200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
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1600
1700
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1900
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2100
2200
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2800
2900
3000
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
4100
4200

IDENTIFICATION

PRODUCT CODE: AC-E149B-MC

PRODUCT NAME: CZLAIBO LA00,LA34,LA38 DMT DIAG

DATE CREATED: 23 FEB 1979

MAINTAINER : DIAGNOSTIC ENGINEERING

AUTHOR : RALPH A. SCHAUBER

EDIT HISTORY

REV B0 23-FEB-79 RALPH SCHAUBER

CHANGED QUIET SUBROUTINE TO INCLUDE TIMEOUT IF XON IS NOT RECIEVED WITHIN TEN SECONDS. ALSO CHANGED SEND ROUTINE TIMEOUT FROM TWENTY TO TEN SECONDS.

INCLUDED ERROR REPORT CALLS IN TIMEOUT ROUTINES TO IDENTIFY FAILING LINE NUMBERS.

LIFE TEST NOW RESETS THE PASS NO. TO 0 ON STARTUP.

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1.0 ABSTRACT

THIS PROGRAM IS A FUNCTIONAL TEST OF THE LA00,LA34,LA38 TERMINAL. IT CAN TEST UP TO 40 TERMINALS AT A TIME, INTERFACED THROUGH A DZ11-A/E ASYNCRONOUS MULTIPLEXERS. THIS PROGRAM WAS DESIGNED TO TEST ALL OF THE FUNCTIONAL CHARACTERISTICS OF THE LA00,LA34,LA38 TERMINAL IN A DMT OR PMT ENVIORNMENT.

1.1 FUNCTIONAL DESCRIPTION

THIS PROGRAM CONSISTS OF A TEST SELECTION AND CONTROL SECTION, A CONSOLE TERMINAL DRIVER SECTION, MULTI UNIT DZ11 DRIVER SECTION, AND TWENTY TWO FUNCTIONAL TESTS. THE TESTS ARE OF THREE TYPES, PRINTER FUNCTION TESTS, MANUAL INTERVENTION TESTS, AND EXERCISORS.

1.2 INTENDED USERS

THIS PROGRAM WAS DESIGNED TO TEST EVERY FUNCTIONAL CHARACTERISTIC OF THE LA00,LA34,LA38 TERMINAL, AND AS SUCH WILL BE USED FOR DESIGN MATURITY TESTING. THE OPERATOR WILL HAVE THE OPTION OF RUNNING THE PROGRAM IN A NON-INTERVENTION MODE, THUS ALLOWING THE PROGRAM TO BE USED IN A PMT ENVIORNMENT. THE TESTS WERE NOT WRITTEN TO F.S. OR FA&T REQUIREMENTS, AND THE USE OF THIS PROGRAM IN THOSE AREAS IS NOT RECOMMENDED.

2.0 REQUIREMENTS

2.1 EQUIPMENT

THIS PROGRAM WILL REQUIRE A PDP-11 PROCESSOR, WITH 16K OF MEMORY. FOR EACH EIGHT TERMINALS TO BE TESTED A DZ11-A,E IS REQUIRED ALONG WITH ONE H317-E DISTRIBUTION PANNEL FOR EACH SIXTEEN TERMINALS UNDER TEST. A HARDWARE SWITCH REGISTER IS SUPPORTED, BUT IS NOT REQUIRED. IF PROGRAM CONTROL IS TO BE VIA CONSOLE TERMINAL THEN A TERMINAL AND INTERFACE AT THE STANDARD ADDRESS & VECTOR ARE REQUIRED.

2.2 RELATED PROGRAMS.

THIS PROGRAM WILL PERFORM CURSORARY TESTING OF THE DZ11 INTERFACE, AND SHOULD NOT BE CONSIDERED A VALID TEST OF ANYTHING OTHER THAN THE LA00,LA34,LA38 TERMINAL. PDP-11 PROCESSOR AND MEMORY DIAGNOSTIC PROGRAMS, ALONG WITH DZ11 DIAGNOSTIC PROGRAMS SHOULD BE RUN PERIODICLY TO INSURE CORRECT OPERATION OF THE SYSTEM.

OTHER LA00,LA34,LA38 DIAGNOSTIC PROGRAMS:

CILAJA-0 LA00,LA34,LA38 FA&T PROGRAM

2.3 TERMINAL CONFIGURATION

THIS PROGRAM REQUIRES THAT ALL TERMINALS TO BE TESTED BE SET UP FOR 300 BAUD, 1 STOP BIT, ODD PARITY, AND XON-XOFF ENABLED. ENTER SETUP MODE AND TYPE AN 8 TO GET A PRINTOUT OF THE CURRENT SWITCH SETTINGS. IF NOT CORRECT CHANGE THE SWITCHES THEN VERIFY AGAIN USING THE 8 KEY AGAIN. THESE SWITCHES ARE LOCATED ON THE PC BOARD DIRECTLY UNDER THE KEYBOARD ASSY.

3.0 LOADING PROCEDURE AND INITIALIZATION

LOAD THE LA00,LA34,LA38 DIAGNOSTIC PROGRAM TAPE FOLLOWING NORMAL PROCEDURES. IF A HARDWARE SWITCH REGISTER DOES NOT EXIST, THE PROGRAM WILL USE THE CONTENTS OF LOCATION 000176 AS THE VALUE OF THE SWITCHES. THEREFORE, BE SURE TO LOAD LOCATION 000176 WITH THE SWITCH VALUE BEFORE STARTING THE PROGRAM WHEN NOT USING SWITCHES.

3.1 STARTING ADDRESSES

THERE ARE TWO STARTING ADDRESSES FOR THIS PROGRAM. STARTING AT LOCATION 000200 WILL PUT THE TESTING UNDER SWITCH REGISTER CONTROL. STARTING AT LOCATION 000204 WILL PUT THE PROGRAM UNDER CONSOLE CONTROL.

3.2 MODIFICATIONS TO PROGRAM.

THERE ARE A NUMBER OF COMMON DATA STORAGE LOCATIONS WHICH MAY BE MODIFIED BY THE OPERATOR TO COMPENSATE FOR NON STANDARD CONFIGURATIONS, AND DIFFERENT CPU TYPES.

FOR DZ11'S NOT AT THE STANDARD ADDRESSES OR VECTORS THE LOCATIONS NAMED DZADDR AND DZVECT CAN BE CHANGED ACCORDINGLY PRIOR TO STARTING THE PROGRAM.

LOCATION LOOPC CONTAINS A TIME CONSTANT AND IS INITIALLY SET FOR A PDP-11/20 PROCESSOR. THIS TIME CONSTANT IS NOT CRITICAL, BUT LARGE VARIATIONS FROM THOSE LISTED IN THE TABLE WILL RESULT IN INEFFICIENT OPERATION. IT IS BETTER TO HAVE A LONGER TIME CONSTANT THAN ONE TOO SHORT BECAUSE THE ROUTINES THAT USE THE TIMEOUT FEATURE WILL ABORT THE TIMEOUT WHEN THE REQUIRED INPUT IS RECIEVED. THOSE TESTS THAT REQUIRE MANUAL INTERVENTION WILL NOT FUNCTION CORRECTLY IF THE TIMEOUT IS TOO FAST FOR OPERATOR RESPONSE TIMES.

THIS TABLE IS DUPLICATED IN THE LISTING.

```
LOOPC:  000314  ;TIME CONSTANT FOR11/20
                ;SET TO 202 FOR 11/03
                ;SET TO 251 FOR 11/10
                ;SET TO 554 FOR 11/40
                ;SET TO 755 FOR 11/45, 11/60
                ;SET TO 1237 FOR 11/45, 11/70
                ;SET TO 2127 FOR 11/45 BIP, 11/55
```

3.3 EXECUTION TIME

AT 300 BAUD AND EXCLUDING MANUAL INTERVENTION TESTS THIS PROGRAM SHOULD TAKE APPROXIMATELY 13 MIN.

4.0 CONTROL AND TEST SELECTION

THERE ARE TWO MEANS OF CONTROLLING THE EXECUTION OF THIS PROGRAM: VIA THE CONSOLE SWITCH REGISTER, OR VIA THE CONSOLE TERMINAL.

IF THE PROGRAM IS STARTED AT LOCATION 200 AND NO HARDWARE SWITCH REGISTER EXISTS THE PROGRAM WILL USE THE CONTENTS OF LOCATION 176 AS THE SWITCHES

4.1 SWITCH REGISTER CONTROL

THE VARIOUS SWITCHES AND THEIR FUNCTIONS ARE LISTED BELOW. SWITCHES MAY BE CHANGED AND SET AS DESIRED EXCEPT AS NOTED IN THE SPECIFIC SWITCH DESCRIPTIONS. REFER TO THE DETAILED SWITCH DESCRIPTIONS FOR FURTHER, MORE COMPLETE INFORMATION.

