124 MOV @TKDBR,@TPDBR
983 003066 005303 DEC R3
984 003070 001356 BNE 1$
985 003072 012604 MOV (SP)+,R4
    
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|      |        |        |        |  |                |              |             |
|------|--------|--------|--------|--|----------------|--------------|-------------|
| 986  | 003074 | 012603 |        |  | MOV            | (SP)+,R3     |             |
| 987  | 003076 | 010346 |        |  | .INSTE: MOV    | R3,-(SP)     |             |
| 988  | 003100 | 010446 |        |  | MOV            | R4,-(SP)     |             |
| 989  | 003102 | 104402 | 004346 |  | TYPE           | .MQM         |             |
| 990  | 003106 | 000741 |        |  | BR             | .INST1       |             |
| 991  | 003110 | 012604 |        |  | INSTR2: MOV    | (SP)+,R4     | :RESTORE R4 |
| 992  | 003112 | 012603 |        |  | MOV            | (SP)+,R3     | :RESTORE R3 |
| 993  | 003114 | 000002 |        |  | RTI            |              |             |
| 994  |        |        |        |  |                |              |             |
| 995  |        |        |        |  |                |              |             |
| 996  |        |        |        |  |                |              |             |
| 997  |        |        |        |  |                |              |             |
| 998  | 003116 | 010546 |        |  | .PARAM: MOV    | R5,-(SP)     |             |
| 999  | 003120 | 010446 |        |  | MOV            | R4,-(SP)     |             |
| 1000 | 003122 | 016605 | 000004 |  | MOV            | 4(SP),R5     |             |
| 1001 | 003126 | 012537 | 003306 |  | MOV            | (R5)+,LOLIM  |             |
| 1002 | 003132 | 012537 | 003310 |  | MOV            | (R5)+,HILIM  |             |
| 1003 | 003136 | 012537 | 003312 |  | MOV            | (R5)+,DEVADR |             |
| 1004 | 003142 | 112537 | 003314 |  | MOVB           | (R5)+,LOBITS |             |
| 1005 | 003146 | 112537 | 003315 |  | MOVB           | (R5)+,ADRCNT |             |
| 1006 | 003152 | 010566 | 000004 |  | MOV            | R5,4(SP)     |             |
| 1007 | 003156 | 005005 |        |  | PARAM1: CLR    | R5           |             |
| 1008 | 003160 | 012704 | 005560 |  | MOV            | #INBUF,R4    |             |
| 1009 | 003164 | 122714 | 000015 |  | CMPB           | #15,(R4)     |             |
| 1010 | 003170 | 001420 |        |  | BEQ            | PARERR       |             |
| 1011 | 003172 | 121427 | 000060 |  | 1\$: CMPB      | (R4),#60     |             |
| 1012 | 003176 | 002415 |        |  | BLT            | PARERR       |             |
| 1013 | 003200 | 121427 | 000067 |  | CMPB           | (R4),#67     |             |
| 1014 | 003204 | 003012 |        |  | BGT            | PARERR       |             |
| 1015 | 003206 | 142714 | 000060 |  | BICB           | #60,(R4)     |             |
| 1016 | 003212 | 152405 |        |  | BISB           | (R4)+,R5     |             |
| 1017 | 003214 | 122714 | 000015 |  | CMPB           | #15,(R4)     |             |
| 1018 | 003220 | 001406 |        |  | BEQ            | LIMITS       |             |
| 1019 | 003222 | 006305 |        |  | ASL            | R5           |             |
| 1020 | 003224 | 006305 |        |  | ASL            | R5           |             |
| 1021 | 003226 | 006305 |        |  | ASL            | R5           |             |
| 1022 | 003230 | 000760 |        |  | BR             | 1\$          |             |
| 1023 | 003232 | 104404 |        |  | PARERR: INSTER |              |             |
| 1024 | 003234 | 000750 |        |  | BR             | PARAM1       |             |
| 1025 |        |        |        |  |                |              |             |
| 1026 |        |        |        |  |                |              |             |
| 1027 |        |        |        |  |                |              |             |
| 1028 |        |        |        |  |                |              |             |
| 1029 | 003236 | 020537 | 003310 |  | LIMITS: CMP    | R5,HILIM     |             |
| 1030 | 003242 | 101373 |        |  | BHI            | PARERR       |             |
| 1031 | 003244 | 020537 | 003306 |  | CMP            | R5,LOLIM     |             |
| 1032 | 003250 | 103770 |        |  | BLO            | PARERR       |             |
| 1033 | 003252 | 133705 | 003314 |  | BITB           | LOBITS,R5    |             |
| 1034 | 003256 | 001365 |        |  | BNE            | PARERR       |             |
| 1035 |        |        |        |  |                |              |             |
| 1036 |        |        |        |  |                |              |             |
| 1037 |        |        |        |  |                |              |             |
| 1038 | 003260 | 013704 | 003312 |  |                |              |             |
| 1039 | 003264 | 010524 |        |  | 1\$: MOV       | DEVADR,R4    |             |
| 1040 | 003266 | 062705 | 000002 |  | MOV            | R5,(R4)+     |             |
| 1041 | 003272 | 105337 | 003315 |  | ADD            | #2,R5        |             |
|      |        |        |        |  | DECB           | ADRCNT       |             |

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|      |        |        |        |        |  |               |
|------|--------|--------|--------|--------|--|---------------|
| 1042 | 003276 | 001372 |        |        | BNE  | 1\$           |
| 1043 | 003300 | 012604 |        |        | MOV  | (SP)+,R4      |
| 1044 | 003302 | 012605 |        |        | MOV  | (SP)+,R5      |
| 1045 | 003304 | 000002 |        |        | RTI  |               |
| 1046 | 003306 | 000000 |        |        | LOLIM:   | 0             |
| 1047 | 003310 | 000000 |        |        | HILIM:   | 0             |
| 1048 | 003312 | 000000 |        |        | DEVADR:  | 0             |
| 1049 | 003314 | 000000 |        |        | LOBITS:  | 0             |
| 1050 |        | 003315 |        |        | ADRCNT=LOBITS+1  |               |
| 1051 |        |        |        |        | :CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER |               |
| 1052 |        |        |        |        | :-----   |               |
| 1053 |        |        |        |        |  |               |
| 1054 | 003410 | 104402 | 004352 |        | .CONVR: TYPE   | ,MCR LF       |
| 1055 | 003414 | 010046 |        |        | .CNVRT: MOV  | R0,-(SP)      |
| 1056 | 003416 | 010146 |        |        | MOV  | R1,-(SP)      |
| 1057 | 003420 | 010346 |        |        | MOV  | R3,-(SP)      |
| 1058 | 003422 | 010446 |        |        | MOV  | R4,-(SP)      |
| 1059 | 003424 | 010546 |        |        | MOV  | R5,-(SP)      |
| 1060 | 003426 | 017601 | 000012 |        | MOV  | @12(SP),R1    |
| 1061 | 003432 | 062766 | 000002 | 000012 | ADD  | #2,12(SP)     |
| 1062 | 003440 | 012137 | 003614 |        | MOV  | (R1)+,WRDCNT  |
| 1063 | 003444 | 112137 | 003616 |        | 1\$: MOV B   | (R1)+,CHRCNT  |
| 1064 | 003450 | 112137 | 003617 |        | MOV B  | (R1)+,SPACNT  |
| 1065 | 003454 | 013137 | 003620 |        | MOV  | @(R1)+,BINWRD |
| 1066 | 003460 | 013704 | 003620 |        | 2\$: MOV   | BINWRD,R4     |
| 1067 | 003464 | 113705 | 003616 |        | MOV B  | CHRCNT,R5     |
| 1068 | 003470 | 012700 | 005454 |        | MOV  | #TEMP,R0      |
| 1069 | 003474 | 010403 |        |        | 3\$: MOV   | R4,R3         |
| 1070 | 003476 | 042703 | 177770 |        | BIC  | #177770,R3    |
| 1071 | 003502 | 062703 | 000060 |        | ADD  | #060,R3       |
| 1072 | 003506 | 110320 |        |        | MOV B  | R3,(R0)+      |
| 1073 | 003510 | 000241 |        |        | CLC  |               |
| 1074 | 003512 | 006004 |        |        | ROR  | R4            |
| 1075 | 003514 | 000241 |        |        | CLC  |               |
| 1076 | 003516 | 006004 |        |        | ROR  | R4            |
| 1077 | 003520 | 000241 |        |        | CLC  |               |
| 1078 | 003522 | 006004 |        |        | ROR  | R4            |
| 1079 | 003524 | 005305 |        |        | DEC  | R5            |
| 1080 | 003526 | 001362 |        |        | BNE  | 3\$           |
| 1081 | 003530 | 012703 | 005516 |        | MOV  | #M DATA,R3    |
| 1082 | 003534 | 114023 |        |        | 4\$: MOV B   | -(R0),(R3)+   |
| 1083 | 003536 | 105337 | 003616 |        | DECB   | CHRCNT        |
| 1084 | 003542 | 001374 |        |        | BNE  | 4\$           |
| 1085 | 003544 | 105737 | 003617 |        | TSTB   | SPACNT        |
| 1086 | 003550 | 001405 |        |        | BEQ  | 6\$           |
| 1087 | 003552 | 112723 | 000040 |        | 5\$: MOV B   | #040,(R3)+    |
| 1088 | 003556 | 105337 | 003617 |        | DECB   | SPACNT        |
| 1089 | 003562 | 001373 |        |        | BNE  | 5\$           |
| 1090 | 003564 | 105013 |        |        | 6\$: CLRB  | (R3)          |
| 1091 | 003566 | 104402 | 005516 |        | TYPE   | ,M DATA       |
| 1092 | 003572 | 005337 | 003614 |        | DEC  | WRDCNT        |
| 1093 | 003576 | 001322 |        |        | BNE  | 1\$           |
| 1094 | 003600 | 012605 |        |        | MOV  | (SP)+,R5      |
| 1095 | 003602 | 012604 |        |        | MOV  | (SP)+,R4      |
| 1096 | 003604 | 012603 |        |        | MOV  | (SP)+,R3      |
| 1097 | 003606 | 012601 |        |        | MOV  | (SP)+,R1      |



