digital

MAINDEC CHANGE NOTICE

CHANGE NO.
11-D8DB- 5
Sheet 1 of 1

AUTHOR	PROGRAM DATE	PRODUCT LINE	MAINDEC NUMBER
J. Friedrich DATE EXT. 12/13/71 3246	DEC. 71	PDP-11	11-D8DB

PROGRAM NAME Synchronous interface diagnosti **DEVICE** PDP-11

ITEM

1-2-3

PROBLEM: This is a composit of all MCN's on this program.
A. Eliminates Vector initialization bug.
B. Eliminates a "RCV active" problem associated with bus buffered systems.
C. Eliminates a software bug discovered when transmitter buffer ECO was implemented.

CORRECTION:	LOCATION	FROM	TO	;RESULT
	1266	Ø1Ø2Ø3	Ø1Ø213	
	3666	ØØØØØ4	ØØ4ØØ4	;Clears "RCV active", "Maintenance Mode".
	6ØØ6	116777	Ø16777	;Changes MOV BYTE to MOV WORD

4.

A. 11/45 ONLY.
PROBLEM: It appears that at the present level of investigation that there is a "shut down" problem going from one test to the next when running on 11/45. The following patch adds an additional SYNC character to the start up routines.

CORRECTION:	LOCATION	FROM	TO
	7010	2	3
	7476	2	3

B. Documentation Change.
Paragraph 9.1.1 LINE.N LINE NUMBER
Halt is at location 1152 no 1052
The reasoning behind developing this scheme of selecting line number and vector address was to force production to configure add-ons as per the key sheet. The routine LINE.N accepts consol switches SW8-SWØ as the vector address of DP11 ZERO (17477Ø) and SW15-SW9 on the octal line number. That is if SW15-SW9 is set to 1 the DP11 address generated is 17476Ø, 2 is 17475Ø, etc.

5.
7/18/72

11/05 only -
To hear bell make following patch:

010206:	004737	017110:	105737
010210:	017110	017112:	177564
010212:	000240	017114:	100375
		017116:	012737
017032:	004737	017120:	000207
017034:	017110	017122:	177566
017036:	000240	017124:	105737
		017126:	177564
		017130:	100375
		017132:	000207

IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-D8DB-D
PRODUCT NAME:	DP11A SYNCHRONOUS LINE UNIT
DATE CREATED:	AUGUST 1971
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	JOHN FRIEDRICH

M. C. N. REQUIRED
THIS PROGRAM REQUIRES MCN(S)
IN ORDER TO WORK PROPERLY

1. ABSTRACT

THIS MAINDEC CONSISTS OF TWO PROGRAMS, FIRSTLY, A DP11A EXERCISER WHICH IS RUN WITH A TEST CONNECTOR (DB25S) IN PLACE OF THE MODEM. THE FUNCTION OF THIS TEST IS TO CHECK OUT THE CABLE (BC01R-25) AND FUNCTIONAL INTERFACE WITH THE MODEM. THIS TEST IS RUN UNDER A SIMULATED (SOFTWARE) CLOCK THAT RUNS AT APPROXIMATELY 54KHZ.

SECONDLY, THERE IS THE PRINCIPLE DIAGNOSTIC FOR THE DP11. THIS PROGRAM RUNS IN THE MAINTENANCE MODE WITH THE BC01R-25 CABLE REMOVED FROM THE SYSTEM UNIT. THIS TEST PROVIDES COMPLETE DIAGNOSTICS FOR THE DP11-DA AND DP11-CA.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP11/20
DB25S TEST CONNECTOR (IF CABLE TEST IS TO BE RUN)
DP11-DA
DP11-CA (OPTIONAL)

2.2 STORAGE

THIS PROGRAM USES MEMORY TO LOCATION 16774.

3. LOADING PROCEDURE

THIS PROGRAM'S OBJECT TAPE IS PUNCHED IN ABSOLUTE FORMAT. THE ABS LOADER IS USED TO LOAD THE PROGRAM.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SWITCH 7 — INDICATES TO THE PROGRAM THAT THIS IS THE FIRST PASS OR THAT A NEW DP11 LINE IS TO BE SELECTED FOR TEST (SEE 4.3 OPERATOR ACTION)

SWITCH 8 — SELECTS THE DP11-CA OPTION FOR TEST

4.2 STARTING ADDRESSES

200 = START ADDRESS FOR MAINTENANCE MODE DIAGNOSTICS (CABLE MUST BE PULLED FROM THE SYSTEM UNIT)

210 = START ADDRESS FOR BC01R-25 CABLE TEST (DB25S TEST CONNECTOR MUST BE PLUGED IN)

4.3 OPERATOR ACTION

4.3.1 IF SWITCH 7 WAS LEFT UP THE PROGRAM WILL HALT AT LOCATION 1052 AND REQUIRE THE FOLLOWING OPERATOR ACTION:

A) SW0-SW8 — MUST BE SET TO THE VECTOR ADDRESS OF THE FIRST DP11.

B) SW9-SW15 — MUST BE SET TO THE OCTAL LINE NUMBER OF THE DP11 TO BE TESTED. E.G, THE FIRST DP11 IS LINE 0.

PRESS CONTINUE, ZERO SWITCHES AND RESELECT AS PER 5,1,1 "SWITCH SETTINGS".
ALL DP11 ADDRESSES SHALL BE ASSIGNED FROM 774777 TO 774400 (CONTIGUOUSLY)!

I.E. 1ST DP11	774776	XMIT	BUFFER
	774774	XMIT	STATUS
	774773	SYNC	BUFFER
	774772	RCV	BUFFER
	774770	RCV	STATUS
2ND	774766		
	774764		
	774762		
	774760		
32ND	774406		
	774404		
	774402		
	774400		

4.3.2 FOR CABLE TEST REMOVE BC01R-25 CABLE FROM MODEM AND PLUG THE DB25S TEST CONNECTOR SOCKET INTO THE CABLE.

4.3.3 FOR THE MAINTENANCE MODE TEST THE CABLE MUST BE REMOVED FROM THE DEVICE SYSTEM UNIT.

5. OPERATING PROCEDURE

5.1.1 SWITCH SETTINGS (APPLICABLE TO BOTH TESTS)

SW15 = 1 OR UP ... HALT ON ERROR

SW14 = 1 OR UP ... SCOPE LOOP

SW13 = 1 OR UP ... INHIBIT PRINTOUT

SW11 = 1 OR UP ... INHIBIT ITERATION

6. ERRORS

6.1 ERROR PRINTOUT

PRINTS ALL ERRORS UNLESS INHIBITED BY SWITCH 13.

6.1.1 ERRORS ARE REPORTED THROUGH AN EMULATOR TRAP TO ERRP. THIS ROUTINE PRINTS THE OCTAL EQUIVALENT OF THE CONTENTS OF THE STACK. FOR EXAMPLE, ASSUME THAT AN ERROR WAS DETECTED IN AN INTERRUPT SERVICE ROUTINE. THE PRINTOUT WOULD BE THE PROGRAM COUNTER PC AND STATUS PS OF THE ERROR REPORT TRAP FOLLOWED BY THE PC AND PS OF THE MAINLINE CODE.

6.2 ERROR RECOVERY

A. IF IN A SCOPE LOOP, RESET SWITCH 14.

B. TO RECOVER FROM HALT ON ERROR, MAKE SURE SW14 IS RESET THEN DEPRESS CONTINUE.

NOTE: SINCE DATA TRANSMITTION MUST BE CONTINUOUS A HALT ON ERROR MAY CAUSE AN AVALANCHE OF ERRORS, IF THIS HAPPENS USE STEP C.

C. RELOAD SA AND START.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

SEE 4.1 AND 4.3.1

7.2 OPERATING RESTRICTIONS

7.2.1 CABLE TEST (SA=210) MUST BE RUN WITH DB25S CONNECTOR IN PLACE OF A MODEM.

7.2.2 MAINTENANCE MODE DIAGNOSTIC MUST BE RUN WITH CABLE REMOVED FROM SYSTEM UNIT.

8. MISCELLANEOUS

8.1 EXECUTION TIME

THE PROGRAM RINGS THE TELETYPE BELL APPROXIMATELY EVERY 4 MINUTES.

9. PROGRAM DESCRIPTION

9.1 INITIALIZATION ROUTINES

THE START CODE FOR BOTH THE MAINTENANCE MODE AND THE CABLE TEST INITIALIZES THE PROCESSOR PRIORITY TO LEVEL SEVEN AND SETS THE STACK POINTER TO ADDRESS 1000. CONSOL SWITCH SEVEN IS THEN EXAMINED TO DETERMINE IF THIS IS THE FIRST PASS OR A NEW LINE IS TO BE SELECTED FOR TEST. IF SWITCH SEVEN IS UP TWO SUBROUTINES (CLRVEC,LINE,N) ARE EXECUTED BEFORE THE TEST SECTION IS ENTERED.

9.1.1 CLRVEC, CLEAR-VECTOR-AREA

THE SUBROUTINE "CLEAR-VECTOR-AREA" LOADS THE COMMUNICATION VECTOR AREA WITH ,+2,HALT, THIS CAUSES ANY ILLEGAL INTERRUPTS TO TRAP TO THERE STATUS WORD.

9.1.2 LINE,N, LINE NUMBER

THE FUNCTION OF THIS SUBROUTINE IS TO SAVE SWITCH EIGHT OF THE CONSOL (SW8 SELECTS DP11-CA OPTION) AND WAIT FOR OPERATOR ACTION TO SPECIFY THE LINE NUMBER AND FIRST DP11 VECTOR ADDRESS. WHEN THE PROGRAM HALTS AT LOCATION 001052 SWITCHES SW0 THRU SW8 MUST BE SET TO THE VECTOR ADDRESS OF THE FIRST DP11 AND SWITCHES SW9 THRU SW15 MUST BE SET TO THE OCTAL EQUIVILANT OF THE LINE NUMBER (E.G. THE FIRST LINE IS LINE 0(8) THE TENTH LINE IS LINE 11(8)); FOLLOWING THIS ACTION "CONTINUE" ENTERS THE PROGRAM INTO THE SELECTED TEST SECTION. IF SWITCH SEVEN IS NOT UP WHEN "START" IS DEPRESSED THE PROGRAM ASSUMES THIS A RERUN OF THE SAME HARDWARE CONFIGURATION AND EXECUTES THE TESTS USING THE SAME PARAMETERS PREVIOUSLY SELECTED.

9.2 MAINTENANCE MODE TESTS

IN AN EFFORT TO OPTIMIZE CORE UTILIZATION MANY OF THE DIAGONOSTIC TEST WERE WRITTEN IN SUBROUTINE FORMAT VERSUS MACROS.

9.2.1 BITST, BIT TEST

THIS SUBROUTINE IS ENTERED WITH A JSR %5, BITST, IMMEDIATELY FOLLOWING THIS INSTRUCTION IS THE BIT SELECTED FOR TEST. THE BIT NUMBER IS FETCHED BY THE SUBROUTINE AND STORED IN LOCATION "BITS". USING A SEQUENCE OF "BIS" "BIT" AND "BIC" INSTRUCTIONS EACH READ/WRITE BIT OF THE TRANSMITTER AND RECEIVER CSR (TCSR,RCSR) IS TESTED TO VERIFY THAT AT LEAST THAT PARTICULAR BIT CAN BE REFERENCED AND IS IN FACT READ/WRITE, NO ATTEMPT IS MADE AT THIS POINT TO CHECK FOR ILLEGITIMATE INTERACTION.

9.2.2 RESET TEST

THIS IS A SIMPLE TEST THAT MERELY WRITES INTO ALL WRITEABLE BITS OF THE TCSR AND RCSR, CHECKS THAT THEY WERE SET, ISSUES "RESET" AND CHECKS THAT ALL BITS THAT ARE SUPPOSED TO BE CLEARED BY RESET-WERE.

9.2.3 VALID

THE FUNCTION OF THIS SUBROUTINE IS TO TEST FOR INTERACTION BETWEEN READ/WRITE BITS OF THE TCSR AND RCSR. THIS ROUTINE IS ENTERED WITH A JSR REGISTER FIVE, FOLLOWED BY THE BIT NUMBER. THE SELECTED BIT IS SET AND THEN THE ENTIRE CSR IS COMPARED WITH THE WORD (BITS) USED TO SET THE SELECTED BIT. IF ANY OTHER BIT IS SET AN ERROR IS REPORTED, LOCATION "REG" CONTAINS THE ADDRESS OF THE CSR SELECTED FOR TEST, AN EXAMINATION OF THIS CSR SHOULD REVEAL A BIT SET OTHER THAN THE ONE IN LOCATION "BITS".

9.2.4 CLEAR

THIS SUBROUTINE IS ENTERED THE SAME WAY AS BITST, AND VALID ARE ENTERED. ITS FUNCTION IS TO TEST FOR INTERACTION BETWEEN ANY CSR BITS DURING A BIT CLEAR INSTRUCTION. THIS IS ACCOMPLISHED BY SETTING ALL READ/WRITE BITS OF THE SELECTED CSR AND MAKING A DUPLICATE BIT MAP IN TMPDAT. THEN "BITS" IS USED TO CLEAR A SINGLE BIT IN THE CSR AND TMPDAT. FOLLOWING THIS THE CSR IS COMPARED WITH TMPDAT TO VERIFY THAT ONLY THAT BIT WAS CLEARED.

9.2.5 PRIORITY TESTS

WITH THE PROCESSOR PRIORITY AT LEVEL FIVE "STATUS-INTERRUPT-ENABLE" (SIE) IS SET AND ALL THE BITS THAT SHOULD CAUSE A STATUS INTERRUPT ARE SET INDIVIDUALLY AND COLLECTIVELY SET, SECONDLY SIE IS REMOVED AND THE PROCESSOR PRIORITY IS LOWERED TO FOUR, AGAIN THE CSR BITS THAT CAUSE "STATUS INTERRUPTS" ARE SET AND RESET, FINALLY THE SIE BIT IS SET WHILE THE PROCESSOR PRIORITY IS AT FOUR AND IT IS VERIFIED THAT EACH DISCRETE EVENT THAT SHOULD CAUSE A STATUS INTERRUPT DOES. THIS SEQUENCE TESTS THAT THE DP11 STATUS BITS INTERRUPT AT THE PROPER PROCESSOR PRIORITY. THE NEXT SEQUENCE OF PRIORITY TESTS VERIFY THE TRANSMITTER INTERRUPTS BY LOADING THE TRANSMIT BUFFER, ENABLING THE MAINTENANCE MODE C[illegible] AND WAITING FOR AN INTERRUPT. IF NO INTERRUPT IS RE[illegible]ED WITHIN 10 CHARACTER TIMES AN ERROR IS REPORTED.

9,2,6 SYNCHRONIZATION TESTS

THE FIRST SYNC TEST (SRW0) VERIFIES THE READ/WRITE CAPABILITY OF THE SYNC REGISTER 174XX3 AND THE SYNC EXTENSION 174XX7 WHEN THE DP11-CA OPTION EXISTS. THIS IS ACCOMPLISHED BY WRITING AND READING ALL POSSIBLE SYNC CHARACTERS (0 THRU 377(8) FOR THE SYNC REG AND 0 THRU 17(8) FOR THE SYNC EXTENSION).

THE NEXT SYNC TEST (SYNC0) ISSUES TWO OF EVERY POSSIBLE SYNC CHARACTER IN EACH OF THE AVAILABLE CHARACTER LENGTH AND CHECKS THAT TWO OF EACH SYNC RAISES "RECEIVER ACTIVE". THEN THE THIRD SYNC IS TRANSMITTED AS DATA. THIS CHECKS THE CAPABILITY OF THE RECEIVER TO INTERRUPT AND ALSO CHECKS THE RECEIVER BUFFER FOR DATA RECEPTION ACCURACY. THIS TEST IS FIRST RAN BY LOADING THE TRANSMIT BUFFER UNDER SOFTWARE CONTROL THEN IS REPEATED IN THE IDLE MODE. THIS CHECKS THAT EACH AND EVERY POSSIBLE SYNC CHARACTER CAN BE TRANSMITTED IN THE IDLE MODE IN THE EVENT THAT AN ERROR IS DETECTED IN THE LAST TWO SYNC TEST AND THE "HALT-ON-ERROR" SWITCH IS UP A SCOPE LOOP MAY BE RUN. THIS IS ACCOMPLISHED BY REMOVING "HALT-ON-ERROR" SW15, SETTING "SCOPE", INHIBIT PRINT, AND PRESSING CONTINUE. THIS CAUSES INCREMENT INSTRUCTION TO BE SKIPPED AND THEREFORE LOOP ON THE SAME SYNC CHARACTER.

9,2,7 INTERRUPT DRIVEN SEQUENTIAL DATA TEST

SYNC IS ESTABLISHED THROUGH THE TRANSMISSION TWO SYNC CHARACTERS. ONCE SYNC IS ESTABLISHED A BINARY COUNT PATTERN IS TRANSMITTED THE SIZE OF WHICH IS DETERMINED BY THE MAXIMUM CHARACTER SELECTED FOR TEST (8 BITS/CHARACTER OR 12/8 BITS/CHARACTER IF THE CA OPTION EXISTS). AT THE COMPLETION OF THE BINARY COUNT PATTERN "ACTIVE" IS DROPPED AND THE NEXT SHORTEST CHARACTER LENGTH IS SELECTED. THIS TEST IS REPEATED FOR THREE CHARACTER LENGTHES (12,11,10,OR 8,7,6).

FUNCTIONALLY THIS TEST VERIFIES THE CAPABLIITY OF THE DP11 TO MAINTAIN SYNC OVER A LONG CHARACTER STRING.

IN THE EVENT THAT AN ERROR IS DETECTED AND "HALT-ON-ERROR" IS UP REMOVE IT, SET "INHIBIT PRINT" AND "SCOPE" AND PRESS CONTINUE. THIS PROCEDURE WILL PREVENT THE BINARY COUNT FROM INCREMENTING AND CAUSES THE INTERRUPT SERVICE ROUTINES TO RUN CONTINUOUSLY.

9.2.8 RANDOM DATA, RANDOM STALL

THIS INTERRUPT DRIVEN TEST TRANSMITS RANDOM DATA FOR A PERIOD OF TIME (0 TO 0,65 SECONDS, 0 TO 260 CHARACTERS) DETERMINED BY A RANDOM GENERATOR. AT THE EXPIRATION OF THE DATA TIME INTERVAL THE "IDLE" MODE IS ENTERED AND SYNC CHARACTERS ARE TRANSMITTED FOR A RANDOM PERIOD OF TIME. WHEN THE IDLE TIME TERMINATES THE DATA MODE IS RESTARTED AND NEW DATA IS TRANSMITTED FOR A NEW TIME INTERVAL.

THIS VERIFIES THAT THE DP11 CAN SWITCH BETWEEN DATA MODE AND IDLE AT RANDOM.

9.2.9 PARITY TEST

THE PARITY TEST CONSISTS OF A TRANSMITTER INTERRUPT SERVICE ROUTINE THAT TRANSMITS A BINARY COUNT PATTERN AND A RECEIVER INTERRUPT SERVICE ROUTINE THAT CALCULATES THE PARITY ON THE EXPECTED DATA, COMPARES THE RECEIVED DATA WITH THE EXPECTED DATA, AND FINALLY TESTS THE PARITY BIT (BIT 12=0 FOR EVEN, 1 FOR ODD).

9.2.10 RECEIVER OVERRUN TEST

THIS TEST TRANSMITS TWO SYNC CHARACTERS TO RAISE "ACTIVE" FOLLOWED BY TWO DATA CHARACTERS. RECEIVER INTERRUPT ENABLE IS NOT SET THEREFORE "RECEIVER OVERRUN" SHOULD SET AND CAUSE A TRANSMITTER STATUS INTERRUPT. THIS SEQUENCE IS REPEATED FOR A FULL BINARY COUNT.

9.2.11 HALF DUPLEX TEST

THE HALF DUPLEX BIT SHOULD PREVENT ANY DATA FROM ENTERING THE RECEIVER WHILE SEND-REQUEST IS UP. TO VERIFY THIS RECEIVER INTERRUPT ENABLE IS SET WHILE THE TRANSMITTER IDLES FOR APPROXIMATELY 30MS. FOR EACH POSSIBLE CHARACTER AVAILABLE IN THE 8 BIT/CHAR SET. ANY DATA ENTRY INTO THE RECEIVER WILL CAUSE A TRAP TO AN ERROR ROUTINE.

9.3 CABLE TEST

THE CABLE TEST REQUIRES THE LEAST AMOUNT OF EFFORT AND THEREFORE CAN BE RUN AS A QUICK CONFIDENCE CHECK. THE OPERATING PROCEDURE IS TO DISCOUNT THE BC01R-25 CABLE FROM THE MODEM AND PLUG IT INTO THE BD25S TEST CONNECTOR. FROM THIS POINT ON THE OPERATING PROCEEDURE IS THE SAME AS THE MAINTENANCE MODE DIAGNOSTIC. THE PRINCIPLE DIFFERENCE BETWEEN THE CABLE TEST AND THE MAINTENANCE MODE TEST IS THE CLOCK. THE MAINTENANCE MODE TEST RUNS OFF OF A FREE RUNNING 3KHZ MULTIVIBRATOR WHERE AS THE CABLE TEST OPERATES OFF A SOFTWARE CLOCK. SETTING BIT 3 OF THE TRANSMITTER STATUS RAISES THE CLOCK, CLEARING IT LOWERS THE CLOCK. THE SOFTWARE CLOCK THEREFORE HAS A FREQUENCY RANGE OF ZERO TO 56KHZ. THIS ENABLES THE PROGRAM TO STEP THROUGH THE TRANSMIT-RECEIVE SEQUENCE ONE BIT AT A TIME. IT ALSO VERIFIES THE 10KHZ CABLE SPEC AND 50KHZ LOGIC SPEC.

9.3.1 DELAY N

THE MACRO CALL DELAY, CAUSES THE PROCESSOR TO ST[illegible]
APPROXIMATELY N TIMES 10 MICROSECONDS.

9.3.2 CLOCK

CLOCK IS THE SUBROUTINE TO RUN THE SOFTWARE CLOCK, IT IS ENTERED BY A JSR %5, CLOCK FOLLOWED BY THE NUMBER OF CYCLES DESIRED. UPON ENTRY THE SUBROUTINE FETCHES THE CYCLE COUNT AND EXAMINE BIT8 OF SAVSR1 TO DETERMINE IF 8 BITS/CHAR OR 12 BITS/CHAR HAVE BEEN SELECTED FOR TEST, IF THE 12 BIT MODE HAS BEEN SELECTED 4 IS ADDED TO THE CLOCK COUNT AND BIT 10 OF THE RECEIVER STATUS IS SET BEFORE EXECUTING THE CLOCKING INSTRUCTIONS, ENBEDED WITHIN THE CLOCKING INSTRUCTIONS IS TWO MACRO CALLS (DELAY N) TO SLOW DOWN THE CLOCK, WITH DELAY 1 THE SOFTWARE CLOCK RUNS AT APPROXIMATELY 25 KHZ, THIS MACRO ENABLES THE OPERATOR TO SLOW THE CLOCK DOWN TO ALMOST ZERO CPS, THIS CAN BE USEFULL IN DETERMING IF A BUG IF FREQUENCY DEPENDENT.

9.3.3 MCLOK

THIS MACRO CALL IS ANOTHER SOFTWARE CLOCK, IT WAS WRITTEN FOR CODE THAT IS INDEPENDENT OF 12/8 BITS PER CHARACTER OPTION. MCLOK N EXECUTES N SOFRWARE CYCLES, MCLOK ALSO HAS THE DELAY MACRO EMBEDDED WITHIN ITS DEFINITION, HOWEVER, BECAUSE IT IS A MACRO THE DELAY INSTRUCTIONS WOULD HAVE TO BE MODIFIED EACH TIME THE MACRO IS CALLED.

9.3.4 REE

REE IS A UTILITY SUBROUTINE TO REINITIALIZE THE DP11 STATUS REGISTER, INTERRUPT VECTOR AND SELECT THE 12/8 BITS PER CHARACTER MODE. THE ENTRY REGISTER IS R5, THE ADDRESS TO WHICH THIS SUBROUTINE RETURNS IS A FUNCTION OF THE NUMBER OF BITS PER CHARACTER SELECTED FOR TEST, IF 8 BITS PER CHARACTER IS SELECTED THE SUBROUTINE RETURNS TO AN INSTRUCTION THAT SETS UP THE DATA LIMIT FOR THAT MODE, IF THE TWELVE BIT PER CHARACTER MODE IS SELECTED THE CONTENTS OF REGISTER 5 IS MODIFIED AND SUBROUTINE RETURNS TO THE INSTRUCTION THAT SETS UP THE TWELVE BIT LIMIT.

9.3.5 SYNCHRONIZATION CHARACTER TESTS

FOLLOWING STATUS REGISTER AND VECTOR INITIALIZATION THE CLOCK IS RUN FOR 30 CYCLES TO CLEAR OUT ANY PREVIOUS DATA THAT MAY BE RESIDING IN THE TRANSMIT OR RECEIVE BUFFERS, AT THIS POINT THE "TRANSMITTER DONE" AND "TRANSMITTER INTERRUPT ENABLE" ARE SET CAUSING AN INTERRUPT TO A SYNCHRONIZATION SUBROUTINE, TV18, TV18 LOADS THE TRANSMIT BUFFER WITH A SYNC CHARACTER, UPON RETURN FROM THE INTERRUPT SERVICE ROUTINE THE SOFTWARE CLOCK RUNS FOR 3 CYCLES, THIS SHOULD BR SUFFICIENT TO RAISE "SEND REQUEST"; IF NOT AN ERROR IS REPORTED, THE SOFTWARE CLOCK THEN GENERATOR ENOUGH CYCLES TO TRANSMIT EXACTLY ONE CHARACTER AND EXAMINES "RECEIVE ACTIVE", IF "RECEIVER ACTIVE" IS UP THE RECEIVER IS PREMATURELY ACTIVE AND AN ERROR IS REPORTED, THE NEXT SET OF CYCLES GENERATED IS ONE SHORT OF THE NUMBER REQUIRED TO TRANSMIT A FULL CHARACTER.

