

.REM a

IDENTIFICATION

PRODUCT CODE: AC-8588B-MC
PRODUCT NAME: CZDPEB0 DUP11 CONFIDENCE TST
DATE: JANUARY 1979
MAINTAINER: DIAGNOSTICS

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1.0 ABSTRACT

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

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

THE MODEM CONTROL LEADS WILL ALSO BE TESTED, IF THE H325 TURN-AROUND CONNECTOR IS USED. THE DETERMINATION OF WHAT WILL BE TESTED IS DONE BY ANSWERING A 'PARAMETER DIALOG' (LOAD ADDRESS 200, START ADDRESS 0 OR 1.) ALL QUESTIONS MUST BE ANSWERED. IF AN ERROR SHOULD OCCUR, A TIMEOUT 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.

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)

4.0 STARTING PROCEEDURE

- A. SET SWITCH REGISTER TO 000200
- B. DEPRESS 'LOAD ADDRESS' KEY AND RELEASE
- C. LEAVE SWR BIT 7=1 TO USE EXISTING PARAMETERS PREVIOUSLY SET UP BY THE DUP11 PARAMETER DIALOG. WHENEVER PROGRAM IS STARTED AT ADR 200 WITH SWR BIT7=0, NEW PARAMETERS MUST BE LOADED.

'EXAMPLE'

'MAP OF DUP11 STATUS'

1500	160050	CSR OF DUP11
1502	000300	VECTOR OF DUP11

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

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

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

4.1 CONTROL SWITCH SETTINGS

SW 15	SET: HALT ON ERROR
SW 14	SET: LOOP ON CURRENT TEST
SW 13	SET: INHIBIT ERROR PRINT OUT
SW 12	SET: INHIBIT TYPE OUT/BELL ON ERROR.
SW 11	SET: INHIBIT ITERATIONS. (QUICK PASS)
SW 10	SET: ESCAPE TO NEXT TEST ON ERROR
SW 09	SET: RESERVED
SW 08	SET: CATCH ERROR AND LOOP ON IT
SW 07	SET: USE PREVIOUS STATUS TABLE.
SW 06	SET: RESERVED
SW 05	SET: RESERVED
SW 04	SET: RESERVED
SW 03	SET: RESERVED
SW 02	SET: LOCK ON SELECTED TEST
SW 01	SET: RESTART PROGRAM AT SELECTED TEST
SW 00	SET: RESERVED

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

4.1.2 SWITCH REGISTER RESTRICTIONS

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

4.1.3 SWITCH REGISTER PRIORITIES

A) ERROR SWITCHES

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

B) SCOPE SWITCHES

1. SW 14 - LOOP ON TEST. WILL LOOP ON TEST UNTIL SWITCH IS LOWERED.
2. SW 11 - INHIBIT ITERATIONS (QUICK PASS). ALLOWS ONLY ONE PASS THROUGH A TEST.

4.2 STARTING ADDRESS

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

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

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

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

4.2.2. H325 TEST CONNECTOR IS ASSUMED TO BE ON.

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

4.2.4. THE BR LEVEL IS ASSUMED TO BE 5.

5.0 OPERATING PROCEDURE

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

5.1 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

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

THE TEST NUMBER AND PC WILL BE TYPED OUT AND 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

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.

TSFNO CONTAINS THE NUMBER OF THE TEST NOW BEING PERFORMED.