SWITCH NUMBER	DESCRIPTION
15	1(UP) = HALT ON ERROR 0(DOWN) = CONTINUE AFTER ERROR REPORT
14	1(UP) = LOOP ON TEST IF ERROR DETECTED 0(DOWN) = CONTINUE TESTING
13	1(UP) = INHIBIT ERROR REPORTS 0(DOWN) = PRINT ERROR REPORTS
12	1(UP) = RUN INDIVIDUAL TEST 0(DOWN) = RUN TESTS IN SEQUENCE
10	1(UP) = GET TEST NO. FROM SWS 4 : 0 0(DOWN) = USE DEFAULT TEST #0
9	1(UP) = PMT MODE MINIMUM MANUAL INTERVENTION 0(DOWN) = DMT MODE INTERVENTION REQUIRED
8	1(UP) = RUN 1 PASS OF TEST SEQUENCE THEN HALT 0(DOWN) = KEEP RUNNING TEST OR SEQUENCE
7-0	TEST NUMBER SELECTION

4.1.1 SWITCH 15
PLACING SWITCH 15 DOWN WILL CAUSE THE PROGRAM TO CONTINUE ON ERRORS DURING ANY OF THE I/O TESTS. WITH SWITCH 15 UP, THE PROGRAM WILL HALT (AT ERRHLT) ON ANY ERROR DURING THE I/O TESTS WITH THE LOCATION OF THE ERROR IN R0. PRESSING CONTINUE WILL CAUSE THE PROGRAM TO CONTINUE IF SWITCH 12 IS DOWN (LOOP ON ERROR). WITH SWITCH 12 UP, PRESSING CONTINUE WILL CAUSE THE PROGRAM TO LOOP ON THE FAILING TEST.

4.1.2 SWITCH 14
PLACING SWITCH 14 UP WILL CAUSE THE PROGRAM TO ''LOOP ON TEST'' IF AN ERROR IS DETECTED IN THAT TEST. ERROR REPORTS WILL BE TYPED UNLESS INHIBITED (SWITCH 13 UP). LOOPING WILL OCCUR AUTOMATICLY, WITHOUT OPERATOR INTERVENTION, AND WILL AND WILL CONTINUE UNTIL THE ERROR CEASES TO HAPPE, OR THE SWITCH IS PLACED DOWN OR =0. 4.1.2 SWITCH 14
PLACING SWITCH 14 UP WILL CAUSE THE PROGRAM TO ''LOOP ON TEST'' IF AN ERROR IS DETECTED IN THAT TEST. ERROR REPORTS WILL BE TYPED UNLESS INHIBITED (SWITCH 13 UP). LOOPING WILL OCCUR AUTOMATICLY, WITHOUT OPERATOR INTERVENTION, AND WILL CONTINUE UNTIL THE ERROR CEASES TO HAPPEN, OR THE SWITCH IS PLACED DOWN OR =0.

4.1.3 SWITCH 13
PLACING SWITCH 13 UP WILL INHIBIT THE PRINTING OF ALL ERROR REPORTS. CAN BE USED IN CONJUNCTION WITH SWITCH 14 TO LOOP IN ERRORS FOR TROUBLESHOOTING.

4.1.4 SWITCH 12
PLACING SWITCH 12 UP WILL CAUSE THE PROGRAM TO LOOP IN THE CURRENT, OR SELECTED TEST. IF SWITCH 8 IS UP THE TEST WILL HALT AT THE END OF THE TEST. PRESSING CONTINUE WILL CAUSE THE TEST TO BE STARTED OVER AGAIN. PLACING SWITCH 12 DOWN WILL CAUSE THE NEXT SEQUENTIAL TEST TO BE EXECUTED , UNLESS THE TEST IS AN INTERVENTION TEST AND PMT MODE IS SELECTED.

4.1.5 SWITCH 11
NOT USED.

4.1.6 SWITCH 10
PLACING SWITCH 10 UP WILL CAUSE THE PROGRAM TO USE THE CONTENTS OF SWITCHES 4 THRU 0 AS THE TEST NUMBER. IF SWITCH 12 IS UP THIS IS THE TEST THAT WILL BE RUN. IF SWITCH 12 IS DOWN THE SEQUENCE OF TESTS TO BE RUN WILL START WITH THIS TEST.

4.1.7 SWITCH 9
PUTTING SWITCH 9 UP AT THE START OF TESTING WILL INHIBIT MANUAL INTERVENTION TESTS , AND USE A FIXED SET OF PARAMETERS AS LISTED IN THE DESCRIPTION OF EACH TEST.

4.1.8 SWITCH 8
WITH SWITCH 8 DOWN THE PROGRAM WILL LOOP ON THE SELECTED TEST OR TEST SEQUENCE AS SELECTED BY SWITCH 12. PLACING SWITCH 8 UP WILL CAUSE THE PROGRAM TO HALT AT THE COMPLETION OF THE CURRENT TEST, OR TEST SEQUENCE. PRESSING CONTINUE WILL RESULT IN THE PROGRAM RESTARTING THE TEST OR SEQUENCE DEPENDING ON SWITCH 12.

4.1.9 SWITCHES 4 TO 0
SWITCHES 4 TO 0 ARE USED TO SELECT SPECIFIC TESTS WHEN UNDER SWITCH REGISTER CONTROL. TEST NUMBERS ARE ALWAYS IN OCTAL, FROM 00 TO 22.

4.2 KEYBOARD CONTROL
SWITCHES ON THE CONSOLE SWITCH REGISTER WILL HAVE NO EFFECT WHEN UNDER TERMINAL CONTROL EXCEPT FOR SWITCH 13.

THE PROGRAM WILL PRINT THE FOLLOWING : ENTER MODE D OR P : RESPOND BY TYPING EITHER A 'D' FOR DMT MODE, OR A 'P' FOR PMT MODE (NO MANUAL INTERVENTION).

THE PROGRAM WILL PRINT READY ON THE CONSOLE, THEN WAIT FOR COMMANDS FROM THE KEYBOARD.

THE FOLLOWING COMMANDS WILL BE RECOGNIZED :

R TO RUN A SELECTED TEST.
S TO SEQUENCE THRU TESTS.
L TO LOOP ON ERROR.
H TO HALT ON ERROR.
C TO CLEAR THE H & L COMMANDS
W TO SET THE 'WIDTH' CONTROL

THE PERIOD (.) IS A TERMINATOR USED IN CONJUNCTION WITH THE R AND S COMMANDS TO SPECIFY A SINGLE PASS. THAT IS TO STOP AFTER RUNNING A TEST, OR TO STOP AFTER RUNNING A SEQUENCE OF TESTS.

TO ABORT OPERATIONS AND RETURN TO THE WAIT STATE AT ANY TIME TYPE A CTL-C. THE PROGRAM WILL RESPOND WITH READY AND WAIT FOR COMMAND INPUT.

ENTER ONE COMMAND PER LINE, FOLLOWED BY A RETURN. IF CONFLICTING COMMANDS ARE ENTERED THE LAST ENTRY WILL BE USED.

TO EXIT ''COMMAND MODE'' TYPE AN ESCAPE. THE PROGRAM WILL TYPE READY AND BEGIN EXECUTION OF THE COMMANDS. COMMANDS CAN BE ENTERED AT ANY TIME, BUT NEW TESTS WILL NOT START UNTIL THE ESCAPE CHARACTER IS RECIEVED.

EXAMPLES OF COMMANDS :

R12 RUN TEST 12

R23. RUN TEST 23 THEN HALT

S. SEQUENCE ALL TESTS THEN HALT

S27 SEQUENCE ALL TESTS STARTING WITH TEST 27

W100 SET WIDTH TO 100 (OCTAL) COLUMNS
(204=132 COLM, 120=80 COLM)

IF A TEST IS SELECTED THAT IS AN OPERATOR INTERVENTION TEST, AND PMT MODE IS SELECTED THE FOLLOWING WILL BE TYPED: RUN INTERVENTION TEST ? ANSWER Y OR N. IF Y IS TYPED THE TEST WILL BE RUN. IF N IS TYPED A NEW TEST NUMBER WILL BE REQUESTED.

THE R,S,H,L,W, AND C MAY BE EITHER UPPER OR LOWER CASE, BUT THE TEST NUMBER MUST ALWAYS BE A 2 DIGIT OCTAL NUMBER. THE COMMAND, TEST NUMBER, AND TERMINATOR ARE ECHOED BY THE PROGRAM, THUS EACH CHARACTER WILL BE PRINTED TWICE IF THE TERMINAL IS IN HALF DUPLEX. IF AN ERROR IS DETECTED IN THE TEST SELECTION (ILLEGAL TEST NUMBER OR COMMAND CHARACTER) A QUESTION MARK IS PRINTED AND THE MESSAGE WILL BE REPEATED.

READY

5.0 TEST GROUPS

5.1 TERMINAL TESTS

5.2 INTERVENTION TESTS

THE TESTS 17 THRU 24 REQUIRE MANUAL INTERVENTION. THESE TESTS ARE NOT RUN IN PMT MODE (SEE DESCRIPTION OF SW 9 4.1.7, AND CONSOLE CONTROL STARTUP 4.2).

5.3 EXERCISORS

TESTS 15 AND 16 ARE DESIGNED AS EXERCISORS, AND CAN BE RUN FOR EXTENDED PERIODS TO 'BURN IN' THE UNITS UNDER TEST.

5.4 TEST ASSIGNMENTS

TESTS LISTED AS DMT WILL NOT BE EXECUTED IN PMT MODE. SEE DESCRIPTION OF SWITCH 9 4.1.7 .

