DQ11

RECEIVER & TRANSMIT TESTS

CZDQDE0

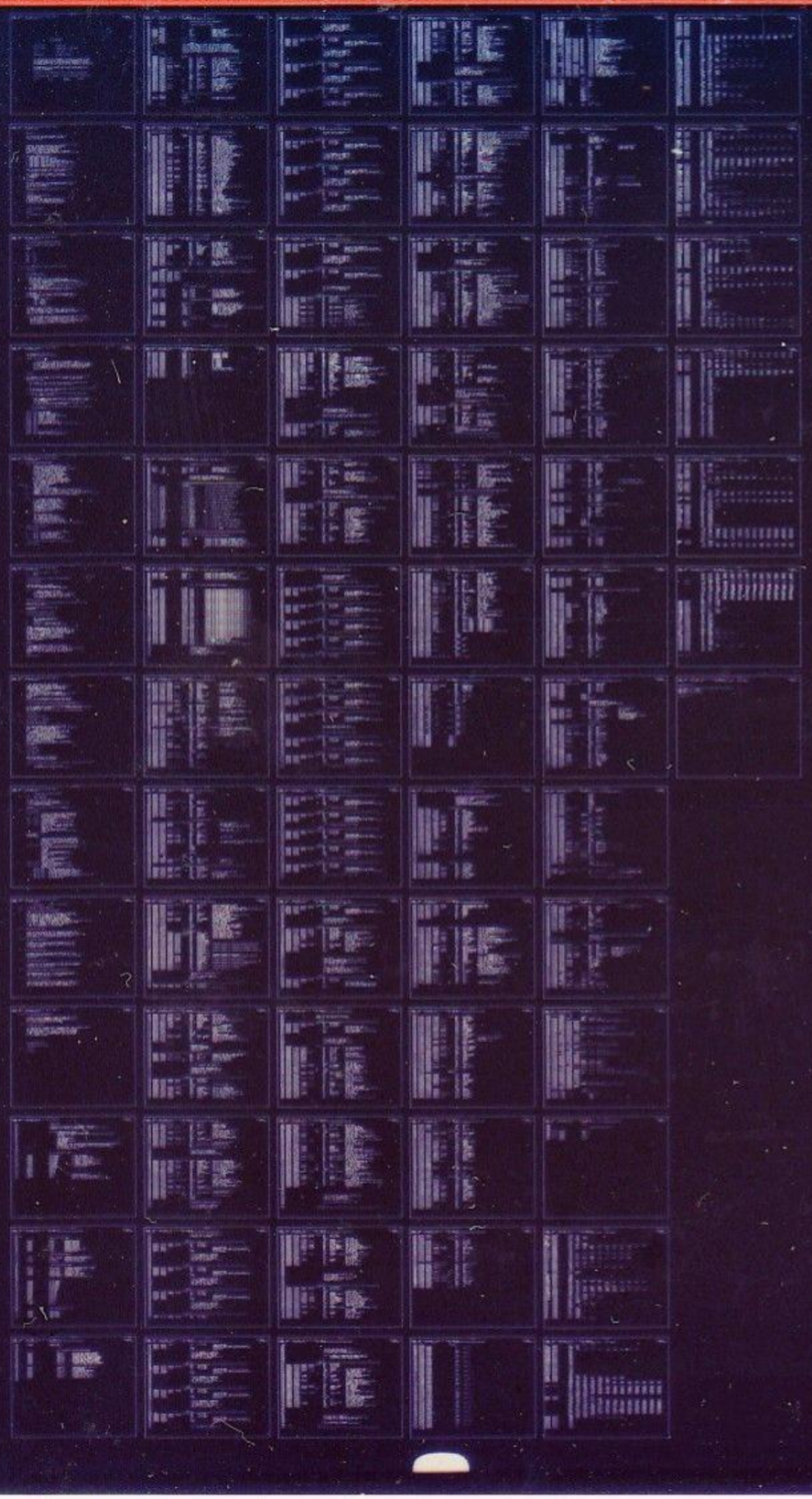
AH-8617E-MC

FICHE 1 OF 1

JAN 1979

digital

MADE IN USA



IDENTIFICATION

PRODUCT CODE: AC-8615E-MC

PRODUCT NAME: CZDQDE0 DQ11 RCVR & XMTR

DATE: JUNE 1978

MAINTAINER: DIAGNOSTIC GROUP

1. ABSTRACT

THE FUNCTION OF THE DQ11 DIAGNOSTICS ARE TO
VERIFY THAT THE OPTION OPERATES ACCORDING
TO SPECIFICATIONS.

CURRENTLY THERE ARE SEVEN OFF LINE DIAGNOSTICS THAT ARE
TO BE RUN IN SEQUENCE TO INSURE THAT IF AN
ERROR SHOULD OCCUR IT WILL BE DETECTED
AT AN EARLY STAGE AND INSURING THAT
DIAGNOSIS OF ERROR WILL BE IMMEDIATE TO PROBLEM
NOTE: ADDITIONAL DIAGNOSTICS MAY BE ADDED IN THE FUTURE.

THE SEVEN DIAGNOSTICS ARE:
1. CZDQA [REV] BASIS R/W TEST #1
2. CZDQB [REV] BASIC R/W TEST #2
3. CZDQC [REV] BASIC NPR AND INTERUPT TEST
4. CZDQD [REV] RECEIVER TRANSMITTER EXERCISER TEST
5. CZDQE [REV] MISC. RX AND TX TESTS. PLUS BCC TESTS.
6. CZDQF [REV] CHARACTER DETECT TESTS.
7. CZDQH [REV] CHARACTER LENGTH AND INTERRUPT TESTS.

THERF IS ALSO AN ONLINE TEST TO BE DISCUSED LATER.
1. CZDQO [REV] ONLINE TEST. (ITEP OVERLAY)

AND A PARAMETER INPUT PROGRAM IS AVAILABLE
1. CZDQG [REV] DQ11 TRIAL PROGRAM (PARAMETER INPUT)

2. REQUIREMENTS

2.1 EQUIPMENT

ANY PDP11 FAMILY CPU (WITH MINIMUM 8K MEMORY)-WITH
 OR WITHOUT A HARDWARE SWITCH REGISTER (LOC. 177570)
ASR 33 (OR EQUILIVALENT)
DQ11
SYNC MODEM (ONLY REQUIRED FOR ONLINE TEST)

2.2 STORAGE

PROGRAM WILL LOAD AND RUN
IN 8K OF MEMORY.
LOCATION 1400 THRU 1600 ARE ESPECIALLY TO
BE NOTED AND TO BE UNTOUCHED BY OPERATOR
AFTER DQ11 TRIAL PROGRAM HAS BEEN EXECUTED.
OR AFTER THE ''AUTO SIZING'' HAS BEEN DONE.

3. LOADING PROCEEDURE

3.1 METHOD

ALL PROGRAMS ARE IN ABSOLUTE FORMAT AND

ARE LOADED USING THE ABSOLUTE LOADER.

ABSOLUTE LOADER STARTING ADDRESS *500

MEMORY *
SIZE

4K	17
8K	37
12K	57
16K	77
20K	117
24K	137
28K	157

3.1.1 LOAD THE ADDRESS OF ABS. LOADER (LOC.XXX500)

3.1.2 THEN START

4. STARTING PROCEEDURE

A. LOAD LOC. 200
B. SET SWR TO ZERO FOR ''AUTO SIZING'' OR LEAVE
LEAVE SWR BIT 7=1 TO USE EXISTING PARAMETERS SET UP
BY DQ11 TRIAL PROGRAM OR A PREVIOUSLY RUN DQ11 DIAGNOSTIC
THAT USED THE ''AUTO SIZING''.
****REFER TO SECTION 4.1 FOR SOFTWARE SWITCH REGISTER OPERATION
AND OPTIONS.****
NOTE:THE SOFTWARE SWITCH REGISTER IS LOCATED AT LOC.176
SOFTWARE DISPLAY REGISTER IS LOCATED AT LOC.174

C.THEN START
THE PROGRAM WILL TYPE MAINDEC NAME AND PROGRAM NAME
IF THIS WAS THE FIRST START UP OF THE PROGRAM) AND ALSO
THE FOLLOWING:
'MAP OF DQ11 STATUS''
1400 160010
1402 152300
1404 160020
1406 150310

THE ABOVE IS ONLY AN EXAMPLE!
THIS WOULD INDICATE THE STATUS TABLE STARTING AT ADD.
1400 IN THE PROGRAM. THE STATUS TABLE MUST BE VERIFIED BY THE
USER IF AUTO SIZING IS DONE. FOR INFORMATION OF STATUS
TABLE SEE SECTION 8.4 FOR HELP.

****IF THE SOFTWARE SWITCH REGISTER IS SELECTED THEN THE FOLLOWING
WILL BE TYPED AFTER THE PROGRAM IDENTIFIES ITSELF:
SWR=XXXXXX NEW= (REFER TO SECTION 4.1 FOR OPERATOR'S OPTION)****
NOTE:IF USING THE SOFTWARE SWITCH REGISTER WHEN A HARDWARE
SWITCH REGISTER IS AVAILABLE THE PROGRAM WILL NOT
TYPE OUT THE TITLE.

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

4.1 CONTROL SWITCH SETTINGS

IF THE DIAGNOSTIC IS RUN ON A CPU WITHOUT A SWITCH
REGISTER THEN A SOFTWARE SWITCH REGISTER IS USED WHICH ALLOWS
THE USER THE SAME SWITCH OPTIONS AS THE HARDWARE SWITCH REGISTER.
IF THE HARDWARE SWITCH REGISTER DOES NOT EXIST OR IF ONE DOES
AND IT CONTAINS ALL ONES (177777) THEN THE SOFTWARE SWITCH
REGISTER (LOC. 176) IS USED.

CONTROL:

THIS PROGRAM ALSO SUPPORTS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH
REGISTER (LOC. 176) FROM THE TTY. THIS CAN BE ACCOMPLISHED BY
DOING THE FOLLOWING:

1) TYPE CONTROL G <^G>; THIS WILL ALLOW THE TTY TO ENTER DATA INTO
   LOC. 176 AT SELECTED POINTS WITHIN THE PROGRAM.

2) THE MACHINE WILL THEN TYPE: SWR=XXXXXXNEW= (XXXXXX IS THE OCTAL CONTENTS
   OF THE SOFTWARE SWITCH REGISTER.)

3) AFTER THE ''NEW='' HAS BEEN TYPED THEN THE OPERATOR CAN DO ONE
   OF THE FOLLOWING AT THE TTY:

   A) TYPE A NUMBER TO BE LOADED INTO LOC. 176 FOLLOWED BY A <CR>.
      (ONLY NUMBERS BETWEEN 0-7 WILL BE ACCEPTED AND ONLY 6 NUMBERS
      WILL BE ALLOWED)
      IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH
      REGISTER CONTENTS WILL NOT BE CHANGED.

   B) IF A CONTROL U <^U> IS DEPRESSED THEN THE PROGRAM WILL SEND YOU
      BACK TO STEP 2.

SW 15 SET: HALT ON ERROR
SW 14 SET: LOOP ON CURRENT TEST
SW 13 SET: INHIBIT ERROR PRINT OUT
SW 12 SET: INHIBIT TYPE OUT/BELL ON ERROR.
SW 11 SET: INHIBIT ITERATIONS
SW 10 SET: ESCAPE TO NEXT TEST
SW 09 SET: LOOP WITH CURRENT DATA
SW 08 SET: CATCH ERROR AND LOOP ON IT
SW 07 SET: USE PREVIOUS STATUS TABLE. CLR-DO AUTO SIZE.
SW 06 SET:
SW 05 SET:
SW 04 SET:
SW 03 SET:
SW 02 SET: LOCK ON SELECTED TEST
SW 01 SET: RESTART PROGRAM AT SELECTED TEST
SW 00 SET: RESELECT DQ11'S DESIRED ACTIVE.

4.1.2 SWITCH REGISTER RESTRICTIONS

SW 00 RESELECT DQ11'S DESIRED ACTIVE.
PLEASE NOTE THAT A MESSAGE IS TYPED
OUT FOR SWITCH REGISTER BEING EQUAL TO DQ11'S
ACTIVE. THIS MEANS IF THE SYSTEM HAS
FOUR DQ11S; BITS 00,01,02,03 WILL
BE SET IN LOC 'DQACTV". USING THIS
SWITCH ALTERS THAT LOCATION;THEREFORE
IF FOUR DQ11S ARE IN THE SYSTEM
DO NOT SET SWITCHS GREATER THAN
SW 03 IN THE UP POSITION. THIS WOULD BE
A FATAL ERROR. DO NOT SELECT MORE ACTIVE
DQ11S THAN HAS BEEN GIVEN INFORMATION
ABOUT IN TRIAL PROGRAM.

METHOD:
A: LOAD ADDRESS 200
B: START WITH SW 00=1
C: PROGRAM WILL TYPE MESSAGE
D: CONTINUE THE BINARY NUMBER OF DQ11S DESIRED ACTIVE
EXAMPLE: 1=1 DQ11; 3=2 DQ11; 7=3 DQ11; 17=4 DQ11 37=5 DQ11 ETC.
E: NUMBER (IF VALID) WILL BE IN DATA LIGHTS (EXCLUDING 11/05, 11/04, 11/34)
F: CONTINUE WITH ANY OTHER SWITCH SETTINGS DESIRED.

SW 01 IT IS STRONGLY SUGGESTED THAT
AT LEAST ONE PASS HAS BEEN MADE
BEFORE TRYING TO SELECT A TEST
THAT IS NOT IN THE ORDER OF SEQUENCE
THE REASON BEING IS THAT THE
PROGRAM HAS TO CLEAR AREAS AND SET
UP PARAMETERS. ALSO WHEN A TEST IS
SELECTED ALWAYS START AT THE VERY
BEGINNING OF THAT TEST.

SW 09 LOOP ON CURRENT DATA:
THIS SWITCH WILL ONLY WORK IF
CALL "SCOP1" IS IN THAT TEST.
THE REASON BEING THAT MOST TESTS
DEAL WITH BLOCKS OF DIFFERENT DATA
TO BE SENT OR RECEIVED ALL AT ONCE
THUS IN BLOCK DATA; ONE PATTERN CANN'T BE SINGLED OUT.

4.1.3 SWITCH REGISTER PRIORITYS

ERROR SWITCHES

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

****HLT (ERROR) ROUTINE SUPPORTS <^G> OPERATION****

SCOPE SWITCHES

1. SW 09 (IF ENABLED BY "SCOP1")
2. SW 14
3. SW 11

****SCOPE ROUTINE WILL SUPPORT <^G> OPERATION****

4.2 STARTING ADDRESS

STARTING ADDRESS IS AT 000200
THERE ARE NO OTHER STARTING ADDRESSES
FOR THE DQ11 DIAGNOSTICS PREVIOUSLY MENTIONED

NOTE: IF ADDRESS 000042 IS NON-ZERO
THE PROGRAM ASSUMES IT IS UNDER
ACT11 OR DDP CONTROL AND WILL ACT ACCORDINGLY
AFTER *ALL* AVAILABLE DQ11'S ARE TESTED
THE PROGRAM WILL RETURN TO "DDP2" OR "ACT-11".

5. OPERATING PROCEDURE

WHEN PROGRAM IS INITIALLY STARTED MESSAGES AS DESCRIBED IN SECTION
FOUR WILL BE PRINTED.

AND PROGRAM WILL BEGIN RUNNING THE
DIAGNOSTIC

5.2 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

1. HALT ON ERROR (VIA SW 15 1)
WHEN EVER AN ERROR OCCURS
2. CLEAR SW 15
3. SET SW 14: (LOOP ON THIS TEST)
4. SET SW 13: (INHIBIT ERROR PRINT OUT)

THE TEST NUMBER AND PC WILL BE TYPED OUT AND
POSSIBILY AN ERROR MESSAGE (THIS DEPENDS ON THE TEST)
TO GIVE THE OPERATOR AN IDEA AS TO THE SOURCE OF THE
PROBLEM. IF IT IS NECESSARY TO KNOW MORE INFORMATION
CONCERNING THE ERROR REPORT; LOOK IN THE LISTING
FOR THAT TEST NUMBER WHICH WAS TYPED OUT
AND THEN NOTE THE PC OF THE ERROR REPORT
THIS WAY THE EXACT FUNCTIONING OF THE TEST
CAN BE INTERPEDITED

6. ERRORS

AS DESCRIBED PREVIOUSLY THERE WILL ALWAY BE
A TEST NUMBER AND PC TYPED OUT AT THE TIME OF AN
ERROR (PROVIDING SW 13=0 AND SW 12=0). IN MOST CASES ADDITIONAL
INFORMATION WILL BE SUPPLIED THE THE ERROR MESSAGE
WHICH IS TO GIVE THE OPERATOR AN INDICATION OF THE
ERROR.

6.2 ERROR RECOVERY

IF FOR SOME REASON THE DQ11 SHOULD
''HANG THE BUS'' (GAIN CONTROL OF BUS SO THAT
CONSOLE MANUAL FUNCTIONS ARE INHIBITED) AN INIT
OR POWER DOWN/UP IS NECESSARY FOR OPERATOR
TO REGAIN CONTROL OF CPU.
IF THIS SHOULD HAPPEN; LOOK IN LOCATION
''TSTNO'' (ADDRESS 1226)FOR THE NUMBER OF THE TEST THAT
WAS RUNNING AT THE TIME OF THE CATASTROPHIC
ERROR.
IN THIS WAY THE OPERATOR WILL HAVE AN IDEA AS TO
WHAT THE DQ11 WAS DOING AT THE TIME OF THE ERROR.

6.3 ****HALT RECOVERY WHEN USING SOFTWARE SWITCH REGISTER****

IF THE SOFTWARE SWITCH REGISTER IS TO BE CHANGED AFTER A HALT
THE THE OPERATOR IS REQUIRED TO TYPE A <^G> BEFORE DEPRESSING CONTINUE.
THE FOLLOWING WILL BE TYPED:
SWR=XXXXXX NEW- (REFER TO SECTION 4.1 FOR OPERATOR OPTION)

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

SEE SECTION 4. (PLEASE)

7.2 OPERATING RESTRICTIONS

DQ11 TRIAL PROGRAM MUST BE RUN PRIOR TO THE
FIRST AND ONLY THE FIRST RUNNING OF ANY DQ11 DIAGNOSTIC
NOTE: IF NO PROGRAM OTHER THAN A
DQ11 DIAGNOSTIC WAS LOADED AFTER DQ11 TRIAL OR
IF CORE MEMORY HAS NOT BEEN CHANGED;OR IF THERE
IS NO DQ11 CONFIGURATION CHANGES; THE
DQ11 TRIAL PROGRAM NEED NEVER BE RUN AGAIN.
HOWEVER IF ANY OF THE ABOVE HAVE BEEN VIOLATED
THE DQ11 TRIAL PROGRAM MUST BE RUN AGAIN
BEFORE RUNNING THE DIAGNOSTICS
NOTE: AN ALTERNATIVE TO THE ABOVE IS ATTEMPTING
THE ''AUTO SIZING'' WHEN PROGRAM IS INITIALLY STARTED
WITH SW07-0.

8. MISCELLANEOUS

8.1 EXECUTION TIME

8.2 PASS COMPLETE

WHEN THE DIAGNOSTIC HAS COMPLETED
A PASS THE FOLLOWING IS AN EXAMPLE
OF THE PRINT OUT TO BE EXPECTED.

END PASS AC-8615E-MC CSR: 160000 VEC: 300 PASSES: 000001 ERRORS: 000000

NOTE: THE NUMBERS FOR CSR AND VEC ARE
NOT NECESSARILY THE VALUES FOR THE DEVICE

THEY ARE ONLY FOR THIS EXAMPLE.

8.3 TST1 (MINI MONITOR)

THE VERY FIRST 'TEST'' (TST1)
IS *NOT* A TEST OF THE DQ11 HARDWARE
IT IS A MINI-MONITOR USED TO CYCLE DQ11 IN THE
SYSTEM THROUGH THE DIAGNOSTIC.

REMEMBER: TST1 IS NOT A TEST OF DQ11 HARDWARE!!!!.!.

8.4 KEY LOCATIONS

RETURN (1214) CONTAINS THE ADDRESS WHERE PROGRAM WILL RETURN WHEN ITERATION COUNT IS REACHED OR IF LOOP ON TEST IS ASSERTED.

NEXT (1216) CONTAINS THE ADDRESS OF THE NEXT TEST TO BE PEFORMED.

TSTNO (1226) CONTAINS THE NUMBER OF THE TEST NOW BEING PEFORMED.

RUN (1304) THE BIT IN 'RUN'' ALWAYS POINTS ONE PAST THE DQ11 CURRENTLY BEING TESTED.
EXAMPLE:
(RUN) 1304/0000000001000000
MEANS THAT DQ11 NO.05 IS THE DQ11 NOW RUNNING.

DQCR00-DQCR17
DQST00-DQST17
(1400)-(1476)

THESE LOCATIONS CONTAIN THE INFORMATION NEEDED TO TEST UP TO 16 (DECIMAL) DQ11S SEQUENTIALY. THEY CONTAIN THE CSR,VECTOR AND STATUS CONCERNING THE CONFIGURATION OF EACH DQ11.

DQACTV (1500) EACH BIT SET IN THIS LOCATION INDICATES THAT THE ASSOCIATED DQ11 WILL BE TESTED IN TURN.
EXAMPLE:
(DQACTV) 1500/0000000000011111
MEANS THAT DQ11 NO. 00,01,02,03,04
WILL BE TESTED.
EXAMPLE:
(DQACTV) 1500/0000000000010001
MEANS THAT DQ11 NO. 00,04
WILL BE TESTED.

DQCSR (1506) CONTAINS THE RECEIVER CSR OF THE CURRENT DQ11 UNDER TEST.

DQSTAT (1510) CONTAINS THE STATUS OF THE CURRENT DQ11 UNDER TEST.

BIT 15 SET: TWO SYNC CHARS/ONE SYNC CHAR
BIT 14 SET: TEST JUMPER INSTALLED/NOT INSTALLED
BIT 13 SET: BB OPTION INSTALLED/NOT INSTALLED
BIT 12 SET: BA OPTION INSTALLED/NOT INSTALLED
BIT 11 SET: ACTIVE ON FIRST NON-SYNC/ACTIVE AFTER NO. OF SYNC
BIT 10 SET: AB OPTION INSTALLED/NOT INSTALLED
BIT 09 SET: ODD VRC/EVEN VRC

BIT 00-08 VECTOR ''A'' OF DEVICE

8.5 *** METHOD OF AUTO SIZING ***

8.5.1 FINDING THE CONTROL STATUS REGISTER.

WHEN LOOKING FOR THE CSR IT IS NECESSARY TO TAKE CARE
THAT WHEN A CSR IS FOUND THAT IT IS INDEED A DQ11. THAT
IS THE METHOD OF MY MADNESS FOR THIS ROUTINE.
AN ATTEMPT TO CLEAR THE MISC. REGISTER IS TRIED
IF A TIME-OUT TRAP OCCURES POINTERS ARE UPDATED
AND ATTEMPTED AGAIN. IF NO TIME-OUT; THE RECEIVER ''ACTIVE BIT'' (BIT 12)
IS SET AND A *COMPARE* FOR BOTH SYNC1 AND SYNC 2 IS DONE
AT THE MISC. REGISTER. IF THEY ARE THERE THIS IS
A DQ11. THE INFORMATION IS STORED AWAY.

8.5.2 ONE SYNC BIT OR TWO?

SINCE TOO MUCH HARDWARE MUST BE TURNED ON TO SENSE THE
PRESENTS OF ONE SYNC OR TWO. THE PROGRAM ASSUMES TWO SYNC
CHARS. NOTE: THIS ASSUMPTION MAY BE ALTERED AFTER AUTO SIZING
BY ALTERING BIT 15 IN APPRIOATE DQSTXX: LOCATION.

8.5.3 ''BB'' OPTION INSTALLED?

TO SENSE FOR THE ''BB'' OPTION THE PROGRAM SELECTS THE
CHARACTER DET. REGISTER AND THE LOADS IN ALL 1'S; IF
ANY ONE OR COMBINATION OF BITS ARE SET THE BB OPTION
IS ASSUMED TO EXIST.

8.5.4 ''AB'' OPTION INSTALLED?

TO SENSE FOR THE ''AB'' OPTION THE PROGRAM SELECTS THE
POLYNOMIAL REGISTER AND WRITES ALL 1'S INTO IT; IF ANY
ONE OR COMBINATION OF BITS ARE SET THE AB OPTION IS ASSUMED
TO EXIST.

8.5.5 ''BA'' OPTION INSTALLED?

TO SENSE FOR ''BA'' OPTION REQUEST TO SEND AND DATA TERMINAL
READY ARE SET; IF EITHER ONE OR BOTH ARE SET THE PROGRAM
ASSUMES THE BA OPTION EXISTES

8.5.6 JUMPER ON END OF CABLE? ***NOTE:CZDQE ONLY***

THE PROGRAM CHECKS TO SEE IF EITHER OR BOTH CLEAR TO
SEND AND CARRIER ARE SET; IF SO THE PROGRAM ASSUMES THE
TEST JUMPER IS ON THE END OF THE CABLE.

8.5.7 ACTIVE ON FIRST NON-SYNC?

SINCE TOO MUCH HARDWARE MUST BE TURNED ON TO SENSE FOR
WHEN THE DQ11 GOES ACTIVE THE PROGRAM ASSUMES ''ACTIVE
ON FIRST NON-SYNC''. NOTE: THIS CAN BE CHANGED BY ALTERING
BIT 11 IN THE APPRIOATE DQSTXX: AFTER AUTO SIZING

8.5.8 SET FOR ODD OR EVEN PARITY?

AS ABOVE TOO MUCH HARDWARE IS NEED TO SENSE WHICH PARITY
WAS SELECTED.SO THE PROGRAM ASSEMES ODD PARITY.
NOTE: THIS CAN BE CHANGED BY ALTERING BIT 9 IN APPRIO-
ATE DQSTXX: LOCATION. AFTER AUTO SIZING

8.5.9 FINDING THE VECTOR.

THE PROGRAM SETS ''PRIMARY DONE'',''SECONDAY DONE'', AND ''INTERUPT ENABLE''
AND LOOKS FOR AN INTERUPT. IF IT INTERUPTS IT IS PICKED
UP AND STORED AWAY. IF NO INTERUPT OCCURES THE PROGRAM
ASSUMES VECTOR =300. THIS PROBLEM WILL BE FIXED IN ONE
OF THE DIAGNOSTICS AND *AUTO SIZING* SHOULD BE REDONE TO
GET THE CORRECT VECTOR.