***NOTE**

CZDPE MACY11 30A(1052) 19-JAN-79 16:09 PAGE 10
CZDPEB.P11 19-JAN-79 16:07

I 1

SEQ 0009
SEQ 0008

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

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379      ;*CZDPEB0 /<377>/DUP11 CONFIDENCE TST
380      ;*COPYRIGHT 1975, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
381      ;*-----
382
383      ;STARTING PROCEDURE
384      ;LOAD PROGRAM
385      ;LOAD ADDRESS 000200
386      ;PRESS START
387      ;PROGRAM WILL TYPE 'CZDPEB0 /<377>/DUP11 CONFIDENCE TST '
388      ;PROGRAM WILL TYPE 'R' TO INDICATE THAT TESTING HAS STARTED
389      ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
390      ;AND THEN RESUME TESTING
391
392
393      ;SWITCH REGISTER OPTIONS
394      ;-----
395
396      100000      SW15=100000      ;=1,HALT ON ERROR
397      040000      SW14=40000      ;=1,LOOP ON CURRENT TEST
398      020000      SW13=20000      ;=1,INHIBIT ERROR TYPEOUT
399      010000      SW12=10000      ;=1,DELETE TYPEOUT/BELL ON ERROR.
400      004000      SW11=4000      ;=1,INHIBIT ITERATIONS
401      002000      SW10=2000      ;=1,ESCAPE TO NEXT TEST ON ERROR
402      001000      SW09=1000      ;=1,LOOP WITH CURRENT DATA
403      000400      SW08=400      ;=1,LOOP ON ERROR
404      000200      SW07=200
405      000100      SW06=100
406      000040      SW05=40
407      000020      SW04=20
408      000010      SW03=10      ;SELECT DUP'S DESIRED ACTIVE
409                                ;NOTE:THIS MUST NOT EXCEED ORIGINAL COUNT
410      000004      SW02=4      ;LOCK ON TEST SELECT
411      000002      SW01=2      ;RESTART PROGRAM AT SELECTED TEST
412      000001      SW  0=1      ;ENTER PARAMETERS
```

```

413
414
415      ;REGISTER DEFINITIONS
416      ;-----
417
418      000000      R0=%0      ;GENERAL REGISTER
419      000001      R1=%1      ;GENERAL REGISTER
420      000002      R2=%2      ;GENERAL REGISTER
421      000003      R3=%3      ;GENERAL REGISTER
422      000004      R4=%4      ;GENERAL REGISTER
423      000005      R5=%5      ;GENERAL REGISTER
424      000006      SP=%6      ;PROCESSOR STACK POINTER
425      000007      PC=%7      ;PROGRAM COUNTER
426
427      ;LOCATION EQUIVALENCIES
428      ;-----
429
430      177776      PS=177776    ;PROCESSOR STATUS WORD
431      001150      STACK=1150   ;START OF PROCESSOR STACK
432
433      ;INSTRUCTION DEFINITIONS
434      ;-----
435
436      005746      PUSH1SP=5746  ;DECREMENT PROCESSOR STACK 1 WORD
437      005726      POP1SP=5726   ;INCREMENT PROCESSOR STACK 1 WORD
438      010046      PUSHRO=10046  ;SAVE R0 ON STACK
439      012600      POPRO=12600   ;RESTORE R0 FROM STACK
440      024646      PUSH2SP=24646 ;DECREMENT STACK TWICE
441      022626      POP2SP=22626  ;INCREMENT STACK TWICE
442      .EQUIV EMT,HLT ;BASIC DEFINITION OF ERROR CALL
443
444
445      100000      BIT15=100000
446      040000      BIT14=40000
447      020000      BIT13=20000
448      010000      BIT12=10000
449      004000      BIT11=4000
450      002000      BIT10=2000
451      001000      BIT9=1000
452      000400      BIT8=400
453      000200      BIT7=200
454      000100      BIT6=100
455      000040      BIT5=40
456      000020      BIT4=20
457      000010      BIT3=10
458      000004      BIT2=4
459      000002      BIT1=2
460      000001      BIT0=1
461
462

```

```
463 ;*****
464 ;-----
465 ;TRAPCATCHER FOR ILLEGAL INTERRUPTS
466 ;THE STANDARD 'TRAP CATCHER' IS PLACED
467 ;BETWEEN ADDRESS 0 TO ADDRESS 776.
468 ;IT LOOKS LIKE 'PC+2 HALT'.
469 ;-----
470 ;*****
471
472      0000C0      .=0
473      ;STANDARD INTERRUPT VECTORS
474      ;-----
475
476      000024      .=24
477      000024      004312      .PFAIL      ;POWER FAIL HANDLER
478      000026      000340      340      ;SERVICE AT LEVEL 7
479      000030      003730      .HLT      ;ERROR HANDLER
480      000032      000340      340      ;SERVICE AT LEVEL 7
481      000034      003676      .TRPSRV      ;GENERAL HANDLER DISPATCH SERVICE
482      000036      000340      340      ;SERVICE AT LEVEL 7
483
484      000040      000000      .=40
485      000042      000000      0      ;SAVE FOR ACT-11 OR DDP2
486      000044      000000      0      ;RETURN ADDRESS IF UNDER ACT-11 OR DDP2
487      000046      002464      0      ;SAVE FOR ACT-11 OR DDP2
488      000052      000052      $ENDAD      ;FOR USE WITH ACT-11 OR DDP2
489      000052      000000      .=52
490      000052      000000      0      ;ACT-11 PROGRAM CHARACTERISTICS
491
492      000174      000174      .=174
493      000176      0000C0      DISPREG:      0      ;SOFTWARE DISPLAY REGISTER
494      000176      000000      SWREG:      0      ;SOFTWARE SWITCH REGISTER
495      000200      000137      001510      .=200
496      000200      000137      001510      JMP      .START      ;GO TO START OF PROGRAM
497
498      001000      001000      .=1000
499      001000      005377      055103      050104      MTITLE: .ASCII <377><12>/CZDPEB0 /<377>/DUP11 CONFIDENCE 1ST /<377>
500      001200      001200      .=1200
501      ;SWR AND LIGHTS
502      ;-----
503
504      001200      177570      DISPLAY:      177570      ;11/45 CONSOLE LIGHTS
505      001202      177570      SWR:      177570      ;INDIRECT POINTER TO SWITCH REGISTER
506
507      ;INDIRECT POINTERS TO TELETYPE VECTORS AND REGISTERS
508      ;-----
509
510      001204      177560      TKCSR:      177560      ;TELETYPE KEYBOARD CONTROL REGISTER
511      001206      177562      TKDBR:      177562      ;TELETYPE KEYBOARD DATA BUFFER
512      001210      177564      TPCSR:      177564      ;TELEPRINTER CONTROL REGISTER
513      001212      177566      TPDBR:      177566      ;TELEPRINTER DATA BUFFER
514
515      ;PROGRAM CONTROL PARAMETERS
516      ;-----
517
```

PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

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