TEST00	LA00,LA34,LA38	DATA PATHS TEST
TEST01	LA00,LA34,LA38	ALL PRINTABLE CHARACTERS TEST
TEST02	LA00,LA34,LA38	NON PRINTABLE CHARACTERS TEST
TEST03	LA00,LA34,LA38	PRINTHEAD DOT MATRIX TEST
TEST04	LA00,LA34,LA38	HORIZONTAL PITCH TEST
TEST05	LA00,LA34,LA38	SPACE-BACKSPACE TEST
TEST06	LA00,LA34,LA38	SET MARGINS TEST
TEST07	LA00,LA34,LA38	HORIZONTAL TABS TEST
TEST10	LA00,LA34,LA38	MULTIPLE LINE FEED TEST
TEST11	LA00,LA34,LA38	HORIZONTAL MOTION TEST
TEST12	LA00,LA34,LA38	BUFFER OVERRUN TEST
TEST13	LA00,LA34,LA38	VERTICAL PITCH TEST
TEST14	LA00,LA34,LA38	BELL TEST
TEST15	LA00,LA34,LA38	LIFE TEST
TEST16	LA00,LA34,LA38	PRINTER DYNAMIC EXERCISOR
TEST17	DMT	INTERFACE SPEEDS TEST
TEST20	DMT	KEYBOARD ECHO TEST
TEST21	DMT	CHARACTER CODE ECHO TEST.
TEST22	DMT	PITCH SETUP TEST

6.0. TEST DESCRIPTION

```
5800                                    6.1 DATA PATHS TEST00
```

THIS TEST WILL PRINT FOUR LINES OF ALTERNATING *U*U PATTERN. IT IS A CONFIDENCE TEST OF THE INTERNAL DATA BUS, AND RECIEVER LOGIC.

EXAMPLE :

```
*U*U*U*U*U*U*U*U...
U*U*U*U*U*U*U*U*...
*U*U*U*U*U*U*U*U...
U*U*U*U*U*U*U*U*...
```

ESTIMATED TIME AT 300 BAUD 18 SECONDS.

6.2 ALL PRINTABLE CHARACTERS TEST01

THIS TEST WILL PRINT EACH OF THE PRINTABLE CHARACTERS IN GROUPS OF FOUR, SEPERATED BY TWO SPACES. THE GROUPS WILL BE PRINTED IN ORDER, AND THE NUMBER OF GROUPS PER LINE WILL BE DEPENDENT ON THE 'WIDTH' SET AT THE START OF THE DIAGNOSTIC. (DEFAULT 132 COLM)

EXAMPLE :

```
AAAA   BBBB   CCCC   DDDD
EEEE   FFFF   GGGG   HHHH
3333   4444   5555   6666
%%%%   aaaa   ++++   ????
```

ESTIMATED TIME AT 300 BAUD 30 SEC

6.3 NON PRINTABLE CHARACTERS TEST02

THIS TEST CHECKS ALL NON-PRINTABLE CHARACTERS. IN THIS TEST ALL NON-PRINTABLE CHARACTER CODES ARE TRANSMITTED, FOLLOWED BY THE WORDS: 'NON-PRINTING CHARACTER TEST.THE NEXT LINE SHOULD BE BLANK.
IF ANY CHARACTERS APPEAR ON THE NEXT LINE AN ERROR EXISTS.

THE FOLLOWING CODES ARE TRANSMITTED :

000	NUL	002	STX	006	ACK
020	DLE	021	DC1	022	DC2
023	DC3	024	DC4	025	NAK
026	SYN	027	ETB	030	CAN
031	EM	032	SUB	034	FS
035	GS	036	RS	037	US
177	DEL	021	DC1(XON)		

ESTIMATED TIME AT 300 BAUD 5 SECONDS

5800 6.4 DOT MATRIX TEST03

THIS TEST WILL PRINT THE FIVE CHARACTERS ZH*#$, THEN PRINT FOUR LINES OF DATA THAT WILL CREATE BLACK BOXES BY OVERPRINTING THE SAME FIVE CHARACTERS AS ABOVE. TEN BOXES WILL APPEAR ON EACH OF THE FOUR LINES AT DIFFERENT SPACINGS. THIS TEST WILL AMPLIFY ANY WEAK OR INTERMITTANT HEAD WIRE PROBLEMS. THE BOXES SHOULD APPEAR AN EVEN DARK BLACK, WITH NO DOTS MISSING OR LITE STREAKS.

ESTIMATED TIME AT 300 BAUD 10 SECONDS

6.5 HORIZONTAL PITCH TEST04

THIS TEST WILL PRINT FIVE GROUPS OF LINES AT EACH OF THE HORIZONTAL PITCH SETTINGS. EACH GROUP OF LINES WILL CONSIST OF FIRST A LINE STATING THE CURRENT PITCH SETTINGS, THEN A LINE OF THE CHARACTERS A THRU Z. THIS IS DONE FOR HORIZONTAL PITCH SETTINGS OF 10 CPI, 12 CPI, 13.2 CPI, AND 16.5 CPI. THE SETUP FOR THIS TEST IS DOWN LINE LOADED.

ESTIMATED TIME AT 300 BAUD 30 SECONDS

6.6 SPACE-BACKSPACE TEST05

A LINE OF ALTERNATING SLASHES AND SPACES IS PRINTED ACROSS THE PAGE. THE PROGRAM WILL THEN BACKSPACE THROUGH THE LINE AND OVERPRINT THE SLASHES WITH BACKSLASHES. TWO LINES ARE PRINTED FOR EACH PASS OF THE TEST. THE PATTERN PRODUCED IS A LINE OF ALTERNATING X'S AND SPACES. THE TWO SLASHES SHOULD CROSS EXACTLY IN THE MIDDLE CREATING THE X CHARACTER.

EXAMPLE : X X X X X X X X X X X X X X X X X X X X X X X X X

ESTIMATED TIME AT 300 BAUD 45 SECONDS

6.7 SET MARGINS TEST06

THIS TEST WILL SET 4 PAIRS OF LEFT AND RIGHT MARGINS, THEN IT WILL PRINT A LINE OF '='S THAT SHOULD BE WITHIN THOSE MARGINS. ALSO A MESSAGE WILL BE SENT SPECIFYING AN ERROR IF IT'S NOT AT THE LEFT MARGIN. A REFERENCE LINE WILL BE PRINTED SHOWING THE MARGIN LIMITS BEING SET UP. ALL HORIZONTAL PITCH SETTINGS WILL BE TESTED.

EXAMPLE :

```
......V.......................V..........
      ========================
      ERROR IF NOT AT LH MARGIN
```

ESTIMATED TIME AT 300 BAUD 40 SECONDS

6.8 HORIZONTAL TABS TEST07

THIS TEST WILL PRINT A REFERENCE LINE COMPOSED OF A NUMBER OF PERIODS FOLLOWED BY A 'V'. THIS PATTERN IS REPEATED ACROSS THE PAGE. THE LOCATION OF EACH V WILL MARK THE LOCATION OF A TAB STOP SET BY THE PROGRAM. THREE LINES WILL THEN BE PRINTED UNDER THIS REFERENCE LINE, COMPOSED OF A HORIZONTAL TAB FOLLOWED BY AN I, REPEATED ACROSS THE PAGE. THE I'S SHOULD LINE UP DIRECTLY UNDER THE REFERENCE LINE V'S.

EXAMPLE :

```
......V......V......V......V...
      I      I      I      I
      I      I      I      I
      I      I      I      I
```

THIS WILL BE REPEATED FOR A VARIETY OF DIFFERENT TAB SETTINGS. THE NUMBER OF TABS PER LINE WILL BE CONTROLED BY THE 'WIDTH' SPECIFIED AT THE START OF THE DIAGNOSTIC.

ESTIMATED TIME AT 300 BAUD, 132 COL - 2 MIN

6.9 MULTIPLE LINE FEED TEST10

THIS TEST WILL PRINT A REFERENCE LINE OF DASHES THEN SKIP N LINES AND PRINT THE NO. OF LINES SKIPPED ALONG WITH SOME DASHES FOR VISUAL REFERENCE. EACH SKIP COUNT IS DONE TWICE FOR N = 1 TO 7. VERTICAL PITCH WILL BE 6 LINES PER INCH.

EXAMPLE :

```
------------------------
------01
------01

------02

------02


------03


------03
```

ESTIMATED TIME AT 300 BAUD 15 SECONDS

6.10 HORIZONTAL MOTION TEST11

THIS TEST WILL EXERCISE THE HEAD POSITIONING LOGIC BY PRINTING A LINE OF H'S AT RANDOM COLUMN LOCATIONS WITHIN THE LINE. THE HEAD WILL BE POSITIONED USING SPACES, BACK-SPACES, AND CARRIAGE RETURNS FOLLOWED BY SPACES. THE NUMBER OF COLUMNS PRINTED IS CONTROLED BY THE 'WIDTH' AS SET AT THE START OF THE PROGRAM. ALL H'S SHOULD BE EVENLY SPACED, WITH NO OVERPRINTS.

ESTIMATED TIME AT 300 BAUD 4 MIN

6.11 BUFFER OVERRUN TEST12

THIS TEST WILL FORCE THE TERMINAL TO SEND AN XOFF CHAR (023) BY ISSUEING A SERIES OF TIME CONSUMEING MOVEMENT COMMANDS, FOLLOWED BY ENOUGH CHARACTERS TO FILL THE BUFFER PAST IT'S 118 CHARACTER LIMIT. WHEN THE TERMINAL HAS EMP-TIED THE BUFFER TO THE 10 CHARACTER LEVEL IT SHOULD TRANSMIT AN XON CHARACTER (021) ALLOWING THE HOST TO FIN-ISH SENDING DATA. ANY TERMINAL THAT FAILS TO SEND THE XON WILL BE CONSIDERED TO BE 'DEAD" , AND WILL BE DESELECTED OR SET INACTIVE.