9. PROGRAM DESCRIPTION

CONTAINED WITHIN LISTING

10. LISTING

FOLLOWING

```
                                .ENABLE AMA

                                ;CZDQDE0/<377>/TRANSMITTER AND RECEIVER EXERCISER
                                ;COPYRIGHT 1975, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754

                                ;REVISED 16-DEC-76 BY R. BLACK
                                ;       A)SUPPORTS SOFTWARE SWITCH REGISTER
                                ;       B)SUPPORTS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH REGISTER
                                ;         BY <^G>.
                                        ;STARTING PROCEDURE
                                        ;LOAD PROGRAM
                                        ;LOAD ADDRESS 000200
                                        ;PRESS START
                                        ;PROGRAM WILL TYPE ''CZDQDE0/<377>/TRANSMITTER AND RECEIVER EXERCISER''
                                        ;PROGRAM WILL TYPE ''R'' TO INDICATE THAT TESTING HAS STARTED
                                        ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
                                        ;AND THEN RESUME TESTING


                                ;SWITCH REGISTER OPTIONS

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

```
550
560
561                             ;REGISTER DEFINITIONS
562
563             000000          R0=%0           ;GENERAL REGISTER
564             000001          R1=%1           ;GENERAL REGISTER
565             000002          R2=%2           ;GENERAL REGISTER
566             000003          R3=%3           ;GENERAL REGISTER
567             000004          R4=%4           ;GENERAL REGISTER
568             000005          R5=%5           ;GENERAL REGISTER
569             000006          SP=%6           ;PROCESSOR STACK POINTER
570             000007          PC=%7           ;PROGRAM COUNTER
571
572                             ;LOCATION EQUIVALENCIES
573
574             177570          DSWR-   177570  ;HARDWARE SWITCH REGISTER LOC.
575             177570          DLIGHTS=177570  ;HARDWARE DISPLAY REGISTER LOC.
576             177776          PS=177776       ;PROCESSOR STATUS WORD
577             001200          STACK=1200      ;START OF PROCESSOR STACK
578
579                             ;INSTRUCTION DEFINITIONS
580
581             005746          PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
582             005726          POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
583             010046          PUSHR0=10046    ;SAVE R0 ON STACK
584             012600          POPR0=12600     ;RESTORE R0 FROM STACK
585             024646          PUSH2SP=24646   ;DECREMENT STACK TWICE
586             022626          POP2SP=22626    ;INCREMENT STACK TWICE
587                             .EQUIV  EMT,HLT ;BASIC DEFINITION OF ERROR CALL
588
589
590             100000          BIT15=100000
591             040000          BIT14=40000
592             020000          BIT13=20000
593             010000          BIT12=10000
594             004000          BIT11=4000
595             002000          BIT10=2000
596             001000          BIT9=1000
597             000400          BIT8=400
598             000200          BIT7=200
599             000100          BIT6=100
600             000040          BIT5=40
601             000020          BIT4=20
602             000010          BIT3=10
603             000004          BIT2=4
604             000002          BIT1=2
605             000001          BIT0=1
606
607
608                             ;DQ11 OPTIONAL DEFINITIONS
609
610             002000          ABBIT=2000
611             004000          ACTBIT=4000
612             010000          BABIT=10000
613             020000          BBBIT=20000
614             040000          JUMBIT=40000
```

```
615          001000                  ODDBIT=1000
616          100000                  SYNBIT=100000
617
618
619                                  ;DQ11 SECONDARY REGISTER DEFINATIONS
620
621          000000                  RXBA.P=0        ;RECEIVER BUS ADDRESS PRIMARY.
622          000001                  RXWC.P=1        ;RECEIVER WORD COUNT PRIMARY.
623          000002                  TXBA.P=2        ;TRANSMITTER BUS ADDRESS PRIMARY.
624          000003                  TXWC.P=3        ;TRANSMITTER BUS ADDRESS PRIMARY.
625          000004                  RXBA.S=4        ;RECEIVER BUS ADDRESS SECONDARY.
626          000005                  RXWC.S=5        ;RECEIVER WORD COUNT SECONDARY.
627          000006                  TXBA.S=6        ;TRANSMITTER BUS ADDRESS SECONDARY.
628          000007                  TXWC.S=7        ;TRANSMITTER WORD COUNT SECONDARY.
629
630          000010                  CHARDT=10       ;CHARACTER DETECT REGISTER.
631          000011                  SYNC.=11        ;SYNC REGISTER.
632          000012                  MISC.=12        ;MISCELLANEOUS REGISTER.
633          000013                  TX.MUX=13       ;TRANSMITTER MUX REGISTER.
634          000014                  SEQ.=14         ;SEQUENCE REGISTER.
635          000015                  RX.BCC=15       ;RECEIVER BCC REGISTER.
636          000016                  TX.BCC=16       ;TRANSMITTER BCC REGISTER.
637          000017                  POLY.=17        ;POLYNOMIAL REGISTER.
638
639
```

```
                                        ;TRAPCATCAER FOR ILLEGAL INTERRUPTS
                000000                  .=0
                                        ;STANDARD INTERRUPT VECTORS
                000024                  .=24
000024  017044                          .PFAIL                  ;POWER FAIL HANDLER
000026  000340                          340                     ;SERVICE AT LEVEL 7
000030  016514                          .HLT                    ;ERROR HANDLER
000032  000340                          340                     ;SERVICE AT LEVEL 7
000034  016462                          .TRPSRV                 ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                          340                     ;SERVICE AT LEVEL 7
                000046                  .=46
000046  015242                          LOGICAL                 ;ACT HOOKS
                000052                  .=52
000052  000000                          .WORD 0
                                        ;THIS ROUTINE TRIES TO FORCE THE RECEIVER TO INTERUPT
                                        ;TO ITS VECTOR WHERE IT WILL PICK UP THE STATUS LOCATION
                                        ;FOR ITS NEW PC; AND PICK UP AN IOT INSTRUCTION FOR ITS
                                        ;NEW PS. WHEN THE NEW PC IS FETCHED AN IOT INSTRUCTION IS
                                        ;EXECUTED, TRAPPING TO LOCATION 20 WHERE A ROUTINE IS EXECUTED
                                        ;TO TAKE THE PC FROM THE STACK AND US IT AS THE VECTOR ADDRESS
                000056                  .=56
000056                                  VECMAP:
000056  010120                  1$:     MOV     R1,(R0)+        ;START FILLING THE VECTOR AREA
000060  012721  000004                  MOV     #4,(R1)+        ;WITH .+2; IOT (4)
000064  022021                          CMP     (R0)+,(R1)+     ;UPDATE THE POINTERS
000066  020127  001000                  CMP     R1,#1000        ;IS ALL FLOATING VECTOR AREA DONE
000072  101771                          BLOS    1$              ;BR IF NOT ALL DONE
000074  012737  000146  000020          MOV     #4$,@#20        ;SET FOR IOT TRAP BY DQ11
000102  013737  001500  001244          MOV     DQACTV,TEMP1    ;GET THE ACTIVE DQ11 S
000110  006037  001244          2$:     ROR     TEMP1           ;ARE YOU ACTIVE.. DQ11
000114  103023                          BCC     5$              ;IF CARRY CLEAR.. NO MORE DQ11S
000116  005037  177776                  CLR     PS              ;CLEAR PS
000122  005722                          TST     (R2)+           ;PUT POINTER TO STATUS TABLE
000124  012772  000340  177776          MOV     #340,@-2(R2)    ;TRY AND SET PRI/SEC DONE AND IE
000132  105200                          INCB    R0              ;DELAY.....
000134  001376                          BNE     .-2             ;.....DELAY
000136  112712  000300                  MOVB    #300,(R2)       ;NO INTERUPT ASSUME 300 FIX IN TEST C
000142  005722                  3$:     TST     (R2)+           ;UPDATE POINTERS
000144  000761                          BR      2$              ;GO DO IT AGAIN
000146  051612                  4$:     BIS     (SP),(R2)       ;ENTERD  BY IOT TRAP BY DQ11
000150  042712  000007                  BIC     #7,(R2)         ;CLEAR UNWANTED BITS
000154  022626                          CMP     (SP)+,(SP)+     ;POP IOT JUNK OFF STACK
000156  012716  000142                  MOV     #3$,(SP)        ;SET RETURN PC ON STACK
000162  000002                          RTI                     ;GO HOME.
000164  000207                  5$:     RTS     PC              ;ALL SIZING IS DONE

                                        ;****SOFTWARE SWITCH REGISTER****
                000174                  .=174
000174  000000                  DISPREG:        0               ;SOFTWARE DISPLAY REGISTER
000176  000000                  SWREG:          0               ;SOFTWARE SWITCH REGISTER

                                        ;PROGRAM START
                000200                  .=200
```

```
696  000200  000137  001512                    JMP     .START          ;GO TO START OF PROGRAM
697
698          000220                    .=220
699  000220  012702  001400            CSRMAP: MOV     #1400,R2        ;CLEAR ALL STATUS TABLE
700  000224  005022                            CLR     (R2)+           ;DO CLEAR
701  000226  022702  001512                    CMP     #1512,R2        ;ALL TABLE DONE
702  000232  001374                            BNE     .-6             ;BR IF MORE TO GO
703  000234  005037  001504                    CLR     DQNUM           ;SET NUMBER OF DQ11S TO 0
704  000240  012702  001400                    MOV     #1400,R2        ;SET TABLE POINTER
705  000244  012701  160000                    MOV     #160000,R1      ;GET FIRST FLOATING ADDRESS
706  000250  012737  000614  000004            MOV     #5$,@#4         ;SET FOR TIME OUT TRAP--NO DEVICE--
707  000256  112761  000012  000005    1$:     MOVB    #12,5(R1)       ;TRY AND SEL MISC REGISTER
708  000264  005061  000006                    CLR     6(R1)           ;TRY AND CLEAR MISC REG
709  000270  012711  010000                    MOV     #10000,(R1)     ;TRY AND SET RX ACTIVE
710  000274  022761  030000  000006            CMP     #30000,6(R1)    ;LOOK FOR SYNC 1 AND SYNC 2
711  000302  001071                            BNE     2$              ;THIS IS NOT A DQ11 IF I BRANCH
712  000304  010122                            MOV     R1,(R2)+        ;NOW THIS IS A DQ11 --STORE CSR
713  000306  052712  100000                    BIS     #SYNBIT,(R2)    ;SET FOR TWO SYNC CHARS
714  000312  005011                            CLR     (R1)            ;CLEAR DQ ACTIVE BIT
715  000314  112761  000010  000005            MOVB    #10,5(R1)       ;SEL CHAR DET REGISTER
716  000322  012761  177777  000006            MOV     #-1,6(R1)       ;WRITE INTO CHAR DET REG
717  000330  005761  000006                    TST     6(R1)           ;WAS THE REGISTER WRITTEN?
718  000334  001402                            BEQ     .+6             ;APPERENTLY NO BB OPTION.
719  000336  052712  020000                    BIS     #BBBIT,(R2)     ;SET FOR BB OPTION
720  000342  112761  000017  000005            MOVB    #17,5(R1)       ;SEL POLYNO. REGISTER
721  000350  012761  177777  000006            MOV     #-1,6(R1)       ;WRITE POLYNO.REGISTER
722  000356  005761  000006                    TST     6(R1)           ;WAS REG WRITTEN??
723  000362  001402                            BEQ     .+6             ;BR IF NO AB OPTION
724  000364  052712  002000                    BIS     #ABBIT,(R2)     ;SET FOR AB OPTION
725  000370  012761  001400  000002            MOV     #1400,2(R1)     ;TRY TO SET .DTR. .RS.
726  000376  032761  001400  000002            BIT     #1400,2(R1)     ;DID ANY OF THEM SET
727  000404  001402                            BEQ     .+6             ;BR IF NO BA OPTION
728  000406  052712  010000                    BIS     #BABIT,(R2)     ;SET FOR BA OPTION
729  000412  032761  030000  000002            BIT     #30000,2(R1)    ;DID .CS. .CO. SET
730  000420  001402                            BEQ     .+6             ;BR IF NO JUMPER
731  000422  052712  040000                    BIS     #JUMBIT,(R2)    ;SET FOR JUMPER
732  000426  052712  004000                    BIS     #ACTBIT,(R2)    ;SET FOR ACTIVE ON FIRST NON-SYNC
733  000432  052712  001000                    BIS     #ODDBIT,(R2)    ;SET FOR ODD VRC.......
734  000436  005722                            TST     (R2)+           ;POP POINTER
735  000440  005011                            CLR     (R1)            ;CLEAR RCSR
736  000442  005061  000002                    CLR     2(R1)           ;CLEAR TCSR
737  000446  005061  000002                    CLR     2(R1)           ;CLEAR AGAIN
738  000452  005061  000004                    CLR     4(R1)           ;CLEAR ERROR REG
739  000456  005061  000006                    CLR     6(R1)           ;CLEAR SEC REG
740  000462  005237  001504                    INC     DQNUM           ;UPDATE NUMBER OF DQ11S
741  000466  062701  000010            2$:     ADD     #10,R1          ;UPDATE CSR POINTER BY 10 (8)
742  000472  022701  164000                    CMP     #164000,R1      ;HAVE ALL FLOATING ADDRESSES BEEN CHECKED??
743  000476  001267                            BNE     1$              ;BR IF NOT ALL DONE
744  000500  005037  001500                    CLR     DQACTV          ;ZERO ACTIVE DQ11S
745  000504  005737  001504                    TST     DQNUM           ;WERE ANY DQ11S FOUND
746  000510  001434                            BEQ     4$              ;HEY BUDDY. NO DQ11S FOUND IN SYSTEM
747  000512  013701  001504                    MOV     DQNUM,R1        ;SAVE NUMBER OF DQ11S
748  000516  010137  001276                    MOV     R1,SAVNUM       ;SAVE NUMBER FOR ACT11
749  000522  000241            3$:     CLC                             ;CLEAR CARRY
750  000524  006137  001500                    ROL     DQACTV          ;       ACTIVE ADDRESS
751  000530  005237  001500                    INC     DQACTV          ;SET BIT 0
```

```
                                                DEC     R1              ;DEC NUMBER OF DQ11S
                                                BNE     3$              ;BR IF MORE TO GO
000534  005301
000536  001371
000540  012737  000006  000004                  MOV     #6,@#4          ;RESET TIME OUT VECTOR
000546  013737  001500  001502                  MOV     DQACTV,SAVACT   ;SAVE ACTIVE
000554  012737  000340  000022                  MOV     #340,@#22       ;SET IOT TRAP PRIO: TO 7
000562  012702  001400                          MOV     #1400,R2        ;SET TABLE POINTER
000566  012700  000300                          MOV     #300,R0         ;SET VECTOR START
000572  012701  000302                          MOV     #302,R1         ;SET VECTOR+2 START
000576  000137  000056                          JMP     VECMAP          ;GO FIND THE VECTORS
000602  104402                          4$:     TYPE                    ;TYPE MESSAGE
000604  017404                                  MERR2                   ;I DIDN'T FIND ANY DQ11S. DON'T USE AUTO SIZE.
000606  005000                                  CLR     R0              ;
000610  000000                                  HALT                    ;HOW CAN I TEST NO DQ11S
000612  000776                                  BR      .-2             ;DON'T LET OPR HIT CONT. SW
000614  012716  000466                  5$:     MOV     #2$,(SP)        ;ENTERED BY TIME OUT TRAP
000620  000002                                  RTI                     ;GO HOME.


                001000                  . 1000
001000  005377  055103  050504          MTITLE: .ASCIZ  <377><12>/CZDQDE0/<377>/TRANSMITTER AND RECEIVER EXERCISER/<377>
001006  042504  177460  051124
001014  047101  046523  052111
001022  042524  020122  047101
001030  020104  042522  042503
001036  053111  051105  042440
001044  042530  041522  051511
001052  051105  000377

                001200                  .-1200
                                        ;INDIRECT POINTERS

001200  177570                  SWR:    177570                  ;SWITCH REGISTER POINTER
001202  177570                  LIGHTS: 177570                  ;DISPLAY REGISTER POINTER
001204  177560                  TKCSR:  177560                  ;TELETYPE KEYBOARD CONTROL REGISTER
001206  177562                  TKDBR:  177562                  ;TELETYPE KEYBOARD DATA BUFFER
001210  177564                  TPCSR:  177564                  ;TELEPRINTER CONTROL REGISTER
001212  177566                  TPDBR:  177566                  ;TELEPRINTER DATA BUFFER

                                        ;PROGRAM CONTROL PARAMETERS

001214  000000                  RETURN: 0                       ;SCOPE ADDRESS FOR LOOP ON TEST
001216  000000                  NEXT:   0                       ;ADDRESS OF NEXT TEST TO BE EXECUTED
001220  000000                  LOCK:   0                       ;ADDRESS FOR LOCK ON CURRENT DATA
001222  000003                  ICOUNT: 3                       ;NUMBER OF ITERATIONS THAT CURRENT TEST WILL BE EXECUTED
001224  000000                  LPCNT:  0                       ;NUMBER OF ITEREATIONS COMPLETED
001226  000000                  TSTNO:  0                       ;NUMBER OF TEST IN PROGRESS
001230  000000                  PASCNT: 0                       ;NUMBER OF PASSES COMPLETED
001232  000000                  ERRCNT: 0                       ;TOTAL NUMBER OF ERRORS
001234  000000                  LSTERR: 0                       ;PC OF LAST ERROR CALL

                                        ;PROGRAM VARIABLES

001236  000000                  CHAR1:  0
001240  000000                  CHAR2:  0
001242  000000                  CHAR3:  0
001244  000000                  TEMP1:  0                       ;TEMPORARY STORAGE
```

```
  808  001246  000000                TEMP2:  0                       ;TEMPORARY STORAGE
  809  001250  000000                TEMP3:  0                       ;TEMPORARY STORAGE
  810  001252  000000                TEMP4:  0                       ;TEMPORARY STORAGE
  811  001254  000000                TEMP5:  0                       ;TEMPORARY STORAGE
  812  001256  000000                SAVR0:  0                       ;R0 STORAGE
  813  001260  000000                SAVR1:  0                       ;R1 STORAGE
  814  001262  000000                SAVR2:  0                       ;R2 STORAGE
  815  001264  000000                SAVR3:  0                       ;R3 STORAGE
  816  001266  000000                SAVR4:  0                       ;R4 STORAGE
  817  001270  000000                SAVR5:  0                       ;R5 STORAGE
  818  001272  000000                SAVSP:  0                       ;STACK POINTER STORAGE
  819  001274  000000                SAVPC:  0                       ;PROGRAM COUNTER STORAGE
  820  001276  000000                SAVNUM: 0
  821  001300  000001                CREAM:  .BLKW   1
  822  001302  000000                RUNFLG: 0
  823  001304  000000                RUN:    0
  824  001306  000000                RUNCNT: 0
```

```
                                        ;PROGRAM CONTROL FLAGS

001310      000         INIFLG: .BYTE   0               ;PROGRAM INITIALIZATION FLAG
001311      000         STFLG:  .BYTE   0               ;TEST START FLAG
001312      000         ERRFLG: .BYTE   0               ;ERROR OCCURED FLAG
001313      000         LOKFLG: .BYTE   0               ;LOCK ON CURRENT TEST FLAG
          000000        $Y=0

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

                        ;*****************************************************************
                        ;*****************************************************************
001314                  .TRPTAB:
          104400        SCOPE=TRAP+0            ;CALL TO SCOPE LOOP AND ITERATION HANDLER
001314    015316              .SCOPE
          104401        SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
001316    015430              .SCOP1
          104402        TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
001320    015450              .TYPE
          104403        INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
001322    015556              .INSTR
          104404        INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
001324    015674              .INSTER
          104405        PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
001326    015726              .PARAM
          104406        SAV05=TRAP+6            ;CALL TO REGISTER SAVE ROUTINE
001330    016142              .SAV05
          104407        RES05=TRAP+7            ;CALL TO REGISTER RESTORE ROUTINE
001332    016202              .RES05
          104410        CONVRT=TRAP+10          ;CALL TO DATA OUTPUT ROUTINE
001334    016234              .CONVRT
          104411        CNVRT=TRAP+11           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR/LF.
001336    016240              .CNVRT
          104412        MSTCLR=TRAP+12          ;CALL TO ISSUE MASTER CLEAR
001340    012116              .MSTCLR
          104413        MEMCLR=TRAP+13          ;CALL TO CLEAR ALL SCRATCH PAD MEMORIES
001342    011772              .MEMCLR
          104414        CKSWR=TRAP+14           ;CALL TO ALLOW SWREG TO BE LOADED FROM TTY
001344    017142              .CKSWR
          104415        CNTLU=TRAP+15           ;CALL TO ALLOW LOADING OF SWREG FROM TTY
001346    017216              .CNTLU

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

                                        ;DQ11 VECTOR AND REGISTER INDIRECT POINTERS

001350    000000        DQRVEC: 0               ;POINTER TO DQ11 RECEIVER INTERRUPT VECTOR
001352    000000        DQRLVL: 0               ;POINTER TO DQ11 RECEIVER INTERRUPT SERVICE PS
001354    000000        DQTVEC: 0               ;POINTER TO DQ11 TRANSMITTER INTERRUPT VECTOR
001356    000000        DQTLVL: 0               ;POINTER TO DQ11 TRANSMITTER INTERRUPT SERVICE PS
001360    000000        DQRCSR: 0               ;POINTER TO DQ11 RECEIVER CONTROL REGISTER
001362    000000        DQRCSH: 0               ;POINTER TO HIGH BYTE OF DQ11 RECEIVER CONTROL REGISTER
```

```
881  001364  000000  DQTCSR: 0               ;POINTER TO DQ11 TRANSMITTER CONTROL REGISTER
882  001366  000000  DQERR:  0               ;POINTER TO DQ11 ERROR REGISTER
883  001370  000000  DQREG:  0               ;POINTER TO HIGH BYTE OF ERROR REGISTER
884  001372  000000  DQSEC:  0               ;POINTER TO DQ11 SECONDARY REGISTER
885  001374  000000  DQSECH: 0               ;POINTER TO HIGH BYTE OF DQ11 SECONDARY REGISTER
886
887
888
889                          ;DQ11 STATUS TABLE AND ADDRESS ASSIGNMENTS
890
891          001400  .=1400
892  001400  000001  DQCR00: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 00
893  001402  000001  DQST00: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 00
894  001404  000001  DQCR01: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 01
895  001406  000001  DQST01: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 01
896  001410  000001  DQCR02: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 02
897  001412  000001  DQST02: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 02
898  001414  000001  DQCR03: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 03
899  001416  000001  DQST03: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 03
900  001420  000001  DQCR04: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 04
901  001422  000001  DQST04: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 04
902  001424  000001  DQCR05: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 05
903  001426  000001  DQST05: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 05
904  001430  000001  DQCR06: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 06
905  001432  000001  DQST06: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 06
906  001434  000001  DQCR07: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 07
907  001436  000001  DQST07: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 07
908  001440  000001  DQCR10: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 10
909  001442  000001  DQST10: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 10
910  001444  000001  DQCR11: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 11
911  001446  000001  DQST11: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 11
912  001450  000001  DQCR12: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 12
913  001452  000001  DQST12: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 12
914  001454  000001  DQCR13: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 13
915  001456  000001  DQST13: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 13
916  001460  000001  DQCR14: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 14
917  001462  000001  DQST14: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 14
918  001464  000001  DQCR15: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 15
919  001466  000001  DQST15: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 15
920  001470  000001  DQCR16: .BLKW   1       ;CONTROL STATUS REGISTER FOR DEVICE NO: 16
921  001472  000001  DQST16: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 16
922  001474  000001  DQCR17: .BLKW   1       ;CONTROL STATUS REGISTER FO? DEVICE NO: 17
923  001476  000001  DQST17: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS FOR DEVICE NO: 17
924  001500  000001  DQACTV: .BLKW   1       ;HOLD ACTIVE BITS FOR TESTING
925  001502  000001  SAVACT: .BLKW   1       ;SAVE NUMBER OF ACTIVE DQ11S
926  001504  000001  DQNUM:  .BLKW   1       ;OCTAL NUMBER OF TOTAL NUMBER OD DQ11S
927  001506  000001  DQCSR:  .BLKW   1       ;CSR OF DQ11 UNDER TEST
928  001510  000001  DQSTAT: .BLKW   1       ;VECTOR AND CONFIGURATION STATUS OF DQ11 UNDER TEST
929
930                          ;PROGRAM INITIALIZATION
931                          ;LOCK OUT INTERRUPTS
932                          ;SET UP PROCESSOR STACK
933                          ;SET UP POWER FAIL VECTOR
934                          ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
935                          ;TYPE TITLE MESSAGE
936
```

```
  937  001512  012737  000340  177776  .START: MOV     #340,PS                 ;LOCK OUT INTERRUPTS
  938  001520  012706  001200                 MOV     #STACK,SP               ;SET UP STACK
  939  001524  012737  017044  000024         MOV     #.PFAIL,@#24            ;SET UP POWER FAIL VECTOR
  940  001532  013737  001504  001276         MOV     DQNUM,SAVNUM
  941  001540  105037  001311                 CLRB    STFLG                   ;CLEAR START FLAG
  942  001544  005037  001230                 CLR     PASCNT                  ;CLEAR PASS COUNT
  943  001550  105037  001312                 CLRB    ERRFLG                  ;CLEAR ERROR FLAG
  944  001554  005037  001302                 CLR     RUNFLG
  945  001560  012737  001400  001300         MOV     #1400,CREAM
  946  001566  005037  001232                 CLR     ERRCNT                  ;CLEAR ERROR COUNT
  947  001572  005037  001234                 CLR     LSTERR                  ;CLEAR LAST ERROR POINTER
  948  001576  012737  000001  001226         MOV     #1,TSTNO                ;SET UP FOR TEST 1
  949  001604  012737  001512  001214         MOV     #.START,RETURN          ;SET UP FOR POWER FAIL BEFORE
  950                                                                         ;TESTING STARTS
  951  001612  012737  177570  001200         MOV     #DSWR,SWR               ;MOV HARDWARE SWR TO SWR
  952  001620  012737  177570  001202         MOV     #DLIGHTS,LIGHTS         ;MOV DISPLAY LIGHTS TO LIGHTS
  953  001626  013746  000006                 MOV     @#6,-(SP)               ;SAVE VECTORS
  954  001632  013746  000004                 MOV     @#4,-(SP)
  955  001636  012737  001656  000004         MOV     #64$,@#4                        ;SET UP FOR TIMEOUT
  956  001644  022777  177777  177326         CMP     #-1,@SWR                ;REFERENCE HARDWARE SWITCH REGISTER
  957  001652  001402                         BEQ     65$
  958  001654  000407                         BR      66$
  959  001656  022626                 64$:    CMP     (SP)+,(SP)+             ;ADJUST STACK
  960  001660  012737  000176  001200 65$:    MOV     #SWREG,SWR              ;POINT TO SOFTWARE SWITCH REG
  961  001666  012737  000174  001202         MOV     #DISPREG,LIGHTS         ;POINT TO SOFT DISPLAY REG
  962  001674  012637  000004                 MOV     (SP)+,@#4               ;RESTORE VECTORS
  963  001700  012637  000006                 MOV     (SP)+,@#6
  964  001704  005737  000042                 TST     @#42                    ;UNDER MONITOR
  965  001710  001014                         BNE     67$
  966                                 ;;******THE NEXT 4 LINES OF CODE MOVED TO SOLVE PR#2757 (JUNE 78)******
  967  001712  105737  001310                 TSTB    INIFLG                  ;HAS INITIALIZATION BEEN PERFORMED?
  968  001716  001035                         BNE     12$                     ;IF YES, BR
  969  001720  104402  001000                 TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
  970  001724  105137  001310                 COMB    INIFLG          ;IF NOT SET FLAG AND INIT
  971  001730  022737  000176  001200         CMP     #SWREG,SWR              ;IS SWREG USED
  972  001736  001001                         BNE     67$
  973  001740  104415                         CNTLU
  974  001742  105777  177232         67$:    TSTB    @SWR
  975  001746  100402                         BMI     .+6
  976  001750  004737  000220                 JSR     PC,CSRMAP
  977  001754  104402  017671                 TYPE    ,XHEAD
  978  001760  012737  001400  001244         MOV     #1400,TEMP1
  979  001766  017737  177252  001246         MOV     @TEMP1,TEMP2
  980  001774  001406                         BEQ     .+16
  981  001776  104410                         CONVRT
  982  002000  017716                         XSTATQ
  983  002002  062737  000002  001244         ADD     #2,TEMP1
  984  002010  000766                         BR      .-22
  985  002012  032777  000001  177160 12$:    BIT     #SW00,@SWR
  986  002020  001424                         BEQ     1$
  987  002022  104402                         TYPE
  988  002024  017612                         MNEW
  989  002026  005000                         CLR     R0
  990  002030  000000                         HALT
  991  002032  104414                         CKSWR
  992  002034  027737  177140  001502         CMP     @SWR,SAVACT
```

```
  993  002042  101404                          BLOS    11$
  994  002044  104402                          TYPE
  995  002046  017453                          MERR3
  996  002050  000000                          HALT
  997  002052  000776                          BR      .-2
  998  002054  017737  177120  001500  11$:    MOV     @SWR,DQACTV
  999  002062  013700  001500                  MOV     DQACTV,R0
 1000  002066  000000                          HALT
 1001  002070  104414                          CKSWR
 1002  002072  012700  000300          ^$:     MOV     #300,R0
 1003  002076  012701  000302                  MOV     #302,R1
 1004  002102  010120                  2$:     MOV     R1,(R0)+
 1005  002104  005021                          CLR     (R1)+
 1006  002106  022021                          CMP     (R0)+,(R1)+
 1007  002110  022700  001000                  CMP     #1000,R0
 1008  002114  001372                          BNE     2$
 1009
 1010                                          ;TEST START AND RESTART
 1011
 1012  002116  012737  000340  177776  .BEGIN: MOV     #340,PS                 ;LOCK OUT INTERRUPTS
 1013  002124  012706  001200                  MOV     #STACK,SP               ;SET UP STACK
 1014  002130  005737  000042                  TST     @#42                    ;IS PROGRAM UNDER MONITOR CONTROL
 1015  002134  001040                          BNE     3$
 1016  002136  104414                          CKSWR                           ;CHECK FOR <^G>
 1017  002140  032777  000004  177032          BIT     #BIT2,@SWR              ;CHECK FOR LOCK ON TEST
 1018  002146  001411                          BEQ     1$
 1019  002150  104402  017511                  TYPE    ,MLOCK
 1020  002154  012737  000240  015326          MOV     #NOP,TTST
 1021  002162  012737  000240  015330          MOV     #NOP,TTST+2             ;SET UP TO LOCK
 1022  002170  000406                          BR      2$
 1023  002172  013737  015424  015326  1$:     MOV     BRW,TTST
 1024  002200  013737  015426  015330          MOV     BRX,TTST+2              ;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOP
 1025  002206  032777  000002  176764  2$:     BIT     #SW01,@SWR              ;IF SW01=1, GET STARTING PC
 1026  002214  001410                          BEQ     3$
 1027  002216  104403                          INSTR
 1028  002220  017477                          MTSTPC
 1029  002222  104405                          PARAM
 1030  002224  002254                          TST1
 1031  002226  007756                          TLAST
 1032  002230  001214                          #RETURN
 1033  002232     001                  .BYTE   1
 1034  002233     001                  .BYTE   1
 1035  002234  000403                          BR      4$
 1036  002236  012737  002254  001214  3$:     MOV     #TST1,RETURN            ;START AT TEST 1
 1037  002244  104402  017401          4$:     TYPE    ,MR                     ;TYPE R
 1038  002250  000177  176740                  JMP     @RETURN                 ;START TESTING
 1039                                          ;  TEST 1
 1040                                          ;*************************************************************************
 1041  002254  012737  000001  001226  TST1:   MOV     #1,TSTNO
 1042  002262  012737  002644  001214          MOV     #TST2,RETURN
 1043  002270  012737  002644  001216          MOV     #TST2,NEXT
 1044  002276  105737  001302                  TSTB    RUNFLG          ;IS THIS MY FIRST TIME HERE?
 1045  002302  001010                          BNE     1$              ;BR IF FLAG IS SET
 1046  002304  012737  000001  001304          MOV     #BIT0,RUN       ;SET RUN POINTER.
 1047  002312  012737  000020  001306          MOV     #16.,RUNCNT     ;SET FOR MAX OF 16 DQ11'S PER SYSTEM
 1048  002320  105137  001302                  COMB    RUNFLG          ;SET RUN FLAG
```