```

560
561                                     ;CONTROL REGISTER DEFINITIONS
562                                     ;-----
563                                     ;RXCSR BIT DEFINITIONS
564      100000      DSCA=BIT15      ;DATA SET CHANGE A
565      040000      RING=BIT14      ;RING
566      020000      CIS=BIT13      ;CLR TO SEND
567      010000      CARDET=BIT12   ;CARRIER DETECT
568      004000      RECACT=BIT11   ;REC ACTIVE
569      002000      SRD=BIT10      ;SEC REC DATA
570      001000      DSR=BIT9       ;DATA SET RDY
571      000400      STPSYN=BIT8    ;STRIP SYNC
572      000200      RXDONE=BIT7    ;REC DONE
573      000100      RINTEN=BIT6    ;REC INTR ENABLE
574      000040      DSINTE=BIT5    ;DSC INTR ENABLE
575      000020      RCVEN=BIT4     ;REC ENABLE
576      000010      STD=BIT3       ;SEC XMIT DATA
577      000004      RTS=BIT2       ;REQ TO SEND
578      000002      DTR=BIT1       ;DATA TERM RDY
579      000001      DSCB=BIT0      ;DATA SET CHANGE B
580                                     ;RXDBUF BIT DEFINITIONS
581      100000      RXDERR=BIT15    ;REC DATA ERROR
582      040000      OVRUN=BIT14    ;OVERRUN ERROR
583      010000      CRCERR=BIT12   ;CRC ERROR
584      002000      RABORT=BIT10   ;REC ABORT
585      001000      RECM=BIT9      ;REC END OF MESSAGE
586      000400      RSOM=BIT8      ;REC STAPT OF MESSAGE
587                                     ;PARCSR BIT DEFINITIONS
588      100000      DECMOD=BIT15    ;DEC MODE (DDCMP)
589      001000      CRCEN=BIT9      ;CRC ENABLE
590      010000      PRISEC=BIT12   ;PRI/SEC SELECT
591                                     ;TXCSR BIT DEFINITIONS
592      100000      TXDLAT=BIT15    ;TX DATA LATE
593      040000      MTDATA=BIT14    ;MAINT DATA OUT
594      020000      CLK=BIT13      ;CLK
595      010000      MMODEB=BIT12   ;MAINT MODE B
596      004000      MMODEA=BIT11   ;MAINT MODE A
597      002000      BITW=BIT10     ;BIT WINDOW INPUT
598      001000      TXACT=BIT9     ;TX ACTIVE
599      000400      MRESET=BIT8    ;MASTER RESET
600      000200      TXDONE=BIT7    ;XMIT DONE
601      000100      TXINTE=BIT6   ;XMIT DONE INTR ENABLE
602      000020      SEND=BIT4     ;SEND
603      000010      HDXEN=BIT3     ;HDX/FDX
604                                     ;TXCSR WRD DEFINITIONS
605      000000      USER=0         ;USER MODE
606      014000      MMODE=14000    ;MAINT INT MODE
607      010000      MEXT=10000     ;MAINT EXT MODE
608      004000      SYSTST=4000    ;SYSTEM TEST MODE
609
610                                     ;TXDBUF BIT DEFINITIONS
611                                     ;-----
612      100000      RCRC7T=BIT15
613      040000      RCRCIN=BIT14
614      020000      TCRC7T=BIT13
615      010000      TCRCIN=BIT12
  
```

PROGRAM PARAMETERS, VARIABLES, AND TRAP CALLS.

616	004000	TIMER=BIT11	;MAINTENANCE TIMER
617	002000	TABORT=BIT10	;TRANSMIT ABORT
618	001000	TEOM=BIT9	;TRANSMIT END OF MESSAGE
619	000400	TSOM=BIT8	;TRANSMIT START OF MESSAGE

;MISC. PROGRAM DEFINITIONS

623	001322	000000	PRIPTY: .WORD 0
624	001324	000001	TCNFLG: .BLKB 1
625	001325	000001	OPCLRJ: .BLKB 1
626	001326	000000	DATA: .WORD 0
627	001330	000000	SHIFTS: .WORD 0
628	001332	000000	MIND: .WORD 0
629	001334	000000	FLAG: .WORD 0
630	001336	000001	STJMFL: .BLKW 1
631	001340	000001	SRJMFL: .BLKW 1
632	001342	000000	MDMFLG: .WORD 0
633	001344	000000	ALJMFL: .WORD 0
634	001346	000000	DSCFLG: .WORD 0

;PROGRAM CONTROL FLAGS

640	001350	000	INIFLG: .BYTE 0	;PROGRAM INITIALIZATION FLAG
641	001351	000	ERRFLG: .BYTE 0	;ERROR OCCURED FLAG
642	001352	000	LOKFLG: .BYTE 0	;LOCK ON CURRENT TEST FLAG
643	001353	000	QV.FLG: .BYTE 0	;QUICK VERIFY FLAG.
644				;ON FIRST PASS OF EACH DUP11 ITERATIONS
645				;WILL BE SUPPRESSED
646			.EVEN	