AGAIN "RECEIVER ACTIVE" IS TESTED FOR A PREMATURE RESPONSE

ONE MORE CYCLE IS THEN GENERATED AND "ACTIVE" SHOULD BE UP. TO VERIFY THAT IT WAS THE TRANSMITTED DATA THAT RAISED "ACTIVE" AND NOT NOISE A THIRD SYNC IS TRANSMITTED AND CHECKED AS DATA. THE SEQUENCE IS CONTINUED FOR COMPLETE SET OF POSSIBLE SYNC CHARACTERS (1 TO LIMIT), IN EACH OF THE THREE AVAILABLE CHARACTER LENGTHS. THIS SET OF TESTS ALSO HAS THE SCOPE LOOP FACILITY WHERE THE SAME SYNC CHARACTER IS NOT CHANGED IF THE SCOPE SWITCH SW14 IS UP.

9.3.6 SEQUENTIAL DATA

THIS TEST IS THE SAME AS THAT RUN IN THE MAINTENANCE MODE TEST. IT'S PRINCIPLE OBJECTIVE IS TO VERIFY THE 50KHZ SPEC OF THE DP11. THE SOFTWARE CLOCK THAT DRIVES THIS TEST OPERATES AT APPROXIMATELY 56KHZ.

9.3.7 RANDOM DATA, RANDOM IDLE

THIS TEST IS SIMILAR TO THE RANDOM DATA TEST RUN IN THE MAINTENANCE MODE. THE DIFFERENCE IS THAT IN GOING FROM "IDLE" TO "DATA", "ACTIVE" IS DROPPED AND THE RECEIVER RESYNCED.

9.3.8 SEND-REQUEST TEST

IN THIS TEST "SEND REQUEST" IS RAISED BY LOADING THE TRANSMIT BUFFER AND GENERATING 3 CYCLES. IF THE CABLE IS WIRED PROPERLY "SEND REQUEST" SHOULD RAISE "CLEAR-TO -SEND" AND "MODEM READY" (DATA SET READY). THIS TEST IS REPEATED IN THE 8, 7, AND 6 BITS PER CHARACTER MODE.

9.3.9 TERMINAL READY

THE FUNCTION OF THIS TEST IS TO VERIFY THAT WITH THE DB25S TEST CONNECTOR IN PLACE, SETTING "TERMINAL READY" RAISES "CARRIER" AND "RING FLAG". THIS TEST ALSO VERIFIES "RING FLAG" AND "CARRIER DOWN FLAG" INTERRUPT.

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                                ;DP11A SYNCHRONOUS MODEM INTERFACE DIAGNOSTIC
                                ;*******MAINTENANCE MODE******
                                ;COPYRIGHT, DIGITAL EQUIPMENT CORPORATION******
                                ;MAYNARD, MASSACHUSETTS  01754
                                ;PROGRAMMER: JOHN FRIEDRICH


                                ;MAINDEC-11-D8DB

                                ;EQUALITIES

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

            000000              R0=%0
            000001              R1=%1
            000002              R2=%2
            000003              R3=%3
            000004              R4=%4
            000005              R5=%5
            000006              R6=%6
            000006              SP=%6
            000007              PC=%7
            177776              PS=177776
            104000              ERROR=EMT
            177570              SWR=177570
            104400              SCOPE=TRAP
            000240              NOP=240
            104001              SAVREG=EMT+1
            104002              RESTOR=EMT+2

                                ;TRAP INITIALIZATION

            000100              .REPT   100
                                        .+2
                                        HALT
                                .ENDR
000000  000002                          .+2
000002  000000                          HALT
000004  000006                          .+2
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000006  000000                  HALT
000010  000012                  .+2
000012  000000                  HALT
000014  000016                  .+2
000016  000000                  HALT
000020  000022                  .+2
000022  000000                  HALT
000024  000026                  .+2
000026  000000                  HALT
000030  000032                  .+2
000032  000000                  HALT
000034  000036                  .+2
000036  000000                  HALT
000040  000042                  .+2
000042  000000                  HALT
000044  000046                  .+2
000046  000000                  HALT
000050  000052                  .+2
000052  000000                  HALT
000054  000056                  .+2
000056  000000                  HALT
000060  000062                  .+2
000062  000000                  HALT
000064  000066                  .+2
000066  000000                  HALT
000070  000072                  .+2
000072  000000                  HALT
000074  000076                  .+2
000076  000000                  HALT
000100  000102                  .+2
000102  000000                  HALT
000104  000106                  .+2
000106  000000                  HALT
000110  000112                  .+2
000112  000000                  HALT
000114  000116                  .+2
000116  000000                  HALT
000120  000122                  .+2
000122  000000                  HALT
000124  000126                  .+2
000126  000000                  HALT
000130  000132                  .+2
000132  000000                  HALT
000134  000136                  .+2
000136  000000                  HALT
000140  000142                  .+2
000142  000000                  HALT
000144  000146                  .+2
000146  000000                  HALT
000150  000152                  .+2
000152  000000                  HALT
000154  000156                  .+2
000156  000000                  HALT
000160  000162                  .+2
000162  000000                  HALT
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000164  000166                    .+2
000166  000000                    HALT
000170  000172                    .+2
000172  000000                    HALT
000174  000176                    .+2
000176  000000                    HALT
000200  000202                    .+2
000202  000000                    HALT
000204  000206                    .+2
000206  000000                    HALT
000210  000212                    .+2
000212  000000                    HALT
000214  000216                    .+2
000216  000000                    HALT
000220  000222                    .+2
000222  000000                    HALT
000224  000226                    .+2
000226  000000                    HALT
000230  000232                    .+2
000232  000000                    HALT
000234  000236                    .+2
000236  000000                    HALT
000240  000242                    .+2
000242  000000                    HALT
000244  000246                    .+2
000246  000000                    HALT
000250  000252                    .+2
000252  000000                    HALT
000254  000256                    .+2
000256  000000                    HALT
000260  000262                    .+2
000262  000000                    HALT
000264  000266                    .+2
000266  000000                    HALT
000270  000272                    .+2
000272  000000                    HALT
000274  000276                    .+2
000276  000000                    HALT
000300  000302                    .+2
000302  000000                    HALT
000304  000306                    .+2
000306  000000                    HALT
000310  000312                    .+2
000312  000000                    HALT
000314  000316                    .+2
000316  000000                    HALT
000320  000322                    .+2
000322  000000                    HALT
000324  000326                    .+2
000326  000000                    HALT
000330  000332                    .+2
000332  000000                    HALT
000334  000336                    .+2
000336  000000                    HALT
000340  000342                    .+2
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```
000342  000000                  HALT
000344  000346                  .+2
000346  000000                  HALT
000350  000352                  .+2
000352  000000                  HALT
000354  000356                  .+2
000356  000000                  HALT
000360  000362                  .+2
000362  000000                  HALT
000364  000366                  .+2
000366  000000                  HALT
000370  000372                  .+2
000372  000000                  HALT
000374  000376                  .+2
000376  000000                  HALT
                        ;VECTOR INITIALIZATION
        000024          .=24
000024  010746                  PFAIL           ;POWER FAIL VECTOR
000026  000340                  340             ;PRIORITY 7

        000030          .=30
000030  010220                  EMTVEC          ;ERROR REPORT VECTOR
000032  000340                  340             ;PRIORITY 7
000034  011102                  SCOPEC          ;SCOPE LOOP VECTOR
000036  000340                  340             ;PRIORITY 7
```

```
        000200                  .=200
000200  000167  000674         START1: JMP     BEGIN1                  ;SET UP CONSOL SWITCH REGISTER

        000210                  .=210
000210  000167  012360                 JMP     BEGIN2                  ;DB25S CONNECTOR TEST

        001100                  .=1100
001100  000005                 BEGIN1: RESET
001102  012706  001100                 MOV     #BEGIN1,SP              ;SET UP STACK POINTER
001106  012767  000340  176662         MOV     #340,PS                 ;SET PROCESSOR PRIORITY = 7
001114  032767  000200  176446         BIT     #BIT7,SWR               ;TEST FOR CHANGE IN DP ADRS
001122  001404                       BEQ     BGN0                    ;BRANCH IF NO CHANGE
001124  004767  000142                 JSR     %7,CLRVEC               ;LOAD ENTIRE COMMUNICATION VECTOR AREA WITH
                                                                       ; .+2
                                                                       ; HALT
001130  004767  000004                 JSR     %7,LINE.N               ;FETCH LINE NUMBER FROM SWR
001134  000167  000416         BGN0:   JMP     BGN1                    ;START TEST

                                ;LINE.N  SUBROUTINE TO FETCH THE LINE
                                ;NUMBER AND FIRST DP11 VECTOR ADDRESS FROM
                                ;THE CONSOL SWITCHES
                                ;SW0-SW8=VECTOR ADDRESS OF FIRST DP11
                                ;SW9-SW15=LINE NUMBER OF DP11 SELECTED FOR TEST

001140  005067  010166         LINE.N: CLR     ERRCNT                  ;CLEAR ERROR COUNT
001144  016767  176420  010100         MOV     SWR,SAVSR1              ;SAVE CONSOL SWITCH SETTINGS
001152  000000                       HALT                            ;SET SWR TO LINE NUMBER
                                                                       ;LOW BYTE = FIRST DP VECTOR
                                                                       ;HIGH BYTE = LINE NUMBER(8)
001154  016767  176410  010072         MOV     SWR,SAVSR2              ;SAVE CONSOL SWITCHES

001162  005001                       CLR     R1
001164  116701  010065               MOVB    SAVSR2+1,R1             ;SAVE LINE NUMBER
001170  006201                       ASR     R1                      ;CLEAR LSB
001172  006301                       ASL     R1                      ;SCALE LINE NUMBER TO ADDRESS
001174  006301                       ASL     R1                      ;MODULO 10(8)
001176  006301                       ASL     R1
001200  012702  174770               MOV     #174770,R2              ;SET R2 = LINE 0 ADDRESS
001204  160102                       SUB     R1,R2                   ;MANUFACTURE DEVICE ADDRESS
001206  012703  011224               MOV     #DPRS,R3                ;R3 = ADDRESS OF RCV STATUS ADRS
001212  010223                       MOV     R2,(R3)+                ;LOAD RCV STATUS ADRS
001214  005722                       TST     (R2)+                   ;INC TO RCV BUFFER ADRS
001216  010223                       MOV     R2,(R3)+                ;LOAD RCV BUFFER ADRS
001220  005202                       INC     R2                      ;INC TO SYNC BUFFER ADRS
001222  010223                       MOV     R2,(R3)+                ;LOAD SYNC ADRS
001224  005202                       INC     R2                      ;INC TO XMIT STATUS ADRS
001226  010223                       MOV     R2,(R3)+                ;LOAD TRANSMITTER STATUS ADRS
001230  005722                       TST     (R2)+                   ;INC TO XMIT BUFFER
001232  010223                       MOV     R2,(R3)+                ;LOAD XMIT BUFFER ADRS
001234  005202                       INC     R2                      ;INC TO SYNC EXTENTION
001236  010223                       MOV     R2,(R3)+                ;LOAD SYNC EXTENSION ADRS
001240  016702  010010               MOV     SAVSR2,R2               ;SET UP VECTOR ADDRESS
001244  042702  177000               BIC     #177000,R2              ;CLEAR LINE NUMBER FROM VEC ADRS
001250  060102                       ADD     R[illegible]2           ;SET VECTOR ADDRESS TO LINE NU[illegible]
```

```
001252  010223                  MOV     R2,(R3)+                ;LOAD RCV VECTOR ADRS
001254  005722                  TST     (R2)+                   ;INC TO NEXT VECTOR
001256  010223                  MOV     R2,(R3)+                ;LOAD RCV PRIORITY ADRS
001260  005722                  TST     (R2)+                   ;INC TO NEXT VECTOR
001262  010223                  MOV     R2,(R3)+                ;LOAD XMIT VECTOR ADRS
001264  005722                  TST     (R2)+                   ;INC TO NEXT VECTOR
001266  010203                  MOV     R2,R3                   ;LOAD XMIT PRIORITY ADRS
001270  000207                  RTS     %7
                        ;**********CLRVEC**********

                        ;CLRVEC,ROUTINE TO FILL COMMUNICATION VECTOR AREA WITH .+2,HALT

001272  012702  000300  CLRVEC: MOV     #300,R2                 ;R2 COMM VECTOR AREA ADRS
001276  012701  000302          MOV     #302,R1                 ;INIT R1 WITH ADRS OF HALT
001302  010122  CV1:    MOV     R1,(R2)+                ;MOV .+2 TO PC
001304  005022          CLR     (R2)+                   ;MOV HALT TO PC
001306  022121          CMP     (R1)+,(R1)+             ;INC TO NEXT VECTOR AREA
001310  022701  000776          CMP     #776,R1                 ;END OF VECTOR AREA
001314  001372          BNE     CV1                     ;NO
001316  000207          RTS     %7                      ;RETURN


                        .MACR   DELAY   N                       ;WHERE N=TENS OF MICROSECONDS
                                MOV     #N,CNT                  ;SET UP COUNT
                        DEL=.
                                DEC     CNT                     ;TIME OUT
                                BNE     DEL                     ;NO
                        .ENDM                                   ;YES

                        ;BITSR,ROUTINE TO TEST READ WRITE BITS OF STATUS
                        ;THIS ROUTINE VERIFIES THAT EACH READ/WRITE BIT
                        ;CAN BE SET AND CLEARED
```

```
                                ;EXAMINE LOCATIONS
                                ;BITS: FOR BIT UNDER TEST
                                ;REG: FOR REGISTER UNDER TEST

001320  012567  000226          BITST: MOV     (R5)+,BITS              ;SAVE BIT NUMBER
001324  056777  000222  000222         BIS     BITS,@REG               ;SET BIT
001332  036777  000214  000214         BIT     BITS,@REG               ;IS BIT SET?
001340  001001                       BNE     .+4                     ;YES
001342  104000                       ERROR                           ;REPORT ERROR
001344  046777  000202  000202         BIC     BITS,@REG               ;CLEAR BIT
001352  036777  000174  000174         BIT     BITS,@REG               ;IS BIT CLEARED
001360  001401                       BEQ     .+4                     ;YES
001362  104000                       ERROR                           ;REPORT ERROR
001364  056777  000162  000162         BIS     BITS,@REG               ;SET BIT
001372  036777  000154  000154         BIT     BITS,@REG               ;IS BIT SET
001400  001001                       BNE     .+4                     ;YES
001402  104000                       ERROR                           ;REPORT ERROR
001404  005077  000144                CLR     @REG                    ;CLEAR REG
001410  036777  000136  000136         BIT     BITS,@REG               ;IS BIT CLEARED
001416  001401                       BEQ     .+4                     ;YES
001420  104000                       ERROR                           ;REPORT ERROR
001422  052777  000004  007574         BIS     #BIT2,@DPRS             ;KEEP CLOCK HUMMING
001430  000205                       RTS     %5

                                ;VALID,ROUTINE TO TEST FOR ANY INTERACTION BETWEEN BITS
                                ;THIS ROUTINE CHECKS THAT WHEN EXECUTING A BIT SET INSTRUCTION
                                ;ONLY THE SPECIFIED BIT IS SET

001432  012567  000114          VALID: MOV     (R5)+,BITS              ;FETCH BIT NUMBER
001436  056777  000110  000110         BIS     BITS,@REG               ;SET BIT
001444  026777  000102  000102         CMP     BITS,@REG               ;WAS ONLY THAT BIT SET?
001452  001401                       BEQ     .+4                     ;YES
001454  104000                       ERROR                           ;REPORT ERROR
001456  046777  000070  000070         BIC     BITS,@REG               ;RESTORE REG
001464  000205                       RTS     %5                      ;RETURN
                                ;
                                ;CLEAR,ROUTINE TO TEST THAT BIC ONLY CLEARS SPECIFIED BIT

001466  012567  000060          CLEAR: MOV     (R5)+,BITS              ;FETCH BIT NUMBER
001472  046777  000054  000054         BIC     BITS,@REG               ;CLEAR BIT
001500  046767  000046  007574         BIC     BITS,TMPDAT             ;CLEAR MASK
                                       DELAY   1600.                   ;DELAY 16 MS
001506  012767  003100  007554         MOV     #1600.,,CNT                     ;SET UP COUNT
        001514
001514  005367  007550          DEL=.: DEC     CNT                     ;TIME OUT
001520  001375                       BNE     DEL                     ;NO
001522  026777  007554  000024         CMP     TMPDAT,@REG             ;WERE ANY OTHER BITS CLEARED
001530  001401                       BEQ     .+4                     ;NO
001532  104000                       ERROR                           ;REPORT ERROR
001534  056777  000012  000012         BIS     BITS,@REG               ;RESTORE REG
001542  056767  000004  007532         BIS     BITS,TMPDAT             ;RESTORE MASK
001550  000205                       RTS     %5                      ;RETURN

001552  000000          BITS:  0
001554  000000          REG:   0
```

```
                                        ;
                                        ;******TEST 1:  READ/WRITE ALL BITS OF STATUS*********
001556  000005                  BGN1:   RESET
001560  012767  000340  176210          MOV     #340,PS                 ;SET PROCESSOR STATUS TO 7
001566  012767  001560  007362          MOV     #BGN1+2,RETURN          ;SET UP SCOPE RETURN
001574  012767  001556  007230          MOV     #BGN1,PUP1+2            ;SET UP PFAIL RETURN ADRS
001602  012767  000400  007342          MOV     #400,ICOUNT             ;ITERATION = 400
001610  005077  007416                  CLR     @DPTS                   ;CLEAR TRANSMITTER STATUS
001614  005077  007404                  CLR     @DPRS                   ;CLEAR RECEIVER STATUS
001620  012777  011472  007416          MOV     #FTINT,@DPTIV           ;SET UP TRANSMITTER TEST VECTOR 1
001626  012777  011476  007404          MOV     #FRINT,@DPRIV           ;SET UP RECEIVER TEST VECTOR 1
001634  012777  000240  007400          MOV     #240,@DPRP              ;SET UP RECEIVER PRIORITY=5
001642  012777  000240  007376          MOV     #240,@DPTP              ;SET UP TRANSMITTER PRIORITY=5
001650  112777  000026  007352          MOVB    #26,@SYNC               ;CLEAR NOISE FROM SYNC
001656  052777  000004  007340          BIS     #BIT2,@DPRS             ;SET MAINTENANCE MODE
                                                                        ;TO ENABLE INTERNAL CLOCK (3KHZ)
001664  032777  000004  007332          BIT     #BIT2,@DPRS             ;MAINT, SET
001672  001001                          BNE     .+4                     ;YES
001674  104000                          ERROR                           ;REPORT ERROR
```

```
                                ;AN ILLEGAL INTERRUPT WILL TRAP TO
                                ;AN ERROR MESSAGE ROUTINE
001676  104400                        SCOPE


001700  012767  000010  007244        MOV     #10,ICOUNT              ;SET ITERATION COUNT TO 10
                                ;TEST ALL READ/WRITE BITS OF RECEIVER STATUS
001706  016767  007312  177640        MOV     DRRS,REG                ;TEST RECEIVER STATUS BITS
001714  004567  177400                JSR     X5,BITST                ;SYNC STRIP
001720  000001                        BIT0
001722  104400                        SCOPE
001724  004567  177370                JSR     X5,BITST                ;HALF DUPLEX
001730  000002                        BIT1
001732  104400                        SCOPE
001734  004567  177360                JSR     X5,BITST                ;MAINTENANCE MODE
001740  000004                        BIT2
001742  104400                        SCOPE
001744  004567  177350                JSR     X5,BITST                ;RECEIVER INTERRUPT ENABLE
001750  000100                        BIT6
001752  104400                        SCOPE
001754  004567  177340                JSR     X5,BITST                ;DONE
001760  000200                        BIT7
001762  104400                        SCOPE
001764  004567  177330                JSR     X5,BITST                ;BITS/CHAR
001770  000400                        BIT8
001772  104400                        SCOPE
001774  004567  177320                JSR     X5,BITST                ;" "
002000  001000                        BIT9
002002  104400                        SCOPE
002004  004567  177310                JSR     X5,BITST                ; "     "
002010  002000                        BIT10
002012  104400                        SCOPE
                                ;BIT3=MISCELLANEOUS RECEIVE=READ ONLY
                                ;BIT11=RECEIVE ACTIVE=READ/WRITE ZERO
                                ;BIT12=PARITY(VRC)=READ ONLY
                                ;ALL OTHER BITS ARE NOT USED
```

```
                                ;TEST ALL READ/WRITE BITS OF TRANSMITTER STATUS

002014  016767  007212  177532          MOV     DPTS,REG                ;TEST TRANS STATUS BITS
002022  004567  177272                  JSR     %5,BITST                ;TERMINAL READY R/W
002026  000001                          BIT0
002030  104400                          SCOPE
002032  042777  000004  007164          BIC     #BIT2,@DPRS             ;SHUT OFF CLOCK FOR IDLE SYNC
002040  004567  177254                  JSR     %5,BITST                ;IDLE SYNC R/W
002044  000002                          BIT1
002046  104400                          SCOPE
002050  052777  000004  007146          BIS     #BIT2,@DPRS             ;START CLOCK
002056  004567  177236                  JSR     %5,BITST                ;SECONDARY TRANSMIT R/W
002062  000010                          BIT3
002064  104400                          SCOPE
002066  004567  177226                  JSR     %5,BITST                ;STATUS INTERRUPT ENABLE R/W
002072  000040                          BIT5
002074  104400                          SCOPE
002076  004567  177216                  JSR     %5,BITST                ;TRANSMITTER INTERRUPT R/W
002102  000100                          BIT6
002104  104400                          SCOPE
002106  004567  177206                  JSR     %5,BITST                ;DONE
002112  000200                          BIT7
002114  104400                          SCOPE
002116  004567  177176                  JSR     %5,BITST                ;RING FLAG R/W
002122  020000                          BIT13
002124  104400                          SCOPE
002126  004567  177166                  JSR     %5,BITST                ;CARRIER DOWN
002132  100000                          BIT15
002134  104400                          SCOPE
002136  004567  177156                  JSR     %5,BITST                ;RECEIVER OVERUN FLAG R/W
002142  040000                          BIT14
002144  104400                          SCOPE
```

```
                                ;RESET TEST
                                ;SET PROCESSOR PRIORITY TO 7
                                ;SET ALL WRITE BITS IN T & R STATUS
                                ;ISSUE RESET AND VERIFY ALL BITS THAT ARE
                                ;TO BE CLEARED BY RESET--WERE

002146  012767  000340  175622          MOV     #340,PS         ;PRIORITY = 7
002154  005077  007052                  CLR     @DPTS                   ;CLEAR TRANSMITTER STATUS
002160  005077  007040                  CLR     @DPRS                   ;CLEAR RECEIVER STATUS
002164  052777  000004  007032          BIS     #BIT2,@DPRS     ;MAINTENANCE MODE
002172  012777  160353  007032          MOV     #160353,@DPTS   ;SET ALL TRANSMITTER STATUS BITS
002200  012777  143707  007016          MOV     #143707,@DPRS   ;SET ALL RECEIVER STATUS BITS

                                ;NOTE! IF BITS/CHAR BITS ARE SET TO ALL 1'S RCV WILL
                                ;NOT GO ACTIVE


                                ;TEST READ/WRITE BITS OF RECEIVER STATUS

002206  032777  000001  007010  RWBRS1  BIT     #BIT0,@DPRS     ;SYNC STRIP SET
002214  001001                          BNE     .+4             ;YES
002216  104000                          ERROR                   ;REPORT ERROR
002220  032777  000002  006776          BIT     #BIT1,@DPRS     ;HALF DUPLEX SET
002226  001001                          BNE     .+4             ;YES
002230  104000                          ERROR                   ;REPORT ERROR
002232  032777  000004  006764          BIT     #BIT2,@DPRS     ;MAINTENANCE MODE SET
002240  001001                          BNE     .+4             ;YES
002242  104000                          ERROR                   ;REPORT ERROR
002244  032777  000100  006752          BIT     #BIT6,@DPRS     ;RCV INT ENB SET
002252  001001                          BNE     .+4             ;YES
002254  104000                          ERROR                   ;REPORT ERROR
002256  032777  000200  006740          BIT     #BIT7,@DPRS     ;RECEIVER DONE
002264  001001                          BNE     .+4             ;YES
002266  104000                          ERROR                   ;REPORT ERROR
002270  032777  000400  006726          BIT     #BIT8,@DPRS     ;#BITS/CHAR (LSB)
002276  001001                          BNE     .+4
002300  104000                          ERROR                   ;REPORT ERROR
002302  032777  001000  006714          BIT     #BIT9,@DPRS     ;#BITS/CHAR
002310  001001                          BNE     .+4
002312  104000                          ERROR                   ;REPORT ERROR
002314  032777  002000  006702          BIT     #BIT10,@DPRS    ;#BITS/CHAR (MSB)
002322  001001                          BNE     .+4
002324  104000                          ERROR                   ;REPORT ERROR