ESTIMATED TIME AT 300 BAUD 10 SECONDS.

6.12 VERTICAL PITCH TEST13

THIS TEST WILL PRINT SIX LINES AT EACH OF THE VERTICAL PITCH SETTINGS: 2,3,4,6,8 AND 12 LINES PER INCH. THE LINE PRINTED WILL BE A MESSAGE THAT LISTS THE CURRENT CPI AND LPI SETTINGS. THE SETUP FOR THIS TEST IS DOWN LINE LOADED.

ESTIMATED TIME AT 300 BAUD 40 SECONDS

6.13 BELL TEST14

THIS TEST CHECKS THE PRINTER BELL TO INSURE THAT EIGHT BELLS ARE DISTINCTLY HEARD, EVEN WHEN SENT AT THE MAXIMUM TRANSFER RATE. THE PROGRAM SENDS 8 BELL CODES AT THE MAXIMUM RATE TO THE PRINTER THEN WAITS 2.5 SECONDS TO ALLOW THE OPERATOR TO HEAR THE BELLS.

ESTIMATED TIME 1 SECOND

6.14 LA00,LA34,LA38 LIFE TEST15

ORDINARILY THIS TEST SIMPLY PRINTS A LINE OF 'A'S.

WHEN THIS TEST IS LOOPED ON, IT PRINTS TWO LINES OF EACH PRINTABLE CHARACTER. WHEN ALL PRINTABLE CHARACTERS HAVE BEEN DONE, THEY WILL SIMPLY BE REPEATED. THE CURRENT PASS NUMBER IS PRINTED ON EACH LINE, WITH A 1 COLUMN OFFSET ON EACH NEW LINE.THE NUMBER OF CHARACTERS PER LINE WILL BE DETERMINED BY THE 'WIDTH'' AS SELECTED AT PROGRAM STARTUP.

EXAMPLE :

```
 01 AAAAAAAAAAAAAAAAAAAAAAAAAAAA..
A 01 AAAAAAAAAAAAAAAAAAAAAAAAAAA..
BB 01 BBBBBBBBBBBBBBBBBBBBBBBBBB..
BBB 01 BBBBBBBBBBBBBBBBBBBBBBBBB..
CCCC 01 CCCCCCCCCCCCCCCCCCCCCCCC..
CCCCC 01 CCCCCCCCCCCCCCCCCCCCCCC..
```

ESTIMATED TIME 1 LINE 300 BAUD 5 SECONDS

6.15 LA00,LA34,LA38 DYNAMIC EXERCISOR TEST16

THIS TEST WILL PRINT 35 LINES OF MIXED FORMAT DATA. A PATTERN WILL BE CREATED WHICH IS COMPRISED OF THE UPPER AND LOWER CASE CHARACTER SET PLUS EIGHT OF THE SPECIAL SYMBOLS. THIS PATTERN WILL BE IN THE FORM OF A 10'' BY 6'' MATRIX, WHERE THE UPPER LEFT CORNER WILL HAVE THE GREATEST CHARACTER DENSITY AND THE LOWER RIGHT CORNER WILL HAVE THE LOWEST DENSITY. ALL POSSABLE COMBINATIONS OF HORIZONTAL AND VERTICAL PITCH WILL BE USED.

ESTIMATED TIME AT 300 BAUD 2.5 MIN.

INTERVENTION TESTS

NO TIME ESTIMATES GIVEN

6.16 INTERFACE BAUD RATES TEST17

THIS TEST WILL REQUEST THAT THE OPERATOR CHANGE THE SPEED ON ALL TERMINALS TO 110 BAUD. THE PROGRAM WILL THEN TRANSMIT A MESSAGE TO ALL TERMINALS AT THIS BAUD RATE, IDENTIFING THE CURRENT SPEED, THEN BY USE OF THE ESCAPE SEQUENCE ESC [0C THE TERMINAL ID MESSAGE WILL BE SENT FROM EACH TERMINAL TO THE PDP-11 TO VERIFY CORRECT TRANSMISSION AND RECEPTION BY THE TERMINAL. THIS SAME PROCEDURE IS REPEATED FOR 300 BAUD. BECAUSE OF INTERVENTION NO TIME ESTIMATE IS GIVEN

6.17 KEYBOARD ECHO TEST20

THIS TEST WILL REQUIRE THE OPERATOR TO TYPE ALL THE PRINTING KEYS ON THE KEYBOARD. IF ANY KEYS ARE NOT SEEN BY THE HOST THEY WILL BE REQUESTED AGAIN , AND A THIRD TIME IF NECESSARY. INSTRUCTIONS WILL THEN BE TYPED TO PRESS THE TAB, RETURN, AND OTHER NON PRINTING KEYS. FIVE SECONDS IS ALLOWED PER KEY DELAY.