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1098 003610 012600          MOV      (SP)+,R0
1099 003612 000002          RTI
1100 003614 000000          WRDCNT: 0
1101 003616 000000          CHRCNT: 0
1102          003617          SPACNT=CHRCNT+1
1103 003620 000000          BINWRD: 0
1104
1105
1106          ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
1107          ;BUFFER TO THE CHARACTERS 'N' AND 'Y'.
1108          ;IF THE CHARACTER IS 'N' CLEAR THE FLAG
1109          ;IF THE CHARACTER IS 'Y' SET THE FLAG
1110
1111 003622 017605 000000      .SETFLG:MOV    @ (SP),R5
1112 003626 042737 000040 005560  BIC      #40,INBUF
1113 003634 122737 000116 005560  CMPB     #'N',INBUF      ;IS IT 'N' ?
1114 003642 001002          BNE      1$
1115 003644 105015          CLRB    (R5)      ;000
1116 003646 000406          BR      2$
1117 003650 122737 000131 005560  1$:  CMPB     #'Y',INBUF      ;IS IT 'Y' ?
1118 003656 001005          BNE      3$
1119 003660 112715 177777      MOV      #-1,(R5)      ;377
1120 003664 062716 000002      2$:  ADD     #2,(SP)
1121 003670 000002          RTI
1122 003672 104404          3$:  INSTER  :RETRY
1123 003674 000752          BR      .SETFLG
1124
1125
1126          ;TRAP DISPATCH SERVICE
1127          ;ARGUMENT OF TRAP IS EXTRACTED
1128          ;AND USED AS OFFSET TO OBTAIN POINTER
1129          ;TO SELECTED SUBROUTINE
1130
1131 003676 011646          .TRPSR: MOV    (SP),-(SP)      ;GET PC OF RETURN
1132 003700 162716 000002      SUB     #2,(SP)      ;=PC OF TRAP
1133 003704 017616 000000      MOV     @ (SP),(SP)  ;GET TRP
1134 003710 006316          TRPOK: ASL     (SP)      ;MULTIPLY TRAP ARG BY 2
1135 003712 042716 177001      BIC     #177001,(SP) ;CLEAR UNWANTED BITS
1136 003716 062716 001354      ADD     #.TRPTAB,(SP) ;POINTER TO SUBROUTINE ADDRESS
1137 003722 017616 000000      MOV     @ (SP),(SP)  ;SUBROUTINE ADDRESS
1138 003726 000136          JMP     @ (SP)+      ;GO TO SUBROUTINE
1139
1140          ;ERROR HANDLER
1141          ;-----
1142
1143 003730 032777 010000 175244  .HLT:  BIT     #SW12,@SWR      ;BELL ON ERROR?
1144 003736 001406          BEQ     XBX            ;BR IF NO BELL
1145 003740 105777 175244          TSTB   @TPCSR         ;TTY READY.
1146 003744 100003          BPL     XBX            ;DON'T WAIT IF TTY NOT READY.
1147 003746 112777 000207 175236  MOV     #207,@TPDBR    ;PUSH A BELL AT THE TTY.
1148 003754 032777 020000 175220  XBX:  BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
1149 003762 001105          BNE     HALTS         ;BR IF NO PRINT OUT WANTED.
1150 003764 021637 001234          CMP     (SP),LSTERR   ;WAS THIS ERROR FOUND LAST TIME?
1151 003770 001404          BEQ     1$            ;BR IF YES
1152 003772 011637 001234          MOV     (SP),LSTERR   ;RECORD BEING HERE
1153 003776 105037 001351          CLRB   ERRFLG        ;PREPARE HEADER

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|      |        |        |        |          |        |              |                                       |
|------|--------|--------|--------|----------|--------|--------------|---------------------------------------|
| 1154 | 004002 | 104406 |        | 1\$:     | SAV05  |              | :SAVE ALL PROC REGISTERS              |
| 1155 | 004004 | 011605 |        |          | MOV    | (SP),R5      | :GET THE PC OF ERROR                  |
| 1156 | 004006 | 162705 | 000002 |          | SUB    | #2,R5        | :GET ADDRESS OF TRAP CALL             |
| 1157 | 004012 | 011504 |        |          | MOV    | (R5),R4      | :GET HLT INSTRUCTION                  |
| 1158 | 004014 | 006304 |        |          | ASL    | R4           | :MULT BY TWO                          |
| 1159 | 004016 | 061504 |        |          | ADD    | (R5),R4      | :DOUBLE IT                            |
| 1160 | 004020 | 006304 |        |          | ASL    | R4           | :MULT AGAIN                           |
| 1161 | 004022 | 042704 | 177001 |          | BIC    | #177001,R4   | :CLEAR JUNK                           |
| 1162 | 004026 | 062704 | 011544 |          | ADD    | #.ERRTAB,R4  | :GET POINTER                          |
| 1163 | 004032 | 012437 | 004146 |          | MOV    | (R4)+,ERRMSG | :GET ERROR MESSAGE                    |
| 1164 | 004036 | 012437 | 004160 |          | MOV    | (R4)+,DATAHD | :GET DATA HEADRER                     |
| 1165 | 004042 | 011437 | 004172 |          | MOV    | (R4),DATABP  | :GET DATA TABLE                       |
| 1166 | 004046 | 105737 | 001351 |          | TSTB   | ERRFLG       | :TYPE HEADREER                        |
| 1167 | 004052 | 001403 |        |          | BEQ    | TYPMSG       | :BR IF YES                            |
| 1168 | 004054 | 005737 | 004172 |          | TST    | DATABP       | :DOES DATA TABLE EXIST?               |
| 1169 | 004060 | 001040 |        |          | BNE    | TYPDAT       | :BR IF YES.                           |
| 1170 | 004062 | 104402 | 004352 | TYPMSG:  | TYPE   | .MCRLF       |                                       |
| 1171 | 004066 | 104402 | 004352 |          | TYPE   | .MCRLF       |                                       |
| 1172 | 004072 | 005737 | 001220 |          | TST    | LOCK         |                                       |
| 1173 | 004076 | 001402 |        |          | BEQ    | 1\$          |                                       |
| 1174 | 004100 | 104402 | 004625 |          | TYPE   | .MASTEK      |                                       |
| 1175 | 004104 | 104402 | 004613 | 1\$:     | TYPE   | .MTSTN       |                                       |
| 1176 | 004110 | 104411 | 004300 |          | CNVRT  | .XTSTN       | :SHOW IT                              |
| 1177 | 004114 | 104402 | 004702 |          | TYPE   | .MERRPC      | :TYPE PC.                             |
| 1178 | 004120 | 104411 | 004272 |          | CNVRT  | .ERTAB0      | :SHOW IT                              |
| 1179 | 004124 | 104402 | 004352 |          | TYPE   | .MCRLF       | :GIVE A CR/LF                         |
| 1180 | 004130 | 112737 | 177777 | 001351   | MOVB   | #-1,ERRFLG   | :NO MORE HEADER UNLESS NO DATA TABLE. |
| 1181 | 004136 | 005737 | 004146 |          | TST    | ERRMSG       | :IS THERE AN ERROR MESSAGE?           |
| 1182 | 004142 | 001402 |        |          | BEQ    | WRKO.FM      | :BR IF NO.                            |
| 1183 | 004144 | 104402 |        |          | TYPE   |              | :TYPE                                 |
| 1184 | 004146 | 000000 |        | ERRMSG:  | 0      |              | : ERROR MESSAGE                       |
| 1185 | 004150 |        |        | WRKO.FM: |        |              |                                       |
| 1186 | 004150 | 005737 | 004160 |          | TST    | DATAHD       | :DATA HEADER?                         |
| 1187 | 004154 | 001402 |        |          | BEQ    | TYPDAT       | :BR IF NO                             |
| 1188 | 004156 | 104402 |        |          | TYPE   |              | :TYPE                                 |
| 1189 | 004160 | 000000 |        | DATAHD:  | 0      |              | : DATA HEADER                         |
| 1190 | 004162 | 005737 | 004172 | TYPDAT:  | TST    | DATABP       | :DATA TABLE?                          |
| 1191 | 004166 | 001402 |        |          | BEQ    | RESREG       | :BR IF NO.                            |
| 1192 | 004170 | 104410 |        |          | CONVRT |              | :SHOW                                 |
| 1193 | 004172 | 000000 |        | DATABP:  | 0      |              | : DATA TABLE                          |
| 1194 | 004174 | 104407 |        | RESREG:  | RES05  |              | :RESTORE PROC REGISTERS               |
| 1195 | 004176 | 022737 | 002464 | 000042   | HALTS: | CMR          | :IF ACT-11 AUTO MODE--HALT!!          |
| 1196 | 004204 | 001403 |        |          | BEQ    | 1\$          |                                       |
| 1197 | 004206 | 005777 | 174770 |          | TST    | @SWR         | :HALT ON ERROR?                       |
| 1198 | 004212 | 100005 |        |          | BPL    | EXITER       | :BR IF NO HALT ON ERROR               |
| 1199 | 004214 | 010046 |        | 1\$:     | PUSHRO |              | :SAVE RO                              |
| 1200 | 004216 | 016600 | 000002 |          | MOV    | 2(SP),RO     | :SHOW ERROR PC IN DATA LIGHTS         |
| 1201 | 004222 | 000000 |        |          | HALT   |              | :HALT                                 |
| 1202 | 004224 | 012600 |        |          | POPPO  |              | :GET RO                               |
| 1203 | 004226 | 005237 | 001232 | EXITER:  | INC    | ERRCNT       | :UPDATE ERROR COUNT                   |
| 1204 | 004232 | 032777 | 000400 | 174742   | BIT    | #SW08,@SWR   | :GOTO TOP OF TEST?                    |
| 1205 | 004240 | 001007 |        |          | BNE    | 1\$          | :BR IF YES                            |
| 1206 | 004242 | 032777 | 002000 | 174732   | BIT    | #SW10,@SWR   | :GOTO NEXT TEST?                      |
| 1207 | 004250 | 001407 |        |          | BEQ    | 2\$          | :BR IF NO                             |
| 1208 | 004252 | 013737 | 001216 | 001214   | MOV    | NEXT,RETURN  | :SET FOR NEXT TEST                    |
| 1209 | 004260 | 012706 | 001150 | 1\$:     | MOV    | #STACK,SP    | :RESET SP                             |

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|      |        |        |        |         |       |         |                      |
|------|--------|--------|--------|---------|-------|---------|----------------------|
| 1210 | 004264 | 000177 | 174724 |         | JMP   | @RETURN | :GOTO SPECIFIED TEST |
| 1211 | 004270 | 000002 |        | 2\$:    | RTI   |         | :RETURN              |
| 1212 | 004272 | 000001 |        | ERTAB0: | 1     |         |                      |
| 1213 | 004274 | 006    | 002    |         | .BYTE | 6.2     |                      |
| 1214 | 004276 | 001266 |        |         | SAVPC |         |                      |
| 1215 | 004300 | 000001 |        | XTSTN:  | 1     |         |                      |
| 1216 | 004302 | 003    | 002    |         | .BYTE | 3.2     |                      |
| 1217 | 004304 | 001226 |        |         | TSTNO |         |                      |
| 1218 |        |        |        |         |       |         |                      |