```
647                                     ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
648                                     ;POINTERS TO SUBROUTINES CAN BE FOUND
649                                     ;IN THE TABLE IMMEDIATELY FOLLOWING THE DEFINITIONS
650
651                                     ;:*****
652                                     ;-----
653 001354 .TRPTAB:
654         104400 SCOPE=TRAP+1          ;CALL TO SCOPE LOOP AND ITERATION HANDLER
655 001354 002540 .SCOPE
656         104401 SCOP1=TRAP+1         ;CALL TO LOOP ON CURRENT DATA HANDLER
657 001356 002672 .SCOP1
658         104402 TYPE=TRAP+2          ;CALL TO TELETYPE OUTPUT ROUTINE
659 001360 002716 .TYPE
660         104403 INSTR=TRAP+3          ;CALL TO ASCII STRING INPUT ROUTINE
661 001362 002772 .INSTR
662         104404 INSTER=TRAP+4         ;CALL TO INPUT ERROR HANDLER
663 001364 003076 .INSTER
664         104405 PARAM=TRAP+5          ;CALL TO NUMERICAL DATA INPUT ROUTINE
665 001366 003116 .PARAM
666         104406 SAV05=TRAP+6          ;CALL TO REGISTER SAVE ROUTINE
667 001370 003316 .SAV05
668         104407 RES05=TRAP+7          ;CALL TO REGISTER RESTORE ROUTINE
669 001372 003356 .RES05
670         104410 CONVRT=TRAP+10        ;CALL TO DATA OUTPUT ROUTINE
671 001374 003410 .CONVRT
672         104411 CNVRT=TRAP+11         ;CALL TO DATA OUTPUT ROUTINE WITHOUT CR/LF.
673 001376 003414 .CNVRT
674         104412 SETFLG=TRAP+12        ;CALL TO TELETYPE INPUT ROUTINE
675 001400 003622 .SETFLG
676
677                                     ;-----
678                                     ;:*****
```