6.18 CHARACTER CODE ECHO TEST21

THIS TEST WILL PRINT THE OCTAL CODE OF ANY KEY PRESSED, ALONG WITH THE ASCII CHARACTER. WHERE THE CHARACTER IS A NON PRINTABLE CODE THE MNEMONIC OF THAT CODE WILL BE PRINTED. THE DELETE CHAR WILL BE ECHOED AS A MNEMONIC, THEN THE TEST WILL BE DONE.

```
                                                                PAGE 18


                              6.19 PITCH SETUP TEST22
                                   THIS TEST WILL REQUIRE THE OPERATOR TO CHANGE THE TERMINAL
                                   SETUP  TO  THAT  REQUESTED.   AFTER  EACH SETUP CHANGE THE
                                   PDP-11 WILL SEND A LINE OF DATA THAT SHOULD CONFORM TO THE
                                   PARAMS  SETUP.  THE DATA SENT AFTER VERTICAL PITCH CHANGES
                                   WILL BE A NUMBER OF SHORT LINES THAT SHOULD  SPAN  1  INCH
                                   VERTICALY.   THAT IS EIGHT LINES AFTER THE CHANGE TO 8 LPI
                                   ETC.
                        .ENDR
```

```
  100
  200
  300                                   .TITLE  CZLAIBO LA00, LA34 DMT PROG
  400                                   ;
  500                                   .SBTTL  DMT/PMT PROGRAM FOR LA00 TERMINAL
  600                                   ; PATCHED QUIET SUBROUTINE TO TIMEOUT IF XON NOT RECVD
  700                                   ; 23-FEB-79   R.SCHAUBER
  800 000000                            .ENABL  ABS
  900                                   .ENABLE AMA
 1000                                   .LIST MC,ME
 1100
 1200                                   ;SOME DEFINITIONS
 1300
 1400            000060                 DLRVEC=60
 1500            000064                 DLTVEC=64
 1600            000000                 PRI0=000000
 1700            000200                 PRI4=200
 1800            000340                 PRI7=340
 1900
 2000            000001                 BIT0=1
 2100            000002                 BIT1=2
 2200            000004                 BIT2=4
 2300            000010                 BIT3=10
 2400            000020                 BIT4=20
 2500            000040                 BIT5=40
 2600            000100                 BIT6=100
 2700            000200                 BIT7=200
 2800            000400                 BIT8=400
 2900            001000                 BIT9=1000
 3000            002000                 BIT10=2000
 3100            004000                 BIT11=4000
 3200            010000                 BIT12=10000
 3300            020000                 BIT13=20000
 3400            040000                 BIT14=40000
 3500            100000                 BIT15=100000
 3600
 3700            000005                 DZCON=5.        ;MAX NO. OF DZ11'S  THIS COMPILE
 3800
 3900 000000                            .ASECT
10100
10200            000000                 .=0
10300 000000     000002  000000                 .WORD   2,0             ;START OF TRAP CATCHER AREA
10400            000004                 .=4
10500 000004     000006  000000  000012 TRAP4:  .WORD   6,0,12,0,16,0,22,0
      000012     000000  000016  000000
      000020     000022  000000
10600            000024                 .=24
10700 000024     001220  000000         PFAIL:  .WORD   START,PRI0
10800            000041                 .=41
10900 000041        000                 ACTDVC: .BYTE   0       ;ACT11 LOAD MEDIUM
11000 000042     000000                         .WORD   0       ;ACT11 MODE  0 IS MANUAL MODE
11100 000044     001000                         .WORD   APTHDR  ;APT11 HEADER BLOCK ADDRESS
11200 000046     003634                         .WORD   EOP     ;ACT11 END OF PASS HOOK ROUTINE
11300 000050     000000                         .WORD   0
11400 000052     020000                         .WORD   20000   ;ACT11 MANUAL MODE ONLY
12100
12200
```

```
 12300               000200                       .=200
 12400 000200        000137   001220                      JMP     START
 12500 000204        000137   001242                      JMP     KSTART
```

```
 12700          001000                  .=1000
 12800                                  .EVEN
 12900                                  ;TOP OF STACK AREA
 13000
 13100                                  ; APT PARAMETER BLOCK
 13200
 13300 001000  000000   APTHDR: .WORD   0        ;HIGH ORDER ADDRESS BITS
 13400 001002  001014           .WORD   $MAIL    ;ADDRESS OF APT MAILBOX
 13500 001004  000360           .WORD   240.     ;TIME FOR LONGEST TEST 4 MIN.
 13600 001006  001440           .WORD   800.     ;TIME FOR QUICK PASS
 13700 001010  000012           .WORD   10.      ;TIME FOR EACH ADDITIONAL DVC
 13800 001012  000030           .WORD   $ETEND-$MAIL/2          ;LENGTH OF MAILBOX + ETABLE
 13900
 14000                                  ;APT MAILBOX AREA
 14100
 14200 001014  000000   $MAIL:  .WORD   000000  ;MESSAGE TYPE CODE
 14300 001016  000000   $FATAL: .WORD   000000  ;FATAL ERROR NO.
 14400 001020  000000   $TSTNO: .WORD   000000  ;TEST NUMBER
 14500 001022  000000   $PASNO: .WORD   000000  ;PASS NUMBER
 14600 001024  000000   $DEVCT: .WORD   000000  ;DEVICE COUNT
 14700 001026  000000   $UNIT:  .WORD   000000  ;UNIT NO. UNDER TEST
 14800 001030  000000   $MSGAD: .WORD   000000  ;MESSAGE ADDRESS (WORD BOUNDRY)
 14900 001032  000000   $MSGL:  .WORD   000000  ;MESSAGE LENGTH (IN WORDS)
 15000
 15100                                  ;APT ENVIORNMENT TABLE
 15200
 15300 001034      000  $ETABL: .BYTE   0        ;0= STAND ALONE, 1=AUTOMATIC MODE
 15400 001035      000          .BYTE   0        ;CONTROL BITS
 15500 001036  000000   $SWREG: .WORD   000000  ;APT SWITCH REG:ISTER
 15600 001040  000000           .WORD   000000  ;USER SWITCHES
 15700 001042  000000   $CPU:   .WORD   000000  ;CPU TYPE AND OPTIONS
 15800 001044  000000   $MEMAD: .WORD   000000  ;MEM TYPE & HIGH ORDER BITS
 15900 001046  000000   $MEMAR: .WORD   000000  ;MEMORY ADDRESS- HIGH
 16000 001050  000000   $MEMA2: .WORD   000000
 16100 001052  000000   $MEMR2: .WORD   000000
 16200 001054  000000   $MEMA3: .WORD   000000
 16300 001056  000000   $MEMR3: .WORD   000000
 16400 001060  000000   $MEMA4: .WORD   000000
 16500 001062  000000   $MEMR4: .WORD   000000
 16600 001064  000000   $VECT1: .WORD   000000  ;VECTOR #1, AND PRIORITY
 16700 001066  000000   $VECT2: .WORD   000000  ;VECTOR #2, AND PRIORITY
 16800 001070  000000   $BASE:  .WORD   000000  ;BASE ADDRESS OF DEVICES
 16900 001072  000000   $DEVM:  .WORD   000000  ;DEVICE MAP
 17000 001074           $ETEND:                 ;END: OF ETABLE
 17100
```

```
 17300                                  .SBTTL  COMMON DATA STORAGE
 17400 001074  160010                   DZADDR: 160010          ;ADDRESS OF 1ST DZ11
 17500 001076  000300                   DZVECT: 000300          ;ADDRESS OF 1ST DZ11 VECTOR
 17600 001100  000000                   DXTMP:  000000          ;TEMP STORAGE FOR DZ XMIT INTERRUPT ROUTINE
 17700 001102  000000                   MSGTYP: 000000
 17800 001104  000000                   MSGADR: 000000
 17900 001106  000000                   SENDTM: 000000
 18000 001110  000000                   ERROR:  000000          ;ERROR SWITCH
 18100 001112  000000                   SEQ:    000000          ;HOLDS TEST TABLE POINTER
 18200 001114  000000                   TEST:   000000          ;POINTER TO CURRENT TEST
 18300 001116  000000                   SO:     000000          ;THIS IS THE SIMULATED SWITCH REGISTER
 18400 001120  000001                   SRCONT: 000001          ;THIS IS THE SWITCH REGISTER CONTROL SWITCH
 18500 001122  177570                   SWR:    177570          ;POINTER TO SWITCH REG, OR SOFT SR
 18600 001124  000000                   PASSNO: 000000          ;THIS IS THE PROGRAM PASS NUMBER
 18700 001126  000000                   ANTMP0: 000000
 18800 001130  000000                   ANTMP1: 000000
 18900 001132  000000                   ANTMP2: 000000
 19000 001134  000000                   TEMP:   000000
 19100 001136  000000                   NOTYET: 000000
 19200 001140  000000                   HOOK:   000000
 19300 001142  000314                   LOOPC:  000314          ;TIME CONSTANT FOR  11/20
 19400                                                          ;SET TO  202 FOR 11/03
 19500                                                          ;SET TO  251 FOR 11/10
 19600                                                          ;SET TO  554 FOR 11/40
 19700                                                          ;SET TO  755 FOR 11/45, 11/60
 19800                                                          ;SET TO 1237 FOR 11/45, 11/70
 19900                                                          ;SET TO 2127 FOR 11/45 BIP, 11/55
 20000 001144  000000                   LOOPI:  000000
 20100 001146  000000                   LOOPO:  000000
 20200 001150  000000                   TSTMP:  000000
 20300 001152  000000                   NUMLIN: 000000
 20400 001154  000000                   COM1:   000000
 20500 001156  000000                   COM2:   000000
 20600 001160  000000                   WORK:   000000
 20700 001162  000000                   WORK1:  000000
 20800 001164  000000                   WORK2:  000000
 20900 001166  000000                   WORK3:  000000
 21000 001170  000000                   CHARIN: 000000
 21100 001172  000204                   WIDTH:  132.    ;SET TO 120 FOR 80 COLM
 21200 001174  000000                   MODE:   000000          ;DZ TRANSMIT MODE
 21300 001176  000000                   PMODE:  000000          ;PMT MODE FLAG
 21400 001200  000000                   RCTMP:  000000
 21500 001202  000000                   DZNUM:  000000          ;NO. OF DZ'S ACTUALLY ON SYSTEM
 21600 001204  000000                   ONLINE: 000000          ;LINE NO. UNDER TEST
 21700 001206  000000                   PNTR:   000000          ;CONSOLE BUFFER POINTER
 21800 001210  000000                   TMPTST: 000000          ;CONSOLE ROUTINE TEMP FLAGS
 21900 001212  000000                   TSTTYP: 000000          ;TEST DESCRIPTION DATA
 22000 001214  000000                   GO:     000000
 22100 001216  000000                   UUT:    000000          ;# OF UNITS UNDER TEST
 22200
 22300                                  .SBTTL  START POINT FOR PROGRAM
 22400
```

```
                                        START:  MOV     #1000,SP        ;SETUP STACK POINTER
                                                BIS     #BIT15,SRCONT   ;SET SWITCH CONTROL
                                                JSR     PC,SWRTST
                                                JMP     INIT

                                        ;START HERE IF IN CONSOLE CONTROL

                                        KSTART: MOV     #1000,SP        ;INIT THE STACK
                                                JSR     PC,SWRTST
                                                MOV     #TTYIN,@#60     ;INIT CONSOLE VECTOR AREAS
