

DUP 11

CONFIDENCE TST  
CZDPECO

AH-8589C-MC  
FICHE 1 OF 1

OCT 1983  
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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 8  
CZDPEC.P11 19-JUL-83 17:09

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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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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 9  
 CZDPEC.P11 19-JUL-83 17:09

## 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.

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 10  
 CZDPEC.P11 19-JUL-83 17:09

## 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)

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 11  
 CZDPEC.P11 19-JUL-83 17:09

#### 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

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 12  
 CZDPEC.P11 19-JUL-83 17:09

## 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	

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 13  
CZDPEC.P11 19-JUL-83 17:09

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

CZDP: MACY11 30A(1052) 20-JUL-83 13:32 PAGE 14  
 CZDPEL.P11 19-JUL-83 17:09

### 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.



CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 15  
CZDPEC.P11 19-JUL-83 17:09

**\*\*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.

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 17  
CZDPEC.P11 19-JUL-83 17:09 INTRODUCTION TO DUP11 DIAGNOSTIC

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421  
422

;\*CZDPECO /<377>/DUP11 CONFIDENCE TST  
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:-----\*

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

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 18  
 CZDPEC.P11 19-JUL-83 17:09 GENERAL DEFINITIONS AND EQUIVALENCIES

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423
424
425      ;REGISTER DEFINITIONS
426      ;-----
427
428      000000      R0=X0      ;GENERAL REGISTER
429      000001      R1=X1      ;GENERAL REGISTER
430      000002      R2=X2      ;GENERAL REGISTER
431      000003      R3=X3      ;GENERAL REGISTER
432      000004      R4=X4      ;GENERAL REGISTER
433      000005      R5=X5      ;GENERAL REGISTER
434      000006      SP=X6      ;PROCESSOR STACK POINTER
435      000007      PC=X7      ;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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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 19  
CZDPEC.P11 19-JUL-83 17:09

TRAPCATCHER FOR UNEXPECTED INTERUPTS

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472 :*****
473 :-----
474 :TRAPCATCHER FOR ILLEGAL INTERRUPTS
475 :THE STANDARD 'TRAP CATCHER' IS PLACED
476 :BETWEEN ADDRESS 0 TO ADDRESS 776.
477 :IT LOOKS LIKE 'PC+2 HALT'.
478 :-----
479 :*****
480
481      000000      .=0
482      :STANDARD INTERRUPT VECTORS
483      :-----
484
485      000024      .=24
486 000024 004312      .PFAIL      :POWER FAIL HANDLER
487 000026 000340      340          :SERVICE AT LEVEL 7
488 000030 003730      .HLT          :ERROR HANDLER
489 000032 000340      340          :SERVICE AT LEVEL 7
490 000034 003676      .TRPSRV       :GENERAL HANDLER DISPATCH SERVICE
491 000036 000340      340          :SERVICE AT LEVEL 7
492
493      000040      .=40
494 000042 000000      0          :SAVE FOR ACT-11 OR DDP2
495 000044 000000      0          :RETURN ADDRESS IF UNDER ACT-11 OR DDP2
496 000046 002464      0          :SAVE FOR ACT-11 OR DDP2
497      000052      0          :FOR USE WITH ACT-11 OR DDP2
498 000052 000000      .SENDAD      :ACT-11 PROGRAM CHARACTERISTICS
499
500
501      000174      .=174
502 000176 000000      DISPREG: 0      0      :SOFTWARE DISPLAY REGISTER
503      000200      SWREG: 0      :SOFTWARE SWITCH REGISTER
504 000200 000137 001510      .=200
505      JMP      .START      :GO TO START OF PROGRAM
506
507
508 001000 005377 055103 050104      .=1000
509      MTITLE: .ASCIZ <377><12>/CZDPECO /<377>/DUP11 CONFIDENCE TST /<377>
510      001200      .=1200
511      :SWR AND LIGHTS
512      :-----
513 001200 177570      DISPLAY: 177570      :11/45 CONSOLE LIGHTS
514 001202 177570      SWR: 177570      :INDIRECT POINTER TO SWITCH REGISTER
515
516      :INDIRECT POINTERS TO TELETYPE VECTORS AND REGISTERS
517      :-----
518
519 001204 177560      TKCSR: 177560      :TELETYPE KEYBOARD CONTROL REGISTER
520 001206 177562      TKDBR: 177562      :TELETYPE KEYBOARD DATA BUFFER
521 001210 177564      TPCSR: 177564      :TELEPRINTER CONTROL REGISTER
522 001212 177566      TPDBR: 177566      :TELEPRINTER DATA BUFFER
523
524      :PROGRAM CONTROL PARAMETERS
525      :-----
526