```
1049  002324  033737  001304  001500  1$:     BIT     RUN,DQACTV      ;FIND AN ACTIVE DQ11 TO TEST.
1050  002332  001032                          BNE     3$              ;BR IF I FOUND ONE TO TEST.
1051  002334  005737  001500                  TST     DQACTV          ;FIND OUT IF THERE ARE NO DQ11 ACTIVE.
1052  002340  001423                          BEQ     2$              ;BR TO FATAL ERROR. WHY AM I HERE IF NO ACTIVE DQ11'S???
1053  002342  000257                          CCC                     ;CLEAR ALL THE CONDITION CODES OF CPU
1054  002344  006137  001304                  ROL     RUN             ;UPDATE RUN POINTER
1055  002350  062737  000004  001300          ADD     #4,CREAM        ;UPDATE ADDRESS POINTER.
1056  002356  005337  001306                  DEC     RUNCNT          ;DEC NUMBER OF TIMES I LOOKED AT ACTIVE.
1057  002362  001360                          BNE     1$              ;BR AND KEEP LOOKING.
1058  002364  012737  000020  001306          MOV     #16.,RUNCNT     ;START RESTORING MY POINTERS.
1059  002372  012737  001400  001300          MOV     #1400,CREAM     ;RESTORE  ADDRESS POINTER
1060  002400  012737  000001  001304          MOV     #1,RUN          ;RESTORE RUN POINTER.
1061  002406  000746                          BR      1$              ;KEEP ON TESTING.
1062  002410  104402                  2$:     TYPE                    ;ALLERT OPERATOR OF FATAL ERROR
1063  002412  017404                          MERR2                   ;NO DQ11 ACTIVE. WHY AM I HERE???
1064  002414  000000                          HALT                    ;YOU MUST RELOAD DQ11 DIAGNOSTIC!!
1065  002416  000776                          BR      .-2             ;STICK HERE ON CONT.
1066  002420  000257                  3$:     CCC                     ;CLEAR CPU COND. CODES
1067  002422  006137  001304                  ROL     RUN             ;UPDATE RUN. ACTIVE DQ11 FOUND.
1068  002426  017737  176646  001506          MOV     @CREAM,DQCSR    ;PLACE ADDRESSS OF DQ11 AT DQCSR
1069  002434  062737  000002  001300          ADD     #2,CREAM        ;UPDATE ADDRESS POINTER
1070  002442  017737  176632  001510          MOV     @CREAM,DQSTAT   ;PLACE STATUS OF DQ11 AT DQSTAT
1071  002450  062737  000002  001300          ADD     #2,CREAM        ;UPDATE ADDRESS POINTER
1072  002456  013737  001506  001360          MOV     DQCSR,DQRCSR
1073  002464  013737  001510  001350          MOV     DQSTAT,DQRVEC
1074  002472  042737  177007  001350          BIC     #177007,DQRVEC
1075  002500  013737  001350  001352          MOV     DQRVEC,DQRLVL   ;GENERATE ADDRESS OF RECEIVER INTERRUPT SERVICE PS
1076  002506  062737  000002  001352          ADD     #2,DQRLVL
1077  002514  013737  001352  001354          MOV     DQRLVL,DQTVEC   ;GENERATE ADDRESS OF TRANSMITTER INTERRUPT VECTOR
1078  002522  062737  000002  001354          ADD     #2,DQTVEC
1079  002530  013737  001354  001356          MOV     DQTVEC,DQTLVL   ;GENERATE ADDRESS  OF TRANSMITTER INTERRUPT SERVICE PS
1080  002536  062737  000002  001356          ADD     #2,DQTLVL
1081  002544  013737  001360  001362          MOV     DQRCSR,DQRCSH
1082  002552  005237  001362                  INC     DQRCSH          ;GENERATE ADDRESS OF HIGH BYTE
1083  002556  013737  001360  001364          MOV     DQRCSR,DQTCSR   ;GENERATE ADDRESS OF TRANSMITTER CONTROL REGISTER
1084  002564  062737  000002  001364          ADD     #2,DQTCSR
1085  002572  013737  001364  001366          MOV     DQTCSR,DQERR    ;GENERATE ADDRESS OF ERROR REGISTER
1086  002600  062737  000002  001366          ADD     #2,DQERR
1087  002606  013737  001366  001370          MOV     DQERR,DQREG     ;GENERATE ADDRESS OF HIGH BYTE OF ERROR REGISTER
1088  002614  005237  001370                  INC     DQREG
1089  002620  013737  001370  001372          MOV     DQREG,DQSEC     ;GENERATE ADDRESS OF SECONDARY REGISTER
1090  002626  005237  001372                  INC     DQSEC
1091  002632  013737  001372  001374          MOV     DQSEC,DQSECH    ;GENERATE ADDRESS OF HIGH BYTE
1092  002640  005237  001374                  INC     DQSECH
1093                                          ;
1094                                          ;TEST TO SEE IF TRANSMITTER ACTIVE
1095                                          ;CAN SET.
1096                                          ;AND IF IT DOES SET CHECK TO
1097                                          ;SEE IF IT CAN BE CLEARED BY
1098                                          ;MASTER CLEAR.
1099                                          ;
1100                                  ;  TEST 2
1101                                  ;*****************************************************************************
1102  002644  012737  000002  001226  TST2:   MOV     #2,TSTNO
1103  002652  012737  003002  001216          MOV     #C%SYN1,NEXT
1104  002660  112777  000002  176502          MOVB    #2,@DQREG       ;SEL TX BA PRI
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1105  002666  012777  014070  176476          MOV     #TMPBUF,@DQSEC  ;LOAD TX BA
1106  002674  105277  176470                  INCB    @DQREG          ;SEL TTX CC PRI
1107  002700  012777  000200  176464          MOV     #200,@DQSEC     ;LOAD WITH 200
1108  002706  112777  000012  176454          MOVB    #MISC.,@DQREG   ;SEL MISC REGISTER
1109  002714  012777  004012  176450          MOV     #4012,@DQSEC    ;SELECT 8 BITS TEST LOOP AUTO STEP
1110  002722  005277  176436                  INC     @DQTCSR         ;SET TX GO
1111  002726  005277  176440                  INC     @DQSEC          ;PRIM THE
1112  002732  005377  176434                  DEC     @DQSEC          ;         TRANSMITTER
1113  002736  005277  176430                  INC     @DQSEC          ;CLOCK THE TRANSMITTER
1114  002742  032777  040000  176422          BIT     #BIT14,@DQSEC   ;CHECK TX ACTIVE.
1115  002750  001001                          BNE     .+4             ;BRANCH IF ACTIVE SET
1116  002752  104024                          HLT 24                  ;ERROR TX ACTIVE NOT SET!!
1117  002754  104412                          MSTCLR                  ;ISSUE
1118  002756  104412                          MSTCLR                  ;TWO MASTER CLEARS
1119  002760  112777  000012  176402          MOVB    #MISC.,@DQREG   ;RESELECT THE MISC REGISTER
1120  002766  032777  040000  176376          BIT     #BIT14,@DQSEC   ;DID TX ACTIVE CLEAR BY MST CLR
1121  002774  001401                          BEQ     .+4             ;BRANCH IF ACTIVE CLEAR
1122  002776  104001                          HLT 1                   ;ERROR TX ACTIVE NOT CLEARED BY MST CLR
1123  003000  104400                          SCOPE                   ;SCOPE TEST
1124
1125                                          ;ROUTINE TO SET
1126                                          ;TRANSMITTER POINTER
1127                                          ;CORRECTLY DEPENDING
1128                                          ;UPON THE NUMBER OF SYNC
1129                                          ;CHARACTERS.
1130
1131  003002  032737  100000  001510  CKSYN1: BIT     #SYNBIT,DQSTAT  ;CHECK TO FIND OUT IF ONE SYNC OR TWO.
1132  003010  001004                          BNE     1$              ;BRANCH IF TWO SYNC CHARS REQUIRED
1133  003012  112737  000377  014524          MOVB    #377,SYNC       ;CLEAR THE FIRST SYNC CHAR                    ;;++E
1134  003020  000403                          BR      2$              ;BR TO LEAVE ROUTINE
1135  003022  112737  000026  014524  1$:     MOVB    #26,SYNC        ;RESET SYNC CHAR TO 26
1136  003030  000240                  2$:     NOP                     ;FALL IN TO NEXT TEST
1137                                          ;
1138                                          ;TEST TO TRANSMITT ONE CHARACTER.
1139                                          ;
1140                                          ;TESTING TO MAKE SURE THAT THE
1141                                          ;CHARACTER COUNT INCREMENTS BY ONE.
1142                                          ;TESTING THAT THE CURRENT ADDRESS
1143                                          ;INCREMENTS BY ONE
1144                                          ;ALSO MAKING SURE THE PRI/SEC BIT SETS.
1145                                          ;
1146                                  ;  TEST 3
1147                                  ;*****************************************************************************
1148  003032  012737  000003  001226  TST3:   MOV     #3,TSTNO
1149  003040  012737  003056  001214          MOV     #A1$,RETURN
1150  003046  012737  003372  001216          MOV     #TST4,NEXT
1151  003054  104413                          MEMCLR                  ;CLEAR ALL THE DQ11
1152  003056  104412                  A1$:    MSTCLR
1153  003060  112777  000002  176302          MOVB    #2,@DQREG       ;SELECT TX CURRENT ADD.
1154  003066  012777  014526  176276          MOV     #TXBUFF,@DQSEC  ;SET THE TX CURRENT ADD.
1155  003074  105277  176270                  INCB    @DQREG          ;SELECT THE TX CHAR CNT.
1156  003100  012777  177777  176264          MOV     #-1,@DQSEC      ;SET TX CHAR CNT FOR 1 CHARACTER.
1157  003106  112777  000012  176254          MOVB    #MISC.,@DQREG   ;SELECT THE MISC REGISTER.
1158  003114  012777  004010  176250          MOV     #4010,@DQSEC    ;SET FOR EIGHT BITS. AND TEST LOOP
1159  003122  005037  014062                  CLR     DELAY           ;CLEAR THE DELAY
1160  003126  005277  176232                  INC     @DQTCSR         ;SET THE GO BIT AND GO..
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1161  003132  105777  176226          1$:     TSTB    @DQTCSR         ;PRIMARY DONE??
1162  003136  100405                          BMI     2$              ;BRANCH IF DONE
1163  003140  062737  000001  014062          ADD     #1,DELAY        ;STALL FOR DONE
1164  003146  001371                          BNE     1$              ;TO SET.
1165  003150  104002                          HLT 2                   ;TX PRI DONE FAILED TO SET.
1166  003152  112777  000003  176210  2$:     MOVB    #3,@DQREG       ;SELECT TX CHAR CNT
1167  003160  005777  176206                  TST     @DQSEC          ;MAKE SURE IT INCREMENTED
1168  003164  001401                          BEQ     .+4             ;BY ONE TO ZERO.
1169  003166  104003                          HLT 3                   ;TX PRI CHAR CNT NOT ZERO.
1170  003170  112777  000002  176172          MOVB    #2,@DQREG       ;SELECT TX CURRENT ADD.(PRI)
1171  003176  022777  014527  176166  3$:     CMP     #TXBUFF+1,@DQSEC        ;
1172  003204  001401                          BEQ     .+4
1173  003206  104005                          HLT 5                   ; CHAR CNT NOT INC BY +1
1174  003210  032777  000004  176146  4$:     BIT     #BIT2,@DQTCSR   ;DID PRI/SEC SET?
1175  003216  001001                          BNE     .+4
1176  003220  104006                          HLT 6                   ;TX PRI/SEC NOT SET.
1177                                          ;
1178                                          ;TEST THAT WITH A CHARACTER
1179                                          ;COUNT THAT IS EVEN THAT THE
1180                                          ;CURRENT ADDRESS INCREMENTS BY +2
1181                                          ;AND THAT THE CHAR CNT GOES TO ZERO.
1182                                          ;
1183
1184
1185  003222  112777  000006  176140  SECND:  MOVB    #6,@DQREG       ;SELECT TX CURRENT ADD.
1186  003230  012777  014526  176134          MOV     #TXBUFF,@DQSEC  ;SET THE TX CURRENT ADD.
1187  003236  105277  176126                  INCB    @DQREG          ;SELECT THE TX CHAR CNT.
1188  003242  012777  177776  176122          MOV     #-2,@DQSEC      ;SET TX CHAR CNT FOR TWO CHARS.
1189  003250  112777  000012  176112          MOVB    #MISC.,@DQREG   ;SELECT THE MISC REGISTER.
1190  003256  012777  004010  176106          MOV     #4010,@DQSEC    ;SET FOR EIGHT BITS AND TEST LOOP
1191  003264  005037  014062                  CLR     DELAY           ;CLEAR THE DELAY
1192  003270  005277  176070                  INC     @DQTCSR         ;SET THE GO BIT AND GO!!
1193  003274  032777  000100  176062  1$:     BIT     #BIT6,@DQTCSR           ;SECONDARY DONE??
1194  003302  001005                          BNE     2$              ;BRANCH IF DONE
1195  003304  062737  000001  014062          ADD     #1,DELAY        ;STALL FOR DONE
1196  003312  001370                          BNE     1$              ;TO SET.
1197  003314  104002                          HLT 2                   ;TX SEC DONE FAILED TO SET.
1198  003316  112777  000007  176044  2$:     MOVB    #7,@DQREG       ;SELECT TX CHAR CNT
1199  003324  005777  176042                  TST     @DQSEC          ;MAKE SURE IT INCREMENTED
1200  003330  001401                          BEQ     .+4             ;BY ONE TO ZERO.
1201  003332  104003                          HLT 3                   ;TX SEC CHAR CNT NOT ZERO.
1202  003334  112777  000006  176026          MOVB    #6,@DQREG       ;SELECT TX CURRENT ADD.(PRI)
1203  003342  022777  014530  176022  3$:     CMP     #TXBUFF+2,@DQSEC        ;
1204  003350  001401                          BEQ     .+4
1205  003352  104004                          HLT 4                   ; CHAR CNT NOT INC BY +2
1206  003354  032777  000004  176002  4$:     BIT     #BIT2,@DQTCSR   ;DID PRI/SEC SET?
1207  003362  001401                          BEQ     .+4
1208  003364  104006                          HLT 6                   ;TX PRI/SEC NOT SET.
1209  003366  104413                          MEMCLR
1210  003370  104400                          SCOPE
1211                                          ;
1212                                          ;TRANSMITTER CHARACTER LENGTH TESTS.
1213                                          ;
1214                                          ;TEST TO TRANSMITT A CHARACTER
1215                                          ; 2 BITS LONG MAKING SURE THAT
1216                                          ;THE CHARACTER IS ALL ZERO'S
```

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1217                                            ;AND THAT THE TX LINE GOES BACK TO
1218                                            ;A MARK STATE WHEN DONE.
1219                                            ;
1220
1221                                    ;  TEST 4
1222                                    ;*************************************************************************
1223  003372  012737  000004  001226    TST4:   MOV     #4,TSTNO
1224  003400  012737  003420  001216            MOV     #TST5,NEXT
1225  003406  004537  010722                    JSR     R5,TXSTRB       ;JSR TO ROUTINE
1226  003412  000002                            2                       ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1227  003414  007000                            7000                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1228  003416  104400                            SCOPE                   ;SCOPE TEST
1229
1230                                            ;TEST TO TRANSMITT A CHARACTER
1231                                            ; 3 BITS LONG MAKING SURE THAT
1232                                            ;THE CHARACTER IS ALL ZERO'S
1233                                            ;AND THAT THE TX LINE GOES BACK TO
1234                                            ;A MARK STATE WHEN DONE.
1235                                            ;
1236
1237                                    ;  TEST 5
1238                                    ;*************************************************************************
1239  003420  012737  000005  001226    TST5:   MOV     #5,TSTNO
1240  003426  012737  003446  001216            MOV     #TST6,NEXT
1241  003434  004537  010722                    JSR     R5,TXSTRB       ;JSR TO ROUTINE
1242  003440  000003                            3                       ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1243  003442  006400                            6400                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1244  003444  104400                            SCOPE                   ;SCOPE TEST
1245
1246                                            ;TEST TO TRANSMITT A CHARACTER
1247                                            ; 4 BITS LONG MAKING SURE THAT
1248                                            ;THE CHARACTER IS ALL ZERO'S
1249                                            ;AND THAT THE TX LINE GOES BACK TO
1250                                            ;A MARK STATE WHEN DONE.
1251                                            ;
1252
1253                                    ;  TEST 6
1254                                    ;*************************************************************************
1255  003446  012737  000006  001226    TST6:   MOV     #6,TSTNO
1256  003454  012737  003474  001216            MOV     #TST7,NEXT
1257  003462  004537  010722                    JSR     R5,TXSTRB       ;JSR TO ROUTINE
1258  003466  000004                            4                       ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1259  003470  006000                            6000                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1260  003472  104400                            SCOPE                   ;SCOPE TEST
1261
1262                                            ;TEST TO TRANSMITT A CHARACTER
1263                                            ; 5 BITS LONG MAKING SURE THAT
1264                                            ;THE CHARACTER IS ALL ZERO'S
1265                                            ;AND THAT THE TX LINE GOES BACK TO
1266                                            ;A MARK STATE WHEN DONE.
1267                                            ;
1268
1269                                    ;  TEST 7
1270                                    ;*************************************************************************
1271  003474  012737  000007  001226    TST7:   MOV     #7,TSTNO
1272  003502  012737  003522  001216            MOV     #TST10,NEXT
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1273  003510  004537  010722                  JSR     R5,TXSTRB       ;JSR TO ROUTINE
1274  003514  000005                          5                       ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1275  003516  005400                          5400                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1276  003520  104400                          SCOPE                   ;SCOPE TEST
1277
1278                                          ;TEST TO TRANSMITT A CHARACTER
1279                                          ; 6 BITS LONG MAKING SURE THAT
1280                                          ;THE CHARACTER IS ALL ZERO'S
1281                                          ;AND THAT THE TX LINE GOES BACK TO
1282                                          ;A MARK STATE WHEN DONE.
1283                                          ;
1284
1285                                  ;  TEST 10
1286                                  ;*************************************************************
1287  003522  012737  000010  001226  TST10:  MOV     #10,TSTNO
1288  003530  012737  003550  001216          MOV     #TST11,NEXT
1289  003536  004537  010722                  JSR     R5,TXSTRB       ;JSR TO ROUTINE
1290  003542  000006                          6                       ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1291  003544  005000                          5000                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1292  003546  104400                          SCOPE                   ;SCOPE TEST
1293
1294                                          ;TEST TO TRANSMITT A CHARACTER
1295                                          ; 7 BITS LONG MAKING SURE THAT
1296                                          ;THE CHARACTER IS ALL ZERO'S
1297                                          ;AND THAT THE TX LINE GOES BACK TO
1298                                          ;A MARK STATE WHEN DONE.
1299                                          ;
1300
1301                                  ;  TEST 11
1302                                  ;*************************************************************
1303  003550  012737  000011  001226  TST11:  MOV     #11,TSTNO
1304  003556  012737  003576  001216          MOV     #TST12,NEXT
1305  003564  004537  010722                  JSR     R5,TXSTRB       ;JSR TO ROUTINE
1306  003570  000007                          7                       ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1307  003572  004400                          4400                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1308  003574  104400                          SCOPE                   ;SCOPE TEST
1309
1310                                          ;TEST TO TRANSMITT A CHARACTER
1311                                          ; 8 BITS LONG MAKING SURE THAT
1312                                          ;THE CHARACTER IS ALL ZERO'S
1313                                          ;AND THAT THE TX LINE GOES BACK TO
1314                                          ;A MARK STATE WHEN DONE.
1315                                          ;
1316
1317                                  ;  TEST 12
1318                                  ;*************************************************************
1319  003576  012737  000012  001226  TST12:  MOV     #12,TSTNO
1320  003604  012737  003624  001216          MOV     #TST13,NEXT
1321  003612  004537  010722                  JSR     R5,TXSTRB       ;JSR TO ROUTINE
1322  003616  000010                          8.                      ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1323  003620  004000                          4000                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1324  003622  104400                          SCOPE                   ;SCOPE TEST
1325
1326                                          ;
1327                                          ;TEST OF CHARACTER LENGTH
1328                                          ;FOR CHARACTERS OVER 8 BITS LONG.
```

```
1329                                    ;
1330                                    ;
1331                                    ;TEST TO TRANSMITT A CHARACTER
1332                                    ; 9 BITS LONG MAKING SURE THAT
1333                                    ;THE CHARACTER IS ALL ZERO'S
1334                                    ;AND THAT THE TX LINE GOES BACK TO
1335                                    ;A MARK STATE WHEN DONE.
1336                                    ;
1337
1338                                ;  TEST 13
1339                                ;*************************************************************************
1340  003624  012737  000013  001226 TST13:  MOV     #13,TSTNO
1341  003632  012737  003652  001216         MOV     #TST14,NEXT
1342  003640  004537  010722                 JSR     R5,TXSTRB       ;DO JSR TO THE SUBROUTINE
1343  003644  000011                         9.                      ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1344  003646  003400                         3400                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1345  003650  104400                         SCOPE                   ;SCOPE THE TEST
1346
1347                                    ;
1348                                    ;TEST TO TRANSMITT A CHARACTER
1349                                    ; 10 BITS LONG MAKING SURE THAT
1350                                    ;THE CHARACTER IS ALL ZERO'S
1351                                    ;AND THAT THE TX LINE GOES BACK TO
1352                                    ;A MARK STATE WHEN DONE.
1353                                    ;
1354
1355                                ;  TEST 14
1356                                ;*************************************************************************
1357  003652  012737  000014  001226 TST14:  MOV     #14,TSTNO
1358  003660  012737  003700  001216         MOV     #TST15,NEXT
1359  003666  004537  010722                 JSR     R5,TXSTRB       ;DO JSR TO THE SUBROUTINE
1360  003672  000012                         10.                     ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1361  003674  003000                         3000                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1362  003676  104400                         SCOPE                   ;SCOPE THE TEST
1363
1364                                    ;
1365                                    ;TEST TO TRANSMITT A CHARACTER
1366                                    ; 11 BITS LONG MAKING SURE THAT
1367                                    ;THE CHARACTER IS ALL ZERO'S
1368                                    ;AND THAT THE TX LINE GOES BACK TO
1369                                    ;A MARK STATE WHEN DONE.
1370                                    ;
1371
1372                                ;  TEST 15
1373                                ;*************************************************************************
1374  003700  012737  000015  001226 TST15:  MOV     #15,TSTNO
1375  003706  012737  003726  001216         MOV     #TST16,NEXT
1376  003714  004537  010722                 JSR     R5,TXSTRB       ;DO JSR TO THE SUBROUTINE
1377  003720  000013                         11.                     ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1378  003722  002400                         2400                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1379  003724  104400                         SCOPE                   ;SCOPE THE TEST
1380
1381                                    ;
1382                                    ;TEST TO TRANSMITT A CHARACTER
1383                                    ; 12 BITS LONG MAKING SURE THAT
1384                                    ;THE CHARACTER IS ALL ZERO'S
```

```
1385                                            ;AND THAT THE TX LINE GOES BACK TO
1386                                            ;A MARK STATE WHEN DONE.
1387                                            ;
1388
1389                                    ;  TEST 16
1390                                    ;*****************************************************************************
1391  003726  012737  000016  001226    TST16:  MOV     #16,TSTNO
1392  003734  012737  003754  001216            MOV     #TST17,NEXT
1393  003742  004537  010722                    JSR     R5,TXSTRB       ;DO JSR TO THE SUBROUTINE
1394  003746  000014                            12.                     ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1395  003750  002000                            2000                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1396  003752  104400                            SCOPE                   ;SCOPE THE TEST
1397
1398                                            ;
1399                                            ;TEST TO TRANSMITT A CHARACTER
1400                                            ; 13 BITS LONG MAKING SURE THAT
1401                                            ;THE CHARACTER IS ALL ZERO'S
1402                                            ;AND THAT THE TX LINE GOES BACK TO
1403                                            ;A MARK STATE WHEN DONE.
1404                                            ;
1405
1406                                    ;  TEST 17
1407                                    ;*****************************************************************************
1408  003754  012737  000017  001226    TST17:  MOV     #17,TSTNO
1409  003762  012737  004002  001216            MOV     #TST20,NEXT
1410  003770  004537  010722                    JSR     R5,TXSTRB       ;DO JSR TO THE SUBROUTINE
1411  003774  000015                            13.                     ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1412  003776  001400                            1400                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1413  004000  104400                            SCOPE                   ;SCOPE THE TEST
1414
1415                                            ;
1416                                            ;TEST TO TRANSMITT A CHARACTER
1417                                            ; 14 BITS LONG MAKING SURE THAT
1418                                            ;THE CHARACTER IS ALL ZERO'S
1419                                            ;AND THAT THE TX LINE GOES BACK TO
1420                                            ;A MARK STATE WHEN DONE.
1421                                            ;
1422
1423                                    ;  TEST 20
1424                                    ;*****************************************************************************
1425  004002  012737  000020  001226    TST20:  MOV     #20,TSTNO
1426  004010  012737  004030  001216            MOV     #TST21,NEXT
1427  004016  004537  010722                    JSR     R5,TXSTRB       ;DO JSR TO THE SUBROUTINE
1428  004022  000016                            14.                     ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1429  004024  001000                            1000                    ;BIT SELECTION TO BE PLACED INTO MISC REG
1430  004026  104400                            SCOPE                   ;SCOPE THE TEST
1431
1432                                            ;
1433                                            ;TEST TO TRANSMITT A CHARACTER
1434                                            ; 15 BITS LONG MAKING SURE THAT
1435                                            ;THE CHARACTER IS ALL ZERO'S
1436                                            ;AND THAT THE TX LINE GOES BACK TO
1437                                            ;A MARK STATE WHEN DONE.
1438                                            ;
1439
1440                                    ;  TEST 21
```

```
1441                                    ;*****************************************************************************
1442  004030  012737  000021  001226  TST21:  MOV     #21,TSTNO
1443  004036  012737  004056  001216           MOV     #TST22,NEXT
1444  004044  004537  010722                   JSR     R5,TXSTRB       ;DO JSR TO THE SUBROUTINE
1445  004050  000017                           15.                     ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1446  004052  000400                           400                     ;BIT SELECTION TO BE PLACED INTO MISC REG
1447  004054  104400                           SCOPE                   ;SCOPE THE TEST
1448
1449                                           ;
1450                                           ;TEST TO TRANSMITT A CHARACTER
1451                                           ; 16 BITS LONG MAKING SURE THAT
1452                                           ;THE CHARACTER IS ALL ZERO'S
1453                                           ;AND THAT THE TX LINE GOES BACK TO
1454                                           ;A MARK STATE WHEN DONE.
1455                                           ;
1456
1457                                    ;  TEST 22
1458                                    ;*****************************************************************************
1459  004056  012737  000022  001226  TST22:  MOV     #22,TSTNO
1460  004064  012737  004104  001216           MOV     #TST23,NEXT
1461  004072  004537  010722                   JSR     R5,TXSTRB       ;DO JSR TO THE SUBROUTINE
1462  004076  000020                           16.                     ;NUMBER OF TIMES CHAR IS TO BE SHIFTED
1463  004100  000000                           0                       ;BIT SELECTION TO BE PLACED INTO MISC REG
1464  004102  104400                           SCOPE                   ;SCOPE THE TEST
1465
1466                                           ;
1467
1468
1469                                           ;
1470                                           ;TEST OF TRANSMITTER IDLE SYNC
1471                                           ;TEST THAT THE TRANSMITTER CAN
1472                                           ;REALLY IDLE SYNC CHARACTERS
1473
1474
1475                                    ;  TEST 23
1476                                    ;*****************************************************************************
1477  004104  012737  000023  001226  TST23:  MOV     #23,ISTNO
1478  004112  012737  004440  0012?6           MOV     #TST24,NEXT
1479  004120  005077  175240                   CLR     @DQTCSR         ;CLR TX STATUS
1480  004124  032777  000002  175232           BIT     #BIT1,@DQTCSR   ;IDLE SET?
1481  004132  001401                           BEQ     .+4
1482  004134  104000                           HLT                     ;IDLE SHOULD NOT BE SET!
1483  004136  052777  000002  175220           BIS     #BIT1,@DQTCSR   ;SET IDLE BIT
1484  004144  032777  000002  175212           BIT     #BIT1,@DQTCSR   ;IS IDLE SET?
1485  004152  001001                           BNE     .+4             ;BR IF SET.
1486  004154  104000                           HLT                     ;IDLE BIT SHOULD BE SET.
1487  004156  042777  000002  175200           BIC     #BIT1,@DQTCSR   ;CLEAR IDLE BIT.
1488  004164  032777  000002  175172           BIT     #BIT1,@DQTCSR   ;IS IDLE BIT SET?
1489  004172  001401                           BEQ     .+4             ;BR IF CLEAR.
1490  004174  104000                           HLT                     ;IDLE BIT NOT CLEARED.
1491  004176  052777  000002  175160           BIS     #BIT1,@DQTCSR   ;SET IDLE
1492  004204  104412                           MSTCLR
1493  004206  032777  000002  175150           BIT     #BIT1,@DQTCSR   ;IS IDLE SET?
1494  004214  001401                           BEQ     .+4
1495  004216  104000                           HLT                     ;IDLE BIT NOT CLEARED BY INIT.
1496  004220  012737  000005  001250           MOV     #5,TEMP3
```

```
1497  004226  012737  000377  014060  1$:     MOV     #377,WORD
1498  004234  112777  000011  175126          MOVB    #11,@DQREG
1499  004242  013777  014522  175122          MOV     .SYNC,@DQSEC
1500  004250  012737  000010  014064          MOV     #10,COUNT       ;PICK UP THE NUMBER OF SHIFTS
1501  004256  012737  004000  014066          MOV     #4000,BITSEL    ;PICK UP NUMBER OF BIT PER CHAR.
1502  004264  112777  000002  175076          MOVB    #2,@DQREG       ;SELECT THE TRANSMITTER BA PRI.
1503  004272  012777  014060  175072          MOV     #WORD,@DQSEC    ;LOAD THE BA
1504  004300  105277  175064                  INCB    @DQREG          ;SELECT THE TRANSMITTER CC PRI.
1505  004304  012777  177777  175060          MOV     #-1,@DQSEC      ;LOAD THE CC WITH -1
1506  004312  112777  000012  175050          MOVB    #MISC.,@DQREG   ;SELECT THE MISC REGISTER.
1507  004320  053777  014066  175044          BIS     BITSEL,@DQSEC   ;LOAD MISC REG WITH NUMBER OF BITS PER CHAR.
1508  004326  052777  000012  175036          BIS     #12,@DQSEC      ;ADD TO THAT TEST LOOP AND AUTO STEP.
1509  004334  052777  000002  175022          BIS     #BIT1,@DQTCSR   ;SET TRANSMITTER IDLE MODE.
1510  004342  005037  001252                  CLR     TEMP4
1511  004346  006037  001252          2$:     ROR     TEMP4           ;SHIFT THE STORAGE OF DATA FROM THE TRANSMITTER.
1512  004352  005277  175014                  INC     @DQSEC          ;CLOCK THE TRANSMITTER -UP-
1513  004356  005377  175010                  DEC     @DQSEC          ;CLOCK THE TRANSMITTER -DOWN-
1514  004362  017702  175004                  MOV     @DQSEC,R2       ;MOVE THE MISC REG TO R2
1515  004366  042702  177577                  BIC     #177577,R2      ;CLEAR ALL BUT THE BIT WINDOW.
1516  004372  050237  001252          3$:     BIS     R2,TEMP4        ;PLACE DATA INTO TEMPORY LOCATION
1517  004376  005337  014064                  DEC     COUNT           ;IS CHARACTER COMPLETELY SHIFTED OUT?
1518  004402  001361                          BNE     2$              ;BRANCH IF MORE BITS TO GO.
1519  004404  005137  001252                  COM     TEMP4           ;COMPLIMENT DATA STORAGE
1520  004410  012737  000026  001254          MOV     #26,TEMP5
1521  004416  123737  001254  001252          CMPB    TEMP5,TEMP4
1522  004424  001401                          BEQ     .+4
1523  004426  104012                          HLT     12
1524  004430  005337  001250                  DEC     TEMP3
1525  004434  001274                          BNE     1$
1526  004436  104400                          SCOPE
1527
1528
1529
1530
1531
1532
1533                                          ;
1534                                          ;TRANSMITTER DATA REALIBILITY TEST.
1535                                          ;TEST TO TRANSMITT AN EIGHT
1536                                          ;BIT BINARY COUNT PATTERN (000-377)
1537                                          ;
1538                                          ;NOTE THIS TEST IS FOR UP TO EIGHT BITS PER CHARACTER.
1539                                          ;PARITY WILL BE ENABLED WHEN 'PARFLG' IS NON-ZERO
1540                                          ;
1541
1542                                  ;  TEST 24
1543                                  ;*************************************************************************
1544  004440  012737  000024  001226  TST24:  MOV     #24,TSTNO
1545  004446  012737  004572  001216          MOV     #TST25,NEXT
1546  004454  012737  004474  001220          MOV     #2$,LOCK
1547  004462  105037  012604                  CLRB    PARFLG
1548  004466  005000                  1$:     CLR     R0              ;SET DATA TO ZERO
1549  004470  005037  014054                  CLR     EXTFLG          ;TELL SUBROUTINE THIS IS FOR EIGHT BITS
1550  004474  010037  014060          2$:     MOV     R0,WORD         ;PLACE DATA FOR WORK.
1551  004500  005037  001252                  CLR     TEMP4           ;CCLEAR WHERE CHAR IS TO BE STORED
1552  004504  104412                          MSTCLR                  ;MASTER CLEAR
```