                                ;VERIFY "RECEIVER ACTIVE" IS READ/WRITE ZERO

002326  032777  004000  006670          BIT     #BIT11,@DPRS    ;RECEIVER ACTIVE=WRITE ZERO
002334  001401                          BEQ     .+4             ;YES
002336  104000                          ERROR                   ;REPORT ERROR

                                ;TEST ALL READ/WRITE BITS OF THE TRANSMITTER STATUS

002340  032777  000001  006664          BIT     #BIT0,@DPTS     ;TERMINAL READY SET
002346  001001                          BNE     [illegible]     ;YES
```

```
002350  104000                          ERROR                   ;REPORT ERROR
002352  032777  000002  006652          BIT     #BIT1,@DPTS     ;;IDLE SYNC SET
002360  001001                          BNE     .+4             ;YES
002362  104000                          ERROR                   ;REPORT ERROR
002364  032777  000010  006640          BIT     #BIT3,@DPTS     ;MISC TRANSMIT SET
002372  001001                          BNE     .+4             ;YES
002374  104000                          ERROR                   ;REPORT ERROR
```

```
002376  032777  000040  006626          BIT     #BIT5,@DPTS     ;STATUS INTERRUPT ENABLE SET
002404  001001                          BNE     .+4             ;YES
002406  104000                          ERROR                   ;REPORT ERROR
002410  032777  000100  006614          BIT     #BIT6,@DPTS     ;TRANSMITTER READY SET GO
002416  001001                          BNE     .+4             ;YES
002420  104000                          ERROR                   ;REPORT ERROR
002422  032777  020000  006602          BIT     #BIT13,@DPTS    ;RING FLAG SET
002430  001001                          BNE     .+4             ;YES
002432  104000                          ERROR                   ;REPORT ERROR
002434  032777  040000  006570          BIT     #BIT14,@DPTS    ;RECEIVER OVERRUN SET
002442  001001                          BNE     .+4             ;YES
002444  104000                          ERROR                   ;REPORT ERROR
002446  032777  100000  006556          BIT     #BIT15,@DPTS    ;CARRIER DOWN FLAG SET
002454  001001                          BNE     .+4             ;YES
002456  104000                          ERROR                   ;REPORT ERROR

                                ;ISSUE "RESET" AND VERIFY ALL BITS ARE CLEARED

002460  000005                          RESET

002462  032777  000001  006534          BIT     #BIT0,@DPRS     ;STRIP SYNC CLEAR
002470  001401                          BEQ     .+4             ;YES
002472  104000                          ERROR                   ;REPORT ERROR
002474  032777  000002  006522          BIT     #BIT1,@DPRS     ;HALF DUPLEX CLEAR
002502  001401                          BEQ     .+4             ;YES
002504  104000                          ERROR                   ;REPORT ERROR
002506  032777  000004  006510          BIT     #BIT2,@DPRS     ;MAINTENANCE MODE CLEAR
002514  001401                          BEQ     .+4             ;YES
002516  104000                          ERROR                   ;REPORT ERROR
002520  032777  000100  006476          BIT     #BIT6,@DPRS     ;RCV INT ENB CLEAR
002526  001401                          BEQ     .+4             ;YES
002530  104000                          ERROR                   ;REPORT ERROR
002532  032777  000400  006464          BIT     #BIT8,@DPRS
002540  001401                          BEQ     .+4
002542  104000                          ERROR                   ;REPORT ERROR
002544  032777  001000  006452          BIT     #BIT9,@DPRS
002552  001401                          BEQ     .+4
002554  104000                          ERROR                   ;REPORT ERROR
002556  032777  002000  006440          BIT     #BIT10,@DPRS
002564  001401                          BEQ     .+4
002566  104000                          ERROR                   ;REPORT ERROR
002570  032777  000200  006426          BIT     #BIT7,@DPRS     ;RECEIVER DONE CLEAR
002576  001401                          BEQ     .+4             ;YES
002600  104000                          ERROR                   ;REPORT ERROR
002602  005777  006416                  TST     @DPRS           ;RCV STATUS CLEAR
002606  001401                          BEQ     .+4             ;YES
002610  104000                          ERROR                   ;REPORT ERROR
```

```
                                        ;VERIFY ALL READ/WRITE BITS OF TRANSMITTER STATUS ARE CLEAR

002612  032777  000001  006412          BIT     #BIT0,@DPTS     ;TERMINAL READY CLEAR
002620  001401                          BEQ     .+4             ;YES
002622  104000                          ERROR                   ;REPORT ERROR
002624  032777  000002  006400          BIT     #BIT1,@DPTS     ;IDLE SYNC CLEAR
002632  001401                          BEQ     .+4             ;YES
002634  104000                          ERROR                   ;REPORT ERROR
002636  032777  000004  006366          BIT     #BIT2,@DPTS     ;MISC TRANSMIT CLEAR
002644  001401                          BEQ     .+4             ;YES
002646  104000                          ERROR                   ;REPORT ERROR
002650  032777  000010  006354          BIT     #BIT3,@DPTS     ;LSB OF #BITS/CHARACTER CLEAR
002656  001401                          BEQ     .+4             ;YES
002660  104000                          ERROR                   ;REPORT ERROR
002662  032777  000020  006342          BIT     #BIT4,@DPTS     ;MSB OF #BITS/CHAR CLEAR
002670  001401                          BEQ     .+4             ;YES
002672  104000                          ERROR                   ;REPORT ERROR
002674  032777  000040  006330          BIT     #BIT5,@DPTS     ;STATUS INTERRUPT ENABLE CLEAR
002702  001401                          BEQ     .+4             ;YES
002704  104000                          ERROR                   ;REPORT ERROR
002706  032777  000100  006316          BIT     #BIT6,@DPTS     ;TRANSMITTER INTERRUPT ENABLE CLEAR
002714  001401                          BEQ     .+4             ;YES
002716  104000                          ERROR                   ;REPORT ERROR
002720  032777  020000  006304          BIT     #BIT13,@DPTS    ;RING FLAG CLEAR
002726  001401                          BEQ     .+4             ;YES
002730  104000                          ERROR                   ;REPORT ERROR
002732  032777  040000  006272          BIT     #BIT14,@DPTS    ;RX O'RUN CLEAR
002740  001401                          BEQ     .+4             ;YES
002742  104000                          ERROR                   ;REPORT ERROR
002744  032777  100000  006260          BIT     #BIT15,@DPTS    ;CARRIER DOWN CLEAR
002752  001401                          BEQ     .+4             ;YES
002754  104000                          ERROR                   ;REPORT ERROR

                                        ;TEST READY BIT CLEAR BEFORE READY CAN COME UP

002756  012777  160377  006246          MOV     #160377,@DPTS   ;LOAD STATUS
002764  000005                          RESET
002766  032777  000200  006236          BIT     #BIT7,@DPTS     ;READY CLEARED
002774  001401                          BEQ     .+4             ;YES
002776  104000                          ERROR                   ;REPORT ERROR
003000  005777  006226                  TST     @DPTS           ;STATUS CLEAR
003004  001401                          BEQ     .+4             ;YES
003006  104000                          ERROR                   ;REPORT ERROR
```

```
                                ;BIT INTERACTION TEST
                                ;SET EACH BIT AND VERIFY THAT ONLY THAT BIT IS AFFECTED


                                ;RECEIVER STATUS BIT VALIDITY TEST

003010  016767  006210  176536  VLID1:  MOV     DPRS,REG                ;TEST RCV
003016  104400                          SCOPE
003020  004567  176406                  JSR     %5,VALID                ;STRIP SYNC
003024  000001                          BIT0
003026  104400                          SCOPE
003030  004567  176376                  JSR     %5,VALID                ;HALF DUPLEX
003034  000002                          BIT1
003036  104400                          SCOPE
003040  004567  176366                  JSR     %5,VALID                ;MAINTENANCE MODE
003044  000004                          BIT2
003046  104400                          SCOPE
003050  004567  176356                  JSR     %5,VALID                ;INTERRUPT ENABLE
003054  000100                          BIT6
003056  104400                          SCOPE
003060  004567  176346                  JSR     %5,VALID                ;DONE
003064  000200                          BIT7
003066  004567  176340                  JSR     %5,VALID                ;BITS/CHAR
003072  000400                          BIT8
003074  104400                          SCOPE
003076  004567  176330                  JSR     %5,VALID                ;"    "
003102  001000                          BIT9
003104  104400                          SCOPE
003106  004567  176320                  JSR     %5,VALID                ;"    "
003112  002000                          BIT10
003114  104400                          SCOPE

                                ;TRANSMITTER STATUS BIT VALIDITY TEST

003116  016767  006110  176430          MOV     DPTS,REG        ;TEST XMIT STATUS
003124  005077  006102                  CLR     @DPTS           ;CLEAR TRANSMITTER STATUS
003130  004567  176276                  JSR     %5,VALID                ;TERMINAL READY
003134  000001                          BIT0
003136  104400                          SCOPE
003140  004567  176266                  JSR     %5,VALID                ;IDLE SYNC
003144  000002                          BIT1
003146  104400                          SCOPE
003150  004567  176256                  JSR     %5,VALID                ;MISC TRANSMIT
003154  000010                          BIT3
003156  104400                          SCOPE
003160  004567  176246                  JSR     %5,VALID                ;STATUS ENABLE
003164  000040                          BIT5
003166  104400                          SCOPE
003170  004567  176236                  JSR     %5,VALID                ;TRANSMITTER ENABLE
003174  000100                          BIT6
003176  104400                          SCOPE
003200  004567  176226                  JSR     %5,VALID                ;TRANSMITTER DONE
003204  000200                          BIT7
003206  104400                          SCOPE
```

```
003210  004567  176216          JSR     %5,VALID                ;RING FLAG
003214  020000                  BIT13
003216  104400                  SCOPE
003220  004567  176206          JSR     %5,VALID                ;RECEIVER OVERRUN
003224  040000                  BIT14
003226  104400                  SCOPE
003230  004567  176176          JSR     %5,VALID                ;CARRIER DOWN
003234  100000                  BIT15

                        ;VERIFY BIT CLEAR ONLY CLEARS SPECIFIED BIT
```

```
                                ;BIT INTERACTION TEST
                                ;SET EACH BIT AND VERIFY THAT ONLY THAT BIT IS AFFECTED

                                ;RECEIVER STATUS BIT VALIDITY TEST

003010  016767  006210  176536  VLID1   MOV     DPRS,REG                ;TEST RCV
003016  104400                          SCOPE
003020  004567  176406                  JSR     %5,VALID                ;STRIP SYNC
003024  000001                          BIT0
003026  104400                          SCOPE
003030  004567  176376                  JSR     %5,VALID                ;HALF DUPLEX
003034  000002                          BIT1
003036  104400                          SCOPE
003040  004567  176366                  JSR     %5,VALID                ;MAINTENANCE MODE
003044  000004                          BIT2
003046  104400                          SCOPE
003050  004567  176356                  JSR     %5,VALID                ;INTERRUPT ENABLE
003054  000100                          BIT6
003056  104400                          SCOPE
003060  004567  176346                  JSR     %5,VALID                ;DONE
003064  000200                          BIT7
003066  004567  176340                  JSR     %5,VALID                ;BITS/CHAR
003072  000400                          BIT8
003074  104400                          SCOPE
003076  004567  176330                  JSR     %5,VALID                ;"   "
003102  001000                          BIT9
003104  104400                          SCOPE
003106  004567  176320                  JSR     %5,VALID                ; "   "
003112  002000                          BIT10
003114  104400                          SCOPE

                                ;TRANSMITTER STATUS BIT VALIDITY TEST

003116  016767  006110  176430          MOV     DPTS,REG        ;TEST XMIT STATUS
003124  005077  006102                  CLR     @DPTS           ;CLEAR TRANSMITTER STATUS
003130  004567  176276                  JSR     %5,VALID                ;TERMINAL READY
003134  000001                          BIT0
003136  104400                          SCOPE
003140  004567  176266                  JSR     %5,VALID                ;IDLE SYNC
003144  000002                          BIT1
003146  104400                          SCOPE
003150  004567  176256                  JSR     %5,VALID                ;MISC TRANSMIT
003154  000010                          BIT3
003156  104400                          SCOPE
003160  004567  176246                  JSR     %5,VALID                ;STATUS ENABLE
003164  000040                          BIT5
003166  104400                          SCOPE
003170  004567  176236                  JSR     %5,VALID                ;TRANSMITTER ENABLE
003174  000100                          BIT6
003176  104400                          SCOPE
003200  004567  176226                  JSR     %5,VALID                ;TRANSMITTER DONE
003204  000200                          BIT7
003206  104400                          SCOPE
```

```
                                ;RECEIVER TEST SECTION

003236  104400                          SCOPE
003240  005067  005706                  CLR     ;COUNT          ;SET ITERATION COUNT TO 1
003244  112777  000026  005756          MOVB    #26,@SYNC       ;LOAD SYNC WITH ANYTHING
003252  016767  005746  176274          MOV     DPRS,REG        ;TEST RCV STATUS
003260  012767  003707  006014          MOV     #3707,TMPDAT    ;STORE STATUS IMAGE
003266  012777  003707  005730          MOV     #3707,@DPRS     ;SET UP STATUS
003274  012767  003304  005654          MOV     #CREG,RETURN
003302  104400                          SCOPE

003304  004567  176156          CREG:   JSR     X5,CLEAR        ;STRIP SYNC
003310  000001                          BIT0
003312  104400                          SCOPE
003314  004567  176146                  JSR     X5,CLEAR        ;HALF DUPLEX
003320  000002                          BIT1
003322  104400                          SCOPE
003324  004567  176136                  JSR     X5,CLEAR        ;MAINTENANCE MODE
003330  000004                          BIT2
003332  104400                          SCOPE
003334  004567  176126                  JSR     X5,CLEAR        ;RECEIVER INT ENB
003340  000100                          BIT6
003342  104400                          SCOPE
003344  004567  176116                  JSR     X5,CLEAR        ;RECEIVER DONE
003350  000200                          BIT7
003352  104400                          SCOPE
003354  004567  176106                  JSR     X5,CLEAR        ;BITS/CHAR
003360  000400                          BIT8
003362  104400                          SCOPE
003364  004567  176076                  JSR     X5,CLEAR        ; "   "
003370  001000                          BIT9
003372  104400                          SCOPE
003374  004567  176066                  JSR     X5,CLEAR        ; "   "
003400  002000                          BIT10
003402  104400                          SCOPE
003404  012767  000012  005540          MOV     #10.,,ICOUNT    ;SET ITERATION COUNT TO 10

                                ;TRANSMITTER TEST SECTION

003412  005077  005606                  CLR     @DPRS           ;CLEAR RECEIVER STATUS
003416  052777  000004  005600          BIS     #BIT2,@DPRS     ;SET MAINTENANCE MODE
003424  012777  160353  005600          MOV     #160353,@DPTS   ;SET UP STATUS
003432  012767  163353  005642          MOV     #163353,TMPDAT  ;STORE STATUS IMAGE
                                        DELAY   600,            ;DELAY 6MS FOR SEND REQUEST
003440  012767  001130  005622          MOV     #600.,,CNT                      ;SET UP COUNT
        003446
                                DEL=.
003446  005367  005616                  DEC     CNT                     ;TIME OUT
003452  001375                          BNE     DEL                     ;NO
003454  032777  001000  005550          BIT     #BIT9,@DPTS     ;SEND REQUEST UP
003462  001001                          BNE     .+4             ;YES
003464  104000                          ERROR                   ;REPORT ERROR

                                ;NOTE: "SEND REQUEST" IS SET BY "IDLE SYNC"
                                ;      "CLEAR-TO-SEND" IS SET BY MAINTENANCE MODE
```

```
003466  012767  003476  005462          MOV     #CREG2,RETURN
003474  104400                          SCOPE
003476  016767  005530  176050  CREG21  MOV     DPTS,REG        ;TEST TRANS
003504  004567  175756                  JSR     X5,CLEAR        ;TERMINAL READY
003510  000001                          BIT0
003512  104400                          SCOPE
                                ;IDLE SYNC

003514  042767  003002  005560          BIC     #3002,TMPDAT    ;CLEARING IDLE SYNC SHOULD CLEAR SEND REQUEST
003522  042777  000002  005502          BIC     #2,@DPTS        ;CLEAR IDLE SYNC
                                        DELAY   1600.           ;WAIT FOR "CLEAR-TO-SEND" TO DROP
003530  012767  003100  005532          MOV     #1600.,,CNT                     ;SET UP COUNT
        003536                  DEL=.
003536  005367  005526                  DEC     CNT                     ;TIME OUT
003542  001375                          BNE     DEL                     ;NO
003544  026777  005532  005460          CMP     TMPDAT,@DPTS    ;IDLE SYNC AND SEND REQUEST CLEAR
003552  001401                          BEQ     .+4             ;YES
003554  104000                          ERROR                   ;REPORT ERROR
003556  052767  003002  005516          BIS     #3002,TMPDAT    ;REINSTATE IMAGE
003564  052777  000002  005440          BIS     #2,@DPTS        ;REINSTATE STATUS
003572  104400                          SCOPE
003574  004567  175666                  JSR     X5,CLEAR        ;MISC TRANSMIT
003600  000010                          BIT3
003602  104400                          SCOPE
003604  004567  175656                  JSR     X5,CLEAR        ;STATUS INTERRUPT ENABLE
003610  000040                          BIT5
003612  104400                          SCOPE
003614  004567  175646                  JSR     X5,CLEAR        ;TRANSMITTER INTERRUPT ENABLE
003620  000100                          BIT6
003622  104400                          SCOPE
003624  042777  000004  005372          BIC     #BIT2,@DPRS     ;MAINT MODE OFF(STOP CLOCK)
003632  042767  002000  005442          BIC     #BIT10,TMPDAT   ;CLEAR "CLEAR-TO-SEND"

003640  004567  175622                  JSR     X5,CLEAR        ;READY
003644  000200                          BIT7

003646  052777  000004  005350          BIS     #BIT2,@DPRS     ;MAINT MODE ON
003654  052767  002000  005420          BIS     #BIT10,TMPDAT   ;SET "CLEAR-TO-SEND" TEST BIT
003662  104400                          SCOPE
003664  042777  000004  005332          BIC     #BIT2,@DPRS     ;SHUT OFF CLOCK
003672  042767  002000  005402          BIC     #BIT10,TMPDAT   ;CLEAR -TO -SEND
003700  004567  175562                  JSR     X5,CLEAR        ;RING FLAG
003704  020000                          BIT13
003706  104400                          SCOPE
003710  004567  175552                  JSR     X5,CLEAR        ;RECEIVER OVERRUN
003714  040000                          BIT14
003716  104400                          SCOPE
003720  004567  175542                  JSR     X5,CLEAR        ;CARRIER DOWN
003724  100000                          BIT15

003726  104400                          SCOPE


                        ;*****************************************************************
```

```
                                ;PRIORITY TESTS
                                ;VERIFY THAT THERE ARE NO STATUS INTERRUPTS
                                ;WHEN PS=5

003730  012767  004000  005214          MOV     #4000,ICOUNT            ;ITERATION COUNT=4000
003736  012767  000240  174032          MOV     #240,PS                 ;PRIORITY=5
003744  052777  000004  005252          BIS     #BIT2,@DPRS             ;SET MAINTENANCE MODE
003752  052777  000040  005252          BIS     #BIT5,@DPTS             ;STATUS INTERRUPT ENABLE (SIE)
                                ;INTERRUPT WILL TRAP TO ERROR MESSAGE
003760  052777  010000  005244          BIS     #BIT12,@DPTS            ;RING FLAG
003766  042777  020040  005236          BIC     #20040,@DPTS            ;CLEAR CSR
003774  052777  000040  005230          BIS     #BIT5,@DPTS             ;INT ENB (STATUS)
004002  052777  040000  005222          BIS     #BIT14,@DPTS            ;RECEIVER OVERRUN FLAG
004010  042777  040040  005214          BIC     #40040,@DPTS            ;CLEAR CSR
004016  052777  000040  005206          BIS     #BIT5,@DPTS             ;INT ENB (STATUS)
004024  052777  100000  005200          BIS     #BIT15,@DPTS            ;CARRIER DOWN FLAG
004032  042777  100040  005172          BIC     #100040,@DPTS           ;CLEAR CSR

                                ;VERIFY NO TRANSMITTER READY INTERRUPTS

004040  052777  000100  005164          BIS     #BIT6,@DPTS             ;XMIT INT ENB
004046  052777  000001  005156          BIS     #BIT0,@DPTS             ;NOISE
004054  052777  000002  005150          BIS     #BIT1,@DPTS             ;MORE NOISE
004062  052777  000004  005142          BIS     #BIT2,@DPTS             ;MORE NOISE
004070  052777  000010  005134          BIS     #BIT3,@DPTS             ;MORE NOISE
004076  052777  000020  005126          BIS     #BIT4,@DPTS             ;MORE NOISE
004104  042777  000037  005120          BIC     #37,@DPTS               ;QUIET!
004112  042777  000100  005112          BIC     #BIT6,@DPTS
004120  104400                          SCOPE
```

```
                                ;TEST FOR CONTROL OF STATUS INTERRUPT ENABLE BIT
                                ;NO INTERRUPT SHOULD OCCUR IF INT ENB IN NOT SET
                                ;INTERRUPT VECTOR POINTS TO ERROR MESSAGE ROUTINE

004122  012767  000200  173646         MOV     #200,PS                 ;PRIORITY=4
004130  052777  020000  005074 INTST1: BIS     #BIT13,@DPTS            ;RING FLAG
004136  042777  020000  005066         BIC     #BIT13,@DPTS            ;CLEAR
004144  052777  040000  005060         BIS     #BIT14,@DPTS            ;RECEIVER OVERRUN FLAG
004152  042777  040000  005052         BIC     #BIT14,@DPTS            ;CLEAR
004160  052777  100000  005044         BIS     #BIT15,@DPTS            ;CARRIER DOWN FLAG
004166  042777  100000  005036         BIC     #BIT15,@DPTS
004174  052777  160000  005030         BIS     #160000,@DPTS           ;SET ALL STATUS ERROR BITS
004202  042777  160000  005022         BIC     #160000,@DPTS           ;CLEAR
004210  162767  000040  173560         SUB     #40,PS                  ;DECREASE PRIORITY LEVEL
004216  016767  173554  005056         MOV     PS,TMPDAT               ;STORE PROCESSOR STATUS
004224  042767  000017  005050         BIC     #17,TMPDAT              ;CLEAR T,N,Z,V,C
004232  162767  000040  005042         SUB     #40,TMPDAT              ;HAVE ALL PRIORITY LEVELS BEEN TESTED
004240  100333                        BPL     INTST1                  ;NO
004242  104400                        SCOPE                           ;YES

                                ;VERIFY THAT ALL STATUS BITS INTERRUPT AT ALL LEVELS
                                ;EQUAL TO OR LESS THAN 4
                                ;IF THE DEVICE INTERRUPTS SUCCESSFULLY, THE
                                ;INTERRUPT SERVICE ROUTINE WILL RETURN
                                ;THE PROGRAM COUNTER TO THE INSTRUCTION AFTER
                                ;THE ERROR TRAP

004244  012777  004300  004772         MOV     #IT2A,@DPTIV            ;SET UP INTERRUPT VECTOR=RTI
004252  012767  000200  173516         MOV     #200,PS                 ;PRIORITY=4
004260  052777  000040  004744 INTST2: BIS     #BIT5,@DPTS             ;INT ENB STATUS
004266  052777  020000  004736         BIS     #BIT13,@DPTS            ;RING FLAG
004274  000240                        NOP                             ;SHOULD INTERRUPT AFTER NOP
004276  104000                        ERROR                           ;REPORT ERROR
004300  042777  020000  004724 IT2A:  BIC     #BIT13,@DPTS            ;CLEAR RING
004306  022626                        CMP     (SP)+,(SP)+             ;ADJUST STACK
004310  012777  004336  004726         MOV     #IT2B,@DPTIV            ;SET UP NEXT INTERRUPT VECTOR
004316  042767  000040  173452         BIC     #BIT5,PS                ;SET PRIORITY TO 4
004324  052777  040000  004700         BIS     #BIT14,@DPTS            ;RECEIVER OVERRUN FLAG
004332  000240                        NOP
004334  104000                        ERROR                           ;REPORT ERROR
004336  042777  040000  004666 IT2B:  BIC     #BIT14,@DPTS            ;CLEAR RCV O RUN
004344  022626                        CMP     (SP)+,(SP)+             ;ADJUST STACK
004346  012777  004374  004670         MOV     #IT2C,@DPTIV            ;SET UP NEXT INTERRUPT VECTOR
004354  042767  000040  173414         BIC     #BIT5,PS                ;SET PRIORITY TO 4
004362  052777  100000  004642         BIS     #BIT15,@DPTS            ;CARRIER DOWN FLAG
004370  000240                        NOP
004372  104000                        ERROR                           ;REPORT ERROR
004374  042777  100000  004630 IT2C:  BIC     #BIT15,@DPTS            ;CLEAR CARRIER DOWN FLAG
004402  022626                        CMP     (SP)+,(SP)+             ;ADJUST STACK
004404  012777  011472  004632         MOV     #FTINT,@DPTIV           ;FALSE INT TRAP
004412  104400                        SCOPE                           ;YES