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```

1219          ;WAIT ROUTINE
1220 004306 000240 SMALL: NOP          ;STALL
1221 004310 000207          RTS      PC      ;RETURN
1222
1223
1224          ;POWER FAIL ROUTINE
1225
1226 004312 012737 004322 000024 .PFAIL: MOV      #PWRUP,24      ;LOAD PFAIL VECTOR FOR POWER UP
1227 004320 000000          HALT
1228 004322 000005          PWRUP: RESET
1229 004324 012706 001150          MOV      #STACK,SP      ;WAIT TTY TO COME UP
1230 004330 012737 004312 000024          MOV      #.PFAIL,24      ;REINIT STACK POINTER
1231 004336 104402          TYPE
1232 004340 004355          MPOWER
1233 004342 000177 174646          JMP      @RETURN
1234
1235 004346 020040 000077          MQM:   .ASCIZ  / ?/
1236 004352 005015          000          MCRLF: .ASCIZ  <15><12>
1237 004355          377 053520 020122          MPOWER: .ASCIZ  <377>/PWR FAILED. /
1238 004362 040506 046111 042105
1239 004370 020056          000
1240 004373          015 042777 042116          MEPASS: .ASCIZ  <15><377>/END PASS CZDPEC /
1241 004400 050040 051501 020123
1242 004406 055103 050104 041505
1243 004414 000040
1244 004416 051377          000          MR:   .ASCIZ  <377>/R/
1245 004421          377 051120 043517          MERR2: .ASCIZ  <377>/PROGRAM INDICATES NO DEVICES PRESENT./
1246 004426 040522 020115 047111
1247 004434 044504 040503 042524
1248 004442 020123 047516 042040
1249 004450 053105 041511 051505
1250 004456 050040 042522 042523
1251 004464 052116 000056
1252 004470 044777 051516 043125          MERR3: .ASCIZ  <377>/INSUFFICIENT DATA!/
1253 004476 044506 044503 047105
1254 004504 020124 040504 040524
1255 004512 000041
1256 004514 052377 051505 020124          MTSTPC: .ASCIZ  <377>/TEST PC-/
1257 004522 041520 000055
1258 004526 046377 041517 020113          MLOCK: .ASCIZ  <377>/LOCK ON SELECTED TEST/
1259 004534 047117 051440 046105
1260 004542 041505 042524 020104
1261 004550 042524 052123          000
1262 004555          103 051123 020072          MCSRX: .ASCIZ  /CSR: /
1263 004562          000
1264 004563          126 041505 020072          MVECX: .ASCIZ  /VEC: /
1265 004570          000
1266 004571          120 051501 042523          MPASSX: .ASCIZ  /PASSES: /
1267 004576 035123 000040
1268 004602 051105 047522 051522          MERRX: .ASCIZ  /ERRORS: /
1269 004610 020072          000
1270 004613          124 051505 020124          MTSTN: .ASCIZ  /TEST NO: /
1271 004620 047516 020072          000
1272 004625          052          000          MASTEK: .ASCIZ  /*/
1273 004627          377 042523 020124          MNEW:  .ASCIZ  <377>/SET SWITCH REG TO DUP11'S DESIRED ACTIVE./
1274 004634 053523 052111 044103

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|      |        |        |        |        |  |
|------|--------|--------|--------|--------|--|
| 1275 | 004642 | 051040 | 043505 | 052040 |  |
| 1276 | 004650 | 020117 | 052504 | 030520 |  |
| 1277 | 004656 | 023461 | 020123 | 042504 |  |
| 1278 | 004664 | 044523 | 042522 | 020104 |  |
| 1279 | 004672 | 041501 | 044524 | 042526 |  |
| 1280 | 004700 | 000056 |        |        |  |
| 1281 | 004702 | 041520 | 020072 | 000    | MERRPC: .ASCIZ /PC: /  |
| 1282 | 004707 | 377    | 042522 | 020103 | MCSR: .ASCIZ <377>/REC CSR ADRS /  |
| 1283 | 004714 | 051503 | 020122 | 042101 |  |
| 1284 | 004722 | 051522 | 000040 |        |  |
| 1285 | 004726 | 053377 | 041505 | 040440 | MVEC: .ASCIZ <377>/VEC ADRS /  |
| 1286 | 004734 | 051104 | 020123 | 000    |  |
| 1287 | 004741 | 377    | 051511 | 040440 | MMODEM: .ASCIZ <377>/IS A MODEM WITH ANALOG LOOPBACK ENABLED CONNECTED? (Y OR N) |
| 1288 | 004746 | 046440 | 042117 | 046505 |  |
| 1289 | 004754 | 053440 | 052111 | 020110 |  |
| 1290 | 004762 | 047101 | 046101 | 043517 |  |
| 1291 | 004770 | 046040 | 047517 | 041120 |  |
| 1292 | 004776 | 041501 | 020113 | 047105 |  |
| 1293 | 005004 | 041101 | 042514 | 020104 |  |
| 1294 | 005012 | 047503 | 047116 | 041505 |  |
| 1295 | 005020 | 042524 | 037504 | 024040 |  |
| 1296 | 005026 | 020131 | 051117 | 047040 |  |
| 1297 | 005034 | 004451 | 000    |        |  |
| 1298 | 005037 | 377    | 051511 | 052040 | MJMPR: .ASCIZ <377>/IS THE OPTIONAL CLR JMPR IN? (Y OR N) /                      |
| 1299 | 005044 | 042510 | 047440 | 052120 |  |
| 1300 | 005052 | 047511 | 040516 | 020114 |  |
| 1301 | 005060 | 046103 | 020122 | 046512 |  |
| 1302 | 005066 | 051120 | 044440 | 037516 |  |
| 1303 | 005074 | 020040 | 054450 | 047440 |  |
| 1304 | 005102 | 020122 | 024516 | 020040 |  |
| 1305 | 005110 | 000040 |        |        |  |
| 1306 | 005112 | 044777 | 020123 | 044124 | MTCN: .ASCIZ <377>/IS THE H325 CONNECTOR ON? (Y OR N) /                          |
| 1307 | 005120 | 020105 | 031510 | 032462 |  |
| 1308 | 005126 | 041440 | 047117 | 042516 |  |
| 1309 | 005134 | 052103 | 051117 | 047440 |  |
| 1310 | 005142 | 037516 | 024040 | 020131 |  |
| 1311 | 005150 | 051117 | 047040 | 020051 |  |
| 1312 | 005156 | 020040 | 000    |        |  |
| 1313 | 005161 | 377    | 051120 | 047511 | MPAR: .ASCIZ <377>/PRIORITY (4 TO 7) /   |
| 1314 | 005166 | 044522 | 054524 | 024040 |  |
| 1315 | 005174 | 020064 | 047524 | 033440 |  |
| 1316 | 005202 | 020051 | 000    |        |  |
| 1317 | 005205 | 377    | 042523 | 020103 | MSTJM: .ASCIZ <377>/SEC TX JMPR IN? (Y OR N) /                                   |
| 1318 | 005212 | 054124 | 045040 | 050115 |  |
| 1319 | 005220 | 020122 | 047111 | 020077 |  |
| 1320 | 005226 | 054450 | 047440 | 020122 |  |
| 1321 | 005234 | 024516 | 000040 |        |  |
| 1322 | 005240 | 051777 | 041505 | 051040 | MSRJM: .ASCIZ <377>/SEC RX JMPR IN? (Y OR N) /                                   |
| 1323 | 005246 | 020130 | 046512 | 051120 |  |
| 1324 | 005254 | 044440 | 037516 | 024040 |  |
| 1325 | 005262 | 020131 | 051117 | 047040 |  |
| 1326 | 005270 | 020051 | 000    |        |  |
| 1327 | 005273 | 377    | 040515 | 020120 | XHEAD: .ASCIZ <377>/MAP OF DUP11 STATUS/<377>                                    |
| 1328 | 005300 | 043117 | 042040 | 050125 |  |
| 1329 | 005306 | 030461 | 051440 | 040524 |  |
| 1330 | 005314 | 052524 | 177523 | 000    |  |

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|      |        |        |        |        |   |
|------|--------|--------|--------|--------|---|
| 1331 | 005321 | 377    | 051101 | 020105 | MALLJM: .ASCIZ <377>/ARE THE DEFAULT JUMPERS ALL IN? (Y OR N) / |
| 1332 | 005326 | 044124 | 020105 | 042504 |   |
| 1333 | 005334 | 040506 | 046125 | 020124 |   |
| 1334 | 005342 | 052512 | 050115 | 051105 |   |
| 1335 | 005350 | 020123 | 046101 | 020114 |   |
| 1336 | 005356 | 047111 | 020077 | 054450 |   |
| 1337 | 005364 | 047440 | 020122 | 024516 |   |
| 1338 | 005372 | 020040 | 000    |        |   |
| 1339 | 005375 | 377    | 051101 | 020105 | MDSC: .ASCIZ <377>/ARE DSC 1 AND 2 BOTH IN? (Y OR N) /          |
| 1340 | 005402 | 051504 | 020103 | 020061 |   |
| 1341 | 005410 | 047101 | 020104 | 020062 |   |
| 1342 | 005416 | 047502 | 044124 | 044440 |   |
| 1343 | 005424 | 037516 | 024040 | 020131 |   |
| 1344 | 005432 | 051117 | 047040 | 020051 |   |
| 1345 | 005440 | 000040 |        |        |   |
| 1346 |        |        |        |        | .EVEN   |
| 1347 | 005442 | 000002 |        |        | XSTATQ: 2   |
| 1348 | 005444 | 006    | 003    |        | .BYTE 6,3   |
| 1349 | 005446 | 001236 |        |        | TEMP1   |
| 1350 | 005450 | 006    | 002    |        | .BYTE 6,2   |
| 1351 | 005452 | 001240 |        |        | TEMP2   |
| 1352 |        |        |        |        | .EVEN   |
| 1353 |        |        |        |        |   |
| 1354 | 005454 | 000000 |        |        | TEMP: 0   |
| 1355 |        | 005516 |        |        | .+.40   |
| 1356 | 005516 | 000000 |        |        | MDATA: 0  |
| 1357 |        | 005560 |        |        | .+.40   |
| 1358 | 005560 | 000000 |        |        | INBUF: 0  |
| 1359 |        | 005622 |        |        | .+.40   |
| 1360 | 005622 | 000001 |        |        | TRP.PC: .BLKW 1   |
| 1361 |        |        |        |        |   |