                                                MOV     #PRI4,@#62      ;COMMANDS HAVE PRIORITY
                                                MOV     #66,64
                                                MOV     #PRI4,@#66
                                                MOV     #101,@#177560   ;TURN ON THE CONSOLE
                                                CLR     TMPTST
                                                CLR     SRCONT
                                                MOV     #TKBUF,PNTR     ;INPUT BUFFER POINTER
                                                SENDC   #MSG00          ;SEND TEST ID
                                                MOV     #MSG00,R5               ;GET MESSAGE ADDRESS
                                                JSR     PC,CSEND        ;SEND MESSAGE
                                                JMP     INIT

                                        ;HERE WE INIT THE DZ11 ROUTINES
                                        INIT:   NOP
                                                CLR     UUT
                                                MOV     #2$,TRAP4       ;SU TRAP CATCHER
                                                MOV     DZADDR,R0       ;GET FIRST DZ ADDRESS
                                                CLR     DZNUM
                                        1$:     TST     (R0)            ;DZ PRESENT ?
                                                INC     DZNUM           ;YES COUNT IT
                                                ADD     #10,R0          ;POINT TO NEXT ADDRESS
                                                BR      1$

                                        2$:     MOV     #6,TRAP4        ;FIX TRAP CATCHER
                                                TST     DZNUM           ;ANY DZ'S ?
                                                BNE     3$
                                                HALT                    ;NO- NOTHING TO TEST
                                                BR      .-2
                                        3$:     MOV     #1000,SP        ;CLEAR THE STACK POINTER
                                                MOV     DZNUM,R1        ;GET DZ COUNT
                                                ASL     R1
                                                ASL     R1
                                                ASL     R1              ;8 LINES PER DZ
                                                MOV     R1,NUMLIN       ;SAVE TOTAL NO OF LINES
                                                CLR     R0
                                                MOV     #DZCOMB,R2      ;START OF COMMAND BUFFERS
                                        4$:     MOV     R2,COMIN(R0)
                                                MOV     R2,COMOUT(R0)
                                                MOV     R2,COMEND(R0)
                                                ADD     #50,COMEND(R0)  ;END IS 20 WORDS AWAY
                                                CLR     COMCNT(R0)
                                                CLR     CURREP(R0)
                                                CLR     CURADD(R0)
                                                CLR     CURTER(R0)
                                                CLR     STOP(R0)
```

```
 5600 001520  012760  000145  020634          MOV     #145,DZLINE(R0) ;INIT TO  300 BAUD ODD PARITY
 5700 001526  062700  000002                  ADD     #2,R0
 5800 001532  062702  000050                  ADD     #50,R2          ;NEW BUF=OLD BUF + 20.
 5900 001536  005301                          DEC     R1
 6000 001540  001344                          BNE     4$
 6100
 6200
 6300                                 ;SETUP VECTORS FOR INTERRUPTS
 6400 001542  012702  032412          INIT1:  MOV     #DZRINT,R2
 6500 001546  012703  032330                  MOV     #DZTINT,R3
 6600 001552  013705  001076                  MOV     DZVECT,R5       ;FIRST VECTOR ADDRESS
 6700 001556  013704  001202                  MOV     DZNUM,R4        ;SETUP A COUNT FOR DZS
 6800 001562  010225                  1$:     MOV     R2,(R5)+        ;SETUP RECIEVE INT VECTOR
 6900 001564  012725  000240                  MOV     #240,(R5)+      ;AND ITS PRIORITY
 7000 001570  010325                          MOV     R3,(R5)+        ;SETUP TRANSMIT VECTOR
 7100 001572  012725  000240                  MOV     #240,(R5)+      ;AND ITS PRIORITY
 7200 001576  062703  000012                  ADD     #12,R3          ;SET POINTER TO NEXT INT SERVICE ROUTINE
 7300 001602  062702  000012                  ADD     #12,R2          ;SU NEXT RX INT SVC ROUTINE
 7400 001606  005304                          DEC     R4              ;NEXT LINE PLEASE
 7500 001610  001364                          BNE     1$              ;IF THERE IS ONE
 7600 001612  000240                          NOP
```

```
 7800
 7900                                   ;INIT DZ11 RECIEVE
 8000 001614  013701  001152            INIT2:  MOV     NUMLIN,R1       ;GET # OF LINES
 8100 001620  012702  026454                    MOV     #KBBUF,R2       ;SETUP FIRST KEYBOARD BUFFER AREA ADDRESS
 8200 001624  005000                            CLR     R0
 8300 001626  005060  025634            1$:     CLR     KBCNT(R0)       ;ZERO CHAR COUNT
 8400 001632  010260  026074                    MOV     R2,KBBUFB(R0)   ;DEFINE BEGINING OF BUFFER
 8500 001636  010260  026214                    MOV     R2,KBBUFI(R0)   ;INIT PUT IN POINTER
 8600 001642  010260  026334                    MOV     R2,KBBUFO(R0)   ;AND TAKE OUT POINTER
 8700 001646  010260  025754                    MOV     R2,KBBUFE(R0)   ;DEFINE END OF BUFFER
 8800 001652  062760  000016  025754           ADD     #16,KBBUFE(R0)  ;AS 16 BYTES PAST BEGINING
 8900 001660  062700  000002                    ADD     #2,R0           ;NEXT LINE PLEASE
 9000 001664  062702  000020                    ADD     #20,R2          ;BUFFER AREAS ARE 20 BYTES LONG EACH
 9100 001670  005301                            DEC     R1              ;ANY  MORE TO SETUP?
 9200 001672  001355                            BNE     1$              ;YES. DO SO
 9300
 9400                                   ;INIT DZ11 CSR REGISTER TABLE
 9500 001674  013700  001202            INIT3:  MOV     DZNUM,R0        ;COUNT OF DZS
 9600 001700  012701  031554                    MOV     #DZCSR,R1       ;SETUP ADDRESS OF TABLE
 9700 001704  013702  001074                    MOV     DZADDR,R2       ;SETUP ADDRESS OF 1ST CSR
 9800 001710  010221                    1$:     MOV     R2,(R1)+        ;PUT A CSR ADDRESS INTO THE TABLE
 9900 001712  012712  000020                    MOV     #20,(R2)                ;CLEAR THE DZ
10000 001716  062702  000010                    ADD     #10,R2          ;CSRS ARE 4 WORDS APPART
10100 001722  005300                            DEC     R0              ;ANY MORE TO DO?
10200 001724  001371                            BNE     1$              ;YES. DO EM.
10300
10400
10500
10600                                  ;INITIALIZE TABLE OF TCR BITS
10700 001726  013701  001202            INIT4:  MOV     DZNUM,R1
10800 001732  012702  025514                    MOV     #TCRBIT,R2
10900 001736  012703  000001            1$:     MOV     #1,R3
11000 001742  010322                    2$:     MOV     R3,(R2)+
11100 001744  006303                            ASL     R3
11200 001746  022703  000400                    CMP     #400,R3
11300 001752  001373                            BNE     2$
11400 001754  005301                            DEC     R1
11500 001756  001367                            BNE     1$
11600
11700 001760  005000            INIT5:  CLR     R0
11800 001762  005003                    CLR     R3
11900 001764  012737  002044  000004            MOV     #5$,TRAP4
12000 001772  016001  031554            1$:     MOV     DZCSR(R0),R1
12100 001776  012702  012720                    MOV     #12720,R2       ;RX-ON,300,P-ODD,1-STOP,7-BIT
12200 002002  010261  000002            2$:     MOV     R2,2(R1)        ;LOAD LPR REG
12300 002006  005202                            INC     R2
12400 002010  022702  012730                    CMP     #12730,R2       ;DONE ALL LINES ?
12500 002014  001372                            BNE     2$
12600 002016  062700  000002                    ADD     #2,R0
12700 002022  005203                            INC     R3
12800 002024  023703  001202                    CMP     DZNUM,R3
12900 002030  001360                            BNE     1$
13000 002032  012737  000006  000004            MOV     #6,TRAP4
13100 002040  000137  002046                    JMP     INIT6
13200
13300 002044  000000            5$:     HALT            ;DZLPR TRAPPED (16XXX2)
13400
```

```
 13600
 13700 002046  005000                    INIT6:  CLR     R0
 13800 002050  013701  001202                    MOV     DZNUM,R1
 13900 002054  016002  031554            1$:     MOV     DZCSR(R0),R2
 14000 002060  012737  002156  000004            MOV     #5$,TRAP4
 14100 002066  005762  000006                    TST     6(R2)           ;RING-CARRIER REG.
 14200 002072  012737  002164  000004            MOV     #6$,TRAP4
 14300 002100  012712  040140                    MOV     #40140,(R2)     ;SCAN-EN,RX INT EN,TX INT FN >>CSR
 14400 002104  012737  002172  000004            MOV     #7$,TRAP4
 14500 002112  112762  000377  000004            MOVB    #377,4(R2)      ;ENABLE ALL LINES TX >> TCR
 14600 002120  012737  002200  000004            MOV     #8$,TRAP4
 14700 002126  112762  000377  000005            MOVB    #377,5(R2)      ;SET DTR ALL LINES >> TCR+1
 14800 002134  062700  000002                    ADD     #2,R0
 14900 002140  005301                            DEC     R1
 15000 002142  001344                            BNE     1$
 15100 002144  012737  000006  000004            MOV     #6,TRAP4
 15200 002152  000137  002220                    JMP     ISEQ
 15300
 15400
 15500 002156  000000                    5$:     HALT            ;TRAPPED FROM 16XXX6 RING/CARRIER
 15600 002160  000137  002202                    JMP     10$
 15700
 15800 002164  000000                    6$:     HALT            ;TRAPPED FROM 16XXX0    CSR
 15900 002166  000137  002202                    JMP     10$
 16000
 16100 002172  000000                    7$:     HALT            ;TRAPPED FROM 16XXX4    TXMIT CTL
 16200 002174  000137  002202                    JMP     10$
 16300
 16400 002200  000000                    8$:     HALT            ;TRAPPED FROM 16XXX5    DTR
 16500 002202  005737  001120            10$:    TST     SRCONT
 16600 002206  001002                            BNE     11$
 16700 002210  000137  001242                    JMP     KSTART
 16800 002214  000137  001220            11$:    JMP     START
 16900
 17000
```

```
 17200                                          ;TEST SEQUENCER SUBROUTINE
 17300
 17400                                          ; TEST SEQUENCE INITIALIZATION
 17500