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1553  004506  004537  011270                    JSR     R5,TXSTRD       ;GO TO ROUTINE
1554  004512  000010                            8.                      ;NUMBER OF SHIFTS REQUIRED
1555  004514  004000                            4000                    ;EIGHT BITS
1556  004516  105737  012604                    TSTB    PARFLG
1557  004522  001402                            BEQ     .+6
1558  004524  004737  012446                    JSR     PC,GENPAR
1559  004530  013737  014060  001254            MOV     WORD,TEMP5      ;STORE  GOOD CHARACTER
1560  004536  123737  001254  001252            CMPB    TEMP5,TEMP4     ;COMPARE GOOD CHAR TO TX CHAR
1561  004544  001401                            BEQ     .+4             ;BR IF SAME
1562  004546  104012                            HLT 12                  ;DATA COMPARISON ERROR
1563  004550  104401                            SCOP1                   ;DOES USER WANT TO LOCK ON THIS CHAR?
1564  004552  105200                            INCB    R0              ;UPDATE GOOD CHARACTER
1565  004554  001347                            BNE     2$              ;IF NOT ALL CHARACTERS GO DO AGAIN
1566  004556  012700  000200                    MOV     #200,R0
1567  004562  105137  012604                    COMB    PARFLG
1568  004566  001342                            BNE     2$
1569  004570  104400                            SCOPE                   ;SCOPE THIS TEST
1570                                            ;
1571                                            ;TRANSMITTER DATA REALIBILITY TEST
1572                                            ;TEST TO TRANSMITT AN EIGHT BIT
1573                                            ;BINARY COUNT PATTERN (000400-177400)
1574                                            ;
1575                                            ;PARITY WILL BE ENABLED WHEN 'PARFLG' IS NON-ZERO
1576                                            ;NOTE THIS IS FOR 16 BITS PER CHAR. (LOW BYTE IS=0; THE HIGH BYTE =BINARY COUNT.
1577
1578                                    ;  TEST 25
1579                                    ;*****************************************************************************
1580  004572  012737  000025  001226    TST25:  MOV     #25,TSTNO
1581  004600  012737  004732  001216            MOV     #TST26,NEXT
1582  004606  012737  004630  001220            MOV     #2$,LOCK
1583  004614  112737  000377  014054            MOVB    #377,EXTFLG     ;TELL SUBROUTINE THIS IS FOR 16 BITS PER CHAR
1584  004622  105037  012604                    CLRB    PARFLG          ;NO PARITY CHECKING NOW
1585  004626  005000                    1$:     CLR     R0              ;ZERO DATA POINTER
1586  004630  010037  014060            2$:     MOV     R0,WORD         ;PREPARE DATA FOR SUBROUTINE
1587  004634  000337  014060                    SWAB    WORD            ;PUT DATA IN HIGH BYTE
1588  004640  005037  001252                    CLR     TEMP4           ;ZERO STORE AREA
1589  004644  104412                            MSTCLR                  ;INIT DQ11
1590  004646  004537  011270                    JSR     R5,TXSTRD       ;GOTO SUBROUTINE
1591  004652  000020                            16.                     ;THIS IS NUMBER OF SHIFTS.
1592  004654  000000                            0                       ;THIS IS BITS/PER/CHARACTER SELECT
1593  004656  105737  012604                    TSTB    PARFLG          ;IS PARITY ENABLED?
1594  004662  001402                            BEQ     .+6             ;BR IF NOT ENABLED
1595  004664  004737  012446                    JSR     PC,GENPAR       ;GO CALCULATE THE PARITY
1596  004670  013737  014060  001254            MOV     WORD,TEMP5      ;STORE THE CHARACTER
1597  004676  023737  001254  001252            CMP     TEMP5,TEMP4     ;IS THE CHARACETER CORRECT
1598  004704  001401                            BEQ     .+4             ;BR IF GOOD
1599  004706  104012                            HLT     12              ;DATA COMPARISON ERROR.
1600  004710  104401                            SCOP1                   ;LOCK ON DATA? (SW09=1)
1601  004712  105200                            INCB    R0              ;UPDATE DATA POINTER
1602  004714  001345                            BNE     2$              ;BR IF MORE TO GO
1603  004716  012700  000200                    MOV     #200,R0
1604  004722  105137  012604                    COMB    PARFLG          ;NOW ENABLE THE PARITY TEST.
1605  004726  001340                            BNE     2$              ;BR IF FIRST TIME FOR PARITY
1606  004730  104400                            SCOPE                   ;SCOPE THE TEST.
```

```
1607
1608                                            ;
1609                                            ;RECEIVER CHARACTER LENGTH TEST
1610                                            ;TEST THAT ALL CHARACTER
1611                                            ;LENGTHS WORK CORRECTLY.
1612                                            ;
1613                                            ;TEST OF RX CHARACTER LENGTH 2 BITS LONG.
1614                                            ;
1615                                    ;  TEST 26
1616                                    ;*****************************************************************************
1617  004732  012737  000026  001226  TST26:  MOV     #26,TSTNO
1618  004740  012737  004760  001216          MOV     #TST27,NEXT
1619  004746  004537  012134                  JSR     R5,RXLNG        ;GOTO JSR SUBROUTINE
1620  004752  007000                          7000                    ;CHARACTER EXPECTED TO FIND
1621  004754  000002                          2                       ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1622  004756  104400                          SCOPE                   ;SCOPE THIS TEST
1623
1624                                            ;TEST OF RX CHARACTER LENGTH 3 BITS LONG.
1625                                            ;
1626                                    ;  TEST 27
1627                                    ;*****************************************************************************
1628  004760  012737  000027  001226  TST27:  MOV     #27,TSTNO
1629  004766  012737  005006  001216          MOV     #TST30,NEXT
1630  004774  004537  012134                  JSR     R5,RXLNG        ;GOTO JSR SUBROUTINE
1631  005000  006400                          6400                    ;CHARACTER EXPECTED TO FIND
1632  005002  000004                          4                       ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1633  005004  104400                          SCOPE                   ;SCOPE THIS TEST
1634
1635                                            ;TEST OF RX CHARACTER LENGTH 4 BITS LONG.
1636                                            ;
1637                                    ;  TEST 30
1638                                    ;*****************************************************************************
1639  005006  012737  000030  001226  TST30:  MOV     #30,TSTNO
1640  005014  012737  005034  001216          MOV     #TST31,NEXT
1641  005022  004537  012134                  JSR     R5,RXLNG        ;GOTO JSR SUBROUTINE
1642  005026  006000                          6000                    ;CHARACTER EXPECTED TO FIND
1643  005030  000010                          10                      ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1644  005032  104400                          SCOPE                   ;SCOPE THIS TEST
1645
1646                                            ;TEST OF RX CHARACTER LENGTH 5 BITS LONG.
1647                                            ;
1648                                    ;  TEST 31
1649                                    ;*****************************************************************************
1650  005034  012737  000031  001226  TST31:  MOV     #31,TSTNO
1651  005042  012737  005062  001216          MOV     #TST32,NEXT
1652  005050  004537  012134                  JSR     R5,RXLNG        ;GOTO JSR SUBROUTINE
1653  005054  005400                          5400                    ;CHARACTER EXPECTED TO FIND
1654  005056  000020                          20                      ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1655  005060  104400                          SCOPE                   ;SCOPE THIS TEST
1656
1657                                            ;TEST OF RX CHARACTER LENGTH 6 BITS LONG.
1658                                            ;
1659                                    ;  TEST 32
1660                                    ;*****************************************************************************
1661  005062  012737  000032  001226  TST32:  MOV     #32,TSTNO
1662  005070  012737  005110  001216          MOV     #TST33,NEXT
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1663  005076  004537  012134                  JSR     R5,PXLNG        ;GOTO JSR SUBROUTINE
1664  005102  005000                          5000                    ;CHARACTER EXPECTED TO FIND
1665  005104  000040                          40                      ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1666  005106  104400                          SCOPE                   ;SCOPE THIS TEST
1667
1668                                          ;TEST OF RX CHARACTER LENGTH 7 BITS LONG.
1669                                          ;
1670                                  ;  TEST 33
1671                                  ;*****************************************************************************
1672  005110  012737  000033  001226  TST33:  MOV     #33,TSTNO
1673  005116  012737  005136  001216          MOV     #TST34,NEXT
1674  005124  004537  012134                  JSR     R5,RXLNG        ;GOTO JSR SUBROUTINE
1675  005130  004400                          4400                    ;CHARACTER EXPECTED TO FIND
1676  005132  000100                          100                     ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1677  005134  104400                          SCOPE                   ;SCOPE THIS TEST
1678
1679                                          ;TEST OF RX CHARACTER LENGTH 8 BITS LONG.
1680                                          ;
1681                                  ;  TEST 34
1682                                  ;*****************************************************************************
1683  005136  012737  000034  001226  TST34:  MOV     #34,TSTNO
1684  005144  012737  005164  001216          MOV     #TST35,NEXT
1685  005152  004537  012134                  JSR     R5,RXLNG        ;GOTO JSR SUBROUTINE
1686  005156  004000                          4000                    ;CHARACTER EXPECTED TO FIND
1687  005160  000200                          200                     ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1688  005162  104400                          SCOPE                   ;SCOPE THIS TEST
1689
1690                                          ;
1691                                          ;RECEIVER CHARACTER LENGTH TEST
1692                                          ;FOR CHARACTERS OVER EIGHT BITS LONG.
1693                                          ;
1694                                          ;
1695                                          ;TEST OF CHARACTER LENGTH 9 BITS LONG.
1696                                          ;
1697                                  ;  TEST 35
1698                                  ;*****************************************************************************
1699  005164  012737  000035  001226  TST35:  MOV     #35,TSTNO
1700  005172  012737  005212  0012'6          MOV     #TST36,NEXT
1701  005200  004537  012304                  JSR     R5,RXELNG       ;GOTO SUBROUTINE
1702  005204  003400                          3400                    ;CHARACTER EXPECTED TO BE FOUND
1703  005206  000400                          400                     ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1704  005210  104400                          SCOPE                   ;SCOPE THIS TEST
1705
1706                                          ;TEST OF CHARACTER LENGTH 10 BITS LONG.
1707                                          ;
1708                                  ;  TEST 36
1709                                  ;*****************************************************************************
1710  005212  012737  000036  001226  TST36:  MOV     #36,TSTNO
1711  005220  012737  005240  001216          MOV     #TST37,NEXT
1712  005226  004537  012304                  JSR     R5,RXELNG       ;GOTO SUBROUTINE
1713  005232  003000                          3000                    ;CHARACTER EXPECTED TO BE FOUND
1714  005234  001000                          1000                    ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1715  005236  104400                          SCOPE                   ;SCOPE THIS TEST
1716
1717                                          ;TEST OF CHARACTER LENGTH 11 BITS LONG.
1718                                          ;
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1719                                    ;  TEST 37
1720                                    ;*****************************************************************************
1721  005240  012737  000037  001226    TST37:  MOV     #37,TSTNO
1722  005246  012737  005266  001216            MOV     #TST40,NEXT
1723  005254  004537  012304                    JSR     R5,RXELNG       ;GOTO SUBROUTINE
1724  005260  002400                            2400                    ;CHARACTER EXPECTED TO BE FOUND
1725  005262  002000                            2000                    ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1726  005264  104400                            SCOPE                   ;SCOPE THIS TEST
1727
1728                                            ;TEST OF CHARACTER LENGTH 12 BITS LONG.
1729                                            ;
1730                                    ;  TEST 40
1731                                    ;*****************************************************************************
1732  005266  012737  000040  001226    TST40:  MOV     #40,TSTNO
1733  005274  012737  005314  001216            MOV     #TST41,NEXT
1734  005302  004537  012304                    JSR     R5,RXELNG       ;GOTO SUBROUTINE
1735  005306  002000                            2000                    ;CHARACTER EXPECTED TO BE FOUND
1736  005310  004000                            4000                    ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1737  005312  104400                            SCOPE                   ;SCOPE THIS TEST
1738
1739                                            ;TEST OF CHARACTER LENGTH 13 BITS LONG.
1740                                            ;
1741                                    ;  TEST 41
1742                                    ;*****************************************************************************
1743  005314  012737  000041  001226    TST41:  MOV     #41,TSTNO
1744  005322  012737  005342  001216            MOV     #TST42,NEXT
1745  005330  004537  012304                    JSR     R5,RXELNG       ;GOTO SUBROUTINE
1746  005334  001400                            1400                    ;CHARACTER EXPECTED TO BE FOUND
1747  005336  010000                            10000                   ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1748  005340  104400                            SCOPE                   ;SCOPE THIS TEST
1749
1750                                            ;TEST OF CHARACTER LENGTH 14 BITS LONG.
1751                                            ;
1752                                    ;  TEST 42
1753                                    ;*****************************************************************************
1754  005342  012737  000042  001226    TST42:  MOV     #42,TSTNO
1755  005350  012737  005370  001216            MOV     #TST43,NEXT
1756  005356  004537  012304                    JSR     R5,RXELNG       ;GOTO SUBROUTINE
1757  005362  001000                            1000                    ;CHARACTER EXPECTED TO BE FOUND
1758  005364  020000                            20000                   ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1759  005366  104400                            SCOPE                   ;SCOPE THIS TEST
1760
1761                                            ;TEST OF CHARACTER LENGTH 15 BITS LONG.
1762                                            ;
1763                                    ;  TEST 43
1764                                    ;*****************************************************************************
1765  005370  012737  000043  001226    TST43:  MOV     #43,TSTNO
1766  005376  012737  005416  001216            MOV     #TST44,NEXT
1767  005404  004537  012304                    JSR     R5,RXELNG       ;GOTO SUBROUTINE
1768  005410  000400                            400                     ;CHARACTER EXPECTED TO BE FOUND
1769  005412  040000                            40000                   ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1770  005414  104400                            SCOPE                   ;SCOPE THIS TEST
1771
1772                                            ;TEST OF CHARACTER LENGTH 16 BITS LONG.
1773                                            ;
1774                                    ;  TEST 44
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1775                                    ;*************************************************************************
1776  005416  012737  000044  001226    TST44:  MOV     #44,TSTNO
1777  005424  012737  005444  001216            MOV     #TST45,NEXT
1778  005432  004537  012304                    JSR     R5,RXELNG       ;GOTO SUBROUTINE
1779  005436  000000                            0                       ;CHARACTER EXPECTED TO BE FOUND
1780  005440  100000                            100000                  ;BITS/PER/CHAR TO BE PLACED INTO MISC REG
1781  005442  104400                            SCOPE                   ;SCOPE THIS TEST
1782
1783                                            ;
1784                                            ;TEST THAT SYNC1 AND SYNC2
1785                                            ;SET WHEN RECEIVER ACTIVE SET
1786                                            ;AND IF THEY DO THE TEST THAT THEY
1787                                            ;CLEAR BY MASTER CLEAR.
1788                                            ;
1789                                    ;  TEST 45
1790                                    ;*************************************************************************
1791  005444  012737  000045  001226    TST45:  MOV     #45,TSTNO
1792  005452  012737  005550  001216            MOV     #TST46,NEXT
1793  005460  112777  000012  173702            MOVB    #MISC.,@DQREG   ;SELECT THE MISC REGISTER
1794  005466  012777  000012  173676            MOV     #12,@DQSEC      ;SET TEST LOOP AND AUTO/STEP
1795  005474  052777  010000  173656            BIS     #BIT12,@DQRCSR  ;SET RX ACTIVE
1796  005502  017700  173664                    MOV     @DQSEC,R0       ;READ THE DQSEC
1797  005506  042700  147777                    BIC     #147777,R0      ;CLEAR ALL BUT SYNC 1 AND SYNC 2
1798  005512  022700  030000                    CMP     #30000,R0       ;DID BOTH OF THEM SET?
1799  005516  001401                            BEQ     .+4             ;BR IF GOOD
1800  005520  104016                            HLT 16                  ;SYNC 1 AND SYNC 2 NOT SET.
1801  005522  052777  000040  173642            BIS     #BIT5,@DQSEC    ;SET MASTER CLEAR
1802  005530  112777  000012  173632            MOVB    #MISC.,@DQREG   ;RESELECT THE MISC REGISTER
1803  005536  005777  173630                    TST     @DQSEC          ;IS THE DQSEC =0
1804  005542  001401                            BEQ     .+4             ;BR IF YES
1805  005544  104017                            HLT 17                  ;DQSEC NOT=0
1806  005546  104400                            SCOPE                   ;SCOPE THIS TEST.
1807
1808
1809
1810                                            ;SYNC TESTS.
1811                                            ;TEST THAT RECEIVER ACTIVE AND SYNC 1 AND SYNC 2
1812                                            ;ASSERT AT THE PROPER TIME.
1813                                            ;TEST INVOLVES BOTH SYNCING AN AN EIGHT BIT CHAR
1814                                            ;AND A SIXTEEN BIT CHAR.
1815
1816                                            ;LOOK AT LOCATION 'WORD''
1817                                            ;IF 'WORD IS EQUAL TO 377 THE THE EIGHT
1818                                            ;BIT PER CHAR IS BEING EXECUTED.
1819                                            ;IF 'WORD'' IS EQUAL TO 177777 THEN THE SYXTEEN
1820                                            ;BIT PER CHAR IS BEING EXECUTED.
1821
1822                                    ;  TEST 46
1823                                    ;*************************************************************************
1824  005550  012737  000046  001226    TST46:  MOV     #46,TSTNO
1825  005556  012737  005600  001216            MOV     #TST47,NEXT
1826  005564  004537  005630                    JSR     R5,SYNTST       ;GOTO THE ACTUAL TEST.
1827  005570  000377                            377                     ;DATA CHAR FOR EIGHT BITS PER CHAR.
1828  005572  000010                            8.                      ;SHIFTS PER CHAR. NEEDED FOR TEST
1829  005574  004000                            4000                    ;BITS PER CHAR SELECTION FOR DQSEC.
1830  005576  104400                            SCOPE
```

```
1831
1832                                    ;ABOVE TEST FOR EIGHT BITS PER CHAR.
1833                                    ;BELOW TEST FOR SIXTEEN BITS PER CHAR.
1834
1835                                    ;  TEST 47
1836                                    ;*************************************************************************
1837  005600  012737  000047  001226  TST47:  MOV     #47,TSTNO
1838  005606  012737  006240  001216           MOV     #TST50,NEXT
1839  005614  004537  005630                  JSR     R5,SYNTST       ;GOTO THE ACTUAL TEST
1840  005620  177777                          177777                  ;DATA FOR 16 BTS PER CHAR.
1841  005622  000020                          16.                     ;SHIFTS PER CHAR.
1842  005624  000000                          0000                    ;SELECTION FOR DQSEC BITS/PER CHAR.
1843  005626  104400                          SCOPE                   ;SCOPE THIS TEST
1844
1845
1846                                          ;
1847                                          ;TEST THAT SYNC 1 AND SYNC 2
1848                                          ;SET WHEN DATA IS RECEIVED
1849                                          ;THIS TEST WILL CHECK FOR EITHER
1850                                          ;1 OR 2 SYNC CHARACTERS.
1851                                          ;
1852  005630                          SYNTST:
1853  005630  012537  014060                  MOV     (R5)+,WORD      ;GET DATA CHARACTER
1854  005634  011537  005724                  MOV     (R5),4$         ;GET NUMBER OF SHIFTS.
1855  005640  011537  006046                  MOV     (R5),6$         ;'' ''
1856  005644  162737  000002  006046          SUB     #2,6$           ;ADJUST SHIFTS.
1857  005652  012537  006170                  MOV     (R5)+,8$        ;GET THE SHIFTS
1858  005656  005337  006170                  DEC     8$              ;ADJUST THE SHIFTS.
1859  005662  011537  005726                  MOV     (R5),5$         ;GET THE BITS/PER CHAR.
1860  005666  011537  006050                  MOV     (R5),7$         ;'' ''
1861  005672  012537  006172                  MOV     (R5)+,9$        ;'' '' ''
1862  005676  010537  006236                  MOV     R5,10$          ;SAVE THE PC TO RETURN
1863  005702  104412                          MSTCLR                  ;INIT THE DQ11
1864  005704  112777  000011  173456          MOVB    #11,@DQREG      ;SEL THE SYNC REG
1865  005712  012777  177777  173452          MOV     #-1,@DQSEC      ;SET SYNC CHAR TO ALL 1'S
1866  005720  004537  011524                  JSR     R5,RXSTRA       ;GOTO THE SUBROUTINE
1867  005724  000001                  4$:     .BLKW 1                 ;NUMBER OF SHIFTS
1868  005726  000001                  5$:     .BLKW 1                 ;MISC   FUNCTION
1869  005730  112777  000012  173432          MOVB    #MISC.,@DQREG   ;SELECT THE MISC REGISTER
1870  005736  032777  020000  173426          BIT     #BIT13,@DQSEC   ;IS SYNC 1 UP YET
1871  005744  001401                          BEQ     .+4             ;BR IF NO
1872  005746  104000                          HLT                     ;SYNC 1 UP TOO SOON
1873  005750  032777  010000  173402          BIT     #BIT12,@DQRCSR  ;ACTIVE UP??
1874  005756  001401                          BEQ     .+4             ;BR IF ACTIVE NOT UP
1875  005760  104000                          HLT                     ;ACTIVE UP TOO SOON.
1876  005762  005277  173404                  INC     @DQSEC          ;CLOCK UP
1877  005766  005377  173400                  DEC     @DQSEC          ;CLOCK DN
1878  005772  032737  100000  001510          BIT     #SYNBIT,DQSTAT  ;NUMBER OF SYNC CHARS=?
1879  006000  001003                          BNE     .+10            ;BR IF TWO SYNC CHAR.
1880  006002  005337  006170                  DEC     8$              ;ADJUST COUNT WHEN ONE SYNC SELECTED.
1881  006006  000442                          BR      1$              ;BR TO TEST ONE SYNC CHAR.
1882  006010  017700  173356                  MOV     @DQSEC,R0       ;READ DQSEC
1883  006014  042700  147777                  BIC     #147777,R0      ;CLEAR GARBAGE
1884  006020  022700  020000                  CMP     #20000,R0       ;IS SYNC 1 UP?
1885  006024  001401                          BEQ     .+4             ;BR IF YES
1886  006026  104000                          HLT                     ;SYNC ONE NOT SET OR SYNC 2 IS SET
```