```

679                                     ;DUP11 VECTOR AND REGISTER INDIRECT POINTERS
680
681 001402 000000      DUPRVC: 0          ;POINTER TO DUP11 RECEIVER INTERRUPT VECTOR
682 001404 000000      DUPRPS: 0          ;POINTER TO DUP11 RECEIVER INTERRUPT SERVICE PS
683 001406 000000      DUPTVC: 0          ;POINTER TO DUP11 TRANSMITTER INTERRUPT VECTOR
684 001410 000000      DUPTPS: 0          ;POINTER TO DUP11 TRANSMITTER INTERRUPT SERVICE PS
685 001412 000000      RXCSR: 0           ;POINTER TO DUP11 RECEIVER STATUS REGISTER
686 001414 000000      RXDBUF: 0          ;POINTER TO DUP11 RECEIVER DATA BUFFER
687 001416 000000      PARCSR: 0          ;POINTER TO DUP11 PARAMETER STATUS REGISTER
688 001420 000000      TXCSR: 0           ;POINTER TO DUP11 TRANSMITTER STATUS REGISTER
689 001422 000000      TXDBUF: 0          ;POINTER TO DUP11 TRANSMITTER DATA BUFFER
690 001424 000000      DUPSEC: 0          ;POINTER TO DUP11 SECONDARY REGISTER SELECT REGISTER
691 001426 000000      HUPPSR: 0          ;POINTER TO PARAMETER STATUS HIGH BYTE
692 001430 000000      HUPRBF: 0          ;POINTER TO RECEIVER BUFFER HIGH BYTE
693 001432 000000      HUPTCR: 0          ;POINTER TO RECEIVER CONTROL REG HIGH BYTE
694 001434 000000      HUPTBF: 0          ;POINTER TO TRANSMITTER BUFFER HIGH BYTE
695 001436 000000      HUPTCR: 0          ;POINTER TO TRANSMITTER CONTROL REG HIGH BYTE
696
697
698                                     ;DUP11 CONTROL INDICATORS FOR CURRENT DUP11 UNDER TEST
699                                     ;-----
700
701 001440      000      MASK.A: .BYTE 000      ;LAST CHAR TO TEST AND PARITY MASK
702
703 001441      010      CLK.A: .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR
704
705 001442 000000      L00.00: 000000          ;PARAMETERS
706
707
708                                     ;DUP11 STATUS TABLE AND ADDRESS ASSIGNMENTS
709                                     ;-----
710
711                                     . =1500
712 001500      DUP.MAP:
713 001500 000001      DUPCRO: .BLKW 1          ;CONTROL STATUS REGISTER FOR DUP11 NUMBER 0
714 001502 000001      DUPTRO: .BLKW 1          ;VECTOR 'A' FOR DUP11 NUMBER 0
715 001504 000001      DUPO.A: .BLKW 1          ;PARAMETER FOR DUP11 NUMBER 0
716
717 001506 000000      DUP.END:      000000
718
719
720
721

```


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

```

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

```


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N 2

SEQ 0027
SEQ 0026

1201	004264	000177	174724		JMP	@RETURN	:GOTO SPECIFIED TEST
1202	004270	000002		2\$:	RTI		:RETURN
1203	004272	000001		ERTAB0:	1		
1204	004274	006	002		.BYTE	6,2	
1205	004276	001266			SAVPC		
1206	004300	000001		XTSTN:	1		
1207	004302	003	002		.BYTE	3,2	
1208	004304	001226			TSTNO		
1209							

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D 3

SEQ 0030
SEQ 0029

1322	005321	377	051101	020105	MALLJM: .ASCIIZ <377>/ARE THE DEFAULT JUMPERS ALL IN? (Y OR N) /
1323	005326	044124	020105	042504	
1324	005334	040506	046125	020124	
1325	005342	052512	050115	051105	
1326	005350	020123	046101	020114	
1327	005356	047111	020077	054450	
1328	005364	047440	020122	024516	
1329	005372	020040	000		
1330	005375	377	051101	020105	MDSC: .ASCIIZ <377>/ARE DSC 1 AND 2 BOTH IN? (Y OR N) /
1331	005402	051504	020103	020061	
1332	005410	047101	020104	020062	
1333	005416	047502	044124	044440	
1334	005424	037516	024040	020131	
1335	005432	051117	047040	020051	
1336	005440	000040			
1337					.EVEN
1338	005442	000002			XSTATQ: 2
1339	005444	006	003		.BYTE 6.3
1340	005446	001236			TEMP1
1341	005450	006	002		.BYTE 6.2
1342	005452	001240			TEMP2
1343					.EVEN
1344					
1345	005454	000000			TEMP: 0
1346		005516			.=. +40
1347	005516	000000			MDATA: 0
1348		005560			.=. +40
1349	005560	000000			INBUF: 0
1350		005622			.=. +40
1351	005622	000001			TRP.PC: .BLKW 1
1352					

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

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SEQ 0043
 SEQ 0042

```

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

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0050
SEQ 0049

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