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1362
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1370
1371 005624 105737 001316      CYCLE:  TSTB      DUPACTV      ;ARE ANY DUP11'S TO BE TESTED?
1372 005630 001004              BNE          1$          ;BR IF OK.
1373 005632 104402 004421      TYPE        ,MERR2      ;NO DUP11'S SELECTED!!
1374 005636 000000              HALT        ;STOP THE SHOW.
1375 005640 000776              BR          -2          ;DISQUALIFY CONT. SW.
1376 005642 012700 001500      1$:      MOV          #DUP.MAP,RO ;RESTORE POINTER.
1377 005646 012037 001412      MOV        (RO)+,RXCSR  ;LOAD SYSTEM CTRL. REG
1378 005652 012037 001402      MOV        (RO)+,DUPRVC ;LOAD VECTOR
1379 005656 012037 001442      MOV        (RO)+,LOO.00 ;GET PARAMETERS
1380 005662 012700 000002      MOV        #2,RO       ;SAVE CORE THIS WAY!
1381 005666 013737 001412 001432      MOV        RXCSR,HUPRCR ;GET CONTROL REG HIGH BYTE
1382 005674 005237 001432      INC        HUPRCR      ;GOT IT
1383 005700 013737 001432 001414      MOV        HUPRCR,RXDBUF ;GET RX CONTROL REG BUFFER
1384 005706 005237 001414      INC        RXDBUF      ;GOT IT
1385 005712 013737 001414 001424      MOV        RXDBUF,DUPSEC ;GOT SECONDARY REG SELECT REG
1386 005720 013737 001414 001416      MOV        RXDBUF,PARCSR ;GOT PARAMETER STATUS REGISTER
1387 005726 013737 001414 001430      MOV        RXDBUF,HUPRBF ;GET RX BUFFER HIGH BYTE
1388 005734 005237 001430      INC        HUPRBF      ;GOT IT
1389 005740 013737 001430 001426      MOV        HUPRBF,HUPPSR ;GOT PAR STATUS REG HIGH BYTE
1390 005746 013737 001426 001420      MOV        HUPPSR,TXCSR  ;GET TX CONTROL REGISTER
1391 005754 005237 001420      INC        TXCSR       ;GOT IT
1392 005760 013737 001420 001436      MOV        TXCSR,HUPTCR  ;GET TX CONTROL REG HIGH BYTE
1393 005766 005237 001436      INC        HUPTCR      ;GOT IT
1394 005772 013737 001436 001422      MOV        HUPTCR,TXDBUF ;BET TX BUFFER
1395 006000 005237 001422      INC        TXDBUF      ;GOT IT
1396 006004 013737 001422 001434      MOV        TXDBUF,HUPTBF ;GET TX BUFFER HIGH BYTE
1397 006012 005237 001434      INC        HUPTBF      ;GOT IT
1398
1399 006016 013737 001402 001404      MOV        DUPRVC,DUPRPS ;RX VECTOR
1400 006024 060037 001404      ADD        RO,DUPRPS    ;RX PRIORITY LEVEL
1401 006030 013737 001404 001406      MOV        DUPRPS,DUPTVC ;TX VECTOR
1402 006036 060037 001406      ADD        RO,DUPTVC    ;TX VECTOR
1403 006042 013737 001406 001410      MOV        DUPTVC,DUPTPS ;TX PRIORITY LEVEL
1404 006050 060037 001410      ADD        RO,DUPTPS    ;TX PRIORITY LEVEL
1405
1406
1407 006054 012700 001442      MOV        #LOO.00,RO   ;LOAD STAU 00-00
1408 006060 012701 001440      MOV        #MASK.A,R1  ;PREPARE MASK.
1409 006064 012702 001441      MOV        #CLK.A,R2   ;PREPARE CLOCKS
1410 006070 004737 006234      JSR        PC,FIX.00   ;GO AND CALCULATE CONFIGURATION.
1411 006074 005737 000042      TST        @#42
1412 006100 001050              BNE        4$
1413 006102 032777 000002 173072      BIT        #SW01,@SWR  ;IF SW01=1,GET STARTING TEST #
1414 006110 001444              BEQ        4$
1415 006112 104402 004352      7$:      TYPE        ,MCRLF
1416 006116 104403      INSTR      ;OUTPUT MESSAGE & GET INPUT STRING
1417 006120 004613      MTSTN     ;MESSAGE

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|      |        |        |        |        |             |                                      |  |
|------|--------|--------|--------|--------|-------------|--------------------------------------|--|
| 1418 | 006122 | 104405 |        |        | PARAM       | :CONVERT STRING                      |  |
| 1419 | 006124 | 000001 |        |        | 1           | :LOW LIMIT                           |  |
| 1420 | 006126 | 001000 |        |        | 1000        | :HIGH LIMIT                          |  |
| 1421 | 006130 | 001226 |        |        | TSTNO       | :STORE AT THIS LOCATION              |  |
| 1422 | 006132 | 000    |        |        | 0           | :MASK                                |  |
| 1423 | 006133 | 001    |        |        | .BYTE 1     | :HOW MANY TIMES + 2                  |  |
| 1424 | 006134 | 012700 | 006364 |        | MOV         | #TST1,R0                             |  |
| 1425 | 006140 | 022710 | 012737 |        | 5\$: CMP    | #12737,(R0)                          |  |
| 1426 | 006144 | 001017 |        |        | BNE         | 6\$                                  |  |
| 1427 | 006146 | 023760 | 001226 | 000002 | CMP         | TSTNO,2(R0)                          |  |
| 1428 | 006154 | 001013 |        |        | BNE         | 6\$                                  |  |
| 1429 | 006156 | 022760 | 001226 | 000004 | CMP         | #TSTNO,4(R0)                         |  |
| 1430 | 006164 | 001007 |        |        | BNE         | 6\$                                  |  |
| 1431 | 006166 | 010037 | 001214 |        | MOV         | R0,RETURN ;SAVE PC                   |  |
| 1432 | 006172 | 104402 | 004352 |        | TYPE        | ,MCRLF                               |  |
| 1433 | 006176 | 104402 | 004416 |        | TYPE        | ,MR                                  |  |
| 1434 | 006202 | 000412 |        |        | BR          | 8\$                                  |  |
| 1435 | 006204 | 005720 |        |        | 6\$: TST    | (R0)+                                |  |
| 1436 | 006206 | 020027 | 010036 |        | CMP         | R0,#TLAST+10                         |  |
| 1437 | 006212 | 001352 |        |        | BNE         | 5\$                                  |  |
| 1438 | 006214 | 104402 | 004346 |        | TYPE        | ,MQM                                 |  |
| 1439 | 006220 | 000734 |        |        | BR          | 7\$                                  |  |
| 1440 |        |        |        |        |             |                                      |  |
| 1441 | 006222 | 012737 | 006364 | 001214 | 4\$: MOV    | #TST1,RETURN ;PREPARE RETURN ADDRESS |  |
| 1442 | 006230 | 000177 | 172760 |        | 8\$: JMP    | @RETURN ;GO START TESTING.           |  |
| 1443 |        |        |        |        |             |                                      |  |
| 1444 | 006234 | 011003 |        |        | FIX.00: MOV | (R0),R3 ;GET PARAMETERS.             |  |
| 1445 | 006236 | 000207 |        |        | 5\$: RTS    | PC ;                                 |  |



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1446                                     :THIS ROUTINE PICKS UP THE ADDRESS OF
1447                                     :THE JUMPER TABLE AND LOADS R5 WITH
1448                                     :THE CORRECT DATA BASED ON THE STATE
1449                                     :OF THE JUMPER AND CONNECTOR FLAGS.
1450                                     :-----
1451
1452 006240 012100          JUMPER: MOV      (R1)+,R0      ;GET THE TABLE ADDRESS
1453 006242 105737 001324  TSTB     TCNFLG      ;TEST THE TURN AROUND CONNECTOR FLAG
1454 006246 001406          BEQ      2$           ;BRANCH IF CONNECTOR IS MISSING
1455 006250 105737 001325  TSTB     OPCLRJ      ;TEST CLEAR JUMPER FLAG
1456 006254 001403          BEQ      2$           ;BRANCH IF JUMPER IS MISSING
1457 006256 011005          MOV      (R0),R5      ;MOVE THE DATA TO R5, BOTH JUMPER
1458                                     ;AND CONNECTOR ARE THERE
1459 006260 000137 006304  JMP      5$           ;
1460 006264 022020          2$:  CMP      (R0)+,(R0)+    ;POP POINTER
1461 006266 105737 001325  TSTB     OPCLRJ      ;TEST CLEAR JUMPER FLAG
1462 006272 001403          BEQ      3$           ;BRANCH IF MISSING
1463 006274 011005          MOV      (R0),R5      ;MOVE DATA- JUMPER IN, CONNECTOR OFF
1464 006276 000137 006304  JMP      5$           ;
1465 006302 012005          3$:  MOV      (R0)+,R5      ;NO CONNECTOR OR JUMPER
1466 006304 000201          5$:  RTS      R1         ;RETURN
1467
1468 006306 012100          OJUMPER:MOV    (R1)+,R0     ;GET THE POINTER ADDRESS
1469 006310 105737 001324  TSTB     TCNFLG     ;CHECK FOR TURNAROUND CONNECTOR
1470 006314 001403          BEQ      4$           ;BR IF MISSING
1471 006316 011005          MOV      (R0),R5     ;MOVE THE INFO TO R5
1472 006320 000137 006330  JMP      6$           ;GO BACK
1473 006324 022020          4$:  CMP      (R0)+,(R0)+    ;POP POINTER
1474 006326 011005          MOV      (R0),R5     ;LOAD DATA TO R5
1475 006330 000201          6$:  RTS      R1         ;RETUN
1476
1477
1478                                     ;ROUTINE TO SET UP INTERRUPT VECTORS
1479 006332 012577 173044  SETVEC: MOV    (R5)+,@DUPRVC
1480 006336 012577 173044  MOV      (R5)+,@DUPTVC
1481 006342 112577 173036  MOVB    (R5)+,@DUPRPS
1482 006346 112577 173036  MOVB    (R5)+,@DUPTPS
1483 006352 000205          RTS      R5
1484 006354          NO.ATRAP:
1485 006354 104001          HLT      1
1486 006356 000002          RTI
1487
1488          NO.BTRAP:
1489 006360 104002          HLT      2
1490 006362 000002          RTI
1491

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006364 012737 000001 001226  
006372 012737 006744 001216  
006400 012746 173017  
006404 012746 173001  
006410 012746 001016  
006414 012746 000000  
006420 105737 001324  
006424 001532  
006426 105737 001344  
006432 001034  
006434 012701 002010  
006440 105737 001336  
006444 001007  
006446 040137 006734  
006452 040137 006736  
006456 040137 006740  
006462 000411  
006464 105737 001340  
006470 001006  
006472 040137 006734  
006476 040137 006736  
006502 040137 006740  
006506 105737 001346  
006512 001004  
006514 005337 006734  
006520 005337 006736  
006524 004137 006306  
006530 006734  
006532 005077 172654  
006536 052777 000400 172654  
006544 004737 004306  
006550 013703 001412  
006554 052777 010000 172636  
006562 052713 000016  
006566 012737 000110 006616  
006574 032777 004000 172620  
006602 001374  
006604 032777 004000 172610  
006612 001774  
006614 005327

```
***** 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  
: *****  
: *****  
TST1: MOV #1,@TSTNO  
MOV #TST2,NEXT  
MOV #173017,-(SP) ;SAVE  
MOV #173001,-(SP)  
MOV #1016,-(SP)  
MOV #0,-(SP)  
TSTB TCNFLG ;H325 TEST CONNECTOR ON?  
BEQ 6$ ;IF NO, SKIP TEST.  
100$: TSTB ALJMFL  
BNE 12$  
MOV #STD!SRD,R1  
TSTB STJMFL  
BNE 101$  
BIC R1,7$  
BIC R1,7$+2  
BIC R1,7$+4  
BR 102$  
101$: TSTB SRJMFL  
BNE 102$  
BIC R1,7$  
BIC R1,7$+2  
BIC R1,7$+4  
102$: TSTB DSCFLG  
BNE 12$  
DEC 7$  
DEC 7$+2  
12$: JSR R1,OJUMPER ;THIS CALL DETERMINES IF TURNAROUND CONNECTOR  
;AND OPTIONAL JUMPER ARE USED  
;AND LOADS R5 (EXPECTED) ACCORDINGLY.  
CLR @RXCSR  
BIS #MRESET,@TXCSR ;RESET THE DEVICE  
JSR PC,SMALL ;WAIT FOR RESET TO FINISH  
MOV RXCSR,R3 ;LOAD THE RECEIVER CONTROL REGISTER TO R3.  
BIS #MEXT,@TXCSR ;ENTER EXTERNAL MAINT. MODE  
1$: BIS #DTR!RTS!STD,(R3) ;TURN ON DTR!RTS!STD  
MOV #110,68$ ;LOAD THE NUMBER  
66$: BIT #TIMER,@TXDBUF ;CHECK THE TIMER BIT  
BNE 66$ ;BR IF SET  
67$: BIT #TIMER,@TXDBUF ;CHECK THE BIT  
BEQ 67$ ;BR IF CLEAR  
DEC (PC)+ ;DECREMENT THE NUMBER
```