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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 20  
 CZDPEC.P11 19-JUL-83 17:09 PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

527	001214	000000	RETURN: 0	:SCOPE ADDRESS FOR LOOP ON TEST
528	001216	000000	NEXT: 0	:ADDRESS C: 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 CTSDLY
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	

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 21  
 CZDPEC.P11 19-JUL-83 17:09 PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

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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      OVERRUN=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   :
622      040000      RCRCIN=BIT14   :
623      020000      TCRC7T=BIT13   :
624      010000      TCRCIN=BIT12   :
    
```



CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 22  
CZDPEC.P11 19-JUL-83 17:09 PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

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 PRTY: .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

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 23  
CZDPEC.P11 19-JUL-83 17:09

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  
658  
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001354 104400  
001354 002540 104401  
001356 002672 104403  
001360 002716 104404  
001362 002772 104405  
001364 003076 104406  
001366 003116 104407  
001370 003316 104410  
001372 003356 104411  
001374 003410 104412  
001376 003414 104412  
001400 003622

```
:*****  
:-----  
:TRPTAB:  
SCOPE=TRAP+0           ;CALL TO SCOPE LOOP AND ITERATION HANDLER  
  .SCOPE  
SCOPI=TRAP+1          ;CALL TO LOOP ON CURRENT DATA HANDLER  
  .SCOPI  
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  
:-----  
:*****
```

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 24  
 CZDPEC.P11 19-JUL-83 17:09 PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

```

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
707                ;DUP11 CONTROL INDICATORS FOR CURRENT DUP11 UNDER TEST
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
717                ;DUP11 STATUS TABLE AND ADDRESS ASSIGNMENTS
718                -----
719
720                .=1500
721 001500 001500  DUP.MAP:
722 001500 000001  DUPCRO: .BLKW 1          ;CONTROL STATUS REGISTER FOR DUP11 NUMBER 0
723 001502 000001  DUPTRO: .BLKW 1          ;VECTOR 'A' FOR DUP11 NUMBER 0
724 001504 000001  DUPO.A: .BLKW 1          ;PARAMETER FOR DUP11 NUMBER 0
725
726 001506 00000C  DUP.END: 000000
727
728
729
730

```



CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 25  
 CZDPEC.P11 19-JUL-83 17:09 PROGRAM INITIALIZATION AND START UP.

```

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          CLR ERRFLG          ;CLEAR ERROR FLAG
744 001540 105037 001353          CLR QV.FLG          ;ZERO QUICK VERIFY FLAG
745 001544 105037 001317          CLR DUPNUM
746 001550 105037 001320          CLR SAVNUM
747 001554 105037 001316          CLR 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$,@#4
756 001622 005777 177354          TST @SWR
757 001626 000407          BR 13$
758 001630 012737 000176 001202 12$: MOV #SWREG,SWR
759 001636 012737 000174 001200  MOV #DISPREG,DISPLAY ;POINT TO SOFT SWR
760 001644 022626          CMP (SP)+,(SP)+    ;POINT TO SOFT DISPLAY REG
761 001646 012637 000004 13$: MOV (SP)+,@#4
762 001652 012637 000006          MOV (SP)+,@#6
763 001656 005737 000042 11$: TST @#42
764 001662 001123          BNE 66$
765 001664 104402 001000          TYPE .MITLE
766 001670 105777 177306 6$: TSTB @SWR
767 001674 100002          BPL 'ne
768 001676 000137 002246          JMP .BEGIN
769 001702          10$:
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 ;CONVRT 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 004,26          MVEC ;MESSAGE
786 001750 104405          PARAM ;CONVERT STRING

```

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 26  
 CZDPEC.P11 19-JUL-83 17:09 PROGRAM INITIALIZATION AND START UP.

787	001752	000300		300	:LOW LIMIT
788	001754	000770		770	:HIGH LIMIT
789	001756	001502		DUPTRO	: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\$:	

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 27  
 CZDPEC.P11 19-JUL-83 17:09 PROGRAM INITIALIZATION AND START UP.