                                ;DOES LOADING XMT BUFFER CLEAR XMT DONE
```

```
004414  012767  000620  004530          MOV     #400,,ICOUNT            ;SET ITERATION COUNT TO 400

004422  005077  004576                  CLR     @DPRS                   ;CLEAR RCV STATUS
004426  005077  004600                  CLR     @DPTS                   ;CLEAR XMIT STATUS
004432  052777  000200  004572          BIS     #BIT7,@DPTS             ;DONE
004440  032777  000200  004564          BIT     #BIT7,@DPTS             ;DONE SET
004446  001001                          BNE     .+4                     ;YES
004450  104000                          ERROR                           ;REPORT ERROR
004452  016777  004624  004554          MOV     TMPDAT,@DPTB            ;LOAD BUFFER
004460  032777  000200  004544          BIT     #BIT7,@DPTS             ;DONE CLEARED
004466  001401                          BEQ     .+4                     ;YES
004470  104000                          ERROR                           ;REPORT ERROR
004472  052777  000004  004524          BIS     #BIT2,@DPRS             ;SET MAINTENANCE MODE

                                ;VERIFY TRANSMITTER READY INTERRUPTS AT LEVEL 4
                                ;AT 8 BITS PER CHARACTER

004500  005077  004526          TST0:   CLR     @DPTS                   ;CLR STATUS
004504  012777  004564  004532          MOV     #IT3A,@DPTIV            ;TEST PASS VECTOR = RT1 TO IT3A
004512  012767  000200  173256          MOV     #200,PS                 ;PRIORITY=4
004520  116777  004556  004506  INTST3: MOVB    TMPDAT,@DPTB            ;LOAD XMIT BUFFER
004526  052777  000100  004476          BIS     #BIT6,@DPTS             ;XMIT INT ENB
004534  032777  000200  004470          BIT     #BIT7,@DPTS             ;READY CLEARED BY BUFF LOAD
004542  001401                          BEQ     .+4                     ;YES
004544  104000                          ERROR                           ;REPORT ERROR
                                        DELAY   2500.                   ;25 MS
004546  012767  004704  004514          MOV     #2500.,,CNT                     ;SET UP COUNT
        004554
                                DEL=.
004554  005367  004510                  DEC     CNT                     ;TIME OUT
004560  001375                          BNE     DEL                     ;NO
004562  104000                          ERROR                           ;TRANSMITTER FAILED TO INTERRUPT
004564  042777  000100  004440  IT3A:   BIC     #BIT6,@DPTS             ;CLEAR INT ENB
004572  042767  000040  173176          BIC     #BIT5,PS                ;SET PRIORITY TO 4
004600  022626                          CMP     (SP)+,(SP)+             ;ADJUST STACK

                                ;VERIFY READY INTERRUPTS AT LEVEL 4
                                ;AT 7 BITS PER CHARACTER

004602  005077  004424                  CLR     @DPTS                   ;CLR STATUS
004606  012777  004674  004430          MOV     #IT4A,@DPTIV            ;TEST PASS VECTOR = IT4A
004614  012767  000200  173154          MOV     #200,PS                 ;PRIORITY=4
004622  052777  001000  004374          BIS     #BIT9,@DPRS             ;7 BITS/CHARACTER
004630  116777  004446  004376  INTST4: MOVB    TMPDAT,@DPTB            ;LOAD XMIT BUFFER
004636  052777  000100  004366          BIS     #BIT6,@DPTS             ;XMIT INT ENB
004644  032777  000200  004360          BIT     #BIT7,@DPTS             ;LOAD BUFFER CLEARED READY
```

```
004652  001401                          BEQ     .+4                     ;YES
004654  104000                          ERROR                           ;REPORT ERROR
                                        DELAY   2500.                   ;25 MS
004656  012767  004704  004404          MOV     #2500.,,CNT                     ;SET UP COUNT
        004664
004664  005367  004400          DEL=.   DEC     CNT                     ;TIME OUT
004670  001375                          BNE     DEL                     ;NO
004672  104000                          ERROR                           ;TRANSMITTER FAILED TO INTERRUPT
004674  042777  001000  004322  IT4A:   BIC     #BIT9,@DPRS             ;CLR 7 BITS/CHAR
004702  042777  000100  004322          BIC     #BIT6,@DPTS             ;CLEAR INT ENB
004710  042767  000040  173060          BIC     #BIT5,PS                ;SET PRIORITY TO 4
004716  022626                          CMP     (SP)+,(SP)+             ;ADJUST STACK
004720  104400                          SCOPE                           ;YES

                                ;VERIFY READY INTERRUPTS AT LEVEL 4
                                ;AT 6 BITS PER CHARACTER

004722  012767  000012  004222          MOV     #10.,,ICOUNT            ;SET ITERATION COUNT TO 10
004730  012767  000200  173040          MOV     #200,PS                 ;PRIORITY=4
004736  005077  004270                  CLR     @DPTS                   ;CLR STATUS
004742  012777  005022  004274          MOV     #IT5A,@DPTIV            ;TEST PASS VECTOR = IT5A
004750  052777  002000  004246          BIS     #BIT10,@DPRS            ;6 BITS/CHARACTER
004756  116777  004320  004250  IQTST5: MOVB    TMPDAT,@DPTB            ;LOAD XMIT BUFFER
004764  052777  000100  004240          BIS     #BIT6,@DPTS             ;XMIT INT ENB
004772  032777  000200  004232          BIT     #BIT7,@DPTS             ;LOAD BUFFER CLEARED READY
005000  001401                          BEQ     .+4                     ;YES
005002  104000                          ERROR                   ;REPORT ERROR
                                        DELAY   2500.                   ;25 MS
005004  012767  004704  004256          MOV     #2500.,,CNT                     ;SET UP COUNT
        005012
005012  005367  004252          DEL=.   DEC     CNT                     ;TIME OUT
005016  001375                          BNE     DEL                     ;NO
005020  104000                          ERROR                           ;TRANSMITTER FAILED TO INTERRUPT
005022  042777  002000  004174  IT5A:   BIC     #BIT10,@DPRS            ;CLR 6 BITS/CHAR
005030  005077  004176                  CLR     @DPTS                   ;CLEAR STATUS
005034  022626                          CMP     (SP)+,(SP)+             ;ADJUST STACK
005036  104400                          SCOPE


                                ;TEST SYNC BUFFER IS READ/WRITE

005040  005067  004236  SRW0:   CLR     TMPDAT                  ;CLEAR TEST DATA
005044  005077  004154          CLR     @DPRS                   ;CLEAR RECEIVER STATUS
005050  105077  004154          CLRB    @SYNC                   ;CLEAR SYNC
005054  105777  004150          TSTB    @SYNC                   ;
005060  001401                  BEQ     .+4                     ;BRANCH IF SYNC CLEARED
005062  104000                  ERROR                           ;REPORT ERROR
005064  116777  004212  004136  SRW1:   MOVB    TMPDAT,@SYNC            ;LOAD SYNC
005072  126777  004204  004130          CMPB    TMPDAT,@SYNC            ;TEST IF LOAD OK
005100  001401                  BEQ     .+4                     ;BRANCH OK
005102  104000                  ERROR                           ;REPORT ERROR
005104  005267  004172          INC     TMPDAT                  ;NEXT SYNC
```

```
005110  122767  000400  004164          CMPB    #400,TMPDAT             ;HAVE ALL SYNC'S BEEN TESTED
005116  001401                          BEQ     .+4                     ;YES
005120  000761                          BR      SRW1                    ;NO,TEST NEXT SYNC
005122  112777  000026  004100          MOVB    #26,@SYNC               ;ANY SYNC BUT ALL 1'S
005130  104400                          SCOPE

                                ;READ/WRITE ALL CHARACTERS IN SYNC EXTENSION

005132  032767  000400  004112          BIT     #BIT8,SAVSR1            ;12 BITS/CHAR
005140  001431                          BEQ     SY                      ;NO, BRANCH AROUND TEST
005142  005067  004134                  CLR     TMPDAT                  ;LOAD TMPDAT WITH ZEROS
005146  112777  000017  004062          MOVB    #17,@SEXT               ;LOAD SYNC EXT WITH 1'S
005154  116777  004122  004054  EXT1:   MOVB    TMPDAT,@SEXT            ;LOAD SYNC EXTENSION
005162  127767  004050  004112          CMPB    @SEXT,TMPDAT            ;DID SYNC LOAD CORRECTLY
005170  001401                          BEQ     .+4                     ;YES
005172  104000                          ERROR                           ;REPORT ERROR
005174  005267  004102                  INC     TMPDAT                  ;NEXT SYNC
005200  022767  000020  004074          CMP     #20,TMPDAT              ;HAVE ALL SYNC'S BEEN TESTED
005206  001362                          BNE     EXT1                    ;NO, CONTINUE TEST
005210  105077  004022                  CLRB    @SEXT                   ;CLEAR SYNC EXT
005214  105777  004016                  TSTB    @SEXT                   ;TEST SYNC EXT
005220  001401                          BEQ     .+4                     ;BRANCH IF SYNC CLEARED
005222  104000                          ERROR                           ;REPORT ERROR

                                ;*************** SYNC TESTS ************************


                                ;SYNCHRONIZATION CHARACTER TEST
                                ;;ISSUE ALL SYNC CHARACTERS AND VERIFY THAT IT WAS THE
                                ;CORRECT SYNC



005224  105077  004006          SY:     CLRB    @SEXT                   ;CLEAR SYNC EXTENSION
005230  005077  003776                  CLR     @DPTS                   ;CLEAR TRANSMITTER STATUS
005234  005077  003764                  CLR     @DPRS                   ;CLEAR RECEIVER STATUS
005240  012767  000200  172530          MOV     #200,PS                 ;PRIORITY=4
005246  012767  000377  004024          MOV     #377,SLIM               ;SYNC LIMIT FOR 8BITS/CHAR
005254  012767  000400  004000          MOV     #400,BPC                ;;INDEX TO  CHANGE BITS/CHAR
005262  052777  000004  003734          BIS     #BIT2,@DPRS             ;MAINT MODE
005270  012767  000001  003770          MOV     #1,TSYNC                ;FIRST SYNC = 1
005276  012777  011476  003734  SYC02:  MOV     #FRINT,@DPRIV           ;SET UP RECEIVER INT VECTOR TO ERROR
                                SYC2:   DELAY   6000.                   ;10 CHAR TIMES FOR ALL 1'S IN BUFF
005304  012767  013560  003756          MOV     #6000.,,CNT                     ;SET UP COUNT
        005312
                                DEL=.
005312  005367  003752                  DEC     CNT                     ;TIME OUT
005316  001375                          BNE     DEL                     ;NO
005320  116777  003742  003702          MOVB    TSYNC,@SYNC             ;LOAD SYNC BUFFER
005326  117767  003676  003752          MOVB    @SYNC,TDATA             ;STORE SYNC
005334  116777  003726  003672          MOVB    TSYNC,@DPTB             ;LOAD FIRST SYNC CHAR
005342  032777  000200  003662          BIT     #BIT7,@DPTS             ;READY FOR NEXT SYNC
```

```
005350  001774                          BEQ     .-6                     ;NO TEST AGAIN
005352  032777  004000  003644          BIT     #BIT11,@DPRS            ;TEST FOR PREMATURE ACTIVE
005360  001401                          BEQ     .+4                     ;BRANCH IF NOT SET
005362  104000                          ERROR                           ;PREMATURE ACTIVE
```

```
005364  116777  003676  003642          MOVB    TSYNC,@DPTB             ;LOAD SECOND SYNC BYTE
005372  012777  005440  003640          MOV     #SYC2A,@DPRIV           ;SET UP TEST VECTOR
005400  105777  003626                  TSTB    @DPTS                   ;TRANSMITTER READY
005404  100375                          BPL     .-4                     ;NO
005406  016777  003654  003620          MOV     TSYNC,@DPTB             ;XMIT 3ED SYNC AS DATA
005414  052777  000100  003602          BIS     #BIT6,@DPRS             ;RCV INT ENB
                                        DELAY   3000.                   ;STALL 10 CHARACTER TIMES
005422  012767  005670  003640          MOV     #3000.,,CNT                     ;SET UP COUNT
        005430                  DEL=.
005430  005367  003634                  DEC     CNT                     ;TIME OUT
005434  001375                          BNE     DEL                     ;NO
005436  104000                          ERROR                           ;REPORT ERROR
005440  017767  003562  003634  SYC2A:  MOV     @DPRB,TMPDAT            ;SAVE DATA
005446  026767  003630  003612          CMP     TMPDAT,TSYNC            ;CORRECT SYNC CHARACTER
005454  001404                          BEQ     SYC2B                   ;YES
005456  042777  000004  003540          BIC     #BIT2,@DPRS             ;NO,SHUT OFF CLOCK
005464  104000                          ERROR                           ;REPORT ERROR
005466  032777  000200  003530  SYC2B:  BIT     #BIT7,@DPRS             ;DONE CLEARED
```

```
005474  001401                          BEQ     .+4                     ;YES
005476  104000                          ERROR                           ;REPORT ERROR
005500  042777  000100  003516          BIC     #BIT6,@DPRS             ;CLEAR REV INT ENB
005506  032777  004000  003510          BIT     #BIT11,@DPRS            ;RECEIVER ACTIVE
005514  001001                          BNE     .+4                     ;YES
005516  104000                          ERROR                           ;REPORT ERROR
005520  112777  000026  003502          MOVB    #26,@SYNC               ;CHANGE SYNC
005526  042777  004000  003470          BIC     #BIT11,@DPRS            ;CLEAR RECEIVER ACTIVE
005534  032777  004000  003462          BIT     #BIT11,@DPRS            ;RCV ACTIVE CLEARED
005542  001401                          BEQ     .+4                     ;YES
005544  104000                          ERROR                           ;REPORT ERROR
005546  022626                          CMP     (SP)+,(SP)+             ;ADJUST STACK
005550  042767  000040  172220          BIC     #BIT5,PS                ;SET PRIORITY TO 4
005556  032767  040000  172004          BIT     #BIT14,SWR              ;TEST FOR SCOPE LOOP
005564  001002                          BNE     SYC2C                   ;BRANCH AROUND INC IF SCOPE
005566  105267  003474                  INCB    TSYNC                   ;NEXT SYNC
005572  126767  003502  003466  SYC2C1: CMPB    SLIM,TSYNC              ;HAVE ALL SYNC'S BEEN TESTED
005600  001241                          BNE     SYC2                    ;NO
005602  005067  003460                  CLR     TSYNC                   ;YES
005606  056777  003450  003410          BIS     BPC,@DPRS               ;DEC BITS/CHAR BY 1 BIT
005614  006267  003460                  ASR     SLIM                    ;DECREASE #BITS/CHAR
005620  062767  000400  003434          ADD     #400,BPC                ;DEC BITS/CHAR BY 1 BIT
005626  022767  001400  003426          CMP     #1400,BPC               ;HAVE ALL CHAR SEIZES BEEN TESTED
005634  001220                          BNE     SYC02                   ;NO
005636  012767  000376  003434          MOV     #376,SLIM               ;SET UP SYNC LIMIT TO 8BITS/CHAR

                                ;*****SYNC EXTENSION TEST***********

005644  032767  000400  003400  S0,EXT: BIT     #BIT8,SAVSR1            ;DOES TWELVE BIT OPTION EXIST
005652  001574                          BEQ     ISYC                    ;BRANCH IF NOT
005654  042777  003400  003342          BIC     #3400,@DPRS             ;CLEAR BITS/CHARACTER
005662  052777  002104  003334          BIS     #2104,@DPRS             ;SET STATUS TO 12 BITS/CHARACTER
005670  012767  000400  003370          MOV     #400,TSYNC              ;FIRST SYNC CHARACTER
005676  105077  003326                  CLRB    @SYNC                   ;LOAD SYNC BUFFERS WITH 400
005702  112777  000001  003326          MOVB    #1,@SEXT                ;LOAD SYNC BUFFERS WITH 400
005710  012767  007400  003362          MOV     #7400,SLIM              ;SET UP SYNC LIMIT
005716  012767  002000  003336          MOV     #2000,BPC               ;SET # BITS/CHAR TO 12
005724  012777  011476  003306  S1,EXT: MOV     #FRINT,@DPRIV           ;RCV INTERRUPT VECTOR = ERROR
                                        DELAY   6000                    ;WAIT FOR ALL 1'S
005732  012767  006000  003330          MOV     #6000,CNT                       ;SET UP COUNT
        005740
005740  005367  003324          DEL=.:  DEC     CNT                     ;TIME OUT
005744  001375                          BNE     DEL                     ;NO
                                                                        ;TO SHIFT INTO XMIT,RCV BUFS
005746  105077  003256                  CLRB    @SYNC                   ;CLEAR SYNC EXTENTION
005752  116777  003311  003256          MOVB    TSYNC+1,@SEXT           ;LOAD NEXT SYNC
005760  016777  003302  003246          MOV     TSYNC,@DPTB             ;TRANSMIT FIRST SYNC
005766  105777  003240                  TSTB    @DPTS                   ;WAIT FOR "DONE"
005772  100375                          BPL     .-4                     ;
005774  032777  004000  003230          BIT     #BIT11,@DPTS            ;TEST FOR PREMATURE "ACTIVE"
006002  001401                          BEQ     .+4                     ;NO
006004  104000                          ERROR                           ;REPORT ERROR
006006  116777  003254  003220          MOVB    TSYNC,@DPTB             ;TRANSMIT SECOND SYNC
006014  105777  003212                  TSTB    @DPTS                   ;WAIT FOR "DONE"
006020  100375                          BPL     .-4                     ;
```

```
006022  012777  000102  003210          MOV     #S2,EXT,@DPRIV          ;SET UP RECEIVER INT VECTOR
006030  052777  000100  003166          BIS     #BIT6,@DPRS             ;RCV INTERRUPT ENABLE
006036  016777  003224  003170          MOV     TSYNC,@DPTB             ;TRANSMIT 3ED SYNC AS DATA
006044  105777  003162                  TSTB    @DPTS                   ;WAIT FOR "DONE"
006050  100375                          BPL     .-4                     ;
006052  032777  004000  003144          BIT     #BIT11,@DPRS            ;TEST FOR ACTIVE
006060  001001                          BNE     .+4                     ;OK
006062  104000                          ERROR                           ;REPORT ERROR
                                        DELAY   6000.                   ;WAIT FOR INTERRUPT
006064  012767  013560  003176          MOV     #6000.,,CNT                     ;SET UP COUNT
        006072
006072                          DEL=.
006072  005367  003172                  DEC     CNT                     ;TIME OUT
006076  001375                          BNE     DEL                     ;NO
006100  104000                          ERROR                           ;DEVICE FAILED TO INTERRUPT
006102  017767  003120  003172  S2,EXT: MOV     @DPRB,TMPDAT            ;SAVE RECEIVED DATA
006110  026767  003152  003164          CMP     TSYNC,TMPDAT            ;COMPARE SYNC
006116  001401                          BEQ     .+4                     ;BRANCH IF SYNC OK
006120  104000                          ERROR                           ;REPORT ERROR
006122  022626                          CMP     (SP)+,(SP)+             ;ADJUST STACK
006124  042767  000040  171644          BIC     #BIT5,PS                ;LOWER PRIORITY
006132  042777  004000  003064          BIC     #BIT11,@DPRS            ;CLEAR ACTIVE
006140  042777  000100  003056          BIC     #BIT6,@DPRS             ;CLEAR INT ENB
006146  032767  040000  171414          BIT     #BIT14,SWR              ;TEST FOR SCOPE LOOP
006154  001002                          BNE     S4,EXT                  ;BRANCH AROUND INC IF SCOPE
006156  105267  003105                  INCB    TSYNC+1                 ;INC TO NEXT TEST SYNC
006162  126767  003101  003111  S4,EXT: CMPB    TSYNC+1,SLIM+1          ;HAVE ALL SYNC'S BEEN TESTED
006170  001404                          BEQ     S3,EXT                  ;YES
006172  112777  000026  003030          MOVB    #26,@SYNC               ;CHANGE SYNC
006200  000651                          BR      S1,EXT
006202  005067  003060          S3,EXT: CLR     TSYNC                   ;CLEAR TSYNC
006206  006267  003066                  ASR     SLIM                    ;DECREASE SYNC LIMIT
006212  046777  003044  003004          BIC     BPC,@DPRS               ;CLEAR OLD CHAR SIZE
006220  062767  000400  003034          ADD     #400,BPC                ;INC BITS/CHAR TO NEXT SIZE
006226  056777  003030  002770          BIS     BPC,@DPRS               ;CHANGE BIT MODE
006234  022767  003400  003020          CMP     #3400,BPC               ;CHECK CHARACTER SIZE
006242  001230                          BNE     S1,EXT                  ;BRANCH UNTIL ALL SIZES HAVE BEEN TESTED


                                ;*****************************************************************

                                ;IDLE SYNC TEST
                                ;
                                ;RAISE "ACTIVE" BY IDLEING IN EACH AVAILABLE CHARACTER LENGTH

006244  012767  000012  002700  ISYC:  MOV     #10.,,ICOUNT            ;SET ITERATION COUNT TO 10
006252  012767  000026  003006          MOV     #26,TSYNC               ;LOAD TEST SYNC CHARACTER
006260  005077  002746                  CLR     @DPTS                   ;CLEAR STATUS REGISTERS
006264  005077  002734                  CLR     @DPRS                   ;
006270  016703  002730                  MOV     DPRS,R3                 ;FETCH DEVICE ADRS
006274  005203                          INC     R3                      ;CHANGE ADRS TO HIGH BYTE OF STATUS
006276  052777  000004  002720          BIS     #BIT2,@DPRS             ;START MAINTENANCE
006304  012702  006612                  MOV     #TAG2,R2                ;SET UP CHARACTER LENGTH SELECTOR

                                ISYC1:  DELAY   6000.                   ;WAIT FOR ALL 1'S TO SHIFT IN
```

```
006310  012767  013560  002752          MOV     #6000.,,CNT                     ;SET UP COUNT
        006316
                                DEL=.
006316  005367  002746                  DEC     CNT                     ;TIME OUT
006322  001375                          BNE     DEL                     ;NO
006324  012777  006406  002706          MOV     #ISYC2,@DPRIV           ;LOAD DP RCV INTERRUPT VECTOR
006332  116777  002730  002670          MOVB    TSYNC,@SYNC             ;LOAD LOW BYTE OF SYNC
006340  116777  002723  002670          MOVB    TSYNC+1,@SEXT           ;LOAD SYNC EXTENSION BITS
006346  016777  002714  002660          MOV     TSYNC,@DPTB             ;LOAD XMIT BUFFER
006354  052777  000002  002650          BIS     #BIT1,@DPTS             ;SET IDLE SYNC
006362  052777  000100  002634          BIS     #BIT6,@DPRS             ;SET RCV INTERRUPT ENABLE

                                        DELAY   12000.                  ;WAIT FOR RCV INTERRUPT
006370  012767  027340  002672          MOV     #12000.,,CNT                    ;SET UP COUNT
        006376
                                DEL=.
006376  005367  002666                  DEC     CNT                     ;TIME OUT
006402  001375                          BNE     DEL                     ;NO
006404  104000                          ERROR                           ;REPORT ERROR
006406  017767  002614  002666  ISYC2:  MOV     @DPRB,TMPDAT            ;SAVE RCV DATA
006414  000406          ISYC3:  BR      ISYC4                   ;CONTROL WORD 12 BITS=BR .+2
006416  026767  002660  002642          CMP     TMPDAT,TSYNC            ;DOES SYNC CHECK
006424  001401                          BEQ     .+4                     ;YES
006426  104000                          ERROR                           ;REPORT ERROR
006430  000411                          BR      ISYC5
006432  105767  002645          ISYC4:  TSTB    TMPDAT+1                ;VERIFY ONLY 8 BITS WERE TRANSMITTED
006436  001401                          BEQ     .+4                     ;BRANCH IF OK
006440  104000                          ERROR                           ;REPORT ERROR
006442  126767  002634  002616          CMPB    TMPDAT,TSYNC            ;CHECK SYNC IN LOW BYTE
006450  001401                          BEQ     .+4                     ;BRANCH IF SYNC OK
006452  104000                          ERROR                           ;REPORT ERROR
006454  032777  000200  002542  ISYC5:  BIT     #BIT7,@DPRS             ;DID READING RCV BUFF CLR DONE
006462  001401                          BEQ     .+4                     ;YES
006464  104000                          ERROR                           ;REPORT ERROR
006466  042777  004000  002530          BIC     #BIT11,@DPRS            ;CLEAR ACTIVE
006474  032777  004000  002522          BIT     #BIT11,@DPRS            ;ACTIVE CLEARED?
006502  001401                          BEQ     .+4                     ;YES
006504  104000                          ERROR                           ;REPORT ERROR
006506  042777  000002  002516          BIC     #BIT1,@DPTS             ;CLEAR IDLE
006514  042767  000040  171254          BIC     #BIT5,PS                ;LOWER PRIORITY TO 4
006522  022626                          CMP     (SP)+,(SP)+             ;ADJUST STACK
006524  142213                          BICB    (R2)+,@R3               ;CLEAR CHAR LENGTH
006526  152213                          BISB    (R2)+,@R3               ;SELECT NEXT CHAR LENGTH
006530  020227  006616                  CMP     R2,#TAG2+4              ;END OF MODE?
006534  001265                          BNE     ISYC1                   ;NO
006536  032767  000400  002506          BIT     #BIT8,SAVSR1            ;TEST 12 BITS/CHARACTER
006544  001424                          BEQ     SEQD0                   ;NO
006546  032777  002000  002450          BIT     #BIT10,@DPRS            ;END OF 12 BIT TEST
006554  001020                          BNE     SEQD0                   ;YES
006556  052777  002000  002440          BIS     #BIT10,@DPRS            ;NO
006564  024242                          CMP     -(R2),-(R2)             ;ADJUST CHAR SELECTION
006566  042777  001400  002430          BIC     #1400,@DPRS             ;CLEAR CHAR LENGTH LSB'S
006574  012767  000400  177612          MOV     #400,ISYC3              ;CHANGE CONTROL WORD
006602  012767  001426  002456          MOV     #1426,TSYNC             ;CHANGE SYNC
006610  000637                          BR      ISYC1
006612  000403          TAG2:   403                             ;CHARACTER LENGTH SELECTION
006614  001003                          1003                    ;CHARACTER LENGTH SELECTION
```