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1548 006616 000110      68$: 110      ;OF TIMES TO REPEAT
1549 006620 001365      BNE      66$      ;BR IF MORE TO GO
1550 006622 011304      MOV      (R3),R4  ;GET THE BITS FROM THE RXCSR
1551 006624 020504      CMP      R5,R4    ;R5=GOOD R4=?
1552 006626 001401      BEQ      2$       ;BRANCH IF THEY MATCH
1553 006630 104003      HLT      3        ;NO MATCH - SHOW OPR.
1554 006632 012737 006644 001220 2$: MOV      #3$,LOCK ;SW09 SETUP
1555 006640 042705 073016      BIC      #RING!CTS!CARDET!SRD!DSR!STD!RTS!DTR,R5 ;CLEAR OUT UNWANTED BITS
1556 006644 005013      CLR      (R3)    ;CLEAR OUT THE REGISTER
1557 006646 012737 000005 006676 3$: MOV      #5,73$  ;LOAD THE NUMBER
1558 006654 032777 004000 172540 71$: BIT      #TIMER,@TXDBUF ;CHECK THE TIMER BIT
1559 006662 001374      BNE      71$     ;BR IF SET
1560 006664 032777 004000 172530 72$: BIT      #TIMER,@TXDBUF ;CHECK THE BIT
1561 006672 001774      BEQ      72$     ;BR IF CLEAR
1562 006674 005327      DEC      (PC)+   ;DECREMENT THE NUMBER
1563 006676 000005      73$: 5          ;OF TIMES TO REPEAT
1564 006700 001365      BNE      71$     ;BR IF MORE TO GO
1565 006702 011304      MOV      (R3),R4  ;READ BACK THE REGISTER
1566 006704 020504      CMP      R5,R4    ;R5=GOOD R4=?
1567 006706 001401      BEQ      6$      ;BRANCH IF ONLY THE DSC BITS ARE SET
1568 006710 104003      HLT      3        ;NO-GO TELL OPR
1569 006712      6$: MOV      (SP)+,7$+6 ;RESTORE
1570 006712 012637 006742      MOV      (SP)+,7$+4
1571 006716 012637 006740      MOV      (SP)+,7$+2
1572 006722 012637 006736      MOV      (SP)+,7$
1573 006726 012637 006734      MOV      (SP)+,7$
1574 006732 104400      SCOPE      ;SCOPE THE WHOLE TEST
1575 006734 173017      7$: .WORD 173017
1576 006736 173001      .WORD 173001
1577 006740 001016      .WORD 1016
1578 006742 000000      .WORD 0

```

```

:***** TEST 2 *****
:*TEST OF THE DUP RUNNING A BINARY COUNT
:*PATTERN WITH A CRC CALCULATION AS A SECONDARY STATION
:*****

```

```

:*****
: TEST 2
:*****

```

```

1591
1592 006744 012737 000002 001226 TST2: MOV      #2,@TSTNO
1593 006752 012737 010026 001216      MOV      #TST3,NEXT
1594 006760 052777 000400 172432      BIS      #MRESET,@TXCSR ;RESET THE DEVICE
1595 006766 004737 004306      JSR      PC,SMALL ;WAIT FOR RESET TO FINISH
1596 006772 105737 001324      TSTB    TCNFLAG ;H325 TEST CONNECTOR ON?
1597 006776 001403      BEQ      102$    ;IF NO, BR.
1598 007000 012737 010000 007104      MOV      #NEXT,103$+2 ;IF YES, SET MAINT
1599 007006 012737 000005 001244 102$: MOV      #5,TEMP4
1600 007014 005001      CLR      R1      ;CLEAR OUT DATA
1601 007016 012737 102010 010020      MOV      #CRC.CCITT,XPOLY ;SET UP THE POLYNOMIAL
1602 007024 012737 177777 010024      MOV      #-1,CALBCC ;SETUP FOR THE FIRST TIME
1603 007032 013737 010024 007054 16$: MOV      CALBCC,20$ ;ALLOW FOR THE NEXT CHARACTER

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1604 007040 010137 007052      MOV      R1,17$      ;LOAD DATA
1605 007044 004537 007646      JSR      R5,SIMBCC   ;GO CALCULATE SOFTWARE BCC
1606 007050 000010                8.                ;BASED ON THESE PARAMETERS
1607 007052 000001      17$: .BLKW 1      ;DATA
1608 007054 000001      20$: .BLKW 1      ;PREVIOUS BCC
1609 007056 105201      INCB     R1          ;INCREMENT DATA
1610 007060 001364      BNE     16$         ;BR IF MORE TO GO
1611 007062 012737 000001 001236      MOV      #1,TEMP1    ;LOAD DATA
1612 007070 005037 001240      CLR     TEMP2       ;CLEAR EXPECTED
1613 007074 012737 000340 177776      MOV      #340,PS     ;PS = 7
1614 007102 052777 004000 172310 103$: BIS      #SYSTST,@TXCSR ;ENTER SYSTEM TEST MODE
1615 007110 004537 006332      JSR     R5,SETVEC   ;LOAD INTERRUPT VECTORS
1616 007114 007402      11$                ;RECEIVER
1617 007116 007450      12$                ;TRANSMITTER
1618 007120      340      340      .BYTE 340,340      ;LEVEL
1619
1620      ;*****
1621      ;**FOLLOWING CODE FOR TESTING DUP11 CONNECTED TO MODEM WITH ANALOG LOOPBACK ENABLED**
1622      ;*****
1622 007122 105737 001342      TSTB   MDMFLG      ;MODEM CONNECTED?
1623 007126 001427      BEQ    104$        ;IF NO, BR.
1624 007130 013703 001310      MOV     REPEAT,R3   ;REPEAT CTSDLY
1625 007134 012777 010000 172256      MOV     #MEXT,@TXCSR ;SET EXTERNAL MAINTENANCE
1626 007142 013737 001314 007372      MOV     DELAY,73$   ;SET TIMER
1627 007150 052777 000006 172234      BIS     #DTR!RTS,@RXCSR ;ENABLE MODEM.
1628 007156 013702 001312 106$: MOV     CTSDLY,R2   ;WAIT FOR CTS
1629 007162 032777 020000 172222 105$: BIT     #CTS,@RXCSR ;CLEAR TO SEND UP?
1630 007170 001006      BNE    104$        ;IF YES, BR.
1631 007172 005302      DEC    R2          ;STEP COUNTER IF NO.
1632 007174 001372      BNE    105$        ;IF NO TRY AGAIN.
1633 007176 005303      DEC    R3          ;ALLOW CTSDLY TO REPEAT
1634 007200 001366      BNE    106$        ;BR IF NOT COMPLETE
1635 007202 104007      HLT    7           ;CTS STILL NOT ACTIVE
1636 007204 000475      BR     6$          ;DO NOT CONTINUE TEST
1637
1638 007206 052777 000020 172176 104$: BIS     #RCVEN,@RXCSR ;TURN ON THE RECEIVER
1639 007214 052777 000100 172170      BIS     #RINTEN,@RXCSR ;TURN ON REC INTERRUPT ENABLE
1640 007222 105777 172172      1$: TSTB  @TXCSR     ;TEST FOR TX DONE
1641 007226 100375      BPL    1$          ;BR IF NOT SET
1642 007230 052777 000020 172162 2$: BIS     #SEND,@TXCSR ;TURN ON SEND
1643 007236 012777 000400 172156      MOV     #TSOM,@TXDBUF ;TURN ON START OF MESSAGE
1644 007244
1645 007244 012737 000005 007274 101$: MOV     #5,68$      ;LOAD THE NUMBER
1646 007252 032777 004000 172142 66$: BIT     #TIMER,@TXDBUF ;CHECK THE TIMER BIT
1647 007260 001374      BNE    66$         ;BR IF SET
1648 007262 032777 004000 172132 67$: BIT     #TIMER,@TXDBUF ;CHECK THE BIT
1649 007270 001774      BEQ    67$         ;BR IF CLEAR
1650 007272 005327      DEC    (PC)+       ;DECREMENT THE NUMBER
1651 007274 000005      68$: 5           ;OF TIMES TO REPEAT
1652 007276 001365      BNE    66$         ;BR IF MORE TO GO
1653 007300 005337 001244      DEC    TEMP4
1654 007304 001001      BNE    3$          ;
1655 007306 104004      HLT    4           ;
1656 007310 105777 172104      3$: TSTB  @TXCSR     ;WAIT FOR DONE
1657 007314 100353      BPL    101$        ;BR IF NOT SET
1658 007316 005077 172100 4$: CLR     @TXDBUF    ;PUSH OUT DATA
1659 007322 052777 000100 172070      BIS     #TXINTE,@TXCSR ;TURN ON TRANSMITTER INT ENABLE

```

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1660 007330 005037 177776          CLR      PS          ;LOWER PROCESOR STATUS
1661 007334          5$:
1662          ;;*****
1663 007334 105737 001342          TSTB    MDMFLG      ;MODEM FLAG SET?
1664 007340 001003          BNE     71$        ;IF YES, BR
1665          ;;*****
1666 007342 012737 000040 007372          MOV     #32,,73$   ;LOAD THE NUMBER
1667 007350 032777 004000 172044 71$:    BIT     #TIMER,@TXDBUF ;CHECK THE TIMER BIT
1668 007356 001374          BNE     71$        ;BR IF SET
1669 007360 032777 004000 172034 72$:    BIT     #TIMER,@TXDBUF ;CHECK THE BIT
1670 007366 001774          BEQ     72$        ;BR IF CLEAR
1671 007370 005327          DEC     (PC)+     ;DECREMENT THE NUMBER
1672 007372 000040          73$:    32.      ;OF TIMES TO REPEAT
1673 007374 001365          BNE     71$        ;BR IF MORE TO GO
1674 007376 104004          HLT     4          ;FAILED TO INTERRUPT IN TIME
1675 007400 104400          6$:    SCOPE      ;SCOPE THIS TEST
1676
1677          ;INTERRUPT SERVICE ROUTINES
1678          ;-----
1679          ;RECEIVER:
1680 007402 017737 172006 001326 11$:    MOV     @RXDBUF,DATA ;GET THE REGISTER AND DATA
1681 007410 123737 001240 001326          CMPB   TEMP2,DATA  ;CHECK IT
1682 007416 001401          BEQ     .+4        ;BR IF OK
1683 007420 104004          HLT     4          ;COMPARISON ERROR
1684 007422 105237 001240          INCB   TEMP2      ;COUNT UP EXPECTED
1685 007426 105737 001240          TSTB   TEMP2      ;CHECK TO SEE IF DONE
1686 007432 001005          BNE     7$        ;BR IF NO
1687 007434 004537 006332          JSR    R5,SETVEC  ;YES--RESET THE VECTORS
1688 007440 007554          14$     ;RECEIVER
1689 007442 007450          12$     ;TRANSMITTER
1690 007444          340     ;LEVEL
1691 007446 000002          7$:    RTI          ;RETURN
1692
1693 007450 113777 001236 171744          12$:    MOVB   TEMP1,@TXDBUF ;LOAD THE TRANSMITTER BUFFER
1694 007456 105237 001236          INCB   TEMP1      ;UP THE COUNT
1695 007462 122737 000377 001236          CMPB   #377,TEMP1 ;ARE WE DONE
1696 007470 001026          BNE     13$       ;BR IF NO
1697 007472 012777 007502 171706          MOV    #21$,@DUPTVC ;SETUP FOR NEXT PART
1698 007500 000422          BR     13$       ;LEAVE
1699 007502 012777 000377 171712 21$:    MOV    #377,@TXDBUF ;LOAD BUFFER
1700 007510 012777 007520 171670          MOV    #22$,@DUPTVC ;SETUP NEXT PART
1701 007516 000413          BR     13$       ;LEAVE
1702 007520 012777 001000 171674 22$:    MOV    #TEOM,@TXDBUF ;SET END OF MSG
1703 007526 000240          NOP          ;STALL
1704 007530 000240          NOP          ;DITTO
1705 007532 042777 000120 171660          BIC    #SEND!TXINTE,@TXCSR ;TURN OFF TRANSMITTER
1706 007540 012777 006360 171640          MOV    #NO.BTRAP,@DUPTVC ;LOAD VECTOR
1707 007546 012716 007334          13$:    MOV    #5$, (SP)  ;CRUNCH STACK
1708 007552 000002          RTI          ;RETURNS
1709          ;CRC CATCH INT SVC
1710 007554 117737 171634 001326 14$:    MOVB   @RXDBUF,DATA ;GET FIRST PART OF CRC
1711 007562 105777 171624          TSTB   @RXCSR     ;WAIT FOR SECOND PART
1712 007566 100375          BPL    .-4        ;DITTO
1713 007570 117737 171620 001327          MOVB   @RXDBUF,DATA+1 ;GET THE REST OF THE CRC
1714 007576 012716 007604          MOV    #15$, (SP) ;SETUP FOR RETURN
1715 007602 000002          RTI          ;RETURN
    
```