```

836                                     ;** FOLLOWING PARAMETERS ARE LOADED IF UNDER ACT11 OR XXDP CONTROL.**
837
838 002132 012700 001500                MOV    #DUP.MAP,RO        ;SET UP POINTER
839 002136 105237 001316                INCB   DUPACTV           ;DEVICE ACTIVE FOR TESTING
840 002142 012710 160050                MOV    #160050,(RO)     ;CSR
841 002146 012760 000770 000002        MOV    #770,2(RO)       ;VECTOR
842 002154 012760 140026 000004        MOV    #140026,4(RO)    ;STATUS AND SYNC
843 002162 112737 000005 001322        MOVVB  #5,PRIORITY      ;PRIORITY
844 002170 113737 001236 001324        MOVVB  TEMP1,TCNFLAG    ;TURN-AROUND-CONNECTER FLAG
845 002176 113737 001236 001325        MOVVB  TEMP1,OPCLRJ     ;OPTIONAL CLEAR JUMPER
846 002204 105037 001342                CLRB   MDMFLAG         ;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

```



CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 28  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

```

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,@DISPLAY :DISPLAY PASS COUNT
884 002374 104402 004373      TYPE    ,MEPASS      :TYPE END PASS
885 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                                     :STOP THE SHOW--CLEAR THE WORLD
899 002464      SENDAD: 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 INTERATION 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
    
```

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 29  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

```

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 .TYPE: MOV R5,-(SP) ;SAVE R5 ON THE STACK.
951 MOV @2(SP),R5 ;GET ADDRESS OF MESSAGE.
952 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$: MOV (SP)+,R5 ;END OF OUTPUT. RESTORE R5
963 002770 000002 RTI ;GO HOME
964 ;-----
965
966 .INSTR: MOV R3,-(SP) ;SAVE R3 ON STACK
967 002774 010446 MOV R4,-(SP) ;SAVE R4 ON STACK
968 002776 017637 000004 003014 MOV @4(SP),MSG
969 003004 062766 000002 000004 ADD #2,4(SP)
970 .INST1: TYPE
971 003014 000000 .MSG: 0
972 003016 012704 005560 MOV #INBUF,R4
973 003022 012703 000007 MOV #7,R3
974 003026 105777 176152 1$: 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
    
```

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 30  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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	

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 31  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 32  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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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          MOVB   #-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)      ;OINTER 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          MOVB   #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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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 33  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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,P4	: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		: DA TABLE
1194	004174	104407		RESREG:	RES05		:RESTORE PROC REGISTERS
1195	004176	022737	002464	000042	HALTS:	CMP	#SENDAD,@#42
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



CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 34  
CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

1210	004264	000177	174724		JMP	@RETURN	:GOTO SPECIFIED TEST
1211	004270	000002		2\$:	RTI		:RETURN
1212	004272	000001		ERTABO:	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							

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 35  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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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
1 56 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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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 36  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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	

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 37  
CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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					

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 38  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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1362
1363
1364      :ROUTINE USED TO "CYCLE" THROUGH UP TO EIGHT DUP11'S
1365      :THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
1366      :AND RUNS THE SPECIFIED DUP11'S.  THIS ROUTINE *MUST*
1367      :BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
1368      :SETUP NECESSARY.
1369
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 STAUS 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          ;OUTPUT MESSAGE & GET INPUT STRING
1416      006116 104403      INSTR     ;MESSAGE
1417      006120 004613      MTSTN

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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 39  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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	.BYTE	; MASK
1423	006133	001			1	.BYTE	; 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 ;



CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 40  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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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 ;RETURN
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 006360 NO.BTRAP:
1489 006360 104002 HLT 2
1490 006362 000002 RTI
1491

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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 41  
CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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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
```