```
006616  012767  000026  002442  SEQD01  MOV     #26,TSYNC               ;RESTORE TSYNC
006624  012767  000406  177562          MOV     #406,ISYC3              ;RESTORE CONTROL WORD
```

```
                                        ;******INTERRUPT DRIVEN SEQUENTIAL DATA TEST********

006632  005067  002314        SEQD1:  CLR     ICOUNT                  ;SET ITERATION COUNT TO 1
006636  105077  002374                CLRB    @SEXT                   ;CLEAR SYNC EXTENTION
006642  012767  000000  002434        MOV     #0,RDATA                ;INIT RCV DATA
006650  012767  000000  002430        MOV     #0,TDATA                ;INIT XMIT DATA
006656  005077  002342                CLR     @DPRS                   ;RECEIVER STATUS
006662  005077  002344                CLR     @DPTS                   ;TRANSMITTER STATUS
006666  052777  000005  002330        BIS     #5,@DPRS                ;CLOCK ON + STRIP SYNC
006674  012767  007042  003162        MOV     #RAND,R5+2              ;SET UP RETURN ADDRESS
006702  012767  000400  002366        MOV     #400,CHLEN              ;CHAR LENGTH INDEX
006710  032767  000400  002334        BIT     #BIT8,SAVSR1            ;TEST 12 BIT CHAR MODE
006716  001414                      BEQ     SEQD2                   ;NO
006720  012767  010000  002322        MOV     #10000,LIMIT            ;SELECT END OF DATA
006726  052777  002000  002270        BIS     #BIT10,@DPRS            ;SELECT 12 BITS/CHARACTER
006734  012767  000426  002324        MOV     #426,TSYNC              ;SYNC FOR 12 BIT CHAR
006742  105277  002270                INCB    @SEXT                   ;PLACE MSB OF SYNC IN SYNC EXT
006746  000406                      BR      SEQD3
006750  012767  000400  002272  SEQD2:  MOV     #400,LIMIT              ;TEMPORARY CHARACTER LIMIT
006756  012767  000026  002302        MOV     #26,TSYNC               ;INIT SYNC STORAGE
006764  012777  011532  002252  SEQD3:  MOV     #TV18,@DPTIV            ;TRANSMITTER VECTOR
006772  012777  011652  002240        MOV     #RV18,@DPRIV            ;RECEIVER VECTOR
007000  012767  000200  170770        MOV     #200,PS                 ;PRIORITY=4
007006  012767  000002  002256        MOV     #2,SCNT                 ;SYNC COUNT=2
007014  116777  002246  002206        MOVB    TSYNC,@SYNC             ;LOAD SYNC
007022  052777  000100  002174        BIS     #BIT6,@DPRS             ;RCV INT ENB
007030  052777  000340  002174        BIS     #340,@DPTS              ;STATUS INT ENB
                                                                      ;TRANS INT ENB
                                                                      ;TRANS DONE
007036  000001                      WAIT                            ;WAIT FOR INTERRUPTS
007040  000776                      BR      .-2

                                        ;******RANDOM DATA, RANDOM STALL********


007042  104400                RAND1:  SCOPE
007044  012767  000000  002224        MOV     #0,CHLEN                ;SET CHAR LENGTH TO 8 BITS
007052  012767  000026  002206        MOV     #26,TSYNC               ;SYNC = 26
007060  116777  002202  002142        MOVB    TSYNC,@SYNC             ;LOAD SYNC BUFFER
007066  004767  000100                JSR     %7,AND                  ;EXECUTE DATA + STALL MODES

                                        ;REPEAT PREVIOUS TEST AT 7 BITS/CHAR

007072  012767  000200  002176        MOV     #200,CHLEN              ;SET CHAR LENGTH TO 7 BITS
007100  052777  000400  002116        BIS     #BIT8,@DPRS             ;7 BITS/CHAR
007106  042777  004000  002110        BIC     #BIT11,@DPRS            ;CLEAR ACTIVE
007114  004767  000052        RAND4:  JSR     %7,AND                  ;EXECUTE DATA + STALL MODES
```

```
                                ;REPEAT PREVIOUS TEST AT 6 BITS/CHAR

007120  012767  000300  002150          MOV     #300,CHLEN              ;SET CHAR LENGTH TO 6 BITS
007126  042777  000400  002070          BIC     #BIT8,@DPRS
007134  052777  001000  002062          BIS     #BIT9,@DPRS             ;SET MODE TO 6 BITS/CHAR
007142  042777  004000  002054          BIC     #BIT11,@DPRS            ;CLEAR ACTIVE

007150  004767  000016          RAND8:  JSR     X7,AND                  ;EXECUTE DATA & STALL MODES
007154  042777  007700  002042  LOOP:   BIC     #7700,@DPRS             ;CLEAR RCV STATUS
007162  042777  160342  002042          BIC     #160342,@DPTS           ;CLEAR XMIT STATUS
007170  000511                          BR      PARTY

                                ;COMMON DATA AND IDLE SUBROUTINE

007172  012701  015371          AND:    MOV     #15371,R1               ;PRIME RANDOM # GEN
007176  012702  072414                  MOV     #72414,R2               ;"      "       "
007202  012703  004036                  MOV     #4036,R3                ;"      "       "
007206  012767  007300  001742          MOV     #STAG,RETURN            ;SET UP SCOPE RETURN
007214  042777  004300  002002          BIC     #4300,@DPRS             ;RCV INT ENB, RCV ACTIVE
007222  042777  160342  002002          BIC     #160342,@DPTS           ;INT ENBS IDLE SYNC, ERRORS
007230  012767  012562  002106          MOV     #BOTTOM,RP              ;SET UP RCV POINTER
007236  016767  002102  002076          MOV     RP,TP                   ;SET UP XMIT POINTER
007244  012777  012220  001766          MOV     #RRRR,@DPRIV            ;RCV INT VECTOR
007252  012777  012066  001764          MOV     #RRRT,@DPTIV            ;XMIT INT VECTOR
007260  012767  000002  002004          MOV     #2,SCNT                 ;SYNC COUNT * 2
007266  110267  002014                  MOVB    R2,TDATA                ;RANDOM DATA
007272  052777  000100  001724          BIS     #100,@DPRS              ;RCV INT ENB
007300  016777  001762  001726  STAG:   MOV     TSYNC,@DPTB             ;LOAD BUFFER
007306  012767  000010  001636          MOV     #10,ICOUNT              ;SET ITERATION TO 10
007314  052777  000340  001710          BIS     #340,@DPTS              ;XMIT DONE, INT ENB, STATUS ENB
007322  010167  002012          TIM0:   MOV     R1,TIME                 ;"ON" STALL
007326  005367  002006          TIM1:   DEC     TIME                    ;0.6 SEC MAX
007332  001375                          BNE     TIM1
007334  042777  000140  001670          BIC     #140,@DPTS              ;TURN OFF INT ENB
007342  052777  000002  001662          BIS     #BIT1,@DPTS             ;IDLE SYNC
007350  004567  001606                  JSR     X5,RNUM                 ;GENERATE "STALL" TIME
007354  010167  001760                  MOV     R1,TIME                 ;FETCH RANDON STALL TIME
007360  005367  001754          TIM2:   DEC     TIME                    ;COUNT IDLE TIME
007364  001375                          BNE     TIM2                    ;TIME OUT?
007366  004567  001570                  JSR     X5,RNUM                 ;GENERATE "ON" TIME + SYNC
007372  042777  000002  001632          BIC     #BIT1,@DPTS             ;CLEAR IDLE
007400  000240                          NOP
007402  104400                          SCOPE
007404  042777  000100  001612          BIC     #100,@DPRS              ;CLEAR RCV INT ENB
007412  000207                          RTS     X7
```

```
                                ;******PARITY TEST******

                                ;VERIFY "PARITY" BIT=1 FOR ODD PARITY AND=0 FOR EVEN

007414  012767  007422  001534  PARTY1: MOV     #PARTY+6,RETURN ;SET UP SCOPE RETURN
007422  012767  000002  001522          MOV     #2,ICOUNT       ;ITERATION = 10.
007430  012767  001401  002770          MOV     #1401,RPRT1     ;LOAD RPRT2WITH BEQ .+4
007436  012767  000400  001604          MOV     #400,LIMIT      ;SET UP CHARACTER LIMIT
007444  005067  001634                  CLR     RDATA           ;CLR RCV DATA
007450  005067  001632                  CLR     TDATA           ;CLR XMIT DATA
007454  105077  001556                  CLRB    @SEXT           ;CLEAR SYNC EXTENTION
007460  012767  000026  001600          MOV     #26,TSYNC       ;SET UP SYNC
007466  116777  001574  001534          MOVB    TSYNC,@SYNC     ;INIT SYNC
007474  012767  000002  001570          MOV     #2,SCNT         ;2 SYNC'S
007502  005077  001516                  CLR     @DPRS           ;CLR RECEIVER STATUS
007506  005077  001520                  CLR     @DPTS           ;CLR TRANSMITTER STATUS
007512  032767  000400  001532          BIT     #BIT8,SAVSR1    ;8/12 BITS/CHAR
007520  001406                          BEQ     TY1             ;BRANCH IF 8 BITS/CHAR
007522  012767  010000  001520          MOV     #10000,LIMIT    ;SET LIMIT TO 12 BITS/CHAR
007530  052777  002000  001466          BIS     #BIT10,@DPRS    ;SELECT 12 BIT MODE
007536  012767  000200  170232  TY1:    MOV     #200,PS         ;PRIORITY = 4
007544  012777  012302  001472          MOV     #TPRTY,@DPTIV   ;TRANSMITTER PARITY TEST VECTOR
007552  012777  012372  001460          MOV     #RPRTY,@DPRIV   ;RECEIVER PARITY TEST VECTOR
007560  052777  000105  001436          BIS     #105,@DPRS      ;RCV INT ENB, STRIP SYNC, CLOCK
007566  052777  000300  001436          BIS     #300,@DPTS      ;XMIT INT ENB,DONE
007574  000001                  SLP:    WAIT
007576  000776                          BR      SLP

                                ;RECEIVER OVERRUN TST

007600  104400                  OVRUN:  SCOPE
007602  012767  000002  001342          MOV     #2,ICOUNT       ;SET ITERATION COUNT TO 10
007610  012767  000000  001464          MOV     #0,TMPDAT       ;STOR TEST CHAR IN TMPDAT
007616  105077  001414                  CLRB    @SEXT           ;CLEAR SYNC EXTENTION
007622  112777  000026  001400          MOVB    #26,@SYNC       ;LOAD SYNC BUFFER
007630  032767  000400  001414          BIT     #BIT8,SAVSR1    ;8/12 BITS/CHAR
007636  001403                          BEQ     OR0             ;BRANCH IF 8 BITS/CHAR
007640  052777  002000  001356          BIS     #BIT10,@DPRS    ;SELECT 12 BITS/CHAR
007646  012777  010010  001370  OR0:    MOV     #ORUN,@DPTIV    ;XMIT STATUS INT VECTOR=0!RUN
007654  052777  000004  001342          BIS     #BIT2,@DPRS     ;TURN ON CLOCK
                                OR1:    DELAY   6000.           ;WAIT FOR RCV TO CLEAR
007662  012767  013560  001400          MOV     #6000.,.CNT                     ;SET UP COUNT
        007670
                                DEL=.
007670  005367  001374                  DEC     CNT                     ;TIME OUT
007674  001375                          BNE     DEL                     ;NO
007676  052777  000200  001326          BIS     #BIT7,@DPTS     ;DONE
007704  105777  001322                  TSTB    @DPTS           ;TRANSMIT FIRST SYNC
007710  100375                          BPL     .-4
007712  012777  000026  001314          MOV     #26,@DPTB
007720  105777  001306                  TSTB    @DPTS
007724  100375                          BPL     .-4
007726  012777  000026  001300          MOV     #26,@DPTB       ;TRANSMIT SECOND SYNC
007734  105777  001272                  TSTB    @DPTS
007740  100375                          BPL     .-4
007742  016777  001334  001264          MOV     TMPDAT,@DPTB    ;TRANSMIT DATA CHAR #1
```

```
007750  105777  001256          TSTB    @DPTS
007754  100375                  BPL     .-4
007756  016777  001320  001250  MOV     TMPDAT,@DPTB    ;TRANSMIT DATA CHAR #2
007764  052777  000040  001240  BIS     #BIT5,@DPTS     ;SET STATUS INT ENB
                                DELAY   3000.           ;WAIT FOR O'RUN INTERRUPT
007772  012767  005670  001270  MOV     #3000.,.CNT                     ;SET UP COUNT
        010000                  DEL=.
010000  005367  001264          DEC     CNT                     ;TIME OUT
010004  001375                  BNE     DEL                     ;NO
010006  104000                  ERROR                   ;REPORT ERROR, NO O'RUN INT
010010  032777  040000  001214  ORUN1:  BIT     #BIT14,@DPTS    ;TEST FOR O'RUN
010016  001001                  BNE     .+4             ;BRANCH IF O'RUN CAUSED INT
010020  104000                  ERROR                   ;REPORT ERROR
010022  005077  001204          CLR     @DPTS           ;CLEAR XMIT STATUS
010026  042777  004000  001170  BIC     #BIT11,@DPRS    ;CLEAR ACTIVE
010034  022626                  CMP     (SP)+,(SP)+     ;ADJUST STACK
010036  042767  000040  167732  BIC     #BIT5,PS        ;LOWER PRIORITY TO 4
010044  005267  001232          INC     TMPDAT          ;INC TO NEXT DATA
010050  022767  000400  001224  CMP     #400,TMPDAT     ;TEST FOR END OF DATA

010056  001301                  BNE     OR1             ;BRANCH IF NOT END
010060  104400                  SCOPE


                        ;HALF DUPLEX TEST

010062  012767  000620  001062  DUPLX1: MOV     #400.,.ICOUNT           ;ITERRATION COUNT = 400
010070  005077  001130          CLR     @DPRS           ;CLEAR RECEIVER STATUS
010074  005077  001132          CLR     @DPTS           ;CLEAR TRANSMITTER STATUS
010100  052777  000002  001116  BIS     #BIT1,@DPRS     ;HALF DUPLEX
010106  052777  000100  001110  BIS     #BIT6,@DPRS     ;INT ENB RCV
010114  052777  000004  001102  BIS     #BIT2,@DPRS     ;TURN ON CLOCK
010122  012777  011476  001110  MOV     #FRINT,@DPRIV   ;SETUP TEST VECTOR
010130  005067  001132          CLR     TSYNC           ;CLR TEST SYNC
010134  012767  000200  167634  MOV     #200,PS         ;PRIORITY=4
010142  116777  001120  001060  DPLX11: MOVB    TSYNC,@SYNC     ;LOAD SYNC BUFFER
010150  052777  000002  001054  BIS     #BIT1,@DPTS     ;IDLE SYNC
                                DELAY   3000.           ;DELAY 20.1 MS
010156  012767  005670  001104  MOV     #3000.,.CNT                     ;SET UP COUNT
        010164                  DEL=.
010164  005367  001100          DEC     CNT                     ;TIME OUT
010170  001375                  BNE     DEL                     ;NO
010172  105267  001070          INCB    TSYNC           ;HAVE ALL SYNC BEEN TESTED
010176  001361                  BNE     DPLX1           ;NO
010200  012777  000007  001014  MOV     #7,@CTPB        ;BELL
010206  105777  001006          TSTB    @CTPS           ;PUNCH DONE?
010212  100375                  BPL     .-4             ;NO
010214  000167  171336          JMP     BGN1
```

```
                                    ;EMULATOR ROUTINE

010220  011646                      EMTVEC: MOV     @R6,-(R6)       ;DUPLICATE PC ON STACK
010222  162716  000002                      SUB     #2,@R6          ;POINT PC TO EMT INST,
010226  017616  000000                      MOV     @(R6),@R6       ;MOV EMT INST ONTO STACK
010232  121627  000002                      CMPB    @R6,#2          ;TEST THAT CALL IS WITHIN LIMITS
010236  101401                            BLOS    EMTOK           ;BRANCH IF WITHIN LIMITS
010240  104000                            ERROR                   ;REPORT CALL NOT WITHIN LIMITS
010242  006116                      EMTOK:  ROL     @R6             ;EMT ARGUMENT X 2,
010244  042716  177001                      BIC     #177001,@R6     ;CLEAR HIGH BYTE
010250  062716  010262                      ADD     #EMTAB,@R6      ;FORM ADRS OF ROUTINE ADRS
010254  017616  000000                      MOV     @(R6),@R6       ;PUT ROUTINE ADRS ON STACK
010260  000136                            JMP     @(R6)+          ;JUMP TO ROUTINE

010262  010270                      EMTAB:  ERRP                    ;ERROR PRINT ROUTINE
010264  000000                            0
010266  000000                            0
010270  010667  001014              ERRP:   MOV     R6,SAVPC        ;SAVE STACK POINTER
010274  010046                      SAVR:   MOV     R0,-(R6)        ;SAVR R0 THRU R5
010276  010146                            MOV     R1,-(R6)
010300  010246                            MOV     R2,-(R6)
010302  010346                            MOV     R3,-(R6)
010304  010446                            MOV     R4,-(R6)
010306  010546                            MOV     R5,-(R6)
010310  016701  000774                      MOV     SAVPC,R1        ;R1=SAVPC
010314  036727  167250  020000            BIT     SWR,#BIT13      ;TEST FOR INHIBIT PRINT OUT
010322  001402                            BEQ     ERP0            ;BRANCH TO PRINT
010324  000167  000066                      JMP     PRINT1          ;INHIBIT, RETURN TO MAIN STREAM
010330  105777  000664              ERP0:   TSTB    @CTPS           ;READY
010334  100375                            BPL     .-4             ;NO
010336  012777  000215  000656            MOV     #215,@CTPB      ;YES, CR
010344  105777  000650                      TSTB    @CTPS           ;READY
010350  100375                            BPL     .-4             ;NO
010352  012777  000212  000642            MOV     #212,@CTPB      ;YES, LF
010360  105777  000634                      TSTB    @CTPS           ;READY
010364  100375                            BPL     .-4             ;NO

010366  012102                      ERP1:   MOV     (R1)+,X2        ;FETCH WORD OFF STACK
010370  004767  000054                      JSR     X7,PRTAB        ;PRINT WORD PC OR PS
010374  105777  000620                      TSTB    @CTPS           ;SPACE BETWEEN WORDS
010400  100375                            BPL     .-4
010402  012777  000240  000612            MOV     #240,@CTPB      ;SPACE
010410  020127  001100                      CMP     R1,#BEGIN1      ;TEST FOR END OF STACK
010414  001364                            BNE     ERP1            ;CONTINUE PRINT IF STACK NOT EMPTY
010416  005767  167146              PRINT1: TST     SWR             ;TEST FOR HLT ON ERR
010422  100001                            BPL     .+4
010424  000000                            HALT
010426  005267  000700                      INC     ERRCNT          ;INC ERROR COUNT
010432  012605                      RESTR:  MOV     (R6)+,R5        ;RESTOR R5 THRU R0
010434  012604                            MOV     (R6)+,R4
010436  012603                            MOV     (R6)+,R3
010440  012602                            MOV     (R6)+,R2
010442  012601                            MOV     (R6)+,R1
010444  012600                            MOV     (R6)+,R0
```

```
010446  000002                          RTI                     ;RETURN

                                ;SAVREG EMT CALL TO SAVE R0 THRU R5


010450  005067  000252          PRTAB:  CLR     BINCT
010454  005067  000244                  CLR     WGTCT
010460  012704  010732                  MOV     #LIST,R4        ;GET LIST ADDRESS
010464  012767  000005  000236          MOV     #5,ASCNT
010472  012767  000007  000220          MOV     #7,SEVEN
010500  012767  000001  000214          MOV     #1,DECML
010506  105777  000506          WAIT1:  TSTB    @CTPS
010512  100375                          BPL     WAIT1
010514  005702                          TST     R2
010516  100404                          BMI     MINUS           ;NEG SIGN PRINT 1
010520  012777  000260  000474          MOV     #260,@CTPB      ;POS SIGN PRINT 0
010526  000403                          BR      STAR
010530  012777  000261  000464  MINUS:  MOV     #261,@CTPB
010536  016703  000156          STAR:   MOV     SEVEN,R3        ;PUT MASK IN R3
010542  010267  000150                  MOV     R2,TOODLE       ;GET READY TO DOODLE NUMBER IN TOODLE
010546  005167  000144                  COM     TOODLE          ;COMPENSATES FOR COMPLEMENT DURING BIC
010552  046703  000140                  BIC     TOODLE,R3       ;AND IN OCTAL CHARACTER
010556  001410                          BEQ     WRTOC           ;ZERO, WRITE 0 IN LIST
010560  066767  000136  000136  MKNUM:  ADD     DECML,WGTCT     ;COUNT UP TO
010566  005267  000134                  INC     BINCT           ;AND RECORD
010572  026703  000126                  CMP     WGTCT,R3        ;SAME BINARY WEIGHT
010576  001370                          BNE     MKNUM           ;KEEP COUNTN
010600  062767  000260  000120  WRTOC:  ADD     #260,BINCT      ;ADD ASCII PREFIX
010606  016724  000114                  MOV     BINCT,(4)+      ;WRITE ASCII CHAR IN LIST
010612  066767  000102  000102          ADD     SEVEN,DECML     ;EXPAND BINARY WEIGHT
010620  005067  000100                  CLR     WGTCT
010624  005067  000076                  CLR     BINCT
010630  005367  000074                  DEC     ASCNT
010634  001410                          BEQ     XLIST           ;5 CHAR IN LIST
010636  012703  000003                  MOV     #3,R3           ;SET R3 FOR ADD LOOP
010642  066767  000052  000050  MOADD:  ADD     SEVEN,SEVEN     ;MAKING SEVENTY BY SEVEN
010650  005303                          DEC     R3
010652  001373                          BNE     MOADD
010654  000730                          BR      STAR            ;NX SEVEN SET GET NX OCTAL
010656  012767  000005  000044  XLIST:  MOV     #5,ASCNT        ;SEND 5 CHAR TO TTY
010664  105777  000330          WAIT2:  TSTB    @CTPS
010670  100375                          BPL     WAIT2
010672  014477  000324                  MOV     -(4),@CTPB
010676  005367  000026                  DEC     ASCNT
010702  001401                          BEQ     HOFHM           ;FINISH PRINTING GET NXT NUM
010704  000767                          BR      WAIT2

010706  105777  000306          HOFHM:  TSTB    @CTPS
010712  100375                          BPL     .-4
010714  000207                          RTS     R7              ;HEAD FOR HOME
010716  000000          TOODLE: 0
010720  000000          SEVEN:  0
010722  000000          DECML:  0
010724  000000          WGTCT:  0
```

```
010726  000000                  BINCT:  0
010730  000000                  ASCNT:  0
010732  000000                  LIST:   0
010734  000000                          0
010736  000000                          0
010740  000000                          0
010742  000000                          0
010744  000000                          0

                                ;POWER FAIL ROUTINE

010746  012767  010756  167050  PFAIL:  MOV     #PWRUP,24       ;LOAD PFAIL VECTOR FOR POWER UP
010754  000000                  HALT                            ;
010756  000005                  PWRUP:  RESET                   ;WAIT TTY TO COME UP
010760  012706  001100                  MOV     #BEGIN1,SP      ;REINIT STACK POINTER
010764  012767  010746  167032          MOV     #PFAIL,24       ;LOAD PFAIL VECTOR FOR POWER DOWN
010772  105777  000222                  TSTB    @CTPS           ;READY
010776  100375                          BPL     .-4             ;NO
011000  012777  000215  000214          MOV     #215,@CTPB      ;YES, CR
011006  105777  000206                  TSTB    @CTPS           ;READY
011012  100375                          BPL     .-4             ;NO
011014  012777  000212  000200          MOV     #212,@CTPB      ;YES, LF
011022  010702                          MOV     PC,X2           ;LOAD PC
011024  004767  177420                  JSR     X7,PRTAB        ;PRINT PFAIL PC
011030  000137  001556          PUP1:   JMP     @#BGN1
                                ;SGEN,ROUTINE TO GENERATE A UNIQUE SYNC CHARACTER

011034  112777  000026  000166  SGEN:   MOVB    #26,@SYNC       ;SET UP FILLER SYNC
                                        DELAY   3000.           ;DELAY 10 CHAR
011042  012767  005670  000220          MOV     #3000.,,CNT                     ;SET UP COUNT
        011050
011050  005367  000214          DEL=.:  DEC     CNT                     ;TIME OUT
011054  001375                          BNE     DEL                     ;NO
011056  004567  000100                  JSR     X5,RNUM         ;RANDOM #
011062  110167  000200                  MOVB    R1,TSYNC        ;LOAD SYNC
011066  000207                          RTS     X7