```
1887  006030  032777  010000  173322          BIT     #BIT12,@DQRCSR  ;ACTIVE UP?
1888  006036  001401                          BEQ     .+4             ;BR IF ACTIVE =0
1889  006040  104000                          HLT                     ;ACTIVE UP TOO SOON
1890  006042  004537  011524                  JSR     R5,RXSTRA       ;GOTO THE SUBROUTINE
1891  006046  000001                  6$:     .BLKW 1                 ;NUMBER OF SHIFTS MINUS 2
1892  006050  000001                  7$:     .BLKW 1                 ;MISC FUNCTION (PERS PER CHAR).
1893  006052  017700  173314                  MOV     @DQSEC,R0       ;READ THE DQSEC
1894  006056  042700  147777                  BIC     #147777,R0      ;CLEAR ALL BUT SYNC 1 AND SYNC 2
1895  006062  022700  020000                  CMP     #20000,R0       ;ARE BOTH SYNC 1 *AND* SYNC 2 SET?
1896  006066  001401                          BEQ     .+4             ;BR IF YES
1897  006070  104000                          HLT                     ;EITHER OR BOTH SYNC 1 OR SYNC 2 NOT SET.
1898  006072  032777  010000  173260          BIT     #BIT12,@DQRCSR  ;ACTIVE UP??
1899  006100  001401                          BEQ     .+4             ;BR IF ACTIVE NOT SET.
1900  006102  104000                          HLT                     ;ACTIVE UP TOO SOON
1901  006104  005277  173262                  INC     @DQSEC          ;CLOCK UP.
1902  006110  005377  173256                  DEC     @DQSEC          ;CLOCK DN
1903  006114  017700  173252          $:      MOV     @DQSEC,R0       ;READ AND SAVE DQSEC
1904  006120  042700  147777                  BIC     #147777,R0      ;CLEAR ALL BUT SYNC 1 AND SYNC 2
1905  006124  022700  030000                  CMP     #30000,R0       ;ARE BOTH SYNC 1 AND SYNC 2 SET?
1906  006130  001401                          BEQ     .+4             ;BR IF YES
1907  006132  104000                          HLT                     ;EITHER OR BOTH SYNC 1 OR SYNC 2 NOT SET.
1908  006134  032737  004000  001510          BIT     #ACTBIT,DQSTAT  ;WHEN DO YOU GO ACTIVE??
1909  006142  001006                          BNE     2$              ;BR IF ACTIVE ON FIRST NON-SYNC.
1910  006144  032777  010000  173206          BIT     #BIT12,@DQRCSR  ;IS ACTIVE UP?
1911  006152  001001                          BNE     .+4             ;*** NOW ACTIVE SHOULD BE SET***
1912  006154  104000                          HLT                     ;NOW ACTIVE SHOULD BE UP..
1913  006156  000424                          BR      3$              ;ALL DONE GO HOME
1914  006160  005037  014060          2$:     CLR     WORD            ;SET DATA TO NON-SYNC
1915  006164  004537  011524                  JSR     R5,RXSTRA       ;PUSH IT INTO THE RECEIVER
1916  006170  000001                  8$:     .BLKW 1                 ;NUMBER OF SHIFTS MINUS 1
1917  006172  000001                  9$:     .BLKW 1                 ;MISC FUNCTION.
1918  006174  032777  010000  173156          BIT     #BIT12,@DQRCSR  ;ACTIVE UP
1919  006202  001401                          BEQ     .+4             ;ONE MORE SHIFT BEFORE ACTIVE=1
1920  006204  104000                          HLT                     ;ACTIVE IS UP TOO SOON
1921  006206  005277  173160                  INC     @DQSEC          ;FINAL CLOCK UP
1922  006212  005377  173154                  DEC     @DQSEC          ;       CLOCK DN
1923  006216  032777  010000  173134          BIT     #BIT12,@DQRCSR  ;**** NOW ACTIVE SHOULD BE SET **
1924  006224  001001                          BNE     .+4             ;BR IF ACTIVE =1
1925  006226  104000                          HLT                     ;ACTIVE ON FIRST NON-SYNC NOT WORKING.
1926  006230  013705  006236          3$:     MOV     10$,R5          ;RESTORE PC POINTER
1927  006234  000205                          RTS     R5              ;GOTO MAIN TEST
1928  006236  000000                  10$:    0                       ;STORE R5 (PC) HERE.
1929
1930
1931
1932
1933                                          ;
1934                                          ;TEST OF RECEIVER CHARACTER COUNT AND BUSS
1935                                          ;ADDRESS.  TEST TO MAKE SURE
1936                                          ;THAT THEY INCREMENT PROPPERELY.
1937                                          ;
1938                                          ;TEST WITH CHARACTER COUNT OF -1 (ODD)
1939                                          ;
1940
1941                                  ;  TEST 50
1942                                  ;*****************************************************************
```

```
1943  006240  012737  000050  001226  TST50:  MOV     #50,TSTNO
1944  006246  012737  006366  001216          MOV     #TST51,NEXT
1945  006254  104412                          MSTCLR                  ;INIT DQ11
1946  006256  105077  173106                  CLRB    @DQREG          ;SEL RX BA PRI.
1947  006262  012777  014120  173102          MOV     #RXBUFF,@DQSEC  ;SET RX BA PRI.
1948  006270  105277  173074                  INCB    @DQREG          ;SEL RX WC PRI.
1949  006274  012777  177777  173070          MOV     #-1,@DQSEC      ;ONE CHAR RECEIVE
1950  006302  112777  000012  173060          MOVB    #MISC.,@DQREG   ;SELECT THE MISC REG.
1951  006310  012777  004010  173054          MOV     #4010,@DQSEC    ;SET EIGHT BITS AND TEST LOOP
1952  006316  012777  010001  173034          MOV     #10001,@DQRCSR  ;SET RX ACTIVE AND RX GO!!
1953  006324  105777  173030                  TSTB    @DQRCSR         ;RX PRI DONE?
1954  006330  100375                          BPL     .-4             ;HANG HERE TILL DONE.
1955  006332  105077  173032                  CLRB    @DQREG          ;GET RA BA PRI.
1956  006336  022777  014121  173026          CMP     #RXBUFF+1,@DQSEC        ;DID BA INC RIGHT?
1957  006344  001401                          BEQ     .+4             ;BR IF BA GOOD
1958  006346  104000                          HLT                     ;RX BA ERROR.
1959  006350  105277  173014                  INCB    @DQREG          ;GET RX WC PRI.
1960  006354  005777  173012                  TST     @DQSEC          ;DID IT GOTO ZERO?
1961  006360  001401                          BEQ     .+4             ;BR IF YES
1962  006362  104000                          HLT                     ;RX WC PRI NOT =0
1963  006364  104400                          SCOPE                   ;SCOPE THE TEST
1964
1965
1966
1967
1968                                          ;
1969                                          ;TEST OF RECEIVER CHARACTER COUNT
1970                                          ;AND BUSS ADDRESS
1971                                          ;WITH A CHARACTER COUNT OF -2 (EVEN)
1972                                          ;MAKING SURE THAT THE CC AND BA
1973                                          ;INCREMENT CORRECTLY.
1974
1975
1976                                  ;  TEST 51
1977                                  ;*****************************************************************************
1978  006366  012737  000051  001226  TST51:  MOV     #51,TSTNO
1979  006374  012737  006514  001216          MOV     #TST52,NEXT
1980  006402  104412                          MSTCLR                  ;ISSUE CLEAR
1981  006404  105077  172760                  CLRB    @DQREG          ;SELECT THE RX BA PRI
1982  006410  012777  014120  172754          MOV     #RXBUFF,@DQSEC  ;SET RX BA PRI.
1983  006416  105277  172746                  INCB    @DQREG          ;SELECT RX WC PRI.
1984  006422  012777  177776  172742          MOV     #-2,@DQSEC      ;SET FOR TWO CHARS
1985  006430  112777  000012  172732          MOVB    #MISC.,@DQREG   ;SELECT THE MISC REGISTER
1986  006436  012777  004010  172726          MOV     #4010,@DQSEC    ;SET EIGHT BITS AND TEST LOOP
1987  006444  012777  010001  172706          MOV     #10001,@DQRCSR  ;SET RX ACTIVE AND GO!!
1988  006452  105777  172702                  TSTB    @DQRCSR         ;WAIT FOR RX PRI DONE.
1989  006456  100375                          BPL     .-4             ;HANG HERE TILL DONE
1990  006460  105077  172704                  CLRB    @DQREG          ;SELECT THE RX BA PRI
1991  006464  022777  014122   72700          CMP     #RXBUFF+2,@DQSEC        ;DID RX BA INCREMENT RIGHT?
1992  006472  001401                          BEQ     .+4             ;BR IF GOOD
1993  006474  104000                          HLT                     ;RX BA ERROR
1994  006476  105277  172666                  INCB    @DQREG          ;SELECT THE RX WC PRI.
1995  006502  005777  172664                  TST     @DQSEC          ;DID IF GOTO ZERO
1996  006506  001401                          BEQ     .+4             ;BR IF YES
1997  006510  104000                          HLT                     ;RX WC NOT =ZERO
1998  006512  104400                          SCOPE                   ;SCOPE THE TEST
```

```
1999
2000
2001
2002                                    ;RECEIVER DATA REALIBILITY TEST.
2003                                    ;TEST TO RECEIVE A SIXTEEN
2004                                    ;BIT BINARY COUNT PATTERN (000000-177777)
2005                                    ;
2006                                    ;NOTE: IF PARFLG IS NON-ZERO THE PARITY TEST IS
2007                                    ;      IN PROGRESS. THERE ARE NO ERRORS EXPECTED
2008                                    ;       PARITY TEST DATA (177400-177777)
2009                                    ;
2010                                ;  TEST 52
2011                                ;*****************************************************************************
2012  006514  012737  000052  001226 TST52:  MOV     #52,TSTNO
2013  006522  012737  006662  001216         MOV     #TST53,NEXT
2014  006530  012737  006552  001220         MOV     #1$,LOCK
2015  006536  105037  012604                 CLRB    PARFLG          ;SET FOR NO PARITY NOW
2016  006542  112737  000377  014054         MOVB    #377,EXTFLG     ;TELL SUBROUTINE 16 BIT CHAR.
2017  006550  005000                         CLR     R0              ;ZERO DATA POINTER
2018  006552  104412                 1$:     MSTCLR                  ;ISSUE CLEAR DQ11
2019  006554  010037  014060                 MOV     R0,WORD         ;LOAD DATA FOR SUB ROUTINE
2020  006560  105737  012604                 TSTB    PARFLG          ;IS PARITY ENABLED?
2021  006564  001402                         BEQ     .+6             ;BR IF NO
2022  006566  004737  012446                 JSR     PC,GENPAR       ;GO AND FIGURE PARITY.
2023  006572  004537  011524                 JSR     R5,RXSTRA       ;GO PUSH CHARACTER INTO RECEIVER.
2024  006576  000020                         16.                     ;NUMBER OF SHIFTS NEEDED
2025  006600  000000                         0000                    ;BITS PER/CHAR FOR MISC REG
2026  006602  013737  014120  001252         MOV     RXBUFF,TEMP4    ;GET EXPECTED
2027  006610  013737  014060  001254         MOV     WORD,TEMP5      ;GET EXPECTED
2028  006616  005777  172544 `        2$:     TST     @DQERR          ;ANY ERRORS?
2029  006622  100001                         BPL     .+4             ;BR IF NO ERRORS
2030  006624  104000                         HLT                     ;DQ11 ERROR FLAG SET CHECK SEL 4
2031  006626  023737  001254  001252         CMP     TEMP5,TEMP4     ;DATA OK??
2032  006634  001401                         BEQ     .+4             ;BR IF GGOD DATA
2033  006636  104020                         HLT 20                  ;RECEIVER DATA COMPARISON ERROR.
2034  006640  104401                         SCOP1                   ;LOCK ON SLECTED DATA (SW09=1)
2035  006642  005200                         INC     R0              ;UPDATE DATA POINTER.
2036  006644  001342                         BNE     1$              ;BR IF MORE CHARS TO GO.
2037  006646  012700  177400                 MOV     #177400,R0      ;SET FOR PARITY TEST.
2038  006652  105137  012604                 COMB    PARFLG          ;TURN PARITY ON NOW
2039  006656  001335                         BNE     1$              ;DO TEST WITH PARITY ENABLED NOW.
2040  006660  104400                         SCOPE                   ;SCOPE THE TEST.
2041
2042
2043
2044
2045
2046                                    ;RECEIVER PARITY ERROR TEST.
2047                                    ;THE PARITY WILL PURPOSELY BE MADE INCORRECT AND
2048                                    ;AN ERROR WILL BE EXPECTED EVERY TIME.
2049                                    ;
2050                                    ;TEST TO RECEIVE A SIXTEEN
2051                                    ;BIT BINARY COUNT PATTERN (000000-000177)
2052                                    ;
2053                                ;  TEST 53
2054                                ;*****************************************************************************
```

```
2055  006662  012737  000053  001226  TST53:  MOV     #53,TSTNO
2056  006670  012737  007034  001216          MOV     #TST54,NEXT
2057  006676  012737  006722  001220          MOV     #1$,LOCK
2058  006704  112737  000377  012604          MOVB    #377,PARFLG     ;TELL SUBROUTINE PARITY IS ENABLED.
2059  006712  112737  000377  014054          MOVB    #377,EXTFLG     ;TELL SUBROUTINE THIS IS A 16 BIT CHAR.
2060  006720  005000                          CLR     R0              ;CLEAR DATA POINTER
2061  006722  104412                  1$:     MSTCLR                  ;INIT DQ11
2062  006724  012737  000377  011770          MOV     #377,NPRFLG     ;SET FOR SUBROUTINE.
2063  006732  010037  014060                  MOV     R0,WORD         ;LOAD DATA
2064  006736  004737  012446                  JSR     PC,GENPAR       ;CALCULATE PARITY.
2065  006742  032737  100000  014060          BIT     #BIT15,WORD     ;CHECK PARITY BIT
2066  006750  001404                          BEQ     .+12            ;BR IF PARITY BIT CLEARED
2067  006752  042737  100000  014060          BIC     #BIT15,WORD     ;PARITY BIT SET ;; SO CLEAR IT.
2068  006760  000403                          BR      .+10            ;CONTINUE TEST
2069  006762  052737  100000  014060          BIS     #BIT15,WORD     ;PARITY BIT CLR ;; SO SET IT.
2070  006770  004537  011524                  JSR     R5,RXSTRA       ;PUSH CHARACTER INTO RECEIVER
2071  006774  000020                          16.                     ;SHIFTS NEEDED.
2072  006776  000000                          0000                    ;BITS PER CHAR SELECT.
2073  007000  013737  014120  001252          MOV     RXBUFF,TEMP4    ;GET ACTUAL..
2074  007006  013737  014060  001254          MOV     WORD,TEMP5      ;GET EXPECTED..
2075  007014  005777  172346          2$:     TST     @DQERR          ;DID THE ERROR FLAG SET..**..
2076  007020  100401                          BMI     .+4             ;BR IF AN ERROR OCCURED.
2077  007022  104000                          HLT                     ;ERROR NO ERROR (PARITY ERROR)
2078  007024  104401                          SCOP1                   ;LOCK ON CHARACTER? (SW09=1)
2079  007026  105200                          INCB    R0              ;UPDATE DATA POINTER.
2080  007030  100334                          BPL     1$              ;BR IF NOT 200(8) CHARS DONE.
2081  007032  104400                          SCOPE                   ;SCOPE THIS TEST
2082
2083
2084                                          ;
2085                                          ;TEST OF RECEIVER HALF DUPLEX
2086                                          ;TEST TO TRANSMITT
2087                                          ;A TWO HUNDRED CHARACTER BURST OF DATA CHARACTERS
2088                                          ;WITH THE RECEIVER IN HALF DUPLEX
2089                                          ;MAKING SURE THAT THE RECEIVER
2090                                          ;DOESNT RECEIVE ANY CHARACTERS.
2091
2092
2093                                  ;  TEST 54
2094                                  ;*************************************************************************
2095  007034  012737  000054  001226  TST54:  MOV     #54,TSTNO
2096  007042  012737  007436  001216          MOV     #TST55,NEXT
2097  007050  005000                          CLR     R0              ;INIT DATA REG
2098  007052  012704  014526                  MOV     #TXBUFF,R4      ;PREPARE TO FILL TX BUFFER WITH BINARY COUNT.
2099  007056  110024                  1$:     MOVB    R0,(R4)+        ;START FILLING TX BUFF
2100  007060  105200                          INCB    R0              ;UPDATE DATA REG
2101  007062  100375                          BPL     1$              ;BRANCH IF BUFFER HASN'T BEEN FILLED
2102  007064  104413                  2$:     MEMCLR                  ;INIT THE DEVICE
2103  007066  005000                          CLR     R0              ;CLEAR COUNT REG
2104  007070  012704  014120                  MOV     #RXBUFF,R4      ;PREPARE TO CLEAR THE RECEIVER BUFFER.
2105  007074  105024                  3$:     CLRB    (R4)+           ;START CLEARING RX BUFF
2106  007076  105200                          INCB    R0              ;UPDATE THE COUNTER
2107  007100  001375                          BNE     3$              ;IS RX BUFF ALL CLEARED?
2108  007102  105077  172262                  CLRB    @DQREG          ;SELECT THE RECEIVER BA PRI
2109  007106  012777  014120  172256          MOV     #RXBUFF,@DQSEC  ;LOAD THE BA
2110  007114  105277  172250                  INCB    @DQREG          ;SELECT THE RECEIVER CC PRI
```

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2111  007120  012777  177600  172244          MOV     #-200,@DQSEC    ;LOAD THE CC WITH -200 (I WANT TO RECEIVE 200 CHARACTERS
2112  007126  105277  172236                  INCB    @DQREG          ;SELECT THE TX BA PRI
2113  007132  012777  014524  172232          MOV     #SYNC,@DQSEC    ;LOAD THE TX BA WITH STARTING ADD OF TX DATA PLUS THE SY
2114  007140  105277  172224                  INCB    @DQREG          ;SELECT THE TX CC PRI
2115  007144  012777  177576  172220          MOV     #-202,@DQSEC    ;LOAD THE TX CC WITH -202 (FOUR HUNDRED CHARACTERS AND T
2116  007152  112777  000011  172210          MOVB    #11,@DQREG      ;SELECT THE SYNC REGISTER
2117  007160  013777  014522  172204          MOV     .SYNC,@DQSEC    ;LOAD IT WITH THE SYNC CHAR
2118  007166  105277  172176                  INCB    @DQREG          ;SELECT THE MISC REGISTER
2119  007172  012777  004010  172172          MOV     #4010,@DQSEC    ;LOAD IT WITH EIGHT BITS PER/CHAR AND TEST LOOP
2120  007200  005037  001244                  CLR     TEMP1           ;ZERO DELAY LOC1
2121  007204  012737  000020  001246          MOV     #20,TEMP2       ;SET DELAY FOR 20X177777 (8)
2122  007212  012777  000011  172140          MOV     #11,@DQRCSR     ;SET RECEIVER HALF DUPLEX AND GO!!
2123  007220  005277  172140                  INC     @DQTCSR         ;SET TRANSMITTER GO!!!
2124  007224  105777  172134          4$:     TSTB    @DQTCSR         ;TRANSMITTER DONE??
2125  007230  100407                  BMI     5$              ;BRANCH IF TRANSMITTER IS DONE.
2126  007232  005237  001244          INC     TEMP1           ;START THE DELAY
2127  007236  001372                  BNE     4$              ;DELAY-----
2128  007240  005337  001246          DEC     TEMP2           ;DELAY-----TRANSMITTER  DONE?
2129  007244  001367                  BNE     4$              ;DELAY-----
2130  007246  104000                  HLT                     ;TRANSMITTER DONE NEVER SET (PRI)
2131  007250  005000          5$:     CLR     R0              ;INIT COUNT REG
2132  007252  012705  014120          MOV     #RXBUFF,R5      ;SET REC DATA POINTER
2133  007256  105725          6$:     TSTB    (R5)+           ;START THE DATA CHECK
2134  007260  001401                  BEQ     .+4             ;DATA GOOD SO FAR
2135  007262  104000                  HLT                     ;DATA COMPARISON ERROR
2136  007264  105200                  INCB    R0              ;UPDATE COUNTER
2137  007266  100373                  BPL     6$              ;BRANCH IF MORE DATA TO CHECK
2138
2139
2140                                  ;RECEIVER HALF DUPLEX TEST. PART 2
2141                                  ;TEST THAT WHEN TX IS NOT ACTIVE THAT THE RECEIVER
2142                                  ;CAN RECEIVE CHARS.
2143
2144  007270  104412                  MSTCLR                  ;INIT DQ11
2145  007272  005000                  CLR     R0              ;ZERO DATA POINTER
2146  007274  012704  014120          MOV     #RXBUFF,R4      ;PREPARE TO ZERO RX BUFFER.
2147  007300  105024          7$:     CLRB    (R4)+           ;START CLEARING.
2148  007302  105200                  INCB    R0              ;DONE?
2149  007304  100375                  BPL     7$              ;BR IF MORE TO DO.
2150  007306  105077  172056          CLRB    @DQREG          ;SEL RX BA PRI.
2151  007312  012777  014120  172052  MOV     #RXBUFF,@DQSEC  ;LOAD IT
2152  007320  105277  172044          INCB    @DQREG          ;SEL RX WC PRI.
2153  007324  012777  177600  172040  MOV     #-200,@DQSEC    ;LOAD FOR 200 CHARS.
2154  007332  112777  000012  172030  MOVB    #MISC.,@DQREG   ;SLE MISC REGISTER.
2155  007340  012777  004010  172024  MOV     #4010,@DQSEC    ;SET EIGHT BITS AND TEST LOOP
2156  007346  005037  001244          CLR     TEMP1           ;SET DELAY
2157  007352  012737  000002  001246  MOV     #2,TEMP2        ;"" ""
2158  007360  012777  010011  171772  MOV     #10011,@DQRCSR  ;SET ACTIVE,HALF DUPLEX,GO
2159  007366  105777  171766          8$:     TSTB    @DQRCSR         ;RX DONE PRI?
2160  007372  100407                  BMI     9$              ;BR IF YES
2161  007374  005237  001244          INC     TEMP1           ;DELAY
2162  007400  001372                  BNE     8$              ;"" ""
2163  007402  005337  001246          DEC     TEMP2           ;"" ""
2164  007406  001367                  BNE     8$              ;"" ""
2165  007410  104000                  HLT                     ;RX PRI. DONE NOT SET..
2166  007412  005000          9$:     CLR     R0              ;INIT COUNTER
```

```
2167  007414  012705  014120                  MOV     #RXBUFF,R5      ;GET RX BUFFER.
2168  007420  122725  000377          10$:    CMPB    #377,(R5)+      ;MARK STATE IN BUFFER?
2169  007424  001401                          BEQ     .+4             ;BR IF YES
2170  007426  104000                          HLT                     ;ERROR
2171  007430  105200                          INCB    R0              ;ALL DONE?
2172  007432  100372                          BPL     10$             ;BR IF NO.
2173  007434  104400                          SCOPE                   ;SCOPE THIS TEST.
2174
2175
2176
2177                                          ;
2178                                          ;TEST OF DQ11 TRANSMITTER AND RECEIVER
2179                                          ;DATA REALIBILITY.
2180                                          ;DATA IS TRANSFERED FULL RATE
2181                                          ;AT A FOUR HUNDRED CHARACTER BURST
2182                                          ;
2183
2184                                  ;  TEST 55
2185                                  ;*************************************************************************
2186  007436  012737  000055  001226  TST55:  MOV     #55,TSTNO
2187  007444  012737  007756  001216          MOV     #TST56,NEXT
2188  007452  005000                          CLR     R0              ;INIT DATA REG
2189  007454  012704  014526                  MOV     #TXBUFF,R4      ;PREPARE TO FILL TX BUFFER WITH BINARY COUNT.
2190  007460  110024                  1$:     MOVB    R0,(R4)+        ;START FILLING TX BUFF
2191  007462  105200                          INCB    R0              ;UPDATE DATA REG
2192  007464  001375                          BNE     1$              ;BRANCH IF BUFFER HASN'T BEEN FILLED
2193  007466  104413                  2$:     MEMCLR                  ;INIT THE DEVICE
2194  007470  005000                          CLR     R0              ;CLEAR COUNT REG
2195  007472  012704  014120                  MOV     #RXBUFF,R4      ;PREPARE TO CLEAR THE RECEIVER BUFFER.
2196  007476  105024                  3$:     CLRB    (R4)+           ;START CLEARING RX BUFF
2197  007500  105200                          INCB    R0              ;UPDATE THE COUNTER
2198  007502  001375                          BNE     3$              ;IS RX BUFF ALL CLEARED?
2199  007504  105077  171660                  CLRB    @DQREG          ;SELECT THE RECEIVER BA PRI
2200  007510  012777  014120  171654          MOV     #RXBUFF,@DQSEC  ;LOAD THE BA
2201  007516  105277  171646                  INCB    @DQREG          ;SELECT THE RECEIVER CC PRI
2202  007522  012777  177400  171642          MOV     #-400,@DQSEC    ;LOAD THE CC WITH -400 (I WANT TO RECEIVE 400 CHARACTERS
2203  007530  105277  171634                  INCB    @DQREG          ;SELECT THE TX BA PRI
2204  007534  012777  014524  171630          MOV     #SYNC,@DQSEC    ;LOAD THE TX BA WITH STARTING ADD OF TX DATA PLUS THE SY
2205  007542  105277  171622                  INCB    @DQREG          ;SELECT THE TX CC PRI
2206  007546  012777  177376  171616          MOV     #-402,@DQSEC    ;LOAD THE TX CC WITH -402 (FOUR HUNDRED CHARACTERS AND T
2207  007554  112777  000011  171606          MOVB    #11,@DQREG      ;SELECT THE SYNC REGISTER
2208  007562  013777  014522  171602          MOV     .SYNC,@DQSEC    ;LOAD IT WITH THE SYNC CHAR
2209  007570  105277  171574                  INCB    @DQREG          ;SELECT THE MISC REGISTER
2210  007574  012777  004010  171570          MOV     #4010,@DQSEC    ;LOAD IT WITH EIGHT BITS PER/CHAR AND TEST LOOP
2211  007602  005037  001244                  CLR     TEMP1           ;ZERO DELAY LOC1
2212  007606  012737  000020  001246          MOV     #20,TEMP2       ;SET DELAY FOR 20X177777 (8)
2213  007614  005277  171540                  INC     @DQRCSR         ;SET RECEIVER GO!!
2214  007620  005277  171540                  INC     @DQTCSR         ;SET TRANSMITTER GO!!.
2215  007624  105777  171530          4$:     TSTB    @DQRCSR         ;RECEIVER DONE??
2216  007630  100407                          BMI     5$              ;BRANCH IF RECEIVER IS DONE.
2217  007632  005237  001244                  INC     TEMP1           ;START THE DELAY
2218  007636  001372                          BNE     4$              ;DELAY-----
2219  007640  005337  001246                  DEC     TEMP2           ;DELAY----- REC DONE?
2220  007644  001367                          BNE     4$              ;DELAY-----
2221  007646  104000                          HLT                     ;RECEIVER DONE NEVER SET (PRI)
2222  007650  005777  171512          5$:     TST     @DQERR
```

```
2223  007654  100001                        BPL     .+4
2224  007656  104000                        HLT
2225  007660  122777  000204  171472        CMPB    #204,@DQRCSR
2226  007666  001401                        BEQ     .+4
2227  007670  104000                        HLT
2228  007672  122777  000204  171464        CMPB    #204,@DQTCSR
2229  007700  001401                        BEQ     .+4
2230  007702  104000                        HLT
2231  007704  005000                        CLR     R0              ;INIT COUNT REG
2232  007706  012704  014526                MOV     #TXBUFF,R4      ;SET GOOD DATA POINTER
2233  007712  012705  014120                MOV     #RXBUFF,R5      ;SET REC DATA POINTER
2234  007716  005037  001254        6$:     CLR     TEMP5
2235  007722  005037  001252                CLR     TEMP4
2236  007726  112437  001254                MOVB    (R4)+,TEMP5
2237  007732  112537  001252                MOVB    (R5)+,TEMP4
2238  007736  023737  001254  001252        CMP     TEMP5,TEMP4
2239  007744  001401                        BEQ     .+4             ;DATA GOOD SO FAR
2240  007746  104025                        HLT     25              ;DATA COMPARISON ERROR
2241  007750  105200                        INCB    RC              ;UPDATE COUNTER
2242  007752  001361                        BNE     6$              ;BRANCH IF MORE DATA TO CHECK
2243  007754  104400                        SCOPE                   ;
2244
2245
2246                                        ;
2247                                        ;TEST OF THE THREE STRAP SELECTABLE
2248                                        ;CHARACTERS
2249                                        ;ON THE FIRST PASS THE CHARACTERS
2250                                        ;WILL BE TYPED OUT FOR VERIFICATION
2251                                        ;ON PASSES AFTER THAT THE CHARACTERS WILL BE VERIFIED
2252                                        ;BY THE PROGRAM.
2253                                        ;
2254                                        ;NOTE: IF THE BB OPTION IS INSTALLED
2255                                        ;      PROCEED TO NEXT TEST.
2256                                    ;  TEST 56
2257                                    ;*****************************************************************
2258  007756  012737  000056  001226    TST56:  MOV     #56,TSTNO
2259  007764  012737  015130  001216            MOV     #.EOP,NEXT
2260  007772  012737  010136  001220            MOV     #1$,LOCK
2261  010000  104413                            MEMCLR                  ;CLEAR ALL
2262  010002  005037  011770                    CLR     NPRFLG          ;
2263  010006  032737  020000  001510            BIT     #BBBIT,DQSTAT   ;DOES BB OPTION EXIST?
2264  010014  001405                            BEQ     .+14            ;BR IF BB NOT THERE.
2265  010016  013737  001216  001214            MOV     NEXT,RETURN     ;DO NEXT TEST.
2266  010024  000177  171164                    JMP     @RETURN         ;
2267  010030  012737  000010  010156            MOV     #8.,5$          ;EIGHT SHIFTS.
2268  010036  012737  004000  010160            MOV     #4000,6$        ;EIGHT BITS PER CHAR.
2269  010044  012737  000400  010274            MOV     #400,15$        ;LAST CHARACTER.
2270  010052  005000                            CLR     R0              ;ZERO DATA POINTER
2271                                    ;*****************************************************
2272                                    ;       MAINTAINCE AID.
2273                                    ;       THE FOLLOWING IS TO HELP TROBLE SHOOT
2274                                    ;       PROBLEMS IN THE CHARACTER DET. LOGIC
2275                                    ;       FASTER.
2276                                    ;*****************************************************
2277
2278                                    ;
```

```
2279
2280  010054  000416                          BR      36$             ;CHANGE THIS LOCATION TO '240'' (NOP)
2281                                                                  ;TO LOCK ON SELECTED 8 BIT CHAR.
2282  010056  000000                          HALT                    ;PUT SELECTED CHARACTER IN SWR.
2283                                                                  ;HIT CONT.
2284  010060  104414                          CKSWR                   ;CHECK FOR <^G>
2285  010062  017700  171112                  MOV     @SWR,R0         ;LOAD CHARACTER.
2286  010066  000000                          HALT                    ;PUT DYNAMIC SWR SETTINGS IN SWR AND
2287                                                                  ;HIT CONT.
2288  010070  104414                          CKSWR                   ;CHECK FOR <^G>
2289  010072  000407                          BR      36$             ;CHANGE THIS LOCATION TO '   (NOP)
2290                                                                  ;ALONG WITH THE ABOVE FOR      CHAR
2291                                                                  ;NOTE: BOTH LOCATIONS ARE TO BE CHANGED
2292                                                                  ;FOR A 16 BIT CHAR.
2293  010074  012737  000020  010156          MOV     #16.,5$         ;SET FOR 16 SHIFTS.
2294  010102  005037  010160                  CLR     6$              ;SET 'BITS/PER/CHAR''
2295  010106  005037  010274                  CLR     15$             ;SET LAST LIMIT.
2296                                  ;
2297                                  ;       NOTE SWR BIT 9 MUST BE SET TO LOCK ON THAT CHAR. SELECTED.
2298                                  ;
2299                                  ;-------------------------------------------------- ---
2300
2301  010112  012704  014070          36$:    MOV     #TMPBUF,R4      ;STORAGE POINTER.
2302  010116  005024                          CLR     (R4)+           ;ZERO STORAGE
2303  010120  022704  014106                  CMP     #TMPBUF+16,R4   ;ALL CLEAR?
2304  010124  001374                          BNE     .-6             ;BR IF NO.
2305  010126  005037  014116                  CLR     NUMBER          ;HOW MANY FOUND.
2306  010132  012704  014070                  MOV     #TMPBUF,R4      ;PREPARE POINTER
2307  010136  005137  011770          1$:     COM     NPRFLG          ;TELL SUBROUTINE NOT TO FORCE RX NPR.
2308  010142  005077  171212                  CLR     @DQRCSR         ;CLEAR RX CSR
2309  010146  010037  014060                  MOV     R0,WORD         ;LOAD CHARACTER
2310  010152  004537  011524                  JSR     R5,RXSTRA       ;PUSH CHARACTER INTO RECEIVER.
2311  010156  000010                  5$:     8.                      ;BEWARE THIS LOCATION WILL CHANGE.
2312  010160  004000                  6$:     4000                    ;BEWARE THIS LOCATION WILL CHANGE.
2313  010162  005777  171172                  TST     @DQRCSR         ;WAS A CHARACTER DETECTED?
2314  010166  100037                          BPL     2$              ;BR IF NO CHAR FOUND.
2315  010170  042777  100000  171162          BIC     #BIT15,@DQRCSR  ;CLEAR DETECED CHAR FLAG
2316  010176  005700                          TST     R0              ;WAS THE CHAR=0
2317  010200  001003                          BNE     18$             ;BR IF NO.
2318  010202  005737  014116                  TST     NUMBER          ;HOW MANY WERE FOUND?
2319  010206  001410                          BEQ     19$             ;BR IF NONE YET.
2320  010210  012702  014070          18$:    MOV     #TMPBUF,R2      ;POINTER STORE.
2321  010214  020022                  13$:    CMP     R0,(R2)+        ;WAS THIS CHARACTER FOUND BEFORE?
2322  010216  001423                          BEQ     2$              ;BR IF YES
2323  010220  005722                          TST     (R2)+           ;POP POINTER
2324  010222  022702  014110                  CMP     #TMPBUF+20,R2   ;ALL CHARS CHECKED?
2325  010226  001372                          BNE     13$             ;BR IF NO.
2326  010230  010024                  19$:    MOV     R0,(R4)+        ;STOE CHARACTER
2327  010232  017714  171122                  MOV     @DQRCSR,(R4)    ;GET ADDRESS FOUND IN.
2328  010236  042714  170377                  BIC     #170377,(R4)    ;CLEAR ALL GARBAGE.
2329  010242  000324                          SWAB    (R4)+           ;SWAP AROUND.
2330  010244  005237  014116                  INC     NUMBER          ;UPDATE COUNTER.
2331  010250  022737  000005  014116          CMP     #5,NUMBER       ;TOO MANY CHARS FOUND??
2332  010256  001003                          BNE     2$              ;BR IF OK.
2333  010260  104000                          HLT                     ;ERROR MORE THAN 4 CHARS. WERE DETECTED.
2334  010262  000177  170726                  JMP     @RETURN         ;RESTART TEST. DO NOT CONTINUE IN THIS TEST
```

```
2335  010266  104401                    2$:     SCOP1                   ;LOCK ON CHAR (SW09=1)
2336  010270  005200                            INC     R0              ;UPDATE CHARACTER
2337  010272  020027                            CMP     R0,(PC)+        ;ALL DONE?
2338  010274  000000                    15$:    0                       ;LAST CHAR STORED HERE.
2339  010276  001317                            BNE     1$              ;BR IF NOT DONE
2340  010300  005737  014116                    TST     NUMBER          ;ANY CHARS FOUND?
2341  010304  001024                            BNE     30$             ;BR IF NONE FOUND
2342  010306  022737  000020  010156    31$:    CMP     #16.,5$         ;IS TEST ALL DONE?
2343  010314  001434                            BEQ     7$              ;BR IF YES
2344  010316  012737  000020  010156            MOV     #16.,5$         ;DO A 16 BIT CHAR NOW
2345  010324  005037  010160                    CLR     6$              ;SET FOR 16 BITS PER CHAR.
2346  010330  112777  000012  171032            MOVB    #MISC.,@DQREG   ;SEL MISC REG
2347  010336  042777  177400  171026            BIC     #177400,@DQSEC  ;CLEAR THE HIGH BYTE
2348  010344  005037  010274                    CLR     15$             ;SET LAST CHAR TO 0
2349  010350  005000                            CLR     R0              ;ZERO DATA POINTER
2350  010352  000137  010136                    JMP     1$              ;GO AND DO IT AGAIN
2351  010356  022737  000001  014116    30$:    CMP     #1,NUMBER       ;WAS 1 CHAR FOUND?
2352  010364  001010                            BNE     7$              ;BR IF NO.
2353  010366  022737  000010  014072            CMP     #10,TMPBUF+2    ;WAS ''SYNC DET'' ENABLED?
2354  010374  001004                            BNE     7$              ;BR IF NO.
2355  010376  005337  014116                    DEC     NUMBER          ;ZERO NUMBER.
2356  010402  024444                            CMP     -(R4),-(R4)     ;ADJUST POINTERS
2357  010404  000740                            BR      31$             ;KEEP GOING.
2358  010406  005737  014116            7$:     TST     NUMBER          ;ANY FOUND?
2359  010412  001004                            BNE     .+12            ;BR IF YES
2360  010414  104402  013120                    TYPE    ,EM4            ;ALLERT OPERATOR NONE FOUND.
2361  010420  000137  010630                    JMP     10$             ;LEAVE
2362  010424  105737  014114                    TSTB    XYZFLG          ;WAS THIS DONE BEFORE?
2363  010430  001050                            BNE     3$              ;BR IF TEST WAS DONE BEFORE
2364  010432  012704  014070                    MOV     #TMPBUF,R4      ;POINTER
2365  010436  012437  010702                    MOV     (R4)+,.CHAR1    ;STORE CHARACTER 1
2366  010442  012437  010704                    MOV     (R4)+,.ADDR1    ;STORE  ADDRESS 1
2367  010446  012437  010706                    MOV     (R4)+,.CHAR2    ;STORE CHARACTER 2
2368  010452  012437  010710                    MOV     (R4)+,.ADDR2    ;STORE  ADDRESS 2
2369  010456  012437  010712                    MOV     (R4)+,.CHAR3    ;STORE CHARACTER 3
2370  010462  012437  010714                    MOV     (R4)+,.ADDR3    ;STORE  ADDRESS 3
2371  010466  012437  010716                    MOV     (R4)+,.CHAR4    ;STORE CHARACTER 4
2372  010472  012437  010720                    MOV     (R4)+,.ADDR4    ;STORE  ADDRESS 4
2373  010476  013737  014116  001252            MOV     NUMBER,TEMP4    ;STORE NUMBER OF CHARACTER FOUND.
2374  010504  104402                            TYPE
2375  010506  013726                            MDETCH
2376  010510  104410                            CONVRT
2377  010512  010632                            XCHAR1
2378  010514  005337  001252                    DEC     TEMP4
2379  010520  001414                            BEQ     3$
2380  010522  104410                            CONVRT
2381  010524  010644                            XCHAR2
2382  010526  005337  001252                    DEC     TEMP4
2383  010532  001407                            BEQ     3$
2384  010534  104410                            CONVRT
2385  010536  010656                            XCHAR3
2386  010540  005337  001252                    DEC     TEMP4
2387  010544  001402                            BEQ     3$
2388  010546  104410                            CONVRT
2389  010550  010670                            XCHAR4
2390  010552  022737  000001  001504    3$:     CMP     #1,DQNUM
```

```
 2391  010560  001003                          BNE     .+10
 2392  010562  012737  177777  014114          MOV     #-1,XYZFLG
 2393  010570  013737  014116  001252          MOV     NUMBER,TEMP4
 2394  010576  012704  014070                  MOV     #TMPBUF,R4
 2395  010602  012705  010702                  MOV     #.CHAR1,R5
 2396  010606  022425                  4$:     CMP     (R4)+,(R5)+
 2397  010610  001401                          BEQ     .+4
 2398  010612  104022                          HLT 22
 2399  010614  022425                          CMP     (R4)+,(R5)+
 2400  010616  001401                          BEQ     .+4
 2401  010620  104022                          HLT 22
 2402  010622  005337  001252                  DEC     TEMP4
 2403  010626  001367                          BNE     4$
 2404  010630  104400                  10$:    SCOPE
 2405  010632  000002                  XCHAR1: 2
 2406  010634     006     002                  .BYTE   6,2
 2407  010636  010702                          .CHAR1
 2408  010640     004     002                  .BYTE   4,2
 2409  010642  010704                          .ADDR1
 2410  010644  000002                  XCHAR2: 2
 2411  010646     006     002                  .BYTE   6,2
 2412  010650  010706                          .CHAR2
 2413  010652     004     002                  .BYTE   4,2
 2414  010654  010710                          .ADDR2
 2415  010656  000002                  XCHAR3: 2
 2416  010660     006     002                  .BYTE   6,2
 2417  010662  010712                          .CHAR3
 2418  010664     004     002                  .BYTE   4,2
 2419  010666  010714                          .ADDR3
 2420  010670  000002                  XCHAR4: 2
 2421  010672     006     002                  .BYTE   6,2
 2422  010674  010716                          .CHAR4
 2423  010676     004     002                  .BYTE   4,2
 2424  010700  010720                          .ADDR4
 2425  010702  000000                  .CHAR1: 0
 2426  010704  000000                  .ADDR1: 0
 2427  010706  000000                  .CHAR2: 0
 2428  010710  000000                  .ADDR2: 0
 2429  010712  000000                  .CHAR3: 0
 2430  010714  000000                  .ADDR3: 0
 2431  010716  000000                  .CHAR4: 0
 2432  010720  000000                  .ADDR4: 0
```

```
2433                                            ;
2434                                            ;*****************************************************
2435                                            ;SUBROUTINE TO STROBE INTO THE TRANSMITTER
2436                                            ;THE CHARACTER 'WORD'.
2437                                            ;ENTERED BY A JSR       R5,TXSTRB
2438                                            ;THE NUMBER OF SHIFTS AND THE BIT
2439                                            ;LENGTH SELECT ARE UNDER THE JSR CALL
2440                                            ;*****************************************************
2441                                            ;
2442  010722  104412                 TXSTRB: MSTCLR
2443  010724  005037  014060                 CLR     WORD
2444  010730  010537  014056                 MOV     R5,SAVEPC
2445  010734  012537  014064                 MOV     (R5)+,COUNT
2446  010740  012537  014066                 MOV     (R5)+,BITSEL
2447  010744  112777  000002  170416         MOVB    #2,@DQREG
2448  010752  012777  014060  170412         MOV     #WORD,@DQSEC
2449  010760  105277  170404                 INCB    @DQREG
2450  010764  012777  177777  170400         MOV     #-1,@DQSEC
2451  010772  112777  000012  170370         MOVB    #MISC.,@DQREG
2452  011000  013777  014066  170364         MOV     BITSEL,@DQSEC
2453  011006  052777  000012  170356         BIS     #12,@DQSEC
2454  011014  005277  170344                 INC     @DQTCSR
2455  011020  027777  170340  170336         CMP     @DQTCSR,@DQTCSR ;WAIST TIME
2456  011026  027777  170332  170330         CMP     @DQTCSR,@DQTCSR ;WAIST TIME
2457  011034  027777  170324  170322         CMP     @DQTCSR,@DQTCSR ;WAIST TIME
2458  011042  005277  170324                 INC     @DQSEC
2459  011046  005377  170320                 DEC     @DQSEC
2460  011052  005277  170314         1$:     INC     @DQSEC
2461  011056  005377  170310                 DEC     @DQSEC
2462  011062  032777  000200  170302         BIT     #BIT7,@DQSEC
2463  011070  001001                         BNE     .+4
2464  011072  104023                         HLT 23
2465  011074  005337  014064                 DEC     COUNT
2466  011100  001364                         BNE     1$
2467  011102  005277  170264                 INC     @DQSEC
2468  011106  005377  170260                 DEC     @DQSEC
2469  011112  032777  000200  170252         BIT     #BIT7,@DQSEC
2470  011120  001401                         BEQ     .+4
2471  011122  104007                         HLT     7
2472  011124  000205                         RTS     R5
2473
2474
2475
2476
2477
2478  011126  010537  014056         TXSTRC: MOV     R5,SAVEPC
2479  011132  012537  014064                 MOV     (R5)+,COUNT
2480  011136  012537  014066                 MOV     (R5)+,BITSEL
2481  011142  112777  000002  170220         MOVB    #2,@DQREG
2482  011150  012777  014060  170214         MOV     #WORD,@DQSEC
2483  011156  105277  170206                 INCB    @DQREG
2484  011162  012777  177777  170202         MOV     #-1,@DQSEC
2485  011170  112777  000012  170172         MOVB    #MISC.,@DQREG
2486  011176  013777  014066  170166         MOV     BITSEL,@DQSEC
2487  011204  052777  000012  170160         BIS     #12,@DQSEC
2488  011212  005277  170146                 INC     @DQTCSR
```