 17600 002220  012706  001000                   ISEQ:   MOV     #1000,SP                ;SET STACK AT 1000
 17700 002224  012737  020332  001206                   MOV     #TKBUF,PNTR             ;INIT TTY BUFFER POINTER
 17800 002232                                           SENDALL #MSG00                  ;SEND TEST I.D.
       002232  012705  034650                           MOV     #MSG00,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       002236  005037  001174                           CLR     MODE
       002242  004737  031706                           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 17900 002246  004737  004216                           JSR     PC,SCAN         ;SIZE FOR TERMINALS
 18000 002252  005737  001120                           TST     SRCONT                  ;SWITCH CONTROL ?
 18100 002256  001402                                   BEQ     4$                      ;YES-JUMP
 18200 002260  000137  002450                           JMP     LSEQ
 18300 002264  012737  002342  000060           4$:     MOV     #SEQM$,@#60             ;SU TTI RECV INTR VECTOR
 18400 002272  012737  000000  000062                   MOV     #PRI0,@#62              ;PRI 0
 18500 002300                                           SENDC   #MSGK2                  ;PMT MODE MSG.
       002300  012705  042341                           MOV     #MSGK2,R5               ;GET MESSAGE ADDRESS
       002304  004737  020310                           JSR     PC,CSEND        ;SEND MESSAGE
 18600 002310  004737  034250                           JSR     PC,QUIET
 18700 002314  000001                                   WAIT
 18800 002316                                   SEQ8:   SENDC   #MSGK1                  ;SEND 'READY''
       002316  012705  042327                           MOV     #MSGK1,R5               ;GET MESSAGE ADDRESS
       002322  004737  020310                           JSR     PC,CSEND        ;SEND MESSAGE
 18900 002326                                           SENDC   #MSGK4                  ;'ENTER COMMANDS''
       002326  012705  042400                           MOV     #MSGK4,R5               ;GET MESSAGE ADDRESS
       002332  004737  020310                           JSR     PC,CSEND        ;SEND MESSAGE
 19000 002336  000001                           WSEQ:   WAIT
 19100 002340  000776                                   BR      .-2
 19200
 19300                                          ; MODE ANSWER AND TTY VECTOR SETUP
 19400
 19500 002342  113777  177562  176636           SEQM$:  MOVB    @#177562,@PNTR          ;GET INPUT ANSWER
 19600 002350  142777  000240  176630                   BICB    #240,@PNTR              ;STRIP PARITY & LC
 19700 002356  122777  000120  176622                   CMPB    #'P,@PNTR               ;PMT MODE ?
 19800 002364  001004                                   BNE     2$                      ;NO- JUMP
 19900 002366  052737  100000  001176                   BIS     #BIT15,PMODE            ;YES- FLAG IT
 20000 002374  000402                                   BR      3$
 20100 002376  005037  001176                   2$:     CLR     PMODE                   ;DMT MODE
 20200 002402  012737  017240  000060           3$:     MOV     #TTYIN,@#60             ;SET TTY IN VECTOR
 20300 002410  012737  000340  000062                   MOV     #PRI7,@#62              ;PRIORITY 7
 20400 002416  005037  001160                           CLR     WORK
 20500 002422  117737  176560  001160                   MOVB    @PNTR,WORK
 20600 002430                                           SENDC   #WORK                   ;ECHO THE CHARACTER
       002430  012705  001160                           MOV     #WORK,R5                ;GET MESSAGE ADDRESS
       002434  004737  020310                           JSR     PC,CSEND        ;SEND MESSAGE
 20700 002440  012737  000101  177560                   MOV     #101,@#177560   ;CONSOLE ACTIVE
 20800 002446  000002                           4$:     RTI
 20900
```

```
 21100                                          ;INITIAL TEST STARTUP SEQUENCE
 21200
 21300 002450  005737  001120                   LSEQ:   TST     SRCONT                  ;SWITCH CONTROL ?
 21400 002454  001471                                   BEQ     20$                     ;NO-JUMP TO 20
 21500 002456  004737  004036                           JSR     PC,GETSWS               ;READ SWITCH REG.
 21600 002462  032737  002000  001116             1$:     BIT     #BIT10,SO               ;TEST NO. IN SWS ?
 21700 002470  001452                                   BEQ     13$                     ;NO- GOTO 13
 21800 002472  004737  003302                           JSR     PC,VALID                ;CHECK VALIDITY
 21900 002476  005737  001214                           TST     GO
 22000 002502  001433                                   BEQ     10$                     ;NO GOOD GOTO 10
 22100 002504  004737  003356                           JSR     PC,GETTST               ;TEST ADDR & INFO
 22200 002510  004737  003460                           JSR     PC,MODCON               ;MODE CONFLICT ?
 22300 002514  005737  001214                           TST     GO
 22400 002520  001402                                   BEQ     3$                      ;YES- GOTO 3
 22500 002522  000137  002730                     2$:   JMP     40$                     ;OK- GO START TEST
 22600 002526  032737  010000  001116             3$:   BIT     #BIT12,SO               ;SEQUENCE TESTS ?
 22700 002534  001412                                   BEQ     5$                ;YES GOTO 5
 22800 002536  005037  001214                     4$:   CLR     GO
 22900 002542                                           SENDALL #MSGS2            ;ERROR MODE CONFLICT *****
       002542  012705  042552                           MOV     #MSGS2,R5         ;BUILD SEND CALL USING MESSAGE ADDRESS
       002546  005037  001174                           CLR     MODE
       002552  004737  031706                           JSR     PC,SEND           ;NOW SEND THE MESSAGE
 23000 002556  000137  002730                           JMP     40$
 23100 002562  105237  001116                     5$:   INCB    SO                      ;TRY NEXT TEST
 23200 002566  000137  002462                           JMP     1$
 23300
 23400 002572                                     10$:  SENDALL #MSGS1            ;ERROR INVALID TEST NO. *****
       002572  012705  042514                           MOV     #MSGS1,R5         ;BUILD SEND CALL USING MESSAGE ADDRESS
       002576  005037  001174                           CLR     MODE
       002602  004737  031706                           JSR     PC,SEND           ;NOW SEND THE MESSAGE
 23500 002606  005037  001214                           CLR     GO
 23600 002612  000137  002730                           JMP     40$
 23700
 23800 002616  105037  001116                     13$:  CLRB    SO                ;SU FOR TEST 0
 23900 002622  004737  003356                           JSR     PC,GETTST               ;TEST ADDR & INFO
 24000 002626  012737  000001  001214                   MOV     #1,GO
 24100 002634  000137  002730                           JMP     40$
 24200
 24300                                          ; CONSOLE CONTROL SECTION
 24400
 24500 002640  004737  003356                     20$:  JSR     PC,GETTST               ;GET TEST ADDR & INFO
 24600 002644  004737  003460                           JSR     PC,MODCON               ;MODE CONFLICT ?
 24700 002650  005737  001214                           TST     GO
 24800 002654  001402                                   BEQ     25$                     ;YES- GOTO 25
 24900 002656  000137  002730                     21$:  JMP     40$                     ;GO START TEST
 25000 002662  004737  004104                     25$:  JSR     PC,ANYWAY               ;RUN ANYWAY ?
 25100 002666  042705  000240                           BIC     #240,R5
 25200 002672  122705  000131                           CMPB    #'Y,R5
 25300 002676  001411                                   BEQ     27$                     ;YES GOTO 27
 25400 002700                                           SENDC   #MSGK1                  ;SEND 'READY'
       002700  012705  042327                           MOV     #MSGK1,R5               ;GET MESSAGE ADDRESS
       002704  004737  020310                           JSR     PC,CSEND          ;SEND MESSAGE
 25500 002710  012737  177777  001214                   MOV     #-1,GO                  ;GO BACK TO WAIT
 25600 002716  000137  002730                           JMP     40$
 25700 002722  112737  000001  001214             27$:  MOVB    #1,GO
 25800 002730  005737  001214                     40$:  TST     GO
 25900 002734  001405                                   BEQ     43$
```

```
 26000 002736  100002                          BPL     42$
 26100 002740  000137  002336          41$:    JMP     WSEQ            ;WAIT FOR NEW COMMANDS
 26200 002744  000137  002754          42$:    JMP     RSEQ            ;START TESTING
 26300 002750  000137  002450          43$:    JMP     LSEQ            ;GET NEW TEST DATA FROM SWS
 26400
```

```
 26600
 26700                                          ;TEST RUN & POST RUN CONTROL
 26800
 26900 002754  004737  033062                   RSEQ:   JSR     PC,RESETO       ;RESET THE TERMINALS
 27000 002760  005737  001216                           TST     UUT             ;ANY TERMINALS TO TEST ?
 27100 002764  001474                                   BEQ     91$
 27200 002766                                           SENDALL #MSG75
       002766  012705  037370                           MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       002772  005037  001174                           CLR     MODE
       002776  004737  031706                           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 27300 003002  004777  176106                           JSR     PC,@TEST        ;GO DO TEST >->->->->->->->->->
 27400 003006  004737  034250                           JSR     PC,QUIET        ;WAIT TILL DONE
 27500 003012  005277  176074                           INC     @SEQ            ;PASS COUNT +1
 27600 003016  004737  0035'0                          JSR     PC,EOPT         ;REPORT PASS DONE
 27700 003022  005737  001120                           TST     SRCONT          ;SWITCH CONTROL ?
 27800 003026  001433                                   BEQ     5$              ;NO- GO TO 5
 27900 003030  017737  176066  001160                   MOV     @SWR,WORK
 28000 003036  032737  001000  001160                   BIT     #BIT9,WORK
 28100 003044  001404                                   BEQ     1$              ;CHECK SWITCH REG FOR CHANGES
 28200 003046  052737  100000  001'76                   BIS     #BIT15,PMODE
 28300 003054  000402                                   BR      2$
 28400 003056  005037  001176                   1$:     CLR     PMODE