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1716 007604 012737 000340 177776 15$: MOV #340,PS ;RAISE PS
1717 007612 005137 010024 COM CALBCC ;INVERT BCC
1718 007616 023737 010024 001326 CMP CALBCC,DATA ;COMPARE SOFTWARE AND HARDWARE BCC
1719 007624 001401 BEQ .+4 ;BR IF OK
1720 007626 104004 HLT 4 ;BCC COMPARISON ERROR
1721 007630 052777 000400 171562 BIS #MRESET,@TXCSR ;RESET THE DEVICE
1722 007636 004737 004306 JSR PC,SMALL ;WAIT FOR RESET TO FINISH
1723 007642 000137 007400 JMP 6$ ;LEAVE

```

```

1724
1725
1726 007646 010046 SIMBCC: MOV R0,-(SP)
1727 007650 010146 MOV R1,-(SP)
1728 007652 010246 MOV R2,-(SP)
1729 007654 012537 001236 MOV (R5)+,TEMP1
1730 007660 012537 001240 MOV (R5)+,TEMP2
1731 007664 012537 001242 MOV (R5)+,TEMP3
1732 007670 005037 010022 1$: CLR BCCFBK
1733 007674 013700 001242 MOV TEMP3,R0
1734 007700 006037 001240 ROR TEMP2
1735 007704 005500 ADC R0
1736 007706 032700 000001 BIT #BIT0,R0
1737 007712 001402 BEQ 2$
1738 007714 005137 010022 COM BCCFBK
1739 007720 013700 010020 2$: MOV XPOLY,R0
1740 007724 005100 COM R0
1741 007726 040037 010022 BIC R0,BCCFBK
1742 007732 000241 CLC
1743 007734 006037 001242 ROR TEMP3
1744 007740 013700 010022 MOV BCCFBK,R0
1745 007744 013701 001242 MOV TEMP3,R1
1746 007750 010102 MOV R1,R2
1747 007752 040100 BIC R1,R0
1748 007754 043702 010022 BIC BCCFBK,R2
1749 007760 050200 BIS R2,R0
1750 007762 043737 010020 001242 BIC XPOLY,TEMP3
1751 007770 050037 001242 BIS R0,TEMP3
1752 007774 005337 001236 DEC TEMP1
1753 010000 001333 BNE 1$
1754 010002 013737 001242 010024 MOV TEMP3,CALBCC
1755 010010 012602 MOV (SP)+,R2
1756 010012 012601 MOV (SP)+,R1
1757 010014 012600 MOV (SP)+,R0
1758 010016 000205 RTS R5

```

```

XPOLY: 0
BCCFBK: 0
CALBCC: 0
CRC16=120001
CRC.CCITT=102010

```

```

1759 010020 000000
1760 010022 000000
1761 010024 000000
1762 120001
1763 102010
1764
1765
1766
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1770
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```

:***** TEST 3 *****
:*THIS TEST PROVES THE DEVICE WILL HANDLE THE
:*DDCMP PROTOCOL. SEND AND RECEIVE SYNCs,
:*FOLLOWED BY DATA,BCC,DATA AND FINAL BCC.
:*****

```

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010026 012737 000003 001226  
010034 012737 002352 001216  
010042 105737 001324  
010046 001403  
010050 012737 010000 010144  
010056 012737 000340 177776  
010064 004537 006332  
010070 010626  
010072 010450  
010074 340 340  
010076 005037 001236  
010102 005037 001240  
010106 005037 001242  
010112 005037 001244  
010116 005037 001246  
010122 052777 000400 171270  
010130 004737 004306  
010134 012777 100026 171254  
010142  
010142 052777 004000 171250  
010150 105737 001342  
010154 001427  
010156 013703 001310  
010162 012777 010000 171230  
010170 013737 001314 010422  
010176 052777 000006 171206  
010204 013702 001312 105\$:  
010210 032777 020000 171174 104\$:  
010216 001006  
010220 005302  
010222 001372  
010224 005303  
010226 001366  
010230 104007  
010232 000476  
010234  
010234 052777 000420 171150  
010242 052777 000020 171150  
010250 012777 000426 171144  
010256 012737 000030 010306  
010264 032777 004000 171130 66\$:  
010272 001374  
010274 032777 004000 171120 67\$:  
010302 001774  
010304 005327  
010306 000030 68\$:

```

:*****
:
: TEST 3
:
:*****
:*****
TST3:  MOV    #3,@TSTNO
      MOV    #.EOP,NEXT
      TSTB   TCNFLG      ;H325 TEST CONNECTOR ON?
      BEQ    101$       ;IF NO, BRF
      MOV    #MEXT,102$+2 ;IF YES, SET MAINTENANCE
101$:  MOV    #340,PS    ;RAISE PROCESSOR STATUS
      JSR    R5,SETVEC  ;SET UP VECTORS
      10$
      2$              ;BASED ON
                        ;THESE
                        ;PARAMETERS
      .BYTE  340,340
      CLR    TEMP1
      CLR    TEMP2
      CLR    TEMP3
      CLR    TEMP4
      CLR    TEMP5
      BIS    #MRESET,@TXCSR ;RESET THE DEVICE
      JSR    PC,SMALL    ;WAIT FOR RESET TO FINISH
      MOV    #DECMOD!26,@PARCSR ;LOAD THE MODE AND SYNC CHARACTER
102$:  BIS    #SYSTST,@TXCSR ;ENTER SYSTEM TEST MODE
:*****
:**FOLLOWING CODE FOR TESTING DUP11 CONNECTED TO MODEM WITH ANALOG LOOPBACK ENABLED**
:*****
      TSTB   MDMFLG      ;MODEM CONNECTED?
      BEQ    103$       ;IF NO, BR.
      MOV    REPEAT,R3   ;REPEAT CTSDLY
      MOV    #MEXT,@TXCSR ;SET EXTERNAL MAINTENANCE
      MOV    DELAY,74$   ;SET TIMER.
      BIS    #DTR!RTS,@RXCSR ;ENABLE MODEM.
105$:  MOV    CTSDLY,R2   ;WAIT FOR CTS
104$:  BIT    #CTS,@RXCSR ;CLEAR TO SEND UP?
      BNE   103$       ;IF YES,BR.
      DEC   R2         ;STEP COUNT IF NO.
      BNE   104$       ;TRY AGAIN.
      DEC   R3         ;ALLOW CTSDLY TO REPEAT
      BNE   105$       ;BR IF NOT COMPLETE
      HLT   7          ;CTS STILL NOT ACTIVE
      BR    1$         ;DO NOT CONTINUE TEST.
:*****
103$:  BIS    #RCVEN!STPSYN,@RXCSR ;LOAD RCVEN!STPSYN
      BIS    #SEND,@TXCSR    ;TURN ON TRANSMITTER
      MOV    #TSOM!26,@TXDBUF ;OUTPUT A SYNC CHAR
      MOV    #30,68$        ;LOAD THE NUMBER
66$:  BIT    #TIMER,@TXDBUF ;CHECK THE TIMER BIT
      BNE   66$          ;BR IF SET
67$:  BIT    #TIMER,@TXDBUF ;CHECK THE BIT
      BEQ   67$          ;BR IF CLEAR
      DEC   (PC)+        ;DECREMENT THE NUMBER
68$:  30                ;OF TIMES TO REPEAT

```

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```

1828 010310 001365          BNE      66$          ;BR IF MORE TO GO
1829 010312 105777 171102  TSTB    @TXCSR
1830 010316 100401          BMI     +4
1831 010320 104005          HLT     5          ;EXTERNAL CLOCKING STOPPED
1832 010322 012777 000426 171072  MOV     #TSOM!26,@TXDBUF
1833 010330 105777 171064 69$:  TSTB    @TXCSR          ;CHECK DONE
1834 010334 100375          BPL     69$          ;BR IF NOT SET
1835 010336 012777 000426 171056  MOV     #TSOM!26,@TXDBUF ;SEND SYNC
1836 010344 052777 000100 171040  BIS     #RINTEN,@RXCSR   ;TURN ON INTERRUPTS
1837 010352 052777 000100 171040  BIS     #TXINTE,@TXCSR  ;DITTO
1838 010360 005037 177776          CLR     PS          ;LOWER PROCESSOR STATUS
1839 010364
1840
100$:
1841 010364 105737 001342  ;:*****
1842 010370 001003          TSTB    MDMFLG        ;MODEM FLAG SET?
1843          BNE     72$          ;IF YES, BR
1844 010372 012737 000144 010422  ;:*****
1845 010400 032777 004000 171014 72$:  MOV     #100,74$      ;LOAD THE NUMBER
1846 010406 001374          BIT     #TIMER,@TXDBUF ;CHECK THE TIMER BIT
1847 010410 032777 004000 171004 73$:  BNE     72$          ;BR IF SET
1848 010416 001774          BIT     #TIMER,@TXDBUF ;CHECK THE BIT
1849 010420 005327          BEQ     73$          ;BR IF CLEAR
1850 010422 000144          DEC     (PC)+        ;DECREMENT THE NUMBER
1851 010424 001365          74$:  100.          ;OF TIMES TO REPEAT
1852 010426 104005          BNE     72$          ;BR IF MORE TO GO
1853 010430          HLT     5          ;FAILED TO FINISH TEST
1854 010430 052777 000400 170762 1$:  BIS     #MRESET,@TXCSR ;RESET THE DEVICE
1855 010436 004737 004306          JSR     PC,SMALL     ;WAIT FOR RESET TO FINISH
1856 010442 012706 001150          MOV     #STACK,SP   ;RESET THE STACK
1857 010446 104400          SCOPE          ;SCOPE THIS TEST
1858
1859          ;INTERRUPT SERVICE ROUTINES
1860          ;TRANSMITTER
1861
1862 010450 012777 000252 170744 2$:  MOV     #252,@TXDBUF  ;LOAD FIRST DATA CHAR
1863 010456 012737 000026 001236          MOV     #26,TEMP1   ;LOAD DATA
1864 010464 012777 010474 170714          MOV     #3$,@DUPTVC ;RELOAD VECTOR
1865 010472 000452          BR      7$          ;LEAVE
1866 010474 013777 001236 170720 3$:  MOV     TEMP1,@TXDBUF ;MOV DATA TO BUFFER
1867 010502 105237 001236          INCB   TEMP1        ;UPDATE DATA
1868 010506 122737 000032 001236          CMPB   #32,TEMP1   ;CHECK FOR DONE
1869 010514 001041          BNE     7$          ;BR IF MORE TO SEND
1870 010516 012777 010526 170662          MOV     #4$,@DUPTVC ;RELOAD VECTOR
1871 010524 000435          BR      7$          ;RETURN
1872 010526 012777 001000 170666 4$:  MOV     #TEOM,@TXDBUF ;PUT OUT BCC
1873 010534 012777 010544 170644          MOV     #5$,@DUPTVC ;RELOAD VECTOR
1874 010542 000426          BR      7$          ;RETURN
1875 010544 013777 001240 170650 5$:  MOV     TEMP2,@TXDBUF ;LOAD DATA
1876 010552 105237 001240          INCB   TEMP2        ;UPDATE DATA
1877 010556 122737 000100 001240          CMPB   #100,TEMP2  ;CHECK FOR FINISH
1878 010564 001015          BNE     7$          ;BR IF MORE TO GO
1879 010566 012777 010576 170612          MOV     #6$,@DUPTVC ;RELOAD VECTOR
1880 010574 000411          BR      7$          ;RETURN
1881 010576 012777 001000 170616 6$:  MOV     #TEOM,@TXDBUF ;PUSH OUT DATA BCC
1882 010604 042777 000120 170606          BIC     #SEND!TXINTE,@TXCSR ;SHUT DOWN TRANSMITTER
1883 010612 012777 006360 170566          MOV     #NO.BTRAP,@DUPTVC ;RESET VECTOR
    
```