                                ;SCOPE LOOP ROUTINE ENTERED BY USER TRAP
011070  022606                  SCOPEB: CMP     (6)+,X6         ;REPOSITION THE STACK
011072  012667  166700                  MOV     (6)+,PS         ;UPDATE STATUS
011076  000177  000054                  JMP     @RETURN         ;SCOPE RETURN


                                ;SCOPE OR/AND ITERATION LOOP FOR EACH TEST 4000 TIMES
011102  032767  040000  166460  SCOPEC: BIT     #BIT14,SWR      ;TEST SR FOR SCOPE
011110  001367                          BNE     SCOPEB          ;YES SCOPE
011112  032767  004000  166450          BIT     #BIT11,SWR      ;NO - TEST FOR ITERATION
011120  001013                          BNE     SCOPEA          ;INHIBIT ITERATION
011122  026767  000026  000022          CMP     SCOPEF,ICOUNT
011130  001403                          BEQ     SCOPEG          ;EXIT - DONE
011132  005267  000016                  INC     SCOPEF          ;INCREMENT COUNT
011136  000754                          BR      SCOPEB          ;LOOP SOME MORE
011140  005067  000010          SCOPEG: CLR     SCOPEF          ;CLEAR COUNT
011144  011667  000006                  MOV     @X6,RETURN      ;SAVE SCOPE RETURN POINTER
```

```
011150  000002                  SCOPEA: RTI                     ;RETURN INLINE=NEXT TEST
011152  004000                  ;COUNT: 4000
011154  000000                  SCOPEF: 0                       ;COUNT LOCATION FOR ITERATION LOOP
011156  012576                  RETURN: BEGIN2+2                ;ADDRESS OF LAST TEST
011160  000777                          BR      .               ;SCOPE LOOP FAILURE

                                ;RNUM, PSEUDO RANDOM NUMBER GENERATOR

011162  032767  040000  166400  RNUM:   BIT     #BIT14,SWR      ;TEST FOR SCOPE LOOP
011170  001010                  RNUM1   BNE     RNUM1           ;EXIT IF SCOPE
011172  060201                          ADD     R2,R1
011174  005501                          ADC     R1
011176  060102                          ADD     R1,R2
011200  005502                          ADC     R2
011202  060302                          ADD     R3,R2
011204  005502                          ADC     R2
011206  060203                          ADD     R2,R3
011210  005503                          ADC     R3
011212  000205                  RNUM1:  RTS     %5

                                ;CONSTANTS, DYNAMIC MEMORY STORAGE AND DEVICE ADDRESSES

011214  177560                  CTKS:   177560                  ;CONSOL TTY KEYBOARD STATUS
011216  177562                  CTKB:   177562                  ;CONSOL TTY DATA BUFFER
011220  177564                  CTPS:   177564                  ;CONSOL TTY PUNCH STATUS
011222  177566                  CTPB:   177566                  ;CONSOL TTY PUNCH BUFFER

                                ;*****************************************************************

011224  174770                  DPRS:   174770                  ;DP11 RECEIVER STATUS
011226  174772                  DPRB:   174772                  ;DP11 RECEIVER BUFFER
011230  174773                  SYNC:   174773                  ;SYNC BUFFER
011232  174774                  DPTS:   174774                  ;DP11 TRANSMITTER STATUS
011234  174776                  DPTB:   174776                  ;DP11 TRANSMITTER BUFFER
011236  174777                  SEXT:   174777                  ;DP11 SYNC EXTENSION

                                ;*****************************************************************
011240  000300                  DPRIV:  300                     ;DP11 RECEIVER INTERRUPT VECTOR
011242  000302                  DPRP:   302                     ;DP11 RECEIVER PRIORITY
011244  000304                  DPTIV:  304                     ;DP11 TRANSMITTER INTERRUPT VECTOR
011246  000306                  DPTP:   306                     ;DP11 TRANSMITTER PRIORITY

                                ;*****************************************************************

011250  000400                  LIMIT:  400                     ;CHARACTER LIMIT
011252  000000                  SAVSR1: 0                       ;SWITCH REGISTER STORAGE #1
011254  000000                  SAVSR2: 0
011256  000000                  CLKCNT: 0                       ;COUNT FOR CLOCK MACRO
011260  000000                  ERCOUNT:0                       ;ERROR COUNT
011262  000010                  BPC:    10                      ;BITS PER CHARACTER
011264  000000                  SYNCNT: 0
011266  000000                  TSYNC:  0                       ;TEST SYNC CHARACTER
011270  000000                  CNT:    0                       ;MISC. COUNTER
```

```
011272  000000                    SCNT:   0                       ;SYNC COUNT
011274  000200                    LIMTMP: 200                     ;TEMPORARY LIMIT
011276  000000                    CHLEN:  0                       ;CHARACTER LENGTH
011300  000000                    SLIM:   0
011302  000000                    TMPDAT: 0                       ;TEMPORARY STORAGE
011304  000000                    RDATA:  0                       ;RECEIVER DATA
011306  000000                    TDATA:  0                       ;TRANSMITTER DATA
011310  000000                    SAVPC:  0                       ;SAVE PC
011312  000000                    SAVSP:  0                       ;SAVE PS
011314  000000                    SAVR0:  0                       ;SAVE R0
011316  000000                    SAVR1:  0                       ;SAVE R1
011320  000000                    SAVR2:  0                       ;SAVE R2
011322  000000                    SAVR3:  0                       ;SAVE R3
011324  000000                    SAVR4:  0                       ;SAVE R4
011326  000000                    SAVR5:  0                       ;SAVE R5

011330  000000                    CC:     0                       ;CHARACTER COUNT
011332  000000                    ERRCNT: 0
011334  000000                    FLAG:   0
011336  000000                    RCNT:   0
011340  000000                    TIME:   0
011342  000000                    TP:     0                       ;TRANSMITTER TUMBLE TABLE POINTER
011344  000000                    RP:     0                       ;RECEIVER TT POINTER


                                  ;
                                  ;INTERRUPT SERVICE ROUTINES
                                  ;
                                  ;THESE ROUTINES MAY FUNCTION AS:
                                  ; 1.  ERROR TRAPS FOR FALSE INTERRUPTS
                                  ; 2.  POINTERS BACK TO THE MAIN LINE FOR VALID INTERRUPTS
                                  ; 3.  FUNCTIONAL TEST WHICH ARE INTERRUPT DRIVEN

                                  ;VERIFY THAT INTERRUPT RESULTED FROM RING.
011346  022626                    TV24:   CMP     (SP)+,(SP)+

011350  032777  020000  177654            BIT     #BIT13,@DPTS    ;TEST FOR RING
011356  001001                            BNE     TV24A           ;BRANCH IF SET.
011360  104000                            ERROR                   ;REPORT ERROR

011362  042777  020000  177642  TV24A:    BIC     #BIT13,@DPTS    ;CLEAR RING FLAG.
011370  032777  020000  177634            BIT     #BIT13,@DPTS    ;TEST IT
011376  001401                            BEQ     TV24B           ;BRANCH IF CLEAR.
011400  104000                            ERROR                   ;REPORT ERROR

011402  032777  140200  177622  TV24B:    BIT     #140200,@DPTS   ;NO OTHER STATUS FLAG ON?
011410  001401                            BEQ     TV24C
011412  104000                            ERROR                   ;REPORT ERROR
011414  000167  005334            TV24C:  JMP     RCD1

                                  ;VERIFY THAT INTERRUPT RESULTED FROM 'CARRIER DOWN' FLAG
011420  022626                    TV25:   CMP     (SP)+,(SP)+     ;CLEAN UP STACK
011422  032777  100000  177602            BIT     #BIT15,@DPTS    ;TEST FOR 'CARRIER DOWN' FLAG
011430  001001                            BNE     TV25A           ;BRANCH IF SET
011432  104000                            ERROR                   ;REPORT ERROR
```

```
011434  042777  100000  177570  TV25A:  BIC     #BIT15,@DPTS    ;CLEAR 'CARRIER DOWN' FLAG,
011442  032777  100000  177562          BIT     #BIT15,@DPTS    ;TEST IT
011450  001401                          BEQ     TV25B           ;BRANCH IF CLEAR,
011452  104000                          ERROR                   ;REPORT ERROR

011454  032777  060200  177550  TV25B:  BIT     #060200,@DPTS   ;NO OTHER FLAGS ON?
011462  001401                          BEQ     TV25C
011464  104000                          ERROR                   ;REPORT ERROR

011466  000167  005330          TV25C:  JMP     BELL



011472  104001                  FTINT:  EMT+1                   ;REPORT FALSE TRANSMITTER INTERRUPT
011474  000000                          HALT                    ;ERROR ROUTINE SHOULD RETURN TO MAINLINE

011476  104001                  FRINT:  EMT+1                   ;REPORT FALSE RECEIVER INTERRUPT
011500  000000                          HALT                    ;ERROR ROUTINE SHOULD RETURN TO MAINLINE

011502  062716  000002          TRTI:   ADD     #2,@SP          ;ADD 2 TO PC TO SKIP OVER HALT
011506  000002                          RTI                     ;PC POINTS TO HALT

011510  022626                  TV5:    CMP     (SP)+,(SP)+     ;REPOSITION POINTER
011512  000167  173046                  JMP     IT3A            ;RETURN TO MAINLINE

011516  022626                  TV6:    CMP     (SP)+,(SP)+     ;ADJUST STACK
011520  000167  173150                  JMP     IT4A            ;RETURN TO MAINLINE

011524  022626                  TV7:    CMP     (SP)+,(SP)+     ;ADJUST STACK
011526  000167  173270                  JMP     IT5A            ;RETURN TO MAINLINE


011532  016777  177530  177474  TV18:   MOV     TSYNC,@DPTB     ;XMIT SYNC
011540  116777  177523  177470          MOVB    TSYNC+1,@SEXT   ;LOAD SYNC EXT
011546  005367  177520                  DEC     SCNT            ;HAVE 2 SYNC'S BEEN XMITED
011552  001003                          BNE     T18             ;NO
011554  012777  011564  177462          MOV     #TV19,@DPTIV    ;YES CHANGE VECTOR
011562  000002                  T18:    RTI
```

```
                                ;SEQUENTIAL DATA TRANSMITTION ROUTINE

011564  032777  160000  177440  TV19:   BIT     #160000,@DPTS   ;ANY STATUS ERRORS
011572  001401                          BEQ     .+4             ;NO
011574  104000                          ERROR                   ;REPORT ERROR
011576  032777  000200  177426          BIT     #BIT7,@DPTS     ;TRANSMITTER READY
011604  001001                          BNE     .+4             ;YES
011606  104000                          ERROR                   ;REPORT ERROR
011610  016777  177472  177416          MOV     TDATA,@DPTB     ;LOAD BUFFER
011616  032767  040000  165744          BIT     #BIT14,SWR      ;TEST FOR SCOPE LOOP
011624  001011                          BNE     T19             ;BRANCH AROUND INC IF SCOPE
011626  005267  177454                  INC     TDATA           ;NEXT CHARACTER
011632  026767  177412  177446          CMP     LIMIT,TDATA     ;HAVE ALL CHARACTERS
011640  001003                          BNE     T19             ;NO
011642  042777  000140  177362          BIC     #140,@DPTS      ;YES, CLEAR INTERRUPTS
011650  000002                  T19:    RTI

                                ;RECEIVE SEQUENTIAL DATA

011652  032777  000100  177344  RV18:   BIT     #BIT6,@DPRS     ;RECEIVE DONE
011660  001001                          BNE     .+4             ;YES
011662  104000                          ERROR                   ;REPORT ERROR
011664  026777  177414  177334          CMP     RDATA,@DPRB     ;CORRECT DATA
011672  001404                          BEQ     RV18A
011674  017767  177326  177400          MOV     @DPRB,TMPDAT    ;STORE DATA
011702  104000                          ERROR
011704  042777  000001  177312  RV18A:  BIC     #BIT0,@DPRS     ;CLEAR STRIP SYNC
011712  032767  040000  165650          BIT     #BIT14,SWR      ;TEST FOR SCOPE
011720  001047                          BNE     R18             ;BRANCH AROUND INC IF SCOPE
011722  005267  177356                  INC     RDATA           ;NEXT CHARACTER
011726  026767  177316  177350          CMP     LIMIT,RDATA
011734  001041                          BNE     R18
011736  012767  000000  177340          MOV     #0,RDATA
011744  012767  000000  177334          MOV     #0,TDATA
011752  006267  177272                  ASR     LIMIT           ;DECREASE LIMIT TO 7 BITS
011756  012777  011532  177260          MOV     #TV18,@DPTIV    ;SET UP SYNC TRANSMITTION
011764  012767  000004  177300          MOV     #4,SCNT         ;SYNC COUNT =4
011772  052777  000001  177224          BIS     #BIT0,@DPRS     ;STRIP SYNC
012000  042777  004000  177216          BIC     #BIT11,@DPRS    ;CLEAR RCV ACTIVE
012006  052777  000340  177216          BIS     #340,@DPTS      ;INT ENB + DONE
012014  056777  177256  177202          BIS     CHLEN,@DPRS     ;CHANGE CHAR LENGTH
```

```
012022  062767  000400  177246          ADD     #400,CHLEN      ;DECREASE CHAR LENGTH
012030  022767  001400  177240  R17:    CMP     #1400,CHLEN     ;HAVE ALL LENGTHS BEEN TESTED
012036  001401                          BEQ     R19             ;YES
012040  000002                  R18:    RTI                     ;NO
012042  022626                  R19:    CMP     (SP)+,(SP)+     ;ADJUST POINTER
012044  005077  177162                  CLR     @DPTS           ;CLR TRANSMITTER STATUS
012050  005077  177150                  CLR     @DPRS           ;CLR TECEIVER STATUS
012054  042767  000040  165714          BIC     #BIT5,PS        ;PRIORITY = 4
012062  000137  007042          R20:    JMP     @#RAND          ;JMP TO RANDOM DATA TEST
                        ;SYNC ROUTINE FOR RANDOM DATA TEST
```

```
                                ;SYNC ROUTINE FOR RANDOM DATA TEST

012066  032777  000200  177136  RRRT1:  BIT     #BIT7,@DPTS     ;READY
012074  001001                          BNE     .+4             ;YES
012076  104000                          ERROR                   ;REPORT ERROR
012100  016777  177162  177126          MOV     TSYNC,@DPTB     ;TRANSMIT SYNC
012106  005367  177160                  DEC     SCNT            ;2 SYNC'S
012112  001006                          BNE     RT2             ;NO
012114  012777  012132  177122          MOV     #RRT1,@DPTIV    ;YES, SET UP DATA TRANSMIT VECTOR
012122  042777  160000  177102          BIC     #160000,@DPTS   ;CLEAR ERROR BITS
012130  000002                  RT2:    RTI

                                ;RRRT, RANDOM DATA,  SYNC, RANDOM STALL
                                ;TRANSMITTER SERVICE ROUTINE

012132  032777  000200  177072  RRT1:   BIT     #BIT7,@DPTS     ;TRANSMITTER READY
012140  001001                          BNE     .+4             ;YES
012142  104000                          ERROR                   ;REPORT ERROR
012144  004567  177012                  JSR     %5,RNUM         ;GENERATE NEXT CHARACTER
012150  010167  177132                  MOV     R1,TDATA
012154  046767  177116  177124          BIC     CHLEN,TDATA     ;REDUCE DATA TO # BITS/CHAR
012162  016777  177120  177044          MOV     TDATA,@DPTB     ;TRANSMIT CHARACTER
012170  016704  177146                  MOV     TP,R4           ;SET UP TRANSMITTER POINTER
012174  016724  177106                  MOV     TDATA,(R4)+     ;MOV CHARACTER TO TUMBLE TABLE
012200  020427  012572                  CMP     R4,#TOP         ;END OF TUMBLE TABLE
012204  001002                          BNE     RT1
012206  012704  012562                  MOV     #BOTTOM,R4
012212  010467  177124          RT1:    MOV     R4,TP           ;SAVE TRANSMITTER POINTER
012216  000002                          RTI
                                ;RRRR, RANDOM DATA, RANDOM SYNC, RANDOM STALL, RECEIVER SERVICE

012220  017767  177002  177056  RRRR1:  MOV     @DPRB,RDATA     ;SAVE RECEIVED DATA
012226  016700  177112                  MOV     RP,R0           ;SET UP RECEIVER POINTER
012232  026720  177046                  CMP     RDATA,(R0)+     ;IS DATA CORRECT
012236  001406                          BEQ     RR1             ;YES
012240  026767  177040  177020          CMP     RDATA,TSYNC     ;IF NOT DATA IS IT SYNC
012246  001401                          BEQ     .+4             ;YES
012250  104000                          ERROR                   ;REPORT ERROR
012252  005740                          TST     -(R0)           ;ADJUST TUMBLE TABLE
012254  022700  012572          RR1:    CMP     #TOP,R0         ;TOP OF TUMBLE TABLE
012260  001002                          BNE     RR2             ;NO
012262  012700  012562                  MOV     #BOTTOM,R0      ;YES,RAP AROUND
012266  010067  177052          RR2:    MOV     R0,RP           ;SAVE RECEIVER POINTER
012272  042777  000001  176724          BIC     #BIT0,@DPRS     ;CLEAR STRIP SYNC
012300  000002                          RTI
```

```
                                ;TRANSMITTER SERVICE ROUTINES FOR PARITY TEST

012302  016777  176760  176724  TPRTY1: MOV     TSYNC,@DPTB     ;XMIT SYNC CHARACTER
012310  005367  176756          TPRT1:  DEC     SCNT            ;DEC SYNC COUNT
012314  001003                  BNE     TPRT1                   ;BRANCH IF LESS THAN 2 SYNCS
012316  012777  012326  176720          MOV     #TPRT2,@DPTIV   ;SET VECTOR TO TRANSMIT DATA
012324  000002                  TPRT11: RTI                     ;RETURN TO MAINLINE

012326  032777  160000  176676  TPRT21: BIT     #160000,@DPTS   ;ANY ERRORS
012334  001401                  BEQ     .+4                     ;NO
012336  104000                  ERROR                           ;REPORT ERROR
012340  016777  176742  176666          MOV     TDATA,@DPTB     ;TRANSMIT DATA
012346  005267  176734          INC     TDATA                   ;INC TRANSMIT DATA
012352  026767  176730  176670          CMP     TDATA,LIMIT     ;IS UPPER LIMIT REACHED
012360  001401                  BEQ     TPRT3                   ;YES, EXIT
012362  000002                  RTI                             ;NO, RETURN TO MAINLINE
012364  005077  176642  TPRT31: CLR     @DPTS                   ;CLEAR STATUS REGISTER
012370  000002                  RTI

                                ;RECEIVER SERVICE ROUTINE FOR PARITY TEST

        000000                  HERE=0

012372  017727  176626  000000  RPRTY1: MOV     @DPRS,#HERE     ;SAVE RCV STATUS HERE
012400  017767  176622  176674          MOV     @DPRB,TMPDAT    ;SAVE RCV DATA
012406  026767  176670  176670          CMP     TMPDAT,RDATA    ;CHECK FOR CORRECT DATA
012414  001401                  BEQ     .+4                     ;BRANCH IF DATA OK
012416  104000                  ERROR                           ;REPORT ERROR
012420  032767  010000  177750          BIT     #BIT12,RPRTY+4  ;TEST PARITY
012426  001401                  RPRT11: BEQ     .+4             ;(RPRT1)=BEQ .+4 FOR EVEN PARITY
                                                                ;(RPRT1)=BNE .+4 FOR ODD PARITY
012430  104000                          ERROR                   ;REPORT ERROR
                                                                ;EXAMIN #HERE FOR STATUS
                                                                ;       TMPDAT FOR DATA
                                                                ;       RPRT1 FOR ODD/EVEN
012432  005267  176646                  INC     RDATA           ;INC TO NEXT EXPECTED DATA
012436  005067  176672                  CLR     FLAG            ;PARITY FLAG
012442  012767  000020  176666          MOV     #16.,RCNT       ;SET ROTATE COUNT TO 16.
012450  000241                  CLC                             ;CLEAR CARRY
012452  006167  176626          RPRT21: ROL     RDATA           ;ROTATE  DATA
012456  103002                  BCC     RPRT3                   ;BRANCH IF BIT IS A "0"
012460  005167  176650                  COM     FLAG            ;SET FLAG TO A "1" FOR ODD PARITY
012464  005367  176646          RPRT31: DEC     RCNT            ;DEC ROTATE COUNT
012470  001370                  BNE     RPRT2                   ;BRANCH IF 16 BIT WORD NOT CHECKED

                                ;IF FLAG=1 EXPECTED DATA SHOULD CAUSE ODD PARITY
                                ;BIT 12="1"

012472  006167  176606                  ROL     RDATA           ;RESTORE EXPECTED DATA
012476  005767  176632                  TST     FLAG            ;TEST FOR NEXT PARITY
012502  100404                  BMI     RPRT4                   ;BRANCH FOR ODD PARITY
012504  052767  000400  177714          BIS     #BIT8,RPRT1     ;EVEN PARITY=BEQ .+4
012512  000403                  BR      RPRT5                   ;
012514  042767  000400  177704  RPRT41: BIC     #BIT8,RPRT1     ;ODD PARITY=BNE .+4
```

```
012522  042777  000001  176474  RPRT5:  BIC     #BIT0,@DPRS     ;CLEAR SYNC STRIP
012530  026767  176514  176546          CMP     LIMIT,RDATA     ;END OF DATA
012536  001401                          BEQ     RPRT6           ;YES
012540  000002                          RTI                     ;NO
012542  005077  176456          RPRT6:  CLR     @DPRS           ;CLEAR STATUS
012546  022626                          CMP     (SP)+,(SP)+     ;ADJUST STACK
012550  042767  000040  165220          BIC     #BIT5,PS        ;LOWER PRIORITY
012556  000167  175016                  JMP     OVRUN           ;JUMP TO EVERRUN TEST
012562  000000          BOTTOM: 0                               ;BOTTOM OF TUMBLE TABLE
012564  000000                  0
012566  000000                  0
012570  000000                  0
012572  000000          TOP:    0
```

```
                                ;******PART2 DB25S CONNECTOR TEST SECTION******
012574  000005                  BEGIN2: RESET
012576  012706  001100                  MOV     #BEGIN1,SP      ;SET UP STACK POINTER
012602  012767  000340  165166          MOV     #340,PS         ;SET PROCESSOR PRIORITY = 7
012610  032767  000200  164752          BIT     #BIT7,SWR       ;TEST FOR CHANGE IN DP ADRS
012616  001404                        BEQ     BGN0A           ;BRANCH IF NO CHANGE
012620  004767  166446                JSR     %7,CLRVEC       ;LOAD ENTIRE VECTOR AREA WITH
                                                                ; ,+2
                                                                ; HALT
012624  004767  166310                JSR     %7,LINE,N       ;FETCH LINE NUMBER FROM SWR
012630  000167  000204          BGN0A:  JMP     BGN3

                                ,MACR   DELAY   N               ;WHERE N=TENS OF MICROSECONDS
                                        MOV     #N,CNT          ;SET UP COUNT
                                DEL=.
                                        DEC     CNT             ;TIME OUT
                                        BNE     DEL             ;NO
                                ,ENDM                           ;YES

                                ;
                                ;MACRO TO TEST READ/WRITE AND CLEAR CAPABILITY OF
                                ;ALL BITS IN XMIT & RCV STATUS

                                ,MACR   BITSR   N,R                     ;BIT TEST STATUS REG "R" BIT "N"
                                        BIS     #BIT'N',@DP'R'S         ;SET BIT N
                                        BIT     #BIT'N',@DP'R'S         ;BIT N SET?
                                        BNE     ,+4                     ;YES
                                        ERROR                           ;REPORT ERROR
                                        BIC     #BIT'N',@DP'R'S         ;CLEAR BIT N
                                        BIT     #BIT'N',@DP'R'S         ;BIT CLEAR
                                        BEQ     ,+4                     ;YES
                                        ERROR                           ;REPORT ERROR
                                        BIS     #BIT'N',@DP'R'S         ;SET BIT N
                                        BIT     #BIT'N',@DP'R'S
                                        BNE     ,+4
                                        ERROR                           ;REPORT ERROR
                                        CLR     @DP'R'S                 ;CLEAR BIT "N" BY CLR
                                        BIT     #BIT'N',@DP'R'S
                                        BEQ     ,+4
                                        ERROR                           ;REPORT ERROR
                                ,ENDM
```

```
                                ;CLOCK,SUBROUTINE TO RUN SOFTWARE CLOCK
                                ;NUMBER OF CYCLES IS FETCHED  CALL