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 2489  011216  027777  170142  170140          CMP     @DQTCSR,@DQTCSR ;WAIST TIME
 2490  011224  027777  170134  170132          CMP     @DQTCSR,@DQTCSR ;WAIST TIME
 2491  011232  027777  170126  170124          CMP     @DQTCSR,@DQTCSR ;WAIST TIME
 2492  011240  005277  170126                  INC     @DQSEC
 2493  011244  005377  170122                  DEC     @DQSEC
 2494  011250  005277  170116          1$:     INC     @DQSEC
 2495  011254  005377  170112                  DEC     @DQSEC
 2496  011260  005337  014064                  DEC     COUNT
 2497  011264  001371                          BNE     1$
 2498  011266  000205                          RTS     R5
 2499
 2500
 2501
 2502
 2503
 2504  011270  010537  014056          TXSTRD: MOV     R5,SAVEPC       ;SAVE PC OF ROUTINE CALL
 2505  011274  012537  014064                  MOV     (R5)+,COUNT     ;PICK UP THE NUMBER OF SHIFTS
 2506  011300  012537  014066                  MOV     (R5)+,BITSEL    ;PICK UP NUMBER OF BITS PER CHARACTER
 2507  011304  112777  000002  170056          MOVB    #2,@DQREG       ;SELECT THE TRANSMITTER BA PRI.
 2508  011312  012777  014060  170052          MOV     #WORD,@DQSEC    ;LOAD THE BA
 2509  011320  105277  170044                  INCB    @DQREG          ;SELECT THE TRANSMITTER CC PRI.
 2510  011324  012777  177777  170040          MOV     #-1,@DQSEC      ;LOAD THE CC WITH -1
 2511  011332  112777  000012  170030          MOVB    #MISC.,@DQREG   ;SELECT THE MISC REGISTER.
 2512  011340  013777  014066  170024          MOV     BITSEL,@DQSEC   ;LOAD MISC REG WITH NUMBER OF BITS PER CHAR.
 2513  011346  052777  000012  170016          BIS     #12,@DQSEC      ;ADD TO THAT TEST LOOP AND AUTO STEP.
 2514  011354  105737  012604                  TSTB    PARFLG          ;IS PARITY TO BE TURNED ON?
 2515  011360  001403                          BEQ     .+10            ;BR IF NO
 2516  011362  052777  100000  170002          BIS     #BIT15,@DQSEC   ;TURN PARITY ON.....
 2517  011370  005277  167770                  INC     @DQTCSR         ;SET TRANSMITTER GO!!!!
 2518  011374  027777  167764  167762          CMP     @DQTCSR,@DQTCSR ;WAIST TIME
 2519  011402  027777  167756  167754          CMP     @DQTCSR,@DQTCSR ;WAIST TIME
 2520  011410  027777  167750  167746          CMP     @DQTCSR,@DQTCSR ;WAIST TIME
 2521  011416  005277  167750                  INC     @DQSEC          ;PRIME THE
 2522  011422  005377  167744                  DEC     @DQSEC          ;          TRANSMITTER.
 2523  011426  006037  001252          1$:     ROR     TEMP4           ;SHIFT THE STORAGE OF DATA FROM THE TRANSMITTER.
 2524  011432  005277  167734                  INC     @DQSEC          ;CLOCK THE TRANSMITTER -UP-
 2525  011436  005377  167730                  DEC     @DQSEC          ;CLOCK THE TRANSMITTER -DOWN-
 2526  011442  017702  167724                  MOV     @DQSEC,R2       ;MOVE THE MISC REG TO R2
 2527  011446  042702  177577                  BIC     #177577,R2      ;CLEAR ALL BUT THE BIT WINDOW.
 2528  011452  105737  014054                  TSTB    EXTFLG          ;FIND OUT IF BIT PER CHAR >8
 2529  011456  001404                          BEQ     2$              ;BRANCH IF 8OR<8
 2530  011460  106102                          ROLB    R2              ;SHIFT BIT WINDOW INTO CARRY BIT.
 2531  011462  006002                          ROR     R2              ;SHIFT CARRY INTO R2 (BIT 15 OF R2)
 2532  011464  042702  077777                  BIC     #77777,R2       ;CLEAR ALL BUT THAT BIT OF DATA
 2533  011470  050237  001252          2$:     BIS     R2,TEMP4        ;PLACE DATA INTO TEMPORY LOCATION
 2534  011474  005337  014064                  DEC     COUNT           ;IS CHARACTER COMPLETELY SHIFTED OUT?
 2535  011500  001352                          BNE     1$              ;BRANCH IF MORE BITS TO GO.
 2536  011502  105737  014054                  TSTB    EXTFLG
 2537  011506  001003                          BNE     3$
 2538  011510  105137  001252                  COMB    TEMP4
 2539  011514  000402                          BR      4$
 2540  011516  005137  001252          3$:     COM     TEMP4           ;COMPLIMENT DATA STORAGE
 2541  011522  000205                  4$:     RTS     R5              ;LEAVE THE ROUTINE.
 2542
 2543
 2544
```

```
 2545
 2546  011524  010537  014056          RXSTRA: MOV     R5,SAVEPC
 2547  011530  012537  014064                  MOV     (R5)+,COUNT
 2548  011534  012537  014066                  MOV     (R5)+,BITSEL
 2549  011540  013737  014060  017772          MOV     WORD,TEMP
 2550  011546  005137  017772                  COM     TEMP
 2551  011552  105077  167612                  CLRB    @DQREG
 2552  011556  012777  014120  167606          MOV     #RXBUFF,@DQSEC
 2553  011564  105277  167600                  INCB    @DQREG
 2554  011570  012777  000200  167574          MOV     #200,@DQSEC
 2555  011576  112777  000011  167564          MOVB    #11,@DQREG
 2556  011604  012777  177777  167560          MOV     #-1,@DQSEC
 2557  011612  105277  167552                  INCB    @DQREG
 2558  011616  053777  014066  167546          BIS     BITSEL,@DQSEC
 2559  011624  052777  000012  167540          BIS     #12,@DQSEC
 2560  011632  105737  012604                  TSTB    PARFLG          ;IS PARITY TO BE TURNED ON?
 2561  011636  001403                          BEQ     .+10            ;BR IF NO
 2562  011640  052777  100000  167524          BIS     #BIT15,@DQSEC   ;TURN PARITY ON.....
 2563  011646  052777  000001  167504          BIS     #0001,@DQRCSR
 2564  011654  005737  011770                  TST     NPRFLG
 2565  011660  001403                          BEQ     .+10
 2566  011662  052777  010000  167470          BIS     #BIT12,@DQRCSR
 2567  011670  112777  000012  167472          MOVB    #MISC.,@DQREG
 2568  011676  042777  000200  167466  2$:     BIC     #BIT7,@DQSEC
 2569  011704  006037  017772                  ROR     TEMP
 2570  011710  106037  001244                  RORB    TEMP1
 2571  011714  042737  177577  001244          BIC     #177577,TEMP1
 2572  011722  053777  001244  167442          BIS     TEMP1,@DQSEC
 2573  011730  005277  167436                  INC     @DQSEC
 2574  011734  005377  167432                  DEC     @DQSEC
 2575  011740  005337  014064                  DEC     COUNT
 2576  011744  001354                          BNE     2$
 2577  011746  005737  011770                  TST     NPRFLG
 2578  011752  001003                          BNE     .+10
 2579  011754  052777  000020  167410          BIS     #BIT4,@DQSEC
 2580  011762  005037  011770                  CLR     NPRFLG
 2581  011766  000205                          RTS     R5
 2582  011770  000000              NPRFLG: 0
 2583  011772                      .MEMCLR:
 2584  011772  005077  167362                  CLR     @DQRCSR
 2585  011776  005077  167362                  CLR     @DQTCSR
 2586  012002  005077  167360                  CLR     @DQERR
 2587  012006  012705  000020                  MOV     #16.,R5
 2588  012012  152777  000020  167350  1$:     BISB    #BIT4,@DQREG
 2589  012020  142777  000140  167342          BICB    #140,@DQREG
 2590  012026  005077  167340                  CLR     @DQSEC
 2591  012032  105277  167332                  INCB    @DQREG
 2592  012036  005305                          DEC     R5
 2593  012040  001364                          BNE     1$
 2594  012042  105077  167322                  CLRB    @DQREG
 2595  012046  105077  167310                  CLRB    @DQRCSH
 2596  012052  012705  000020                  MOV     #16.,R5
 2597  012056  112777  000010  167304  2$:     MOVB    #10,@DQREG
 2598  012064  005077  167302                  CLR     @DQSEC
 2599  012070  112777  000014  167272          MOVB    #'',@DQREG
 2600  012076  005077  167270                  CLR     @DQSEC
```

```
2601  012102  105277  167254          INCB    @DQRCSH
2602  012106  005305                  DEC     R5
2603  012110  001362                  BNE     2$
2604  012112  105077  167244          CLRB    @DQRCSH
2605  012116                .MSTCLR:
2606  012116  112777  000012  167244  MOVB    #MISC.,@DQREG
2607  012124  012777  000040  167240  MOV     #BIT5,@DQSEC
2608  012132  000002                  RTI
2609  012134  010537  014056          RXLNG:  MOV     R5,SAVEPC
2610  012140  104412                  MSTCLR
2611  012142  105077  167222          CLRB    @DQREG
2612  012146  012777  014120  167216  MOV     #RXBUFF,@DQSEC
2613  012154  005037  014120          CLR     RXBUFF
2614  012160  105277  167204          INCB    @DQREG
2615  012164  012777  000200  167200  MOV     #200,@DQSEC
2616  012172  112777  000011  167170  MOVB    #11,@DQREG
2617  012200  013777  014522  167164  MOV     .SYNC,@DQSEC
2618  012206  105277  167156          INCB    @DQREG
2619  012212  012577  167154          MOV     (R5)+,@DQSEC
2620  012216  052777  000012  167146  BIS     #12,@DQSEC
2621  012224  052777  000001  167126  BIS     #0001,@DQRCSR
2622  012232  042777  000200  167132  BIC     #BIT7,@DQSEC
2623  012240  005277  167126          INC     @DQSEC
2624  012244  005377  167122          DEC     @DQSEC
2625  012250  052777  000020  167114  BIS     #BIT4,@DQSEC
2626  012256  000240                  NOP
2627  012260  000240                  NOP
2628  012262  000240                  NOP
2629  012264  000337  014120          SWAB    RXBUFF
2630  012270  122537  014120          1$:     CMPB    (R5)+,RXBUFF
2631  012274  001401                  BEQ     .+4
2632  012276  104015                  HLT 15
2633  012300  005205                  INC     R5
2634  012302  000205                  RTS     R5
2635  012304  010537  014056          RXELNG: MOV     R5,SAVEPC
2636  012310  104412                  MSTCLR
2637  012312  105077  167052          CLRB    @DQREG
2638  012316  012777  014120  167046  MOV     #RXBUFF,@DQSEC
2639  012324  005037  014120          CLR     RXBUFF
2640  012330  105277  167034          INCB    @DQREG
2641  012334  012777  000200  167030  MOV     #200,@DQSEC
2642  012342  112777  000011  167020  MOVB    #11,@DQREG
2643  012350  013777  014522  167014  MOV     .SYNC,@DQSEC
2644  012356  105277  167006          INCB    @DQREG
2645  012362  012577  167004          MOV     (R5)+,@DQSEC
2646  012366  052777  000012  166776  BIS     #12,@DQSEC
2647  012374  052777  000001  166756  BIS     #0001,@DQRCSR
2648  012402  042777  000200  166762  BIC     #BIT7,@DQSEC
2649  012410  005277  166756          INC     @DQSEC
2650  012414  005377  166752          DEC     @DQSEC
2651  012420  052777  000020  166744  BIS     #BIT4,@DQSEC
2652  012426  000240                  NOP
2653  012430  000240                  NOP
2654  012432  000240                  NOP
2655  012434  022537  014120          CMP     (R5)+,RXBUFF
2656  012440  001401                  BEQ     .+4
```

```
2657  012442  104015                          HLT 15
2658  012444  000205                          RTS     R5
2659  012446                          GENPAR:
2660  012446  010146                          MOV     R1,-(SP)
2661  012450  010246                          MOV     R2,-(SP)
2662  012452  010346                          MOV     R3,-(SP)
2663  012454  105737  014054                  TSTB    EXTFLG
2664  012460  001003                          BNE     .+10
2665  012462  042737  000200  014060          BIC     #BIT7,WORD
2666  012470  042737  100000  014060          BIC     #BIT15,WORD
2667  012476  005002                          CLR     R2
2668  012500  012703  000020                  MOV     #16.,R3
2669  012504  013701  014060                  MOV     WORD,R1
2670  012510  000241                          CLC
2671  012512  006001                  1$:     ROR     R1
2672  012514  005502                          ADC     R2
2673  012516  005303                          DEC     R3
2674  012520  001374                          BNE     1$
2675
2676  012522  032737  001000  001510          BIT     #ODDBIT,DQSTAT
2677  012530  001404                          BEQ     2$
2678  012532  032702  000001                  BIT     #BIT0,R2
2679  012536  001016                          BNE     4$
2680  012540  000403                          BR      3$
2681  012542  032702  000001          2$:     BIT     #BIT0,R2
2682  012546  001412                          BEQ     4$
2683  012550  105737  014054          3$:     TSTB    EXTFLG
2684  012554  001004                          BNE     .+12
2685  012556  052737  000200  014060          BIS     #BIT7,WORD
2686  012564  000403                          BR      4$
2687  012566  052737  100000  014060          BIS     #BIT15,WORD
2688  012574  012603                  4$:     MOV     (SP)+,R3
2689  012576  012602                          MOV     (SP)+,R2
2690  012600  012601                          MOV     (SP)+,R1
2691  012602  000207                          RTS     PC
2692  012604  000000          PARFLG: 0
```