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```

1884 010620 012716 010364      7$:  MOV      #100$, (SP)      ;SETUP RETURN
1885 010624 000002                RTI                ;RETURN
1886
1887                ;RECEIVER
1888
1889 010626 017737 170560 001242 10$:  MOV      @RXCSR, TEMP3    ;SAVE CSR
1890 010634 017737 170554 001244    MOV      @RXDBUF, TEMP4   ;SAVE BUFFER
1891 010642 105737 001242          TSTB     TEMP3           ;CHECK FOR DONE
1892 010646 100401                BMI      11$            ;BR IF SET
1893 010650 104005                HLT      5              ;FALSE INTERRUPT
1894 010652 005737 001244      11$:  TST      TEMP4           ;CHECK FOR ERROR
1895 010656 100001                BPL      12$            ;BR IF NO ERROR
1896 010660 104005                HLT      5              ;RECEIVER ERROR
1897 010662 122737 000252 001244 12$:  CMPB    #252, TEMP4      ;CHECK DATA
1898 010670 001401                BEQ      13$            ;BR IF A MATCH
1899 010672 104005                HLT      5              ;DATA COMPARE ERROR
1900 010674 012737 000026 001246 13$:  MOV      #26, TEMP5      ;LOAD NEXT EXPECTED
1901 010702 012777 010712 170472    MOV      #14$, @DUPRVC    ;RELOAD VECTOR
1902 010710 000531                BR       26$            ;LEAVE
1903 010712 017737 170476 001244 14$:  MOV      @RXDBUF, TEMP4   ;GET DATA
1904 010720 005737 001244          TST      TEMP4           ;CHECK FOR ERROR
1905 010724 100001                BPL      15$            ;BR IF NO ERROR
1906 010726 104005                HLT      5              ;DATA ERROR
1907 010730 123737 001246 001244 15$:  CMPB    TEMP5, TEMP4     ;CHECK DATA
1908 010736 001401                BEQ      16$            ;BR IF A MATCH
1909 010740 104005                HLT      5              ;DATA COMPARE ERROR
1910 010742 105237 001246          INCB    TEMP5            ;UPDATE DATA
1911 010746 122737 000032 001246 16$:  CMPB    #32, TEMP5      ;CHECK FOR FIRST PART FINISH
1912 010754 001107                BNE     26$            ;BR IF MORE TO GO
1913 010756 012777 010766 170416    MOV      #17$, @DUPRVC    ;SET UP NEXT VECTOR
1914 010764 000503                BR       26$            ;LEAVE
1915 010766 017737 170422 001244 17$:  MOV      @RXDBUF, TEMP4   ;GET THE BUFFER
1916 010774 005737 001244          TST      TEMP4           ;TEST FOR ERROR
1917 011000 100001                BPL      +4             ;BR IF OK
1918 011002 104005                HLT      5              ;RECEIVER ERROR
1919 011004 012777 011014 170370    MOV      #18$, @DUPRVC    ;RELOAD THE VECTOR
1920 011012 000470                BR       26$            ;LEAVE
1921 011014 017737 170374 001326 18$:  MOV      @RXDBUF, DATA    ;GET DATA
1922 011022 032737 010000 001326    BIT      #CRCERR, DATA   ;CHECK FOR CRC ERROR
1923 011030 001001                BNE     19$            ;BR IF OK
1924 011032 104005                HLT      5              ;CRC ERROR!!!!!!
1925 011034 012777 011050 170340 19$:  MOV      #20$, @DUPRVC    ;SET UP VECTOR
1926 011042 005037 001332          CLR     MIND             ;SETUP FOR NEXT DATA
1927 011046 000452                BR       26$            ;LEAVE
1928 011050 017737 170340 001244 20$:  MOV      @RXDBUF, TEMP4   ;GET DATA
1929 011056 005737 001244          TST      TEMP4           ;CHECK FOR ERROR
1930 011062 100001                BPL      21$            ;BR IF NO ERROR
1931 011064 104005                HLT      5              ;RECEIVER ERROR
1932 011066 123737 001332 001244 21$:  CMPB    MIND, TEMP4      ;CHECK DATA
1933 011074 001401                BEQ      22$            ;BR IF A MATCH
1934 011076 104005                HLT      5              ;DATA ERROR
1935 011100 105237 001332          INCB    MIND             ;UPDATE SOFTWARE DATA
1936 011104 122737 000100 001332 22$:  CMPB    #100, MIND       ;CHECK FOR FINISH
1937 011112 001030                BNE     26$            ;BR IF MORE TO GO
1938 011114 012777 011124 170260    MOV      #23$, @DUPRVC    ;RELOAD FINAL VECTOR
1939 011122 000424                BR       26$            ;LEAVE

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```

1955 011176 052777 042516 050130 EM1: .ASCIZ <377>/UNEXPECTED INTERRUPT ON VECTOR 'A' /
(1) 011243 377 047125 054105 EM2: .ASCIZ <377>/UNEXPECTED INTERRUPT ON VECTOR 'B' /
(1) 011310 042777 051122 051117 EM3: .ASCIZ <377>/ERROR WHEN USING MODEM LEADS /
(1) 011347 377 051105 047522 EM4: .ASCIZ <377>/ERROR IN SDLC /
(1) 011367 377 051105 047522 EM5: .ASCIZ <377>/ERROR IN DECMODE /
(1) 011412 051377 047125 042040 EM6: .ASCIZ <377>/RUN DIAGNOSTICS /
(1) 011434 041777 042514 051101 EM7: .ASCIZ <377>/CLEAR TO SEND NOT ACTIVE/
(1) 011466 041777 042514 051101 EM8: .ASCIZ <377>/CLEAR TO SEND STILL NOT ACTIVE-TEST ABORTED/
(1) 011544 .EVEN

```

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(1) 011544 .ERRTAB:
(1) 011544 000000 0
(1) 011546 000000 0
(1) 011550 000000 0
(1) 011552 011176 EM1
(1) 011554 011412 EM6 ;HALT 1
(1) 011556 000000 0
(1) 011560 011243 EM2
(1) 011562 011412 EM6 ;HALT 2
(1) 011564 000000 0
(1) 011566 011310 EM3
(1) 011570 011412 EM6 ;HALT 3
(1) 011572 000000 0
(1) 011574 011347 EM4
(1) 011576 011412 EM6 ;HALT 4
(1) 011600 000000 0
(1) 011602 011367 EM5
(1) 011604 011412 EM6 ;HALT 5
(1) 011606 000000 0
(1) 011610 011434 EM7
(1) 011612 000000 0 ;HALT 6
(1) 011614 000000 0
(1) 011616 011466 EM8
(1) 011620 000000 0 ;HALT 7
(1) 011622 000000 0
(1) 011624 000001 CORMAX:
1956 000001 .END