012634  012567  176416          CLOCK:  MOV     (R5)+,CLKCNT            ;FETCH CLOCK COUNT
012640  032767  000400  176404          BIT     #BIT8,SAVSR1            ;12/8 BITS/CHAR
012646  001411                        BEQ     CLK                     ;BRANCH IF 8 BITS/CHAR
012650  052777  002000  176346        BIS     #BIT10,@DPRS            ;SELECT 12 BIT MODE
012656  052767  000400  176364        BIS     #BIT8,LIMIT             ;9 BIT SYNC
012664  062767  000004  176364        ADD     #4,CLKCNT               ;INCREASE CLOCK COUNT
012672  052777  000010  176332  CLK:   BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        012700                  DEL=.
012700  016767  000042  176362        MOV     FREQ,CNT                ;SET UP DELAY COUNT
012706  005367  176356                DEC     CNT                     ;DECREMENT COUNT
012712  001372                        BNE     DEL                     ;BRANCH IF NO TIMEOUT
012714  042777  000010  176310        BIC     #BIT3,@DPTS             ;SET CLOCK LOW
        012722                  DEL=.
012722  016767  000020  176340        MOV     FREQ,CNT                ;SET UP DELAY COUNT
012730  005367  176334                DEC     CNT                     ;DECREMENT COUNT
012734  001372                        BNE     DEL                     ;BRANCH IF NO TIMEOUT
012736  005367  176314                DEC     CLKCNT
012742  001353                        BNE     CLK
012744  000205                        RTS     X5
012746  000001          FREQ:   1                                       ;NORMAL 12.8 US DELAY
                                                                        ;PATCH FOR 50 FT CABEL


                                ;MCLOK, MACRO TO RUN SOFTWARE CLOCK N CYCLES
                                .MACR MCLOK     N                       ;CLOCK N TIMES
                                        MOV     #N,CLKCNT               ;CLOCK COUNT
                                MCLK=.
                                        BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
                                DEL=.
                                        MOV     FREQ,CNT                ;SET UP DELAY COUNT
                                        DEC     CNT                     ;DECREMENT COUNT
                                        BNE     DEL                     ;BRANCH IF NO TIMEOUT
                                        BIC     #BIT3,@DPTS             ;SET CLOCK LOW
                                DEL=.
                                        MOV     FREQ,CNT                ;SET UP DELAY COUNT
                                        DEC     CNT                     ;DECREMENT COUNT
                                        BNE     DEL                     ;BRANCH IF NO TIMEOUT
                                        DEC     CLKCNT
                                        BNE     MCLK
                                .ENDM


                                ;REE, SUBROUTINE TO REINITIALIZE DP11 FOR NEXT TEST

012750  012767  000200  165020  REE:   MOV     #200,PS                 ;SET PRIORITY TO 4
012756  005077  176250                CLR     @DPTS                   ;CLEAR XMIT STATUS
012762  005077  176236                CLR     @DPRS                   ;CLEAR RCV STATUS
012766  105077  176244                CLRB    @SEXT                   ;CLEAR SYNC EXTENTION
012772  012767  000001  176266        MOV     #1,TSYNC                ;INIT TEST SYNC
013000  012777  011476  176232        MOV     #FRINT,@DPRIV           ;SET UP RVI INT VECTOR
013006  012777  011532  176230        MOV     #TV18,@DPTIV            ;SET XMIT INT VECTOR TO SYNC
```

```
013014  032767  000400  176230          BIT     #BIT8,SAVSR1            ;TEST FOR 8/12 BITS/CHAR
013022  001405                          BEQ     REE1                    ;EXIT IF 8 BITS
013024  062705  000010                  ADD     #10,R5                  ;SET RETURN ADRS FOR 12 BIT LIMIT
013030  052777  002000  176166          BIS     #BIT10,@DPRS            ;SET 12 BIT/CHAR MODE
013036  000205                  REE1:   RTS     %5                      ;RETURN
                                ;******TEST 1: CABLE TESTS

013040  012767  013054  176110  BGN3:   MOV     #BGN3A,RETURN           ;SET UP SCOPE RETURN
013046  012767  000000  176076          MOV     #0,,ICOUNT              ;ITERATION = 0;
013054  104400                  BGN3A:  SCOPE
013056  000005                          RESET
013060  112777  000026  176142          MOVB    #26,@SYNC               ;CLEAR NOISE FROM SYNC
013066  012767  013040  175736          MOV     #BGN3,PUP1+2            ;SET UP PFAIL RETURN ADRS
013074  005077  176132                  CLR     @DPTS                   ;CLEAR TRANSMITTER STATUS
013100  105077  176132                  CLRB    @SEXT                   ;CLEAR SYNC EXT
013104  005077  176114                  CLR     @DPRS                   ;CLEAR RECEIVER STATUS
013110  012777  011472  176126          MOV     #FTINT,@DPTIV           ;SET UP TRANSMITTER TEST VECTOR 1
013116  012777  011476  176114          MOV     #FRINT,@DPRIV           ;SET UP RECEIVER TEST VECTOR 1
013124  012777  000240  176110          MOV     #240,@DPRP              ;SET UP RECEIVER PRIORITY=6
013132  012777  000240  176106          MOV     #240,@DPTP              ;SET UP TRANSMITTER PRIORITY=6
013140  004567  177470                  JSR     %5,CLOCK                ;RUN CLOCK
013144  000030                          30
```

```
                                ;SYNCHRONIZATION CHARACTER TEST 8/12 BITS/CHARACTER
                                ;INTERRUPT ENABLE, COMPARE SYNC, TEST PARITY
213146  004567  177576          JSR     %5,REE                  ;REINIT FOR TEST
213152  012767  000376  176070  MOV     #376,LIMIT              ;8 BIT SYNC LIMIT
213160  000403                  BR      .+10                    ;BRANCH AROUND 12 BIT LIMIT
                                ;REE WILL ENER HERE IF 12 BITS/CHAR
213162  012767  007776  176060  MOV     #7776,LIMIT             ;SET UP 12 BITS/CHAR LIMIT
213170  012767  013512  003706  MOV     #SSYC4A,SRV5B           ;SET UP RCV SERVICE RETURN
213176  012777  011532  176040  SSYC4:  MOV     #TV18,@DPTIV            ;SET XMIT INT VECTOR TO SYNC
213204  012767  000003  176060  MOV     #3,SCNT                 ;SYNC COUNT = 3

213212  004567  177416          JSR     %5,CLOCK                ;RUN CLOCK
213216  000030                  30
213220  116777  176042  176002  MOVB    TSYNC,@SYNC             ;LOAD SYNC BUFFER
213226  116777  176035  176002  MOVB    TSYNC+1,@SEXT           ;LOAD SYNC EXT
213234  052777  000100  175762  BIS     #BIT6,@DPRS             ;RCV INT ENB
213242  052777  000300  175762  BIS     #300,@DPTS              ;XMIT INT ENB
                                MCLOK   3
213250  012767  000003  176000  MOV     #3,CLKCNT               ;CLOCK COUNT
        013256
                                MCLK=.
213256  052777  000010  175746  BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        013264
                                DEL=.
213264  016767  177456  175776  MOV     FREQ,CNT                ;SET UP DELAY COUNT
213272  005367  175772          DEC     CNT                     ;DECREMENT COUNT
213276  001372                  BNE     DEL                     ;BRANCH IF NO TIMEOUT
213300  042777  000010  175724  BIC     #BIT3,@DPTS             ;SET CLOCK LOW
        013306
                                DEL=.
213306  016767  177434  175754  MOV     FREQ,CNT                ;SET UP DELAY COUNT
213314  005367  175750          DEC     CNT                     ;DECREMENT COUNT
213320  001372                  BNE     DEL                     ;BRANCH IF NO TIMEOUT
213322  005367  175730          DEC     CLKCNT
213326  001353                  BNE     MCLK
213330  032777  001000  175674  BIT     #BIT9,@DPTS             ;SEND REQUEST UP?
213336  001001                  BNE     .+4                     ;YES
213340  104000                  ERROR                           ;REPORT ERROR
213342  004567  177266          JSR     %5,CLOCK                ;RUN CLOCK
213346  000010                  10
213350  032777  004000  175646  BIT     #BIT11,@DPRS            ;RECEIVER ACTIVE
213356  001401                  BEQ     .+4                     ;NO
213360  104000                  ERROR                           ;REPORT ERROR
213362  004567  177246          JSR     %5,CLOCK                ;RUN CLOCK
213366  000007                  7
213370  032777  004000  175634  BIT     #BIT11,@DPTS            ;RCV    ACTIVE?
213376  001401                  BEQ     .+4                     ;NO
213400  104000                  ERROR                           ;REPORT ERROR
                                MCLOK   1
213402  012767  000001  175646  MOV     #1,CLKCNT               ;CLOCK COUNT
        013410
                                MCLK=.
213410  052777  000010  175614  BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        013416
                                DEL=.
213416  016767  177324  175644  MOV     FREQ,CNT                ;SET UP DELAY COUNT
213424  005367  175640          DEC     CNT                     ;DECREMENT COUNT
213430  001372                  BNE     DEL                     ;BRANCH IF NO TIMEOUT
213432  042777  000010  175572  BIC     #BIT3,@DPTS             ;SET CLOCK LOW
```

```
        013440                          DEL=.
013440  016767  177302  175622          MOV     FREQ,CNT                ;SET UP DELAY COUNT
013446  005367  175616                  DEC     CNT                     ;DECREMENT COUNT
013452  001372                          BNE     DEL                     ;BRANCH IF NO TIMEOUT
013454  005367  175576                  DEC     CLKCNT
013460  001353                          BNE     MCLK
013462  032777  004000  175534          BIT     #BIT11,@DPRS            ;RCV ACTIVE?
013470  001001                          BNE     .+4                     ;YES
013472  104000                          ERROR                           ;REPORT ERROR
013474  012777  017044  175536          MOV     #SRV5,@DPRIV            ;TEST PASS VECTOR
013502  004567  177126                  JSR     %5,CLOCK                ;RUN CLOCK
013506  000010                          10
013510  104000                          ERROR                           ;REPORT ERROR
013512  042777  004000  175504  SSYC4A: BIC     #BIT11,@DPRS            ;CLEAR ACTIVE
013520  042777  000100  175504          BIC     #BIT6,@DPTS             ;CLEAR INT ENB
013526  032767  040000  164034          BIT     #BIT14,SWR              ;TEST FOR SCOPE LOOP
013534  001220                          BNE     SSYC4                   ;BRANCH IF SCOPE LOOP
013536  112777  000026  175464          MOVB    #26,@SYNC               ;CHANGE SYNC
013544  005267  175516                  INC     TSYNC                   ;NEXT SYNC, ENTRY FROM INTERRUPT
013550  026767  175474  175510          CMP     LIMIT,TSYNC             ;HAVE ALL SYNC'S BEEN TESTED
013556  001207                          BNE     SSYC4
```

```
                                ;SYNCHRONIZATION CHARACTER TEST 7/11 BITS/CHARACTER
                                ;INTERRUPT ENABLE AND SYNC CHARACTER CHECK
013560  004567  177164          JSR     %5,REE                  ;REINIT  DP11
                                ;RETURN HERE IF 8 BITS/CHAR
013564  012767  000176  175456  MOV     #176,LIMIT              ;7 BIT LIMIT
013572  000403                  BR      .+10                    ;BRANCH AROUND 12 BITS/CHAR LIMIT
                                ;RTETURN HERE IF 12 BITS/CHAR
013574  012767  003776  175446  MOV     #3776,LIMIT             ;11 BITS/CHAR LIMIT
013602  052777  000400  175414  BIS     #BIT8,@DPRS             ;7/11 BITS PER CHAR
013610  012767  014132  003266  MOV     #SSYC5A,ERV5B           ;SET UP RCV SERVICE RETURN
013616  012777  011476  175414  MOV     #FRINT,@DPRIV           ;FALSE INT TEST VECTOR
013624  012777  011532  175412  SSYC5I: MOV     #TV18,@DPTIV            ;SET XMIT INT VECTOR TO SYNC
013632  012767  000003  175432  MOV     #3,SCNT                 ;XMIT 3 SYNCS
013640  004567  176770          JSR     %5,CLOCK                ;RUN CLOCK
013644  000024                  24
013646  116777  175414  175354  MOVB    TSYNC,@SYNC             ;LOAD SYNC BUFFER
013654  052777  000300  175350  BIS     #300,@DPTS              ;XMIT INT ENB
013662  052777  000100  175334  BIS     #BIT6,@DPRS             ;RCINT ENB
                                MCLOK   3
013670  012767  000003  175360  MOV     #3,CLKCNT               ;CLOCK COUNT
        013676
                                MCLK=.
013676  052777  000010  175326  BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        013704
                                DEL=.
013704  016767  177036  175356  MOV     FREQ,CNT                ;SET UP DELAY COUNT
013712  005367  175352          DEC     CNT                     ;DECREMENT COUNT
013716  001372                  BNE     DEL                     ;BRANCH IF NO TIMEOUT
013720  042777  000010  175304  BIC     #BIT3,@DPTS             ;SET CLOCK LOW
        013726
                                DEL=.
013726  016767  177014  175334  MOV     FREQ,CNT                ;SET UP DELAY COUNT
013734  005367  175330          DEC     CNT                     ;DECREMENT COUNT
013740  001372                  BNE     DEL                     ;BRANCH IF NO TIMEOUT
013742  005367  175310          DEC     CLKCNT
013746  001353                  BNE     MCLK
013750  032777  001000  175254  BIT     #BIT9,@DPTS             ;SEND REQUEST UP?
013756  001001                  BNE     .+4
013760  104000                  ERROR                           ;REPORT ERROR
013762  004567  176646          JSR     %5,CLOCK                ;RUN CLOCK
013766  000007                  7
013770  032777  004000  175226  BIT     #BIT11,@DPRS            ;RECEIVER ACTIVE
013776  001401                  BEQ     .+4                     ;NO
014000  104000                  ERROR                           ;REPORT ERROR
014002  004567  176626          JSR     %5,CLOCK                ;RUN CLOCK
014006  000006                  6
014010  032777  004000  175214  BIT     #BIT11,@DPTS            ;RCV ACTIVE?
014016  001401                  BEQ     .+4                     ;NO
014020  104000                  ERROR                           ;REPORT ERROR
                                MCLOK   1
014022  012767  000001  175226  MOV     #1,CLKCNT               ;CLOCK COUNT
        014030
                                MCLK=.
014030  052777  000010  175174  BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        014036
                                DEL=.
014036  016767  176704  175224  MOV     FREQ,CNT                ;SET UP DELAY COUNT
014044  005367  175220          DEC     CNT                     ;DECREMENT COUNT
014050  001372                  BNE     DEL                     ;BRANCH IF NO TIMEOUT
```

```
014052  042777  000010  175152          BIC     #BIT3,@DPTS             ;SET CLOCK LOW
        014060
                                DEL=.,
014060  016767  176662  175202          MOV     FREQ,CNT                ;SET UP DELAY COUNT
014066  005367  175176                  DEC     CNT                     ;DECREMENT COUNT
014072  001372                          BNE     DEL                     ;BRANCH IF NO TIMEOUT
014074  005367  175156                  DEC     CLKCNT
014100  001353                          BNE     MCLK
014102  032777  004000  175114          BIT     #BIT11,@DPRS            ;RCV ACTIVE?
014110  001001                          BNE     .+4                     ;YES
014112  104000                          ERROR                           ;REPORT ERROR
014114  012777  017044  175116          MOV     #SRV5,@DPRIV            ;TEST PASS VECTOR
014122  004567  176506                  JSR     X5,CLOCK                ;RUN CLOCK
014126  000007                          7
014130  104000                          ERROR                           ;REPORT ERROR
014132  042777  004000  175064  SSYC5A: BIC     #BIT11,@DPRS            ;CLEAR RCV ACTIVE
014140  042777  000100  175064          BIC     #BIT6,@DPTS             ;CLEAR XMIT INT ENB
014146  112777  000026  175054          MOVB    #26,@SYNC               ;DUMMY SYNC
014154  032767  040000  163406          BIT     #BIT14,SWR              ;TEST FOR SCOPE LOOP
014162  001220                          BNE     SSYC5                   ;BRANCH IF SCOPE
014164  005267  175076                  INC     TSYNC                   ;NEXT SYNC
014170  026767  175054  175070          CMP     LIMIT,TSYNC             ;HAVE ALL SYNC'S BEEN TESTED
014176  001212                          BNE     SSYC5

                                ;SYNCHRONIZATION CHARACTER TEST 6/10 BITS/CHARACTER
                                ;INTERRUPT ENABLE AND SYNC CHARACTER CHECK
014200  004567  176544                  JSR     X5,REE                  ;REINIT DP11
014204  012767  000075  175036          MOV     #75,LIMIT               ;6 BIT LIMIT
014212  000403                          BR      .+10                    ;BRANCH AROUND 10 BIT LIMIT
                                ;RETURN HERE IF 10 BITS/CHAR
014214  012767  001775  175026          MOV     #1775,LIMIT             ;SET UP 10 BITS/CHAR
014222  052777  001000  174774          BIS     #BIT9,@DPRS             ;6/10 BITS/CHAR
014230  012767  014566  002646          MOV     #SSYC6A,SRV5B           ;SET UP RCV SERVICE RETURN
014236  012777  011532  175000  SSYC6I: MOV     #TV18,@DPTIV            ;SET XMIT INT VECTOR TO SYNC
014244  012767  000003  175020          MOV     #3,SCNT                 ;XMIT 3 SYNCS
014252  042777  000100  174752          BIC     #BIT6,@DPTS             ;CLEAR XMIT INT ENB
014260  042777  004000  174736          BIC     #BIT11,@DPRS            ;CLEAR ACTIVE
014266  112777  000026  174734          MOVB    #26,@SYNC               ;CHALGE SYNC
014274  004567  176334                  JSR     X5,CLOCK                ;RUN CLOCK
014300  000021                          21
014302  116777  174760  174720          MOVB    TSYNC,@SYNC             ;LOAD SYNC BUFFER
014310  052777  000100  174706          BIS     #BIT6,@DPRS             ;RCVINT ENB
014316  052777  000300  174706          BIS     #300,@DPTS              ;XMIT INT ENB
                                        MCLOK   3
014324  012767  000003  174724          MOV     #3,CLKCNT               ;CLOCK COUNT
        014332
                                MCLK=.,
014332  052777  000010  174672          BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        014340
                                DEL=.,
014340  016767  176402  174722          MOV     FREQ,CNT                ;SET UP DELAY COUNT
014346  005367  174716                  DEC     CNT                     ;DECREMENT COUNT
014352  001372                          BNE     DEL                     ;BRANCH IF NO TIMEOUT
014354  042777  000010  174650          BIC     #BIT3,@DPTS             ;SET CLOCK LOW
        014362
                                DEL=.,
014362  016767  176360  174700          MOV     FREQ,CNT                ;SET UP DELAY COUNT
014370  005367  174674                  DEC     CNT                     ;DECREMENT COUNT
014374  001372                          BNE     DEL                     ;BRANCH IF NO TIMEOUT
```

```
014376  005367  174654                DEC     CLKCNT
014402  001353                        BNE     MCLK
014404  032777  001000  174620        BIT     #BIT9,@DPTS             ;SEND REQUEST UP?
014412  001001                        BNE     .+4
014414  104000                        ERROR                           ;REPORT ERROR
014416  004567  176212                JSR     %5,CLOCK                ;RUN CLOCK
014422  000006                        6
014424  032777  004000  174572        BIT     #BIT11,@DPRS            ;RECEIVER ACTIVE
014432  001401                        BEQ     .+4                     ;NO
014434  104000                        ERROR                           ;REPORT ERROR
014436  004567  176172                JSR     %5,CLOCK                ;RUN CLOCK
014442  000005                        5
014444  032777  004000  174560        BIT     #BIT11,@DPTS            ;RCV ACTIVE?
014452  001401                        BEQ     .+4                     ;NO
014454  104000                        ERROR                           ;REPORT ERROR
                                      MCLOK   1
014456  012767  000001  174572        MOV     #1,CLKCNT               ;CLOCK COUNT
        014464                MCLK=.
014464  052777  000010  174540        BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        014472                DEL=.
014472  016767  176250  174570        MOV     FREQ,CNT                ;SET UP DELAY COUNT
014500  005367  174564                DEC     CNT                     ;DECREMENT COUNT
014504  001372                        BNE     DEL                     ;BRANCH IF NO TIMEOUT
014506  042777  000010  174516        BIC     #BIT3,@DPTS             ;SET CLOCK LOW
        014514                DEL=.
014514  016767  176226  174546        MOV     FREQ,CNT                ;SET UP DELAY COUNT
014522  005367  174542                DEC     CNT                     ;DECREMENT COUNT
014526  001372                        BNE     DEL                     ;BRANCH IF NO TIMEOUT
014530  005367  174522                DEC     CLKCNT
014534  001353                        BNE     MCLK
014536  032777  004000  174460        BIT     #BIT11,@DPRS            ;RCV ACTIVE?
014544  001001                        BNE     .+4                     ;YES
014546  104000                        ERROR                           ;REPORT ERROR
014550  012777  017044  174462        MOV     #SRV5,@DPRIV            ;TEST VECTOR
014556  004567  176052                JSR     %5,CLOCK                ;RUN CLOCK
014562  000006                        6
014564  104000                        ERROR                           ;REPORT ERROR

014566  042777  004000  174430  SSYC6A: BIC   #BIT11,@DPRS
014574  112777  000026  174426        MOVB    #26,@SYNC
014602  032767  040000  162760        BIT     #BIT14,SWR              ;TEST FOR SCOPE LOOP
014610  001212                        BNE     SSYC6                   ;BRANCH IF SCOPE
014612  005267  174450                INC     TSYNC                   ;NEXT SYNC
014616  026767  174426  174442        CMP     LIMIT,TSYNC             ;HAVE ALL SYNC'S BEEN TESTED
014624  001402                        BEQ     .+6                     ;YES
014626  000167  177404                JMP     SSYC6                   ;NO
014632  104400                        SCOPE
```

```
                        ;INTERRUPT DRIVEN SEQUENTIAL DATA TEST

014634  005067  174312          SSEQD1  CLR     ICOUNT                  ;SET ITERATION COUNT TO 1
014640  105077  174372                  CLRB    @SEXT                   ;CLEAR SYNC EXTENTION
014644  005067  174434                  CLR     RDATA                   ;RECEIVER DATA
014650  005067  174432                  CLR     TDATA                   ;TRANSMITTER DATA
014654  005077  174344                  CLR     @DPRS                   ;RECEIVER STATUS
014660  005077  174346                  CLR     @DPTS                   ;TRANSMITTER STATUS
014664  052777  000001  174332          BIS     #BIT0,@DPRS             ; STRIP SYNC
014672  012767  015146  175164          MOV     #R2AND,R20+2            ;SET UP RETURN ADDRESS
                                                                        ;REPLACE #R2AND WITH #SSEQD
                                                                        ;FOR CONTINUOUS DATA
014700  012767  000400  174370          MOV     #400,CHLEN              ;CHAR LENGTH INDEX
014706  032767  000400  174336          BIT     #BIT8,SAVSR1            ;TEST 12 BIT CHAR MODE
014714  001414                          BEQ     SSEQD2                  ;NO
014716  012767  010000  174324          MOV     #10000,LIMIT            ;SELECT END OF DATA
014724  052777  002000  174272          BIS     #BIT10,@DPRS            ;SELECT 12 BITS/CHARACTER
014732  012767  000426  174326          MOV     #426,TSYNC              ;SYNC FOR 12 BIT CHAR
014740  105277  174272                  INCB    @SEXT                   ;PLACE MSB OF SYNC IN SYNC EXT
014744  000406                          BR      SSEQD3
014746  012767  000400  174274  SSEQD21 MOV     #400,LIMIT              ;TEMPORARY CHARACTER LIMIT
014754  012767  000026  174304          MOV     #26,TSYNC               ;INIT SYNC STORAGE
014762  012777  011532  174254  SSEQD31 MOV     #TV18,@DPTIV            ;TRANSMITTER VECTOR
014770  012777  011652  174242          MOV     #RV18,@DPRIV            ;RECEIVER VECTOR
014776  012767  000200  162772          MOV     #200,PS                 ;PRIORITY=4
015004  012767  000004  174260          MOV     #4,SCNT                 ;SYNC COUNT=4
015012  116777  174250  174210          MOVB    TSYNC,@SYNC             ;LOAD SYNC
015020  052777  000100  174176          BIS     #BIT6,@DPRS             ;RCV INT ENB
015026  052777  000340  174176          BIS     #340,@DPTS              ;STATUS INT ENB
                                                                        ;TRANS INT ENB
                                                                        ;TRANS DONE

015034  022767  000001  175704          CMP     #1,FREQ                 ;TEST FOR HIGH SPEED
015042  001010                          BNE     SCLK3                   ;BRANCH IF NOT HIGH SPEED

015044  052777  000010  174160  SCLK21  BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
015052  042777  000010  174152          BIC     #BIT3,@DPTS             ;SET CLOCK LOW
015060  000771                          BR      SCLK2
015062  000000                          HALT

                                SCLK31  MCLOK   1                       ;RUN SLOW CLOCK
015064  012767  000001  174164          MOV     #1,CLKCNT               ;CLOCK COUNT
        015072                  MCLK=.
015072  052777  000010  174132          BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        015100                  DEL=.
015100  016767  175642  174162          MOV     FREQ,CNT                ;SET UP DELAY COUNT
015106  005367  174156                  DEC     CNT                     ;DECREMENT COUNT
015112  001372                          BNE     DEL                     ;BRANCH IF NO TIMEOUT
015114  042777  000010  174110          BIC     #BIT3,@DPTS             ;SET CLOCK LOW
        015122                  DEL=.
015122  016767  175620  174140          MOV     FREQ,CNT                ;SET UP DELAY COUNT
015130  005367  174134                  DEC     CNT                     ;DECREMENT COUNT
015134  001372                          BNE     DEL                     ;BRANCH IF NO TIMEOUT
015136  005367  174114                  DEC     CLKCNT
015142  001353                          BNE     MCLK
```