```
2693  012606                    .ERRTAB:
2694  012606  000000                    0
2695  012610  000000                    0       ;HALT 0
2696  012612  000000                    0
2697  012614  013012                    EM0
2698  012616  013330                    DH1     ;HALT 1
2699  012620  000000                    0
2700  012622  013012                    EM0
2701  012624  013351                    DH2     ;HALT 2
2702  012626  000000                    0
2703  012630  013030                    EM1
2704  012632  013366                    DH3     ;HALT 3
2705  012634  000000                    0
2706  012636  013030                    EM1
2707  012640  013377                    DH4     ;HALT 4
2708  012642  000000                    0
2709  012644  013030                    EM1
2710  012646  013433                    DH5     ;HALT 5
2711  012650  000000                    0
2712  012652  013012                    EM0
2713  012654  013467                    DH6     ;HALT 6
2714  012656  000000                    0
2715  012660  013012                    EM0
2716  012662  013507                    DH7     ;HALT 7
2717  012664  000000                    0
2718  012666  013175                    EM6
2719  012670  013542                    DH9     ;HALT 10
2720  012672  000000                    0
2721  012674  000000                    0
2722  012676  013536                    DH8     ;HALT 11
2723  012700  000000                    0
2724  012702  013012                    EM0
2725  012704  013550                    DH10    ;HALT 12
2726  012706  014042                    DT0
2727  012710  013066                    EM3
2728  012712  013542                    DH9     ;HALT 13
2729  012714  000000                    0
2730  012716  013066                    EM3
2731  012720  013536                    DH8     ;HALT 14
2732  012722  000000                    0
2733  012724  013175                    EM6
2734  012726  013677                    DH13    ;HALT 15
2735  012730  000000                    0
2736  012732  013152                    EM5
2737  012734  013536                    DH8     ;HALT 16
2738  012736  000000                    0
2739  012740  013152                    EM5
2740  012742  013542                    DH9     ;HALT 17
2741  012744  000000                    0
2742  012746  013175                    EM6
2743  012750  013550                    DH10    ;HALT 20
2744  012752  014042                    DT0
2745  012754  013120                    EM4
2746  012756  000000                    0       ;HALT 21
2747  012760  000000                    0
2748  012762  013210                    EM7
```

```
 2749  012764  000000                          0       ;HALT 22
 2750  012766  000000                          0
 2751  012770  013256                          EM8
 2752  012772  000000                          0       ;HALT 23
 2753  012774  000000                          0
 2754  012776  013012                          EM0
 2755  013000  013310                          DH0     ;HALT 24
 2756  013002  000000                          0
 2757  013004  000000                          0
 2758  013006  013550                          DH10    ;HALT 25
 2759  013010  014042                          DT0
 2760  013012  052377  040522  051516  EM0:    .ASCIZ <377>/TRANSMITTER /
       013030  052377  040522  051516  EM1:    .ASCIZ <377>/TRANSMITTER CHARACTER COUNT /
       013066  053377  041522  042440  EM3:    .ASCIZ <377>/VRC ERROR BIT SHOULD BE /
       013120  047377  020117  044103  EM4:    .ASCIZ <377>/NO CHARACTERS DETECTED./<0>
       013152  051777  047131  020103  EM5:    .ASCIZ <377>/SYNC 1 AND 2 NOT /
       013175     377  042522  042503  EM6:    .ASCIZ <377>/RECEIVER /
       013210  041777  040510  040522  EM7:    .ASCIZ <377>/CHARACTER DETECTION COMPARISON ERROR/
       013256  041777  040510  040522  EM8:    .ASCIZ <377>/CHARACTER NOT ALL ZERO'S/
       013310  041501  044524  042526  DH0:    .ASCIZ /ACTIVE NOT SET./
       013330  041501  044524  042526  DH1:    .ASCIZ /ACTIVE NOT CLEAR/
       013351     104  047117  020105  DH2:    .ASCIZ /DONE NOT SET/
       013366  047516  020124  042532  DH3:    .ASCIZ /NOT ZERO/
       013377     116  052117  044440  DH4:    .ASCIZ /NOT INCREMENTED BY PLUS TWO/
       013433     116  052117  044440  DH5:    .ASCIZ /NOT INCREMENTED BY PLUS ONE/
       013467     120  044522  051452  DH6:    .ASCIZ /PRI*SEC NOT SET/
       013507     114  047111  020105  DH7:    .ASCIZ /LINE NOT AT MARK STATE/
       013536  042523  000124          DH8:    .ASCIZ /SET/
       013542  046103  040505  000122  DH9:    .ASCIZ  /CLEAR/
       013550  040504  040524  041440  DH10:   .ASCII /DATA COMPARISON ERROR/
       013575     377  054105  042520          .ASCIZ <377>/EXPECTED   RECEIVED /
       013623     123  052105  053440  DH11:   .ASCIZ /SET WHEN ACTIVE SET/
       013647     103  042514  051101  DH12:   .ASCIZ /CLEARED BY MASTER CLEAR/
       013677     103  040510  040522  DH13:   .ASCIZ  /CHARACTER LENGTH ERROR/
       013726  051777  042505  040440  MDETCH: .ASCII  <377>/SEE ABSTRACT OR TEST #56 FOR DETAILS/
       013773     377  044103  051101          .ASCII  <377>/CHARACTERS DETECTED:  /
       014022  041777  040510  027122          .ASCIZ  <377>/CHAR.   ADDR. /
                                       .EVEN
       014042  000002                  DT0:    2
 2761  014044     006       004        .BYTE   6,4
 2762  014046  001254                          TEMP5
 2763  014050     006       002        .BYTE   6,2
 2764  014052  001252                          TEMP4
 2765  014054  000000                  EXTFLG: 0
 2766  014056  000000                  SAVEPC: 0
 2767  014060  000000                  WORD:   0
 2768  014062  000000                  DELAY:  0
 2769  014064  000000                  COUNT:  0
 2770  014066  000000                  BITSEL: 0
 2771  014070  000012                  TMPBUF: .BLKW   12
 2772  014114  000000                  XYZFLG: 0
 2773  014116  000000                  NUMBER: 0
 2774  014120  000000                  RXBUFF: 0
 2775          014522                          .=.+400
 2776  014522     026       026        .SYNC:  .BYTE   26,26
 2777  014524     026       026        SYNC:   .BYTE   26,26
```

```
2778  014526  000000                  TXBUFF: 0
2779          015130                          .=.+400
2780
2781                                          ;END OF PASS
2782                                          ;TYPE NAME OF TEST
2783                                          ;UPDATE PASS COUNT
2784                                          ;CHECK FOR EXIT TO ACT-11
2785                                          ;RESTART TEST
2786
2787  015130  005037  001234          .EOP:   CLR     LSTERR                  ;CLEAR LAST ERROR PC
2788  015134  005037  001312                  CLR     ERRFLG                  ;CLEAR ERROR FLAG
2789  015140  005237  001230                  INC     PASCNT                  ;UPDATE PASS COUNT
2790  015144  104402                          TYPE
2791  015146  017360                          MEPASS
2792  015150  104402                          TYPE
2793  015152  017540                          MCSRX
2794  015154  104411                          CNVRT
2795  015156  015266                          XCSR
2796  015160  104402                          TYPE
2797  015162  017546                          MVECX
2798  015164  104411                          CNVRT
2799  015166  015274                          XVEC
2800  015170  104402                          TYPE
2801  015172  017554                          MPASSX
2802  015174  104411                          CNVRT
2803  015176  015302                          XPASS
2804  015200  104402                          TYPE
2805  015202  017565                          MERRX
2806  015204  104411                          CNVRT
2807  015206  015310                          XERR
2808  015210  013777  001230  163764          MOV     PASCNT,@LIGHTS          ;DISPLAY PASS COUNT
2809  015216  005337  001276                  DEC     SAVNUM
2810  015222  001013                          BNE     RESTRT
2811  015224  013737  001504  001276          MOV     DQNUM,SAVNUM
2812  015232  013701  000042                  MOV     @#42,R1                 ;CHECK FOR ACT-11 OR DDP
2813  015236  001405                          BEQ     RESTRT                  ;IF NOT, CONTINUE TESTING
2814  015240  000005                          RESET
2815  015242                          LOGICAL:
2816  015242  004711                          JSR     PC,(R1)
2817  015244  000240                          NOP
2818  015246  000240                          NOP
2819  015250  000240                          NOP
2820  015252  104414                  RESTRT: CKSWR
2821  015254  012737  002254  001214          MOV     #TST1,RETURN
2822  015262  000137  002254                  JMP     TST1
2823  015266  000001                  XCSR:   1
2824  015270     006     002                  .BYTE   6,2
2825  015272  001360                          DQRCSR
2826  015274  000001                  XVEC:   1
2827  015276     003     002                  .BYTE   3,2
2828  015300  001350                          DQRVEC
2829  015302  000001                  XPASS:  1
2830  015304     006     002                  .BYTE   6,2
2831  015306  001230                          PASCNT
2832  015310  000001                  'ERR:   1
2833  015312     006     002                  .BYTE   6,2
```

```
2834  015314  001232                          ERRCNT
2835
2836                                          ;SCOPE LOOP AND INTERATION HANDLER
2837
2838  015316  104414                .SCOPE: CKSWR
2839  015320  032777  040000  163652        BIT     #BIT14,@SWR
2840  015326  001407                TTST:   BEQ     1$
2841  015330  000432                        BR      3$
2842  015332  105777  163646                TSTB    @TKCSR
2843  015336  100027                        BPL     3$
2844  015340  017700  163642                MOV     @TKDBR,R0
2845  015344  000412                        BR      2$
2846  015346  032777  004000  163624  1$:   BIT     #SW11,@SWR
2847  015354  001006                        BNE     2$
2848  015356  005237  001224                INC     LPCNT
2849  015362  023737  001224  001222        CMP     LPCNT,ICOUNT
2850  015370  001012                        BNE     3$
2851  015372  105037  001312          2$:   CLRB    ERRFLG
2852  015376  005037  001224                CLR     LPCNT
2853  015402  012737  000010  001222        MOV     #10,ICOUNT
2854  015410  013737  001216  001214        MOV     NEXT,RETURN
2855  015416  013716  001214          3$:   MOV     RETURN,(SP)
2856  015422  000002                        RTI
2857  015424  001407                BRW:    1407
2858  015426  000432                BRX:    432
2859
2860                                          ;CHECK FOR FREEZE ON CURRENT DATA
2861
2862  015430  104414                .SCOP1: CKSWR
2863  015432  032777  001000  163540        BIT     #SW09,@SWR
2864  015440  001402                        BEQ     1$
2865  015442  013716  001220                MOV     LOCK,(SP)
2866  015446  000002                1$:     RTI
2867
2868                                          ;TELETYPE OUTPUT ROUTINE
2869
2870  015450  010546                .TYPE:  MOV     R5,-(SP)
2871  015452  017605  000002                MOV     @2(SP),R5
2872  015456  062766  000002  000002        ADD     #2,2(SP)
2873  015464  005737  017140          1$:   TST     @#RDSW
2874  015470  001004                        BNE     300$
2875  015472  032777  010000  163500        BIT     #SW12,@SWR
2876  015500  001024                        BNE     3$
2877  015502  105715                300$:   TSTB    (R5)
2878  015504  100014                        BPL     2$
2879  015506  105777  163476                TSTB    @TPCSR
2880  015512  100375                        BPL     .-4
2881  015514  012777  000015  163470        MOV     #15,@TPDBR
2882  015522  105777  163462                TSTB    @TPCSR
2883  015526  100375                        BPL     .-4
2884  015530  012777  000012  163454        MOV     #12,@TPDBR
2885  015536  105777  163446          2$:   TSTB    @TPCSR
2886  015542  100375                        BPL     2$
2887  015544  112577  163442                MOVB    (R5)+,@TPDBR
2888  015550  001345                        BNE     1$
2889  015552  012605                3$:     MOV     (SP)+,R5
```

```
2890  015554  000002                          RTI
2891
2892                                          ;ASCII STRING INPUT ROUTINE
2893
2894  015556  010346                .INSTR: MOV     R3,-(SP)
2895  015560  010446                        MOV     R4,-(SP)
2896  015562  017637  000004 015600        MOV     @4(SP),.MSG
2897  015570  062766  000002 000004        ADD     #2,4(SP)
2898  015576  104402                .INST1: TYPE
2899  015600  000000                .MSG:   0
2900  015602  012704  017730                MOV     #INBUF,R4
2901  015606  012703  000007                MOV     #7,R3
2902  015612  105777  163366          1$:   TSTB    @TKCSR
2903  015616  100375                        BPL     1$
2904  015620  117714  163362                MOVB    @TKDBR,(R4)
2905  015624  142714  000200                BICB    #200,(R4)
2906  015630  121427  000025                CMPB    (R4),#25                ;IS IT <^G>
2907  015634  001003                        BNE     200$
2908  015636  104402  017320                TYPE,MCRLF
2909  015642  000755                        BR      .INST1
2910  015644  122427  000015          200$: CMPB    (R4)+,#15
2911  015650  001423                        BEQ     INSTR2
2912  015652  117777  163330 163332        MOVB    @TKDBR,@TPDBR
2913  015660  105777  163324          2$:   TSTB    @TPCSR
2914  015664  100375                        BPL     2$
2915  015666  005303                        DEC     R3
2916  015670  001350                        BNE     1$
2917  015672  000402                        BR      .INSTG
2918  015674  010346                .INSTE: MOV     R3,-(SP)
2919  015676  010446                        MOV     R4,-(SP)
2920  015700  104402                .INSTG: TYPE
2921  015702  017314                        MQM
2922  015704  005737  017140                TST     @#RDSW
2923  015710  001402                        BEQ     400$
2924  015712  104402  017320                TYPE,MCRLF
2925  015716  000727                400$:   BR      .INST1
2926  015720  012604                INSTR2: MOV     (SP)+,R4
2927  015722  012603                        MOV     (SP)+,R3
2928  015724  000002                        RTI
2929
2930                                          ;CONVERT ASCII STRING TO OCTAL
2931
2932  015726  010546                .PARAM: MOV     R5,-(SP)
2933  015730  010446                        MOV     R4,-(SP)
2934  015732  016605  000004                MOV     4(SP),R5
2935  015736  012537  016132                MOV     (R5)+,LOLIM
2936  015742  012537  016134                MOV     (R5)+,HILIM
2937  015746  012537  016136                MOV     (R5)+,DEVADR
2938  015752  112537  016140                MOVB    (R5)+,LOBITS
2939  015756  112537  016141                MOVB    (R5)+,ADRCNT
2940  015762  010566  000004                MOV     R5,4(SP)
2941  015766  005005                PARAM1: CLR     R5
2942  015770  012704  017730                MOV     #INBUF,R4
2943  015774  122714  000015                CMPB    #15,(R4)
2944  016000  001420                        BEQ     PARERR
2945  016002  121427  000060          '$:   CMPB    (R4),#60
```

```
2946  016006  002415                  BLT     PARERR
2947  016010  121427  000067          CMPB    (R4),#67
2948  016014  003012                  BGT     PARERR
2949  016016  142714  000060          BICB    #60,(R4)
2950  016022  152405                  BISB    (R4)+,R5
2951  016024  122714  000015          CMPB    #15,(R4)
2952  016030  001414                  BEQ     LIMITS
2953  016032  006305                  ASL     R5
2954  016034  006305                  ASL     R5
2955  016036  006305                  ASL     R5
2956  016040  000760                  BR      1$
2957  016042  122714  000015  PARERR: CMPB    #15,(R4)        ;IS FIRST CHARACTER A <CR>
2958  016046  001003                  BNE     120$
2959  016050  005737  017140          TST     @#RDSW          ;IS CKSWR ROUTINE BEING USED
2960  016054  001023                  BNE     PARTI
2961  016056  104404          120$:   INSTER
2962  016060  000742                  BR      PARAM1
2963
2964                                  ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
2965
2966  016062  020537  016134  LIMITS: CMP     R5,HILIM
2967  016066  101365                  BHI     PARERR
2968  016070  020537  016132          CMP     R5,LOLIM
2969  016074  103762                  BLO     PARERR
2970  016076  133705  016140          BITB    LOBITS,R5
2971  016102  001357                  BNE     PARERR
2972
2973                                  ;STORE NUMBER AT SPECIFIED ADDRESS
2974
2975  016104  013704  016136          MOV     DEVADR,R4
2976  016110  010524          1$:     MOV     R5,(R4)+
2977  016112  062705  000002          ADD     #2,R5
2978  016116  105337  016141          DECB    ADRCNT
2979  016122  001372                  BNE     1$
2980  016124  012604          PARTI:  MOV     (SP)+,R4
2981  016126  012605                  MOV     (SP)+,R5
2982  016130  000002                  RTI
2983  016132  000000          LOLIM:  0
2984  016134  000000          HILIM:  0
2985  016136  000000          DEVADR: 0
2986  016140  000000          LOBITS: 0
2987          016141          ADRCNT: LOBITS+1
2988
2989                                  ;SAVE PC OF TEST THAT FAILED AND R0-R5
2990
2991  016142  016637  000004  001274  .SAV05: MOV     4(SP),SAVPC
2992
2993                                  ;SAVE R0-R5
2994
2995  016150  010537  001270          SV05:   MOV     R5,SAVR5
2996  016154  010437  001266          MOV     R4,SAVR4
2997  016160  010337  001264          MOV     R3,SAVR3
2998  016164  010237  001262          MOV     R2,SAVR2
2999  016170  010137  001260          MOV     R1,SAVR1
3000  016174  010037  001256          MOV     R0,SAVR0
3001  016200  000002                  RTI
```

```
                                                ;RESTORE R0-R5
016202  013700  001256          .RES05: MOV     SAVR0,R0
016206  013701  001260                  MOV     SAVR1,R1
016212  013702  001262                  MOV     SAVR2,R2
016216  013703  001264                  MOV     SAVR3,R3
016222  013704  001266                  MOV     SAVR4,R4
016226  013705  001270                  MOV     SAVR5,R5
016232  000002                          RTI

                                                ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
016234  104402                  .CONVR: TYPE
016236  017320                          MCRLF
016240  010046                  .CNVRT: MOV     R0,-(SP)
016242  010146                          MOV     R1,-(SP)
016244  010346                          MOV     R3,-(SP)
016246  010446                          MOV     R4,-(SP)
016250  010546                          MOV     R5,-(SP)
016252  017601  000012                  MOV     @12(SP),R1
016256  013737  017772  001250          MOV     TEMP,TEMP3
016264  062766  000002  000012          ADD     #2,12(SP)
016272  012137  016454                  MOV     (R1)+,WRDCNT
016276  112137  016456          1$:     MOVB    (R1)+,CHRCNT
016302  112137  016457                  MOVB    (R1)+,SPACNT
016306  013137  016460                  MOV     @(R1)+,BINWRD
016312  013704  016460          2$:     MOV     BINWRD,R4
016316  113705  016456                  MOVB    CHRCNT,R5
016322  012700  017772                  MOV     #TEMP,R0
016326  010403                  3$:     MOV     R4,R3
016330  042703  177770                  BIC     #177770,R3
016334  062703  000060                  ADD     #060,R3
016340  110320                          MOVB    R3,(R0)+
016342  000241                          CLC
016344  006004                          ROR     R4
016346  000241                          CLC
016350  006004                          ROR     R4
016352  000241                          CLC
016354  006004                          ROR     R4
016356  005305                          DEC     R5
016360  001362                          BNE     3$
016362  012703  020034                  MOV     #MDATA,R3
016366  114023                  4$:     MOVB    -(R0),(R3)+
016370  105337  016456                  DECB    CHRCNT
016374  001374                          BNE     4$
016376  105737  016457                  TSTB    SPACNT
016402  001405                          BEQ     6$
016404  112723  000040          5$:     MOVB    #040,(R3)+
016410  105337  016457                  DECB    SPACNT
016414  001373                          BNE     5$
016416  105013                  6$:     CLRB    (R3)
016420  104402                          TYPE
016422  020034                          MDATA
016424  005337  016454                  DEC     WRDCNT
016430  001322                          BNE     1$
```

```
3058  016432  013737  001250  017772          MOV     TEMP3,TEMP
3059  016440  012605                          MOV     (SP)+,R5
3060  016442  012604                          MOV     (SP)+,R4
3061  016444  012603                          MOV     (SP)+,R3
3062  016446  012601                          MOV     (SP)+,R1
3063  016450  012600                          MOV     (SP)+,R0
3064  016452  000002                          RTI
3065  016454  000000                  WRDCNT: 0
3066  016456  000000                  CHRCNT: 0
3067          016457                  SPACNT=CHRCNT+1
3068  016460  000000                  BINWRD: 0
3069                                          ;TRAP DISPATCH SERVICE
3070                                          ;ARGUMENT OF TRAP IS EXTRACTED
3071                                          ;AND USED AS OFFSET TO OBTAIN POINTER
3072                                          ;TO SELECTED SUBROUTINE
3073
3074  016462  011646                  .TRPSR: MOV     (SP),-(SP)              ;GET PC OF RETURN
3075  016464  162716  000002                  SUB     #2,(SP)                 ;=PC OF TRAP
3076  016470  017616  000000                  MOV     @(SP),(SP)              ;GET TRP
3077  016474  006316                  TRPOK:  ASL     (SP)                    ;MULTIPLY TRAP ARG BY 2
3078  016476  042716  177001                  BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
3079  016502  062716  001314                  ADD     #.TRPTAB,(SP)           ;POINTER TO SUBROUTINE ADDRESS
3080  016506  017616  000000                  MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
3081  016512  000136                          JMP     @(SP)+                  ;GO TO SUBROUTINE
3082
3083                                          ;ERROR HANDLER
3084
3085  016514  104414                  .HALT:  CKSWR
3086  016516  032777  010000  162454          BIT     #SW12,@SWR
3087  016524  001406                          BEQ     XBX
3088  016526  105777  162456                  TSTB    @TPCSR
3089  016532  100003                          BPL     XBX
3090  016534  112777  000207  162450          MOVB    #207,@TPDBR
3091  016542  032777  020000  162430  XBX:    BIT     #SW13,@SWR
3092  016550  001074                          BNE     HALTS
3093  016552  021637  001234                  CMP     (SP),LSTERR
3094  016556  001404                          BEQ     1$
3095  016560  011637  001234                  MOV     (SP),LSTERR
3096  016564  105037  001312                  CLRB    ERRFLG
3097  016570  104406                  1$:     SAV05
3098  016572  011605                          MOV     (SP),R5
3099  016574  162705  000002                  SUB     #2,R5
3100  016600  011504                          MOV     (R5),R4
3101  016602  006304                          ASL     R4
3102  016604  061504                          ADD     (R5),R4
3103  016606  006304                          ASL     R4
3104  016610  042704  177001                  BIC     #177001,R4
3105  016614  062704  012606                  ADD     #.ERRTAB,R4
3106  016620  012437  016712                  MOV     (R4)+,ERRMSG
3107  016624  012437  016724                  MOV     (R4)+,DATAHD
3108  016630  011437  016736                  MOV     (R4),DATABP
3109  016634  105737  001312                  TSTB    ERRFLG
3110  016640  001403                          BEQ     TYPMSG
3111  016642  005737  016736                  TST     DATABP
3112  016646  001027                          BNE     TYPDAT
3113  016650  104402                  TYPMSG: TYPE
```

```
3114  016652  017576                          MTSTN
3115  016654  104411                          CNVRT
3116  016656  017036                          XTSTN
3117  016660  104402                          TYPE
3118  016662  017664                          MERRPC
3119  016664  104411                          CNVRT
3120  016666  017030                          ERTABO
3121  016670  104402                          TYPE
3122  016672  017320                          MCRLF
3123  016674  112737  177777  001312          MOVB    #-1,ERRFLG
3124  016702  005737  016712                  TST     ERRMSG
3125  016706  001402                          BEQ     WRKO.FM
3126  016710  104402                          TYPE
3127  016712  000000                  ERRMSG: 0
3128  016714                          WRKO.FM:
3129  016714  005737  016724                  TST     DATAHD
3130  016720  001402                          BEQ     TYPDAT
3131  016722  104402                          TYPE
3132  016724  000000                  DATAHD: 0
3133  016726  005737  016736          TYPDAT: TST     DATABP
3134  016732  001402                          BEQ     RESREG
3135  016734  104410                          CONVRT
3136  016736  000000                  DATABP: 0
3137  016740  104407                  RESREG: RESOS
3138  016742  005777  162232          HALTS:  TST     @SWR
3139  016746  100005                          BPL     EXITER
3140  016750  010046                          PUSHRO
3141  016752  016600  000002                  MOV     2(SP),RO
3142  016756  000000                          HALT
3143  016760  012600                          POPRO
3144  016762  104414                  EXITER: CKSWR
3145  016764  005237  001232                  INC     ERRCNT
3146  016770  032777  000400  162202          BIT     #SW08,@SWR
3147  016776  001007                          BNE     1$
3148  017000  032777  002000  162172          BIT     #SW10,@SWR
3149  017006  001407                          BEQ     2$
3150  017010  013737  001216  001214          MOV     NEXT,RETURN
3151  017016  012706  001200          1$:     MOV     #STACK,SP
3152  017022  000177  162166                  JMP     @RETURN
3153  017026  000002                  2$:     RTI
3154  017030  000001                  ERTABO: 1
3155  017032     006     002                  .BYTE   6,2
3156  017034  001274                          SAVPC
3157  017036  000001                  XTSTN:  1
3158  017040     003     002                  .BYTE   3,2
3159  017042  001226                          TSTNO
3160                                          ;ENTER HERE ON POWER FAILURE
3161
3162
3163  017044                          .PFAIL:
3164  017044  012737  017056  000024          MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
3165  017052  000000                          HALT                            ;HALT ON POWER DOWN NORMAL
3166  017054  000777                          BR      .
3167
3168                                          ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
3169
```

```
3170  017056                          RESTAR:
3171  017056  012737  017044  000024          MOV     #.PFAIL,24              ;SET UP FOR POWER FAILURE
3172  017064  012706  001200                  MOV     #STACK,SP
3173  017070  005037  017772                  CLR     TEMP
3174  017074  005237  017772                  INC     TEMP
3175  017100  001375                          BNE     .-4
3176  017102  104402                          TYPE
3177  017104  017322                          MPFAIL
3178  017106  104411                          CNVRT
3179  017110  017132                          PFTAB
3180  017112  005037  001312                  CLR     ERRFLG
3181  017116  005037  001234                  CLR     LSTERR
3182  017122  104412                          MSTCLR
3183  017124  104413                          MEMCLR
3184  017126  000177  162062                  JMP     @RETURN
3185  017132  000001                  PFTAB:  1
3186  017134     003     002          .BYTE   3,2
3187  017136  001226                          TSTNO
3188
3189
3190                                          ;CHECK SWITCH REGISTER ROUTINE. CHECKS FOR ^G TO ALLOW CHANGING
3191                                          ;OF LOC.176.
3192                                          ;LOCATIONS USED:
3193  017140  000000                          RDSW:   .WORD   0
3194
3195
3196  017142  005737  000042          .CKSWR: TST     @#42
3197  017146  001042                          BNE     OUT
3198  017150  022737  000176  001200          CMP     #SWREG,SWR      ;SOFTWARE SWITCH REGISTER PRESENT
3199  017156  001036                          BNE     OUT             ;NO, GET OUT
3200  017160  105777  162020                  TSTB    @TKCSR          ;YES,WAIT FOR
3201  017164  100033                          BPL     OUT             ;READY, GET CHARACTER
3202  017166  017737  162014  015600          MOV     @TKDBR,.MSG     ;AND STRIP OFF
3203  017174  042737  177600  015600          BIC     #177600,.MSG    ;THE GARBAGE
3204  017202  122737  000007  015600          CMPB    #7,.MSG         ;IS IT A <^G>
3205  017210  001021                          BNE     OUT
3206  017212  104402  017270                  TYPE,$CNTG
3207  017216  005137  017140          .CNTLU: COM     @#RDSW
3208  017222  104402  017274                  TYPE,$MSWR
3209  017226  104411  017262                  CNVRT,SWREGC
3210  017232  104403  017303                  INSTR,$MNEW
3211  017236  104405                          PARAM
3212  017240  000000                          0
3213  017242  177777                          177777
3214  017244  000176                          SWREG
3215  017246     000     001          .BYTE           0,1
3216  017250  104402  017320                  TYPF,MCRLF
3217  017254  005037  017140          OUT:    CLR     @#RDSW
3218  017260  000002                          RTI
3219  017262  000001                  SWREGC: 1
3220  017264     006     002          .BYTE   6,2
3221  017266  000176                          SWREG
3222  017270  057377  000107          $CNTG:  .ASCIZ  <377>/^G/
3223  017274  051777  051127  020075  $MSWR:  .ASCIZ  <377>/SWR- /
3224  017302     000
3225  017303     040  047040  053505  $MNEW:  .ASCIZ  /  NEW- /
```