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 42  
CZDPE(.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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1543 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$:          ;
1570 006712 012637 006742      MOV      (SP)+,7$+6 ;RESTORE
1571 006716 012637 006740      MOV      (SP)+,7$+4
1572 006722 012637 006736      MOV      (SP)+,7$+2
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
:*****
:*****

```

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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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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 43  
CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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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 CN TRANSMITTER INT ENABLE

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CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 44  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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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$:  RTI           ;RETURN
1692          ;TRANSMITTER:
1693 007450 113777 001236 171744          12$:  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
    
```

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 45  
CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

```

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 0100' , 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
1767
1768
1769
1770
1771

```

```

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

```



CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 46  
CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

```

1772
1773
1774
1775
1776
1777
1778 010026 012737 000003 001226
1779 010034 012737 002352 001216
1780 010042 105737 001324
1781 010046 001403
1782 010050 012737 010000 010144
1783 010056 012737 000340 177776
1784 010064 004537 006332
1785 010070 010626
1786 010072 010450
1787 010074 340 340
1788 010076 005037 001236
1789 010102 005037 001240
1790 010106 005037 001242
1791 010112 005037 001244
1792 010116 005037 001246
1793 010122 052777 000400 171270
1794 010130 004737 004306
1795 010134 012777 100026 171254
1796 010142
1797 010142 052777 004000 171250
1798
1799
1800
1801 010150 105737 001342
1802 010154 001427
1803 010156 013703 001310
1804 010162 012777 010000 171230
1805 010170 013737 001314 010422
1806 010176 052777 000006 171206
1807 010204 013702 001312
1808 010210 032777 020000 171174
1809 010216 001006
1810 010220 005302
1811 010222 001372
1812 010224 005303
1813 010226 001366
1814 010230 104007
1815 010232 000476
1816
1817 010234
1818 010234 052777 000420 171150
1819 010242 052777 000020 171150
1820 010250 012777 000426 171144
1821 010256 012737 000030 010306
1822 010264 032777 004000 171130
1823 010272 001374
1824 010274 032777 004000 171120
1825 010302 001774
1826 010304 005327
1827 010306 000030

```

```

:*****
:
: 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$ ;BASED ON
      2$ ;THESE
      .BYTE 340,340 ;PARAMETERS
      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

```

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 47  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

```

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    #TSM!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    #TSM!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$:
1841 010364 105737 001342  TSTB   MDMFLG          ;MODEM FLAG SET?
1842 010370 001003          BNE     72$          ;IF YES, BR
1843
1844 010372 012737 000144 010422  MOV    #100,74$        ;LOAD THE NUMBER
1845 010400 032777 004000 171014 72$:  BIT    #TIMER,@TXDBUF ;CHECK THE TIMER BIT
1846 010406 001374          BNE     72$          ;BR IF SET
1847 010410 032777 004000 171004 73$:  BIT    #TIMER,@TXDBUF ;CHECK THE BIT
1848 010416 001774          BEQ     73$          ;BR IF CLEAR
1849 010420 005327          DEC    (PC)+          ;DECREMENT THE NUMBER
1850 010422 000144          74$:  100.          ;OF TIMES TO REPEAT
1851 010424 001365          BNE     72$          ;BR IF MORE TO GO
1852 010426 104005          HLT     5          ;FAILED TO FINISH TEST
1853 010430
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
    
```

CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 48  
 CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

1884	010620	012716	010364		7\$:	MOV	#100\$,(SP)		:SETUP RETURN
1885	010624	000002				RTI			:RETURN
1886									
1887									
1888									:RECEIVER
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		16\$:	INCB	TEMP5		:UPDATE DATA
1911	010746	122737	000032	001246		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	170472	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		22\$:	INCB	MIND		:UPDATE SOFTWARE DATA
1936	011104	122737	000100	001332		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



CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 50  
CZDPEC.P11 19-JUL-83 17:09 END OF PASS ROUTINE

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

(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						
1956		000001					CORMAX:
							.END







CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 54  
 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#						
MOM	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#							







CZDPE MACY11 30A(1052) 20-JUL-83 13:32 PAGE 59  
 CZDPEC.P11 19-JUL-83 17:09 CROSS REFERENCE TABLE -- MACRO NAMES

DUPEND	9#	874												
DUPFRN	9#	389												
HLT	452# 1899	1485 1906	1489 1909	1553 1918	1568 1924	1635 1931	1655 1934	1674 1943	1683 1950	1720	1814	1831	1852	1893 1896
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)