```
015144  000747                          BR      SCLK3


                                ;*************************************************************

                                ;RANDOM DATA RANDOM IDLE


015146  104400                  R2AND:  SCOPE
015150  005067  173776                  CLR     ICOUNT                  ;ITERATIONS = 1
015154  105077  174056                  CLRB    @SEXT                   ;CLEAR SYNC EXTENTION
015160  012767  177400  174110          MOV     #177400,CHLEN           ;SET CHAR LENGTH TO 8 BITS
015166  012767  000026  174072          MOV     #26,TSYNC               ;SYNC = 26
015174  116777  174066  174026          MOVB    TSYNC,@SYNC             ;LOAD SYNC BUFFER
015202  012701  015371                  MOV     #15371,R1               ;PRIME RANDOM # GEN
015206  012702  072414                  MOV     #72414,R2
015212  012703  004036                  MOV     #4036,R3
015216  104400                          SCOPE
015220  004767  000112                  JSR     X7,A2ND
015224  104400                          SCOPE

                                ;REPEAT PREVIOUS TEST AT 7 BITS/CHAR

015226  012767  177600  174042          MOV     #177600,CHLEN           ;SET CHAR LENGHT TO 7 BITS
015234  052777  000400  173762          BIS     #BIT8,@DPRS             ;7 BITS/CHAR
015242  042777  004000  173754          BIC     #BIT11,@DPRS            ;CLEAR ACTIVE

015250  104400                  R2ANDA: SCOPE
015252  004767  000060                  JSR     X7,A2ND
015256  104400                          SCOPE
```

```
                                ;REPEAT PREVIOUS TEST AT 6 BITS/CHAR

015260  012767  177700  174010            MOV     #177700,CHLEN           ;SET CHAR LENGTH TO 6 BITS
015266  042777  000400  173730            BIC     #BIT8,@DPRS
015274  052777  001000  173722            BIS     #BIT9,@DPRS             ;SET MODE TO 6 BITS/CHAR
015302  042777  004000  173714            BIC     #BIT11,@DPRS            ;CLEAR ACTIVE

015310  104400                    R2ANDB1 SCOPE
015312  004767  000020                    JSR     %7,A2ND
015316  104400                            SCOPE
015320  042777  007700  173676  L200P1    BIC     #7700,@DPRS             ;CLEAR RCV STATUS
015326  042777  160343  173676            BIC     #160343,@DPTS           ;CLEAR XMIT STATUS
015334  000550                            BR      SENDR
                                ;COMMON DATA AND IDLE SUBROUTINE

015336  042777  004300  173660  A2ND1     BIC     #4300,@DPRS             ;RCV INT ENB, RCV ACTIVE
015344  042777  160342  173660            BIC     #160342,@DPTS           ;INT ENBS IDLE SYNC, ERRORS
015352  012767  012562  173764            MOV     #BOTTOM,RP              ;RP = BOTTOM OF TUMBLE TABLE
015360  016767  173760  173754            MOV     RP,TP                   ;SET UP TRANSMIT POINTER
015366  012767  000004  173556            MOV     #4,ICOUNT               ;ITERATIONS = 10
015374  012777  012220  173636            MOV     #RRRR,@DPRIV            ;RCV INT VECTOR
015402  012777  012066  173634            MOV     #RRRT,@DPTIV            ;XMIT INT VECTOR
015410  012767  000002  173654            MOV     #2,SCNT                 ;SYNC COUNT = 2
015416  110267  173664                    MOVB    R2,TDATA                ;RANDOM DATA
015422  016777  173640  173604            MOV     TSYNC,@DPTB             ;LOAD BUFFER
015430  052777  000100  173566            BIS     #100,@DPRS              ;RCV INT ENB
015436  052777  000140  173566            BIS     #140,@DPTS              ;XMIT INT ENB
015444  010167  173670          T2IM0:    MOV     R1,TIME                 ;"ON" STALL
                                T2IM1:    MCLOK   1
015450  012767  000001  173600            MOV     #1,CLKCNT               ;CLOCK COUNT
        015456
                                MCLK=.
015456  052777  000010  173546            BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        015464
                                DEL=.
015464  016767  175256  173576            MOV     FREQ,CNT                ;SET UP DELAY COUNT
015472  005367  173572                    DEC     CNT                     ;DECREMENT COUNT
015476  001372                            BNE     DEL                     ;BRANCH IF NO TIMEOUT
015500  042777  000010  173524            BIC     #BIT3,@DPTS             ;SET CLOCK LOW
        015506
                                DEL=.
015506  016767  175234  173554            MOV     FREQ,CNT                ;SET UP DELAY COUNT
015514  005367  173550                    DEC     CNT                     ;DECREMENT COUNT
015520  001372                            BNE     DEL                     ;BRANCH IF NO TIMEOUT
015522  005367  173530                    DEC     CLKCNT
015526  001353                            BNE     MCLK
015530  005367  173604                    DEC     TIME                    ;0.6 SEC AVERAGE
015534  001345                            BNE     T2IM1
015536  042777  000140  173466            BIC     #140,@DPTS              ;TURN OFF INT ENB
015544  052777  000002  173460            BIS     #BIT1,@DPTS             ;IDLE SYNC
015552  004567  173404                    JSR     %5,RNUM                 ;GENERATE "STALL" TIME
015556  010167  173556                    MOV     R1,TIME                 ;
                                T2IM2:    MCLOK   1
015562  012767  000001  173466            MOV     #1,CLKCNT               ;CLOCK COUNT
        015570
                                MCLK=.
015570  052777  000010  173434            BIS     #BIT3,@DPTS             ;SET CLOCK HIGH
        015576
                                DEL=.
```

```
015576  016767  175144  173464          MOV     FREQ,CNT                ;SET UP DELAY COUNT
015604  005367  173460                  DEC     CNT                     ;DECREMENT COUNT
015610  001372                          BNE     DEL                     ;BRANCH IF NO TIMEOUT
015612  042777  000010  173412          BIC     #BIT3,@DPTS             ;SET CLOCK LOW
        015620
                                DEL=.
015620  016767  175122  173442          MOV     FREQ,CNT                ;SET UP DELAY COUNT
015626  005367  173436                  DEC     CNT                     ;DECREMENT COUNT
015632  001372                          BNE     DEL                     ;BRANCH IF NO TIMEOUT
015634  005367  173416                  DEC     CLKCNT
015640  001353                          BNE     MCLK
015642  005367  173472                  DEC     TIME                    ;COUNT IDLE TIME
015646  001345                          BNE     T2IM2                   ;TIME OUT?
015650  004567  173306                  JSR     %5,RNUM                 ;GENERATE "ON" TIME + SYNC
015654  000207                          RTS     %7
```

```
                                ;DB255 TEST CONNECTOR DISCRETE EVENTS TEST

                                ;VERIFY "SEND REQUEST" RAISES "CLEAR-TO-SEND" AND "MODEM READY"
                                ;WHEN TRANSMITTER BUFFER IS LOADED

015656  104400                  SENDR1  SCOPE
015660  012767  000010  173264          MOV     #10,ICOUNT      ;ITERATIONS = 10
015666  012767  000240  162102          MOV     #240,PS         ;PRIORITY=5
015674  005077  173332                  CLR     @DPTS           ;CLR XMIT STATUS
015700  005077  173320                  CLR     @DPRS           ;CLR RCV STATUS
015704  004567  174724                  JSR     %5,CLOCK        ;RUN CLOCK
015710  000010                          10
015712  012777  011472  173324          MOV     #FTINT,@DPTIV   ;XMIT ERROR TRAP VECTOR
015720  012777  011476  173312          MOV     #FRINT,@DPRIV   ;RCV ERROR TRAP VECTOR
015726  052777  000040  173276          BIS     #BIT5,@DPTS     ;STATUS+RDY INT ENB
015734  016777  173346  173272          MOV     TDATA,@DPTB     ;LOAD BUFFER
015742  004567  174666                  JSR     %5,CLOCK        ;RUN CLOCK
015746  000003                          3
015750  032777  001000  173254          BIT     #BIT9,@DPTS     ;"SEND REQUEST" ON
015756  001001                          BNE     .+4             ;YES
015760  104000                          ERROR                   ;REPORT ERROR
015762  032777  002000  173242          BIT     #BIT10,@DPTS    ;CLEAR-TO-SEND" UP?
015770  001001                          BNE     .+4             ;YES
015772  104000                          ERROR                   ;REPORT ERROR
015774  032777  010000  173230          BIT     #BIT12,@DPTS    ;"MODEM READY" UP
016002  001001                          BNE     .+4             ;YES
016004  104000                          ERROR                   ;REPORT ERROR
016006  004567  174622                  JSR     %5,CLOCK        ;RUN CLOCK
016012  000012                          12
016014  032777  001000  173210          BIT     #BIT9,@DPTS     ;"SEND REQUEST" DOWN
016022  001401                          BEQ     .+4             ;YES

016024  104000                          ERROR                   ;REPORT ERROR
016026  032777  002000  173176          BIT     #BIT10,@DPTS    ;"CLEAR-TO-SEND" DOWN
016034  001401                          BEQ     .+4             ;YES
016036  104000                          ERROR                   ;REPORT ERROR
016040  032777  010000  173164          BIT     #BIT12,@DPTS    ;"MODEM READY" DOWN
016046  001401                          BEQ     .+4             ;YES
016050  104000                          ERROR                   ;REPORT ERROR

                                ;PERFORM PREVIOUS TEST AT 7/11 BITS/CHARACTER

016052  012767  000240  161716          MOV     #240,PS         ;PRIORITY = 5
016060  005077  173146                  CLR     @DPTS           ;CLR XMIT STATUS
016064  005077  173134                  CLR     @DPRS           ;CLR RCV STATUS
016070  012777  011472  173146  SENDR2: MOV     #FTINT,@DPTIV   ;XMIT ERROR TRAP VECTOR
016076  012777  011476  173134          MOV     #FRINT,@DPRIV   ;RCV ERROR TRAP VECTOR
016104  052777  000400  173112          BIS     #BIT8,@DPRS     ;7/11 BITS/CHARACTER
016112  052777  000040  173112          BIS     #BIT5,@DPTS     ;STATUS+RDY INT ENB
016120  016777  173162  173106          MOV     TDATA,@DPTB     ;LOAD BUFFER
016126  004567  174502                  JSR     %5,CLOCK        ;RUN CLOCK
016132  000003                          3
016134  032777  001000  173070          BIT     #BIT9,@DPTS     ;"SEND REQUEST" ON
016142  001001                          BNE     .+4             ;YES
```

```
016144  104000                          ERROR                   ;REPORT ERROR
016146  032777  002000  173056          BIT     #BIT10,@DPTS    ;CLEAR-TO-SEND" UP?
016154  001001                          BNE     .+4             ;YES
016156  104000                          ERROR                   ;REPORT ERROR
016160  032777  010000  173044          BIT     #BIT12,@DPTS    ;"MODEM READY" UP
016166  001001                          BNE     .+4             ;YES
016170  104000                          ERROR                   ;REPORT ERROR

016172  004567  174436                  JSR     %5,CLOCK        ;RUN CLOCK
016176  000011                          11
016200  032777  001000  173024          BIT     #BIT9,@DPTS     ;"SEND REQUEST" DOWN
016206  001401                          BEQ     .+4             ;YES
016210  104000                          ERROR                   ;REPORT ERROR
016212  032777  002000  173012          BIT     #BIT10,@DPTS    ;"CLEAR-TO-SEND"DOWN
016220  001401                          BEQ     .+4             ;YES
016222  104000                          ERROR                   ;REPORT ERROR
016224  032777  010000  173000          BIT     #BIT12,@DPTS    ;"MODEM READY" DOWN
016232  001401                          BEQ     .+4             ;YES
016234  104000                          ERROR                   ;REPORT ERROR

                                ;PERFORM PREVIOUS TEST AT 6/10 BITS/CHARACTER

016236  012767  000240  161532          MOV     #240,PS         ;PRIORITY = 5
016244  005077  172762                  CLR     @DPTS           ;CLR XMIT STATUS
016250  005077  172750                  CLR     @DPRS           ;CLR RCV STATUS
016254  012777  011472  172762  SENDR31 MOV     #FTINT,@DPTIV   ;XMIT ERROR TRAP VECTOR
016262  012777  011476  172750          MOV     #FRINT,@DPRIV   ;RCV ERROR TRAP VECTOR
016270  052777  001000  172726          BIS     #BIT9,@DPRS     ;6 BITS/CHARACTER
016276  052777  000040  172726          BIS     #BIT5,@DPTS     ;STATUS+RDY INT ENB
016304  016777  172776  172722          MOV     TDATA,@DPTB     ;LOAD BUFFER
016312  004567  174316                  JSR     %5,CLOCK        ;RUN CLOCK
016316  000003                          3
016320  032777  001000  172704          BIT     #BIT9,@DPTS     ;"SEND REQUEST" ON
016326  001001                          BNE     .+4             ;YES
016330  104000                          ERROR                   ;REPORT ERROR
016332  032777  010000  172672          BIT     #BIT12,@DPTS    ;"MODEM READY" UP
016340  001001                          BNE     .+4             ;YES
016342  104000                          ERROR                   ;REPORT ERROR
016344  004567  174264                  JSR     %5,CLOCK        ;RUN CLOCK
016350  000010                          10
016352  032777  001000  172652          BIT     #BIT9,@DPTS     ;"SEND REQUEST" DOWN
016360  001401                          BEQ     .+4             ;YES
016362  104000                          ERROR                   ;REPORT ERROR
016364  032777  002000  172640          BIT     #BIT10,@DPTS    ;"CLEAR-TO-SEND" DOWN
016372  001401                          BEQ     .+4             ;YES
016374  104000                          ERROR                   ;REPORT ERROR
016376  032777  010000  172626          BIT     #BIT12,@DPTS    ;"MODEM READY" DOWN
016404  001401                          BEQ     .+4             ;YES
016406  104000                          ERROR                   ;REPORT ERROR

                                ;DB25S TEST CONNECTCONNECTOR TEST

                                ;VERIFY "SEND REQUEST" RAISES "MODEM READY" AND "CLEAR TO SEND"

016410  104400                          SCOPE
```

```
016412  005077  172606          MORDY1  CLR     @DPRS           ;CLEAR RCV STATUS
016416  005077  172610                  CLR     @DPTS           ;CLEAR XMIT STATUS
016422  016777  172654  172604          MOV     TMPDAT,@DPTB    ;LOAD XMIT BUFFER
016430  004567  174200                  JSR     X5,CLOCK
016434  000004                          4
016436  032777  001000  172566          BIT     #BIT9,@DPTS     ;SEND REQUEST UP?
016444  001001                          BNE     .+4             ;YES
016446  104000                          ERROR                   ;REPORT ERROR
016450  032777  002000  172554          BIT     #BIT10,@DPTS    ;CLEAR TO SEND?
016456  001001                          BNE     .+4             ;YES
016460  104000                          ERROR                   ;REPORT ERROR
016462  032777  010000  172542          BIT     #BIT12,@DPTS    ;MODEM READY?
016470  001001                          BNE     .+4             ;YES
016472  104000                          ERROR                   ;REPORT ERROR
016474  104400                          SCOPE

                                ;TERMINAL READY
```

```
                                ;TERM RDY=RAISE "CARRIER" AND "RING FLAG", NO INT ENB
016476  012767  000240  161272          MOV     #240,PS             ;PRIORITY = 5
016504  005077  172522                  CLR     @DPTS               ;CLR XMIT STATUS
016510  005077  172510                  CLR     @DPRS               ;CLR RCV STATUS
016514  012777  011472  172510          MOV     #FTINT,@DPTS        ;ERROR TRAP VECTOR
016522  052777  000001  172502          BIS     #BIT0,@DPTS         ;TERMINAL READY
                                        DELAY   1500                ;15MS PROPOGATION DELAY
016530  012767  001500  172532          MOV     #1500,CNT                   ;SET UP COUNT
        016536
                                DEL=,
016536  005367  172526                  DEC     CNT                 ;TIME OUT
016542  001375                          BNE     DEL                 ;NO
016544  032777  000001  172460          BIT     #BIT0,@DPTS         ;TERMINAL READY
016552  001001                          BNE     .+4                 ;YES
016554  104000                          ERROR                       ;REPORT ERROR
016556  032777  004000  172446          BIT     #BIT11,@DPTS        ;CARRIER
016564  001001                          BNE     .+4                 ;YES
016566  104000                          ERROR                       ;REPORT ERROR
016570  032777  020000  172434          BIT     #BIT13,@DPTS        ;RING FLAG UP
016576  001001                          BNE     .+4                 ;YES
016600  104000                          ERROR                       ;REPORT ERROR

                                ;CLEAR TERMINAL READY

016602  042777  000001  172422          BIC     #BIT0,@DPTS         ;CLEAR TERMINAL READY
                                        DELAY   1500
016610  012767  001500  172452          MOV     #1500,CNT                   ;SET UP COUNT
        016616
                                DEL=,
016616  005367  172446                  DEC     CNT                 ;TIME OUT
016622  001375                          BNE     DEL                 ;NO
016624  032777  000001  172400          BIT     #BIT0,@DPTS         ;TERM RDY DOWN
016632  001401                          BEQ     .+4                 ;YES
016634  104000                          ERROR                       ;REPORT ERROR
016636  032777  004000  172366          BIT     #BIT11,@DPTS        ;CARRIER DOWN
016644  001401                          BEQ     .+4                 ;YES
016646  104000                          ERROR                       ;REPORT ERROR
016650  032777  100000  172354          BIT     #BIT15,@DPTS        ;"CARRIER DOWN" FLAG UP
016656  001001                          BNE     .+4                 ;YES
016660  104000                          ERROR                       ;REPORT ERROR
016662  042777  100000  172342          BIC     #BIT15,@DPTS        ;CLEAR DOWN FLAG

                                ;VERIFY THAT "RING" AND "CARRIER DOWN" INTERRUPT
016670  012777  000240  172350          MOV     #240,@DPTP          ;INTERRUPT PRIORITY 5,
016676  005077  172330          RCD1    CLR     @DPTS               ;CLEAR XIMT STATUS
016702  005077  172316                  CLR     @DPRS               ;CLEAR RCV STATUS
016706  012777  011346  172330          MOV     #TV24,@DPTIV        ;TEST PASS VECTOR
016714  012767  000200  161054          MOV     #200,PS             ;PRIORITY = 4
016722  052777  000040  172302          BIS     #BIT5,@DPTS         ;STATUS INTERRUPT ENABLE
016730  052777  000001  172274          BIS     #BIT0,@DPTS         ;TERMINAL READY
                                        DELAY   1500                ;15,75 MS DELAY
016736  012767  001500  172324          MOV     #1500,CNT                   ;SET UP COUNT
        016744
                                DEL=,
016744  005367  172320                  DEC     CNT                 ;TIME OUT
016750  001375                          BNE     DEL                 ;NO
016752  104000                          ERROR                       ;REPORT ERROR
```

```
                                        ;VERIFY "CARRIER DOWN" RAISES INTERRUPT
016754  012777  011420  172262  RCD11:  MOV     #TV25,@DPTIV    ;NEXT TEST VECTOR
016762  012767  000200  161006          MOV     #200,PS
016770  042777  000001  172234          BIC     #BIT0,@DPTS     ;CLEAR TERM. RDY. SHOULD SET 'CARRIER DOWN'.
                                        DELAY   1500            ;15.75MS DELAY
016776  012767  001500  172264          MOV     #1500.,CNT              ;SET UP COUNT
        017004
017004  005367  172260          DEL=.   DEC     CNT             ;TIME OUT
017010  001375                          BNE     DEL             ;NO
017012  104000                          ERROR                   ;REPORT ERROR
017014  046777  060760  172210          BIC     BIT15,@DPTS     ;CLEAR "CARRIER DOWN"
017022  104400                  BELL:   SCOPE
017024  012777  000007  172170          MOV     #7,@CTPB        ;YES, RING BELL
017032  105777  172162                  TSTB    @CTPS           ;PUNCH READY
017036  100375                          BPL     .-4
017040  000167  173774                  JMP     BGN3
```

```
                        ;
                        ;INTERRUPT SERVICE ROUTINES FOR DB25S TESTS
                        ;
                        ;THESE ROUTINES MAY FUNCTION AS:
                        ; 1.  ERROR TRAPS FOR FALSE INTERRUPTS
                        ; 2.  POINTERS BACK TO THE MAIN LINE FOR VALID INTERRUPTS
                        ; 3.  FUNCTIONAL TEST WHICH ARE INTERRUPT DRIVEN


017044  032777  000200  172152  SRV5:   BIT     #BIT7,@DPRS     ;RCV DONE
017052  001001                          BNE     .+4
017054  104000                          ERROR                   ;REPORT ERROR
017056  126777  172204  172142          CMPB    TSYNC,@DPRB     ;CORRECT SYNC CHARACTER
017064  001401                          BEQ     .+4             ;YES
017066  104000                          ERROR                   ;REPORT ERROR
017070  022626                          CMP     (SP)+,(SP)+     ;ADJUST STACK
017072  005726                          TST     (SP)+           ;ADJUST STACK FOR CLOCK SUB
017074  042767  000040  160674          BIC     #BIT5,PS        ;LOWER PRIORITY
017102  000137                          137                     ;JMP
017104  013512                  SRV5B:  SSYC4A                  ;BACK TO MAINLINE
        000001                  .END
```

```
A2ND      015336          DPRP      011242          NOP       000240          RRRR      012220
AND       007172          DPRS      011224          OR0       007646          RRRT      012066
ASCNT     010730          DPTB      011234          OR1       007662          RRT1      012132
BEGIN1    001100          DPTIV     011244          ORUN      010010          RT1       012212
BEGIN2    012574          DPTP      011246          OVRUN     007600          RT2       012130
BELL      017022          DPTS      011232          PARTY     007414          RV18      011652
BGN0      001134          DUPLX     010062          PC        000007R         RV18A     011704
BGN0A     012630          EMTAB     010262          PFAIL     010746          RWBRS     002206
BGN1      001556          EMTOK     010242          PRINT1    010416          S0,EXT    005644
BGN3      013040          EMTVEC    010220          PRTAB     010450          S1,EXT    005724
BGN3A     013054          ERCOUN    011240          PS        177776          S2,EXT    006102
BINCT     010726          ERP0      010330          PUP1      011030          S3,EXT    006202
BIT0      000001          ERP1      010366          PWRUP     010736          S4,EXT    006162
BIT1      000002          ERRCNT    011332          R0        000000R         SAVPC     011310
BIT10     002000          ERROR     104000          R1        000001R         SAVR      010274
BIT11     004000          ERRP      010270          R17       012030          SAVR0     011314
BIT12     010000          EXT1      005154          R18       012040          SAVR1     011316
BIT13     020000          FLAG      011334          R19       012042          SAVR2     011320
BIT14     040000          FREQ      012746          R2        000002R         SAVR3     011322
BIT15     100000          FRINT     011476          R20       012062          SAVR4     011324
BIT2      000004          FTINT     011472          R2AND     015146          SAVR5     011326
BIT3      000010          HDFHM     010706          R2ANDA    015250          SAVREG    104001
BIT4      000020          HERE      000000          R2ANDB    015310          SAVSP     011312
BIT5      000040          ICOUNT    011152          R3        000003R         SAVSR1    011252
BIT6      000100          INTST1    004130          R4        000004R         SAVSR2    011254
BIT7      000200          INTST2    004260          R5        000005R         SCLK2     015044
BIT8      000400          INTST3    004520          R6        000006R         SCLK3     015064
BIT9      001000          INTST4    004630          RAND      007042          SCNT      011272
BITS      001552          IQTST5    004756          RANDA     007114          SCOPE     104400
BITST     001320          ISYC      006244          RANDB     007150          SCOPEA    011150
BOTTOM    012562          ISYC1     006310          RCD       016676          SCOPEB    011070
BPC       011262          ISYC2     006406          RCD1      016754          SCOPEC    011102
CC        011330          ISYC3     006414          RCNT      011336          SCOPEF    011154
CHLEN     011276          ISYC4     006432          RDATA     011304          SCOPEG    011140
CLEAR     001466          ISYC5     006454          REE       012750          SENDR     015656
CLK       012672          IT2A      004300          REE1      013036          SENDR2    016070
CLKCNT    011256          IT2B      004336          REG       001554          SENDR3    016254
CLOCK     012634          IT2C      004374          RESTOR    104002          SEQD      006632
CLRVEC    001272          IT3A      004564          RESTR     010432          SEQD0     006616
CNT       011270          IT4A      004674          RETURN    011156          SEQD2     006750
CREG      003304          IT5A      005022          RNUM      011162          SEQD3     006764
CREG2     003476          L200P     015320          RNUM1     011212          SEVEN     010720
CTKB      011216          LIMIT     011250          RP        011344          SEXT      011236
CTKS      011214          LIMTMP    011274          RPRT1     012426          SGEN      011034
CTPB      011222          LINE.N    001140          RPRT2     012452          SLIM      011300
CTPS      011220          LIST      010732          RPRT3     012464          SLP       007574
CV1       001302          LOOP      007154          RPRT4     012514          SP        000006R
DECML     010722          MCLK      015570          RPRT5     012522          SRV5      017044
DEL       017004          MINUS     010530          RPRT6     012542          SRV5B     017104
DPLX1     010142          MKNUM     010560          RPRTY     012372          SRW0      005040
DPRB      011226          MQADD     010642          RR1       012254          SRW1      005064
DPRIV     011240          MQRDY     016412          RR2       012266          SSEQD     014634
```

ERRORS DETECTED: 0

RUN-TIME: 30 SECONDS

5K CORE USED