```
3226  017310  020075     000
3227          017314                    .EVEN
3228  017314  020040  000077            MQM:     .ASCIZ  /  ?/
3229  017320  000377                    MCRLF:   .ASCIZ   <377>
3230  017322  050377  051127  043040    MPFAIL:  .ASCIZ  <377>/PWR FAILED. RESTART AT TEST /
3231  017330  044501  042514  027104
3232  017336  051040  051505  040524
3233  017344  052122  040440  020124
3234  017352  042524  052123  000040
3235  017360  042777  042116  050040    MEPASS:  .ASCIZ  <377>/END PASS CZDQD /
3236  017366  051501  020123  055103
3237  017374  050504  020104     000
3238  017401     377  000122            MR:      .ASCIZ  <377>/R/
3239  017404  050377  047522  051107    MERR2:   .ASCIZ  <377>/PROGRAM INDICATES NO DEVICES PRESENT./
3240  017412  046501  044440  042116
3241  017420  041511  052101  051505
3242  017426  047040  020117  042504
3243  017434  044526  042503  020123
3244  017442  051120  051505  047105
3245  017450  027124     000
3246  017453     377  047111  052523    MERR3:   .ASCIZ  <377>/INSUFFICIENT DATA!/
3247  017460  043106  041511  042511
3248  017466  052116  042040  052101
3249  017474  020501     000
3250  017477     377  042524  052123    MTSTPC:  .ASCIZ  <377>/TEST PC-/
3251  017504  050040  026503     000
3252  017511     377  047514  045503    MLOCK:   .ASCIZ  <377>/LOCK ON SELECTED TEST/
3253  017516  047440  020116  042523
3254  017524  042514  052103  042105
3255  017532  052040  051505  000124
3256  017540  051503  035122  000040    MCSRX:   .ASCIZ   /CSR: /
3257  017546  042526  035103  000040    MVECX:   .ASCIZ  /VEC: /
3258  017554  040520  051523  051505    MPASSX:  .ASCIZ  /PASSES: /
3259  017562  020072     000
3260  017565     105  051122  051117    MERRX:   .ASCIZ  /ERRORS: /
3261  017572  035123  000040
3262  017576  177777  042524  052123    MTSTN:   .ASCIZ  <377><377> /TEST NO: /
3263  017604  047040  035117  000040
3264  017612  051777  052105  051440    MNEW:    .ASCIZ  <377>/SET SWITCH REG TO DQ11'S DESIRED ACTIVE./
3265  017620  044527  041524  020110
3266  017626  042522  020107  047524
3267  017634  042040  030521  023461
3268  017642  020123  042504  044523
3269  017650  042522  020104  041501
3270  017656  044524  042526  000056
3271  017664  041520  020072     000    MERRPC:  .ASCIZ  /PC: /
3272  017671     377  040515  020120    XHEAD:   .ASCIZ  <377>/MAP OF DQ11 STATUS/<377>
3273  017676  043117  042040  030521
3274  017704  020061  052123  052101
3275  017712  051525  000377
3276                                    .EVEN
3277  017716  000002                    XSTATQ:  2
3278  017720     006     003                     .BYTE   6,3
3279  017722  001244                             TEMP1
3280  017724     006     002                     .BYTE   6,2
3281  017726  001246                             TEMP2
```

```
3282                                    .EVEN
3283
3284                                            ;BUFFERS FOR INPUT-OUTPUT
3285
3286  017730  000000                    INBUF:  0
3287          017772                    .=.+40
3288  017772  000000                    TEMP:   0
3289          020034                    .=.+40
3290  020034  000000                    MDATA.  0
3291          020076                    . .+40
3292          000001                    .END
```

```
ABBIT = 002000            610#    724
ACTBIT= 004000            611#    732    1908
ADRCNT= 016141           2939*   2978*   2987#
A1$     003056           1149    1152#
BABIT = 010000            612#    728
BBBIT = 020000            613#    719    2263
BINWRD  016460           3028*   3029    3068#
BITSEL  014066           1501*   1507    2446*  2452   2480*  2486   2506*  2512   2548*  2558   2770#
BIT0  = 000001            605#   1046    2678   2681
BIT1  = 000002            604#   1480    1483   1484   1487   1488   1491   1493   1509
BIT10 = 002000            595#
BIT11 = 004000            594#
BIT12 = 010000            593#   1[illegible]   1873   1887   1898   1910   1918   1923   2566
BIT13 = 020000            592#   1870
BIT14 = 040000            591#   1114   1120   2839
BIT15 = 100000            590#   2065   2067   2069   2315   2516   2562   2666   2687
BIT2  = 000004            603#   1017   1174   1206
BIT3  = 000010            602#
BIT4  = 000020            601#   2579   2588   2625   2651
BIT5  = 000040            600#   1801   2607
BIT6  = 000100            599#   1193
BIT7  = 000200            598#   2462   2469   2568   2622   2648   2665   2685
BIT8  = 000400            597#
BIT9  = 001000            596#
BRW     015424           1023    2857#
BRX     015426           1024    2858#
CHARDT= 000010             630#
CHAR1   001236             804#
CHAR2   001240             805#
CHAR3   001242             806#
CHRCNT  016456           3026*   3030   3046*  3066#  3067
CKSWR = 104414             865#    991   1001   1016   2284   2288   2820   2838   2862   3085   3144
CKSYN1  003002           1103    1131#
CNTLU = 104415             867#    973
CNVRT = 104411             859#   2794   2798   2802   2806   3115   3119   3178   3209
CONVRT= 104410             857#    981   2376   2380   2384   2388   3135
COUNT   014064           1500*   1517*  2445*  2465*  2479*  2496*  2505*  2534*  2547*  2575*  2769#
CREAM   001300             821#    945*  1055*  1059*  1068   1069*  1070   1071*
CSRMAP  000220             699#    976
DATABP  016736           3108*   3111   3133   3136#
DATAHD  016724           3107*   3129   3132#
DELAY   014062           1159*   1163*  1191*  1195*  2768#
DEVADR  016136           2937*   2975   2985#
DH0     013310           2755    2760#
DH1     013330           2698    2760#
DH10    013550           2725    2743   2758   2760#
DH11    013623           2760#
DH12    013647           2760#
DH13    013677           2734    2760#
DH2     013351           2701    2760#
DH3     013366           2704    2760#
DH4     013377           2707    2760#
DH5     013433           2710    2760#
DH6     013467           2713    2760#
DH7     013507           2716    2760#
DH8     013536           2722    2731   2737   2760#
```

```
DH9     013542  2719   2728   2740   2760#
DISPRE  000174   690#   961
DLIGHT= 177570   575#   952
DQACTV  001500   670    744*   750*   751*   755    924#   998*   999    1049   1051
DQCR00  001400   892#
DQCR01  001404   894#
DQCR02  001410   896#
DQCR03  001414   898#
DQCR04  001420   900#
DQCR05  001424   902#
DQCR06  001430   904#
DQCR07  001434   906#
DQCR10  001440   908#
DQCR11  001444   910#
DQCR12  001450   912#
DQCR13  001454   914#
DQCR14  001460   916#
DQCR15  001464   918#
DQCR16  001470   920#
DQCR17  001474   922#
DQCSR   001506   927#   1068*  1072
DQERR   001366   882#   1085*  1086*  1087   2028   2075   2222   2586*
DQNUM   001504   703*    740*   745    747    926#    940   2390   2811
DQRCSH  001362   880#   1081*  1082*  2595*  2601*  2604*
DQRCSR  001360   879#   1072*  1081   1083   1795*  1873   1887   1898   1910   1918   1923   1952*  1953
                1987*  1988   2122*  2158*  2159   2213*  2215   2225   2308*  2313   2315*  2327   2563*
                2566*  2584*  2621*  2647*  2825
DQREG   001370   883#   1087*  1088*  1089   1104*  1106*  1108*  1119*  1153*  1155*  1157*  1166*  1170*
                1185*  1187*  1189*  1198*  1202*  1498*  1502*  1504*  1506*  1793*  1802*  1864*  1869*
                1946*  1948*  1950*  1955*  1959*  1981*  1983*  1985*  1990*  1994*  2108*  2110*  2112*
                2114*  2116*  2118*  2150*  2152*  2154*  2199*  2201*  2203*  2205*  2207*  2209*  2346*
                2447*  2449*  2451*  2481*  2483*  2485*  2507*  2509*  2511*  2551*  2553*  2555*  2557*
                2567*  2588*  2589*  2591*  2594*  2597*  2599*  2606*  2611*  2614*  2616*  2618*  2637*
                2640*  2642*  2644*
DQRLVL  001352   876#   1075*  1076*  1077
DQRVEC  001350   875#   1073*  1074*  1075   2828
DQSEC   001372   884#   1089*  1090*  1091   1105*  1107*  1109*  1111*  1112*  1113*  1114   1120   1154*
                1156*  1158*  1167   1171   1186*  1188*  1190*  1199   1203   1499*  1503*  1505*  1507*
                1508*  1512*  1513*  1514   1794*  1796   1801*  1803   1865*  1870   1876*  1877*  1882
                1893   1901*  1902*  1903   1921*  1922*  1947*  1949*  1951*  1956   1960   1982*  1984*
                1986*  1991   1995   2109*  2111*  2113*  2115*  2117*  2119*  2151*  2153*  2155*  2200*
                2202*  2204*  2206*  2208*  2210*  2347*  2448*  2450*  2452*  2453*  2458*  2459*  2460*
                2461*  2462   2467*  2468*  2469   2482*  2484*  2486*  2487*  2492*  2493*  2494*  2495*
                2508*  2510*  2512*  2513*  2516*  2521*  2522*  2524*  2525*  2526   2552*  2554*  2556*
                2558*  2559*  2562*  2568*  2572*  2573*  2574*  2579*  2590*  2598*  2600*  2607*  2612*
                2615*  2617*  2619*  2620*  2622*  2623*  2624*  2625*  2638*  2641*  2643*  2645*  2646*
                2648*  2649*  2650*  2651*
DQSECH  001374   885#   1091*  1092*
DQSTAT  001510   928#   1070*  1073   1131   1378   1908   2263   2676
DQST00  001402   893#
DQST01  001406   895#
DQST02  001412   897#
DQST03  001416   899#
DQST04  001422   901#
DQST05  001426   903#
DQST06  001432   905#
```

```
DQST07  001436            907#
DQST10  001442            909#
DQST11  001446            911#
DQST12  001452            913#
DQST13  001456            915#
DQST14  001462            917#
DQST15  001466            919#
DQST16  001472            921#
DQST17  001476            923#
DQTCSR  001364            881#  1083*  1084*  1085   1110*  1160*  1161   1174   1192*  1193   1206   1479*  1480
                         1483*  1484   1487*  1488   1491*  1493   1509*  2123*  2124   2214*  2228   2454*  2455
                         2456   2457   2488*  2489   2490   2491   2517*  2518   2519   2520   2585*
DQTLVL  001356            878#  1079*  1080*
DQTVEC  001354            877#  1077*  1078*  1079
DSWR  = 177570            574#   951
DTO     014042           2726   2744   2759   2760#
EM0     013012           2697   2700   2712   2715   2724   2754   2760#
EM1     013030           2703   2706   2709   2760#
EM3     013066           2727   2730   2760#
EM4     013120           2360   2745   2760#
EM5     013152           2736   2739   2760#
EM6     013175           2718   2733   2742   2760#
EM7     013210           2748   2760#
EM8     013256           2751   2760#
ERRCNT  001232            799#   946*  2834   3145*
ERRFLG  001312            830#   943*  2788*  2851*  3096*  3109   3123*  3180*
ERRMSG  016712           3106*  3124   3127#
ERTABO  017030           3120   3154#
EXITER  016762           3139   3144#
EXTFLG  014054           1549*  1583*  2016*  2059*  2528   2536   2663   2683   2765#
GENPAR  012446           1558   1595   2022   2064   2659#
HALTS   016742           3092   3138#
HILIM   016134           2936*  2966   2984#
ICOUNT  001222            795#  2849   2853*
INBUF   017730           2900   2942   3286#
INIFLG  001310            828#   967    970*
INSTER= 104404            849#  2961
INSTR = 104403            847#  1027   3210
INSTR2  015720           2911   2926#
JUMBIT= 040000            614#   731
LIGHTS  001202            784#   952*   961*  2808*
LIMITS  016062           2952   2966#
LOBITS  016140           2938*  2970   2986#  2987
LOCK    001220            794#  1546*  1582*  2014*  2057*  2260*  2865
LOGICA  015242            652   2815#
LOKFLG  001313            831#
LOLIM   016132           2935*  2968   2983#
LPCNT   001224            796#  2848*  2849   2852*
LSTERR  001234            800#   947*  2787*  3093   3095*  3181*
MCRLF   017320           2908   2924   3016   3122   3216   3229#
MCSRX   017540           2793   3256#
MDATA   020034           3044   3055   3290#
MDETCH  013726           2375   2760#
MEMCLR= 104413            863#  1151   1209   2102   2193   2261   3183
MEPASS  017360           2791   3235#
MERRPC  017664           3118   3271#
```

```
MERRX   017565          2805    3260#
MERR2   017404           762    1063    3239#
MERR3   017453           995    3246#
MISC. = 000012           632#   1108    1119    1157    1189    1506    1793    1802    1869    1950    1985    2154    2346
                        2451    2485    2511    2567    2606
MLOCK   017511          1019    3252#
MNEW    017612           988    3264#
MPASSX  017554          2801    3258#
MPFAIL  017322          3177    3230#
MQM     017314          2921    3228#
MR      017401          1037    3238#
MSTCLR= 104412           861#   1117    1118    1152    1492    1552    1589    1863    1945    1980    2018    2061    2144
                        2442    2610    2636    3182
MTITLE  001000           771#    969
MTSTN   017576          3114    3262#
MTSTPC  017477          1028    3250#
MVECX   017546          2797    3257#
NEXT    001216           793#   1043*   1103*   1150*   1224*   1240*   1256*   1272*   1288*   1304*   1320*   1341*   1358*
                        1375*   1392*   1409*   1426*   1443*   1460*   1478*   1545*   1581*   1618*   1629*   1640*   1651*
                        1662*   1673*   1684*   1700*   1711*   1722*   1733*   1744*   1755*   1766*   1777*   1792*   1825*
                        1838*   1944*   1979*   2013*   2056*   2096*   2187*   2259*   2265    2854    3150
NPRFLG  011770          2062*   2262*   2307*   2564    2577    2580*   2582#
NUMBER  014116          2305*   2318    2330*   2331    2340    2351    2355*   2358    2373    2393    2773#
ODDBIT= 001000           615#    733    2676
OUT     017254          3197    3199    3201    3205    3217#
PARAM = 104405           851#   1029    3211
PARAM1  015766          2941#   2962
PARERR  016042          2944    2946    2948    2957#   2967    2969    2971
PARFLG  012604          1547*   1556    1567*   1584*   1593    1604*   2015*   2020    2038*   2058*   2514    2560    2692#
PARTI   016124          2960    2980#
PASCNT  001230           798#    942*   2789*   2808    2831
PFTAB   017132          3179    3185#
POLY. = 000017           637#
POPRO = 012600           584#   3143
POP1SP= 005726           582#
POP2SP= 022626           586#
PS    = 177776           576#    673*    937*   1012*
PUSHR0= 010046           583#   3140
PUSH1S= 005746           581#
PUSH2S= 024646           585#
RDSW    017140          2873    2922    2959    3193#   3207*   3217*
RESREG  016740          3134    3137#
RESTAR  017056          3164    3170#
RESTRT  015252          2810    2813    2820#
RESOS = 104407           855#   3137
RETURN  001214           792#    949*   1032    1036*   1038    1042*   1149*   2265*   2266    2334    2821*   2854*   2855
                        3150*   3152    3184
RUN     001304           823#   1046*   1049    1054*   1060*   1067*
RUNCNT  001306           824#   1047*   1056*   1058*
RUNFLG  001302           822#    944*   1044    1048*
RXBA.P= 000000           621#
RXBA.S= 000004           625#
RXBUFF  014120          1947    1956    1982    1991    2026    2073    2104    2109    2132    2146    2151    2167    2195
                        2200    2233    2552    2612    2613*   2629*   2630    2638    2639*   2655    2774#
RXELNG  012304          1701    1712    1723    1734    1745    1756    1767    1778    2635#
RXLNG   012134          1619    1630    1641    1652    1663    1674    1685    2609#
```

```
RXSTRA  011524          1866    1890    1915    2023    2070    2310    2546#
RXWC.P= 000001           622#
RXWC.S= 000005           626#
RX.BCC= 000015           635#
SAVACT  001502           755*    925#    992
SAVEPC  014056          2444*   2478*   2504*   2546*   2609*   2635*   2766#
SAVNUM  001276           748*    820#    940*   2809*   2811*
SAVPC   001274           819#   2991*   3156
SAVR0   001256           812#   3000*   3005
SAVR1   001260           813#   2999*   3006
SAVR2   001262           814#   2998*   3007
SAVR3   001264           815#   2997*   3008
SAVR4   001266           816#   2996*   3009
SAVR5   001270           817#   2995*   3010
SAVSP   001272           818#
SAV05 = 104406           853#   3097
SCOPE = 104400           841#   1123    1210    1228    1244    1260    1276    1292    1308    1324    1345    1362    1379
                        1396    1413    1430    1447    1464    1526    1569    1606    1622    1633    1644    1655    1666
                        1677    1688    1704    1715    1726    1737    1748    1759    1770    1781    1806    1830    1843
                        1963    1998    2040    2081    2173    2243    2404
SCOP1 = 104401           843#   1563    1600    2034    2078    2335
SECND   003222          1185#
SEQ.  = 000014           634#
SPACNT= 016457          3027*   3048    3051*   3067#
STACK = 001200           577#    938    1013    3151    3172
STFLG   001311           829#    941*
SV05    016150          2995#
SWR     001200           783#    951*    956     960*    971     974     985     992     998    1017    1025    2285    2839
                        2846    2863    2875    3086    3091    3138    3146    3148    3198
SWREG   000176           691#    960     971    3198    3214    3221
SWREGC  017262          3209    3219#
SW00  = 000001           557#    985
SW01  = 000002           556#   1025
SW02  = 000004           555#
SW03  = 000010           554#
SW04  = 000020           553#
SW05  = 000040           552#
SW06  = 000100           551#
SW08  = 000400           550#   3146
SW09  = 001000           549#   2863
SW10  = 002000           548#   3148
SW11  = 004000           547#   2846
SW12  = 010000           546#   2875    3086
SW13  = 020000           545#   3091
SW14  = 040000           544#
SW15  = 100000           543#
SYNBIT= 100000           616#    713    1131    1878
SYNC    014524          1133*   1135*   2113    2204    2777#
SYNC. = 000011           631#
SYNTST  005630          1826    1839    1852#
TEMP    017772          2549*   2550*   2569*   3023    3031    3058*   3173*   3174*   3288#
TEMP1   001244           670*    671*    807#    978*    979     983*   2120*   2126*   2156*   2161*   2211*   2217*   2570*
                        2571*   2572    3279
TEMP2   001246           808#    979*   2121*   2128*   2157*   2163*   2212*   2219*   3281
TEMP3   001250           809#   1496*   1524*   3023*   3058
TEMP4   001252           810#   1510*   1511*   1516*   1519*   1521    1551*   1560    1588*   1597    2026*   2031    2073*
```

```
                        2235* 2237* 2238  2373* 2378* 2382* 2386* 2393* 2402* 2523* 2533* 2538* 2540*
                        2764
TEMPS   001254           811# 1520* 1521  1559* 1560  1596* 1597  2027* 2031  2074* 2234* 2236* 2238
                        2762
TKCSR   001204           785# 2842  2902  3200
TKDBR   001206           786# 2844  2904  2912  3202
TLAST = 007756          1031  2781#
TMPBUF  014070          1105  2301  2303  2306  2320  2324  2353  2364  2394  2771#
TPCSR   001210           787# 2879  2882  2885  2913  3088
TPDBR   001212           788# 2881* 2884* 2887* 2912* 3090*
TRPOK   016474          5077#
TSTNO   001226           797#  948* 1041* 1102* 1148* 1223* 1239* 1255* 1271* 1287* 1303* 1319* 1340*
                        1357* 1374* 1391* 1408* 1425* 1442* 1459* 1477* 1544* 1580* 1617* 1628* 1639*
                        1650* 1661* 1672* 1683* 1699* 1710* 1721* 1732* 1743* 1754* 1765* 1776* 1791*
                        1824* 1837* 1943* 1978* 2012* 2055* 2095* 2186* 2258* 3159  3187
TST1    002254          1030  1036  1041# 2821  2822
TST10   003522          1272  1287#
TST11   003550          1288  1303#
TST12   003576          1304  1319#
TST13   003624          1320  1340#
TST14   003652          1341  1357#
TST15   003700          1358  1374#
TST16   003726          1375  1391#
TST17   003754          1392  1408#
TST2    002644          1042  1043  1102#
TST20   004002          1409  1425#
TST21   004030          1426  1442#
TST22   004056          1443  1459#
TST23   004104          1460  1477#
TST24   004440          1478  1544#
TST25   004572          1545  1580#
TST26   004732          1581  1617#
TST27   004760          1618  1628#
TST3    003032          1148#
TST30   005006          1629  1639#
TST31   005034          1640  1650#
TST32   005062          1651  1661#
TST33   005110          1662  1672#
TST34   005136          1673  1683#
TST35   005164          1684  1699#
TST36   005212          1700  1710#
TST37   005240          1711  1721#
TST4    003372          1150  1223#
TST40   005266          1722  1732#
TST41   005314          1733  1743#
TST42   005342          1744  1754#
TST43   005370          1755  1765#
TST44   005416          1766  1776#
TST45   005444          1777  1791#
TST46   005550          1792  1824#
TST47   005600          1825  1837#
TST5    003420          1224  1239#
TST50   006240          1838  1943#
TST51   006366          1944  1978#
TST52   006514          1979  2012#
TST53   006662          2013  2055#
```

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TST54   007034            2056    2095#
TST55   007436            2096    2186#
TST56   007756            2187    2258#   2781
TST57 = ****** U          2259
TST6    003446            1240    1255#
TST7    003474            1256    1271#
TTST    015326            1020*   1021*   1023*   1024*   2840#
TXBA.P= 000002             623#
TXBA.S= 000006             627#
TXBUFF  014526            1154    1171    1186    1203    2098    2189    2232    2778#
TXSTRB  010722            1225    1241    1257    1273    1289    1305    1321    1342    1359    1376    1393    1410    1427
                          1444    1461    2442#
TXSTRC  011126            2478#
TXSTRD  011270            1553    1590    2504#
TXWC.P= 000003             624#
TXWC.S= 000007             628#
TX.BCC= 000016             636#
TX.MUX= 000013             633#
TYPDAT  016726            3112    3130    3133#
TYPE  = 104402             761     845#    969     977     987     994    1019    1037    1062    2360    2374    2790    2792
                          2796    2800    2804    2898    2908    2920    2924    3015    3054    3113    3117    3121    3126
                          3131    3176    3206    3208    3216
TYPMSG  016650            3110    3113#
VECMAP  000056             663#    760
WORD    014060            1497*   1503    1550*   1559    1586*   1587*   1596    1853*   1914*   2019*   2027    2063*   2065
                          2067*   2069*   2074    2309*   2443*   2448    2482    2508    2549    2665*   2666*   2669    2685*
                          2687*   2767#
WRDCNT  016454            3025*   3056*   3065#
WRKO.F  016714            3125    3128#
XBX     016542            3087    3089    3091#
XCHAR1  010632            2377    2405#
XCHAR2  010644            2381    2410#
XCHAR3  010656            2385    2415#
XCHAR4  010670            2389    2420#
XCSR    015266            2795    2823#
XERR    015310            2807    2832#
XHEAD   017671             977    3272#
XPASS   015302            2803    2829#
XSTATQ  017716             982    3277#
XTSTN   017036            3116    3157#
XVEC    015274            2799    2826#
XYZFLG  014114            2362    2392*   2772#
$CNTG   017270            3206    3222#
$E    - 000060               1#    1043    1044#   1104#   1150    1151#   1224    1225#   1240    1241#   1256    1257#   1272
                          1273#   1288    1289#   1304    1305#   1320    1321#   1341    1342#   1358    1359#   1375    1376#
                          1392    1393#   1409    1410#   1426    1427#   1443    1444#   1460    1461#   1478    1479#   1545
                          1547#   1581    1583#   1618    1619#   1629    1630#   1640    1641#   1651    1652#   1662    1663#
                          1673    1674#   1684    1685#   1700    1701#   1711    1712#   1722    1723#   1733    1734#   1744
                          1745#   1755    1756#   1766    1767#   1777    1778#   1792    1793#   1825    1826#   1838    1839#
                          1944    1945#   1979    1980#   2013    2015#   2056    2058#   2096    2097#   2187    2188#   2259
                          2261#
$MNEW   017303            3210    3225#
$MSWR   017274            3208    3223#
$N      000056               1#    1039    1044#   1100    1104#   1146    1151#   1221    1225#   1237    1241#   1253    1257#
                          1269    1273#   1285    1289#   1301    1305#   1317    1321#   1338    1342#   1355    1359#   1372
                          1376#   1389    1393#   1406    1410#   1423    1427#   1440    1444#   1457    1461#   1475    1479#
```

```
                    1542    1547#   1578    1583#   1615    1619#   1626    1630#   1637    1641#   1648    1652#   1659
                    1663#   1670    1674#   1681    1685#   1697    1701#   1708    1712#   1719    1723#   1730    1734#
                    1741    1745#   1752    1756#   1763    1767#   1774    1778#   1789    1793#   1822    1826#   1835
                    1839#   1941    1945#   1976    1980#   2010    2015#   2053    2058#   2093    2097#   2184    2188#
                    2256    2261#   2781#
$Y      000016        1#     832#    841     843#    845#    847#    849#    851#    853#    855#    857#    859#    861#
                     863#    865#    867#    869#
.       020076      641#    642     644#    651#    653#    661#    677     689#    695#    698#    702     718     723
                    727     730     765     770#    780#    821#    891#    892#    893#    894#    895#    896#    897#
                    898#    899#    900#    901#    902#    903#    904#    905#    906#    907#    908#    909#    910#
                    911#    912#    913#    914#    915#    916#    917#    918#    919#    920#    921#    922#    923#
                    924#    925#    926#    927#    928#    975     980     984     997     1065    1115    1121    1168
                    1172    1175    1200    1204    1207    1481    1485    1489    1494    1522    1557    1561    1594
                    1598    1799    1804    1867#   1868#   1871    1874    1879    1885    1888    1891#   1892#   1896
                    1899    1906    1911    1916#   1917#   1919    1924    1954    1957    1961    1989    1992    1996
                    2021    2029    2032    2066    2068    2076    2134    2169    2223    2226    2229    2239    2264
                    2304    2359    2391    2397    2400    2463    2470    2515    2561    2565    2578    2631    2656
                    2664    2684    2771#   2775#   2779#   2880    2883    3166    3175    3227#   3287#   3289#   3291#
.ADDR1  010704      2366*   2409    2426#
.ADDR2  010710      2368*   2414    2428#
.ADDR3  010714      2370*   2419    2430#
.ADDR4  010720      2372*   2424    2432#
.BEGIN  002116      1012#
.CHAR1  010702      2365*   2395    2407    2425#
.CHAR2  010706      2367*   2412    2427#
.CHAR3  010712      2369*   2417    2429#
.CHAR4  010716      2371*   2422    2431#
.CKSWR  017142       866    3196#
.CNTLU  017216       868    3207#
.CNVRT  016240       860    3017#
.CONVR  016234       858    3015#
.EOP    015130      2259    2787#
.ERRTA  012606      2693#   3105
.HLT    016514       647    3085#
.INSTE  015674       850    2918#
.INSTG  015700      2917    2920#
.INSTR  015556       848    2894#
.INST1  015576      2898#   2909    2925
.MEMCL  011772       864    2583#
.MSG    015600      2896*   2899#   3202*   3203*   3204
.MSTCL  012116       862    2605#
.PARAM  015726       852    2932#
.PFAIL  017044       645     939    3163#   3171
.RESO5  016202       856    3005#
.SAVO5  016142       854    2991#
.SCOPE  015316       842    2838#
.SCOP1  015430       844    2862#
.START  001512       696     937#    949
.SYNC   014522      1499    2117    2208    2617    2643    2776#
.TRPSR  016462       649    3074#
.TRPTA  001314       840#   3079
.TYPE   015450       846    2870#

. ABS.  020076      000
```

ERRORS DETECTED: 0

DSKZ:CZDQDE,DSKZ:CZDQDE.SEQ=DSKZ:CZDQXX.MAC,DSKZ:CZDQDE.P11
RUN-TIME: 7 11.1 SECONDS
RUN-TIME RATIO: 43/20 2.1
CORE USED: 18K (35 PAGES)

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