```





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 CZDPEC.P11 19-JUL-83 17:09 CROSS REFERENCE TABLE -- USER SYMBOLS

|         |        |       |       |       |       |       |       |       |       |
|---------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| MEPASS  | 004373 | 884   | 1240# |       |       |       |       |       |       |
| MERRPC  | 004702 | 1177  | 1281# |       |       |       |       |       |       |
| MERRX   | 004602 | 891   | 1268# |       |       |       |       |       |       |
| MERR2   | 004421 | 1245# | 1373  |       |       |       |       |       |       |
| MERR3   | 004470 | 1252# |       |       |       |       |       |       |       |
| MEXT =  | 010000 | 616#  | 1540  | 1598  | 1625  | 1782  | 1804  |       |       |
| MIND    | 001332 | 637#  | 1926* | 1932  | 1935* | 1936  |       |       |       |
| MJMPR   | 005037 | 815   | 1298# |       |       |       |       |       |       |
| MLOCK   | 004526 | 865   | 1258# |       |       |       |       |       |       |
| MMODE = | 014000 | 615#  |       |       |       |       |       |       |       |
| MMODEA= | 004000 | 605#  |       |       |       |       |       |       |       |
| MMODEB= | 010000 | 604#  |       |       |       |       |       |       |       |
| MMODEM  | 004741 | 793   | 1287# |       |       |       |       |       |       |
| MNEW    | 004627 | 1273# |       |       |       |       |       |       |       |
| MPAR    | 005161 | 1313# |       |       |       |       |       |       |       |
| MPASSX  | 004571 | 889   | 1266# |       |       |       |       |       |       |
| MPOWER  | 004355 | 1232  | 1237# |       |       |       |       |       |       |
| MQM     | 004346 | 989   | 1235# | 1438  |       |       |       |       |       |
| MR      | 004416 | 872   | 1244# | 1433  |       |       |       |       |       |
| MRESET= | 000400 | 470#  | 608#  | 1537  | 1594  | 1721  | 1793  | 1854  |       |
| MSRJM   | 005240 | 823   | 1322# |       |       |       |       |       |       |
| MSTJM   | 005205 | 819   | 1317# |       |       |       |       |       |       |
| MTCN    | 005112 | 803   | 1306# |       |       |       |       |       |       |
| MTDATA= | 040000 | 602#  |       |       |       |       |       |       |       |
| MTITLE  | 001000 | 508#  | 765   |       |       |       |       |       |       |
| MTSTN   | 004613 | 1175  | 1270# | 1417  |       |       |       |       |       |
| MTSTPC  | 004514 | 1256# |       |       |       |       |       |       |       |
| MVEC    | 004726 | 785   | 1285# |       |       |       |       |       |       |
| MVECX   | 004563 | 887   | 1264# |       |       |       |       |       |       |
| NEXT    | 001216 | 528#  | 941   | 1208  | 1508* | 1593* | 1779* |       |       |
| NO.ATR  | 006354 | 1484# |       |       |       |       |       |       |       |
| NO.BTR  | 006360 | 1488# | 1706  | 1883  |       |       |       |       |       |
| OJUMPE  | 006306 | 1468# | 1533  |       |       |       |       |       |       |
| OPCLRJ  | 001325 | 634#  | 817   | 845*  | 1455  | 1461  |       |       |       |
| OVRRUN= | 040000 | 591#  |       |       |       |       |       |       |       |
| PARAM = | 104405 | 673#  | 778   | 786   | 1418  |       |       |       |       |
| PARAM1  | 003156 | 1007# | 1024  |       |       |       |       |       |       |
| PARBIT= | 000000 | 470#  |       |       |       |       |       |       |       |
| PARCSR  | 001416 | 696#  | 1386* | 1795* |       |       |       |       |       |
| PARERR  | 003232 | 1010  | 1012  | 1014  | 1023# | 1030  | 1032  | 1034  |       |
| PASCNT  | 001230 | 533#  | 742*  | 882*  | 883   | 914   |       |       |       |
| PERFOR= | 000000 | 470#  |       |       |       |       |       |       |       |
| POPPO = | 012600 | 449#  | 1202  |       |       |       |       |       |       |
| POP1SP= | 005726 | 447#  |       |       |       |       |       |       |       |
| POP2SP= | 022626 | 451#  | 943   |       |       |       |       |       |       |
| PRIPTY  | 001322 | 632#  | 843*  |       |       |       |       |       |       |
| PRISEC= | 010000 | 599#  |       |       |       |       |       |       |       |
| PS =    | 177776 | 440#  | 739*  | 859*  | 1613* | 1660* | 1716* | 1783* | 1838* |
| PUSHRO= | 010046 | 448#  | 1199  |       |       |       |       |       |       |
| PUSH1S= | 005746 | 446#  |       |       |       |       |       |       |       |
| PUSH2S= | 024646 | 450#  |       |       |       |       |       |       |       |
| PWRUP   | 004322 | 1226  | 1228# |       |       |       |       |       |       |
| QV.FLG  | 001353 | 652#  | 744*  | 893*  | 932   |       |       |       |       |
| RABORT= | 002000 | 593#  |       |       |       |       |       |       |       |
| RCRCIN= | 040000 | 622#  |       |       |       |       |       |       |       |
| RCRC7T= | 100000 | 621#  |       |       |       |       |       |       |       |



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CZDPEC.P11 19-JUL-83 17:09 CROSS REFERENCE TABLE -- USER SYMBOLS

|                |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|
| SW01 = 000002  | 421#  | 1413  |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW02 = 000004  | 420#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW03 = 000010  | 418#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW04 = 000020  | 417#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW05 = 000040  | 416#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW06 = 000100  | 415#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW07 = 000200  | 414#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW08 = 000400  | 413#  | 1204  |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW09 = 001000  | 412#  | 947   |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW10 = 002000  | 411#  | 1206  |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW11 = 004000  | 410#  | 930   |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW12 = 010000  | 409#  | 953   | 1143  |       |       |       |       |       |       |       |       |       |       |  |  |
| SW13 = 020000  | 408#  | 1148  |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW14 = 040000  | 407#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SW15 = 100000  | 406#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| SYSTST= 004000 | 617#  | 1614  | 1797  |       |       |       |       |       |       |       |       |       |       |  |  |
| TABORT= 002000 | 626#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TCNFLG 001324  | 633#  | 798*  | 805   | 806   | 844*  | 1453  | 1469  | 1513  | 1596  | 1780  |       |       |       |  |  |
| TCRCIN= 010000 | 624#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TCRC7T= 020000 | 623#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TEMP 005454    | 1068  | 1354# |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TEMP1 001236   | 539#  | 844   | 845   | 848*  | 849   | 853*  | 1349  | 1611* | 1693  | 1694* | 1695  | 1729* | 1752* |  |  |
|                | 1788* | 1863* | 1866  | 1867* | 1868  |       |       |       |       |       |       |       |       |  |  |
| TEMP2 001240   | 540#  | 849*  | 1351  | 1612* | 1681  | 1684* | 1685  | 1730* | 1734* | 1789* | 1875  | 1876* | 1877  |  |  |
| TEMP3 001242   | 541#  | 1731* | 1733  | 1743* | 1745  | 1750* | 1751* | 1754  | 1790* | 1889* | 1891  |       |       |  |  |
| TEMP4 001244   | 542#  | 1599* | 1653* | 1791* | 1890* | 1894  | 1897  | 1903* | 1904  | 1907  | 1915* | 1916  | 1928* |  |  |
|                | 1929  | 1932  | 1940* | 1941  |       |       |       |       |       |       |       |       |       |  |  |
| TEMP5 001246   | 543#  | 1792* | 1900* | 1907  | 1910* | 1911  |       |       |       |       |       |       |       |  |  |
| TEOM = 001000  | 627#  | 1702  | 1872  | 1881  |       |       |       |       |       |       |       |       |       |  |  |
| TIMER = 004000 | 625#  | 1543  | 1545  | 1558  | 1560  | 1646  | 1648  | 1667  | 1669  | 1822  | 1824  | 1845  | 1847  |  |  |
| TKCSR 001204   | 519#  | 926   | 974   |       |       |       |       |       |       |       |       |       |       |  |  |
| TKDBR 001206   | 520#  | 928   | 976   | 982   |       |       |       |       |       |       |       |       |       |  |  |
| TLAST = 010026 | 1436  | 1955# |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TPCSR 001210   | 521#  | 958   | 980   | 1145  |       |       |       |       |       |       |       |       |       |  |  |
| TPDBR 001212   | 522#  | 960*  | 982*  | 1147* |       |       |       |       |       |       |       |       |       |  |  |
| TRPOK 003710   | 1134# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TRP.PC 005622  | 1360# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TSOM = 000400  | 628#  | 1643  | 1820  | 1832  | 1835  |       |       |       |       |       |       |       |       |  |  |
| TSTNO 001226   | 532#  | 750*  | 1217  | 1421  | 1427  | 1429  | 1507* | 1592* | 1778* |       |       |       |       |  |  |
| TST1 006364    | 1424  | 1441  | 1507# |       |       |       |       |       |       |       |       |       |       |  |  |
| TST2 006744    | 1508  | 1592# |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TST3 010026    | 1593  | 1778# | 1955  |       |       |       |       |       |       |       |       |       |       |  |  |
| TST4 = ***** U | 1779  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TTST 002554    | 866*  | 867*  | 869*  | 870*  | 924#  |       |       |       |       |       |       |       |       |  |  |
| TWOSYN= 000000 | 470#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TXACT = 001000 | 607#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TXCSR 001420   | 697#  | 1390* | 1391* | 1392  | 1537* | 1540* | 1594* | 1614* | 1625* | 1640  | 1642* | 1656  | 1659* |  |  |
|                | 1705* | 1721* | 1793* | 1797* | 1804* | 1819* | 1829  | 1833  | 1837* | 1854* | 1882* |       |       |  |  |
| TXDBUF 001422  | 698#  | 1394* | 1395* | 1396  | 1543  | 1545  | 1558  | 1560  | 1643* | 1646  | 1648  | 1658* | 1667  |  |  |
|                | 1669  | 1693* | 1699* | 1702* | 1820* | 1822  | 1824  | 1832* | 1835* | 1845  | 1847  | 1862* | 1866* |  |  |
|                | 1872* | 1875* | 1881* |       |       |       |       |       |       |       |       |       |       |  |  |
| TXDLAT= 100000 | 601#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TXDONE= 000200 | 609#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |
| TXINTE= 000100 | 610#  | 1659  | 1705  | 1837  | 1882  |       |       |       |       |       |       |       |       |  |  |
| TYPDAT 004162  | 1169  | 1187  | 1190# |       |       |       |       |       |       |       |       |       |       |  |  |
| TYPE = 104402  | 667#  | 765   | 847   | 865   | 872   | 884   | 885   | 887   | 889   | 891   | 957   | 970   | 989   |  |  |





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 CZDPEC.P11 19-JUL-83 17:09 CROSS REFERENCE TABLE -- MACRO NAMES

|         |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| DUPEND  | 9#    | 874  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| DUPFRN  | 9#    | 389  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| HLT     | 452#  | 1485 | 1489 | 1553 | 1568 | 1635 | 1655 | 1674 | 1683 | 1720 | 1814 | 1831 | 1852 | 1893 | 1896 |
|         | 1899  | 1906 | 1909 | 1918 | 1924 | 1931 | 1934 | 1943 | 1950 |      |      |      |      |      |      |
| POP     | 7#    | 1569 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| PUSH    | 5#    | 1509 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| QQQ     | 8#    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$BINCT | 389#  | 1579 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$BT    | 389#  | 1492 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$BUFFE | 9#    | 1353 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$CLRVE | 8#    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$CYCLE | 9#    | 1362 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$DECST | 389#  | 1793 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$DEC22 | 389#  | 1765 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$EOP   | 4#    | 874  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$ERRTA | 9#    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$FINI  | 3#    | 1955 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$GETFL | 5#    | 792  | 802  | 808  | 814  | 818  | 822  | 826  |      |      |      |      |      |      |      |
| \$GETPA | 5#    | 776  | 784  | 1416 |      |      |      |      |      |      |      |      |      |      |      |
| \$HEADE | 2#    | 389  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$JMPR  | 389#  | 1446 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$MSG   | 8#    | 1235 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$MSGA  | 1955# |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$PFAIL | 8#    | 1223 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$QUEST | 5#    | 770  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$RESET | 9#    | 1537 | 1594 | 1721 | 1793 | 1853 |      |      |      |      |      |      |      |      |      |
| \$SCOPE | 3#    | 918  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$SETFL | 5#    | 1105 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$SETVE | 389#  | 1477 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$SIMBC | 389#  | 1726 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$SMALL | 9#    | 1218 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$SYNC  | 389#  | 1833 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$TRPDE | 8#    | 663  | 665  | 667  | 669  | 671  | 673  | 675  | 677  | 679  | 681  | 683  |      |      |      |
| \$TSTN  | 3#    | 1501 | 1586 | 1772 |      |      |      |      |      |      |      |      |      |      |      |
| \$VARIA | 2#    | 506  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| \$WAIT  | 5#    | 1542 | 1557 | 1644 | 1666 | 1821 | 1844 |      |      |      |      |      |      |      |      |
| \$XZ    | 8#    | 1493 | 1499 | 1581 | 1584 | 1766 | 1770 |      |      |      |      |      |      |      |      |

. ABS. 011624 000

ERRORS DETECTED: 0

CZDPEC.BIN,CZDPEC.SEQ/CRF/SOL/NL:TOC=CZDPEC.MAC,CZDPEC.P11  
 RUN-TIME: 4 6 .6 SECONDS  
 RUN-TIME RATIO: 41/11=3.5  
 CORE USED: 17K (33 PAGES)