 28500 003062  042737  007377  001160           2$:     BIC     #007377,WORK    ;LOOK AT BITS 15,14,13, 88
 28600 003070  053737  001160  001116                   BIS     WORK,SO
 28700 003076  005137  001160                           COM     WORK
 28800 003102  042737  007377  001160                   BIC     #007377,WORK
 28900 003110  043737  001160  001116                   BIC     WORK,SO
 29000 003116  032737  010000  001116           5$:     BIT     #BIT12,SO       ;SEQUENCE TESTS ?
 29100 003124  001423                                   BEQ     10$             ;YES- JUMP TO 10
 29200 003126  032737  000400  001116           6$:     BIT     #BIT8,SO        ;END OF TEST HALT ?
 29300 003134  001406                                   BEQ     9$              ;NO JUMP
 29400 003136  005737  001120                           TST     SRCONT          ;SWITCH CONTROL ?
 29500 003142  001401                                   BEQ     8$              ;NO JUMP
 29600 003144  000000                                   HALT            ; END OF TEST .........................
 29700 003146  000137  002316                   8$:     JMP     SEQ8            ;GET NEW CONTROL INFO
 29800 003152  000137  002754                   9$:     JMP     RSEQ            ;RESTART TEST
 29900
 30000 003156                                   91$:    SENDC   #MSGK6          ;NO TERMINALS SELECTED !!!
       003156  012705  042460                           MOV     #MSGK6,R5               ;GET MESSAGE ADDRESS
       003162  004737  020310                           JSR     PC,CSEND        ;SEND MESSAGE
 30100 003166  000000                                   HALT
 30200 003170  000137  002220                           JMP     ISEQ
 30300 003174  105237  001116                   10$:    INCB    SO              ;POINT TO NEXT TEST
 30400 003200  004737  003356                           JSR     PC,GETTST       ;GET TEST ADDR & INFO
 30500 003204  023727  001114  '77777                   CMP     TEST,#-1        ;END OF TABLE ?
 30600 003212  001407                                   BEQ     15$             ;YES- JUMP
 30700 003214  004737  003460                           JSR     PC,MODCON       ;CHECK MODE
 30800 003220  005737  001214                           TST     GO
 30900 003224  001763                                   BEQ     10$             ;BAD- TRY NEXT TEST
 31000 003226  000137  002754                   11$:    JMP     RSEQ            ;OK GO DO NEXT TEST
 31100
 31200 003232  005237  001124                   '5$:    INC     PASSNO          ;PASS NUMBER +1
 31300 003236  004737  003634                           JSR     PC,EOP          ;REPORT PASS COMPLETE
 31400 003242  032737  000400  001116           16$:    BIT     #BIT8,SO        ;END OF PASS HALT ?
 31500 003250  001406                                   BEQ     19$             ;NO- JUMP
 31600 003252  005737  001120                           TST     SRCONT          ;SWITCH CONTROL ?
 31700 003256  001401                                   BEQ     17$             ;NO JUMP
```

```
003260  000000                                     HALT                  ;END OF PASS .........................
003262  000137  002450                    17$:     JMP     LSEQ                  ;GET NEW TEST NO. ETC.
003266  105037  001116                    19$:     CLRB    S0                    ;SET TEST 0
003272  004737  003356                             JSR     PC,GETTST
003276  000137  002754                    22$:     JMP     RSEQ                  ;START TEST.....
003302  005037  001214                    VALID:   CLR     GO
003306  105737  001116                             TSTB    S0
003312  002407                                     BLT     4$
003314  123727  001116  000022                     CMPB    S0,#22
003322  003003                                     BGT     4$
003324  012737  000001  001214                     MOV     #1,GO
003332  000207                            4$:      RTS     PC
003334  105037  001214                    REAL:    CLRB    GO
003340  005737  001212                             TST     TSTTYP
003344  100403                                     BMI     1$
003346  012737  000001  001214                     MOV     #1,GO
003354  000207                            1$:      RTS     PC
003356  005037  001160                    GETTST:  CLR     WORK
003362  005037  001112                             CLR     SEQ
003366  113737  001116  001160                     MOVB    S0,WORK
003374  006337  001160                             ASL     WORK
003400  063737  001160  001112                     ADD     WORK,SEQ
003406  006337  001112                             ASL     SEQ
003412  063737  001160  001112                     ADD     WORK,SEQ
003420  062737  004424  001112                     ADD     #TSTTBL,SEQ
003426  017737  175460  001114                     MOV     @SEQ,TEST
003434  062737  000002  001112                     ADD     #2,SEQ
003442  017737  175444  001212                     MOV     @SEQ,TSTTYP
003450  062737  000002  001112                     ADD     #2,SEQ                ;POINT TO PASS NO.
003456  000207                                     RTS     PC
003460  112737  000001  001214            MODCON:  MOVB    #1,GO
003466  005737  001176                             TST     PMODE
003472  001405                                     BEQ     2$
003474  105737  001212                             TSTB    TSTTYP
003500  100002                                     BPL     2$
003502  005037  001214                             CLR     GO
003506  000207                            2$:      RTS     PC
                                          ;END OF TEST PASS ROUTINE
003510  005037  001134                    EOPT:    CLR TEMP                      ;CONVERT TEST NO TO ASCII
003514  113737  001116  001134                     MOVB    S0,TEMP
003522  012705  020600                             MOV     #EBUF,R5
003526  004737  033730                             JSR     PC,BIOCT
003532  113737  020604  035106                     MOVB    EBUF+4,MSG03+23.         ;PUT IN MSG03
003540  113737  020605  035107                     MOVB    EBUF+5,MSG03+24.
003546  017737  175340  001134                     MOV     @SEQ,TEMP                ;CONVERT PASS NO.
003554  012705  020600                             MOV     #EBUF,R5
003560  004737  033730                             JSR     PC,BIOCT
003564  113737  020603  035075                     MOVB    EBUF+3,MSG03+14.         ;PUT IN MSG03
003572  113737  020604  035076                     MOVB    EBUF+4,MSG03+15.
```

```
 37500 003600  113737  020605  035077          MOVB    EBUF+5,MSG03+16.
 37600 003606                                  SENDALL #MSG03                  ;REPORT END OF TEST PASS
       003606  012705  035057                  MOV     #MSG03,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       003612  005037  001174                  CLR     MODE
       003616  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 37700 003622                                  SENDC   #MSG03
       003622  012705  035057                  MOV     #MSG03,R5               ;GET MESSAGE ADDRESS
       003626  004737  020310                  JSR     PC,CSEND        ;SEND MESSAGE
 37800 003632  000207                          RTS     PC
 37900
 38000
 38100                                 ;.....................................................................
 38200                                 ;END OF PASS SUBROUTINE
 38300 003634                          EOP:    SENDALL #MSG01
       003634  012705  035040                  MOV     #MSG01,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       003640  005037  001174                  CLR     MODE
       003644  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 38400 003650                                  SENDC   #MSG01
       003650  012705  035040                  MOV     #MSG01,R5               ;GET MESSAGE ADDRESS
       003654  004737  020310                  JSR     PC,CSEND        ;SEND MESSAGE
 38500 003660  013737  001124  001134          MOV     PASSNO,TEMP     ;CONVERT PASS NO TO ASCII
 38600 003666  012705  020600                  MOV     #EBUF,R5
 38700 003672  004737  033730                  JSR     PC,BIOCT
 38800 003676  105037  020606                  CLRB    EBUF+6          ;PRINT PASS NO.
 38900 003702                                  SENDALL #EBUF
       003702  012705  020600                  MOV     #EBUF,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
       003706  005037  001174                  CLR     MODE
       003712  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39000 003716                                  SENDC   #EBUF
       003716  012705  020600                  MOV     #EBUF,R5                ;GET MESSAGE ADDRESS
       003722  004737  020310                  JSR     PC,CSEND        ;SEND MESSAGE
 39100 003726                                  SENDALL #MSG75          ;SEND CRLF
       003726  012705  037370                  MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       003732  005037  001174                  CLR     MODE
       003736  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39200 003742                                  SENDC   #MSG75
       003742  012705  037370                  MOV     #MSG75,R5               ;GET MESSAGE ADDRESS
       003746  004737  020310                  JSR     PC,CSEND        ;SEND MESSAGE
 39300 003752  000207                          RTS     PC              ;RETURN
 39400
 39500                                 ;.....................................................................
 39600                                 ;  TEST FOR HARDWARE SWITCH REGISTER
 39700                                 ;  SWR =  176 IF NONE ON SYSTEM
 39800
 39900 003754  012737  004002  000004  SWRTST: MOV     #2$,TRAP4
 40000 003762  012737  000340  000006          MOV     #PRI7,TRAP4+2
 40100 003770  017737  175126  001116  1$:     MOV     @SWR,S0
 40200 003776  000240                          NOP
 40300 004000  000407                  BR      3$
 40400 004002  012737  000176  001122  2$:     MOV     #176,SWR        ;TRAPPED TO 4 SET UP FOR
 40500 004010  017737  175106  001116          MOV     @SWR,S0         ;SOFTWARE SWITCH REG.
 40600 004016  000002                          RTI
 40700 004020  012737  000006  000004  3$:     MOV     #6,TRAP4        ;RESET TRAP CATCHER
 40800 004026  012737  000000  000006          MOV     #0,TRAP4+2
 40900 004034  000207                          RTS     PC
 41000
 41100
```

```
                                         ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                         ; ROUTINE TO GET SWITCHES

004036  023727  001122  000176           GETSWS: CMP     SWR,#000176              ;REAL SWS ?
004044  001001                                   BNE     3$                       ;YES SKIP HALT
004046  000000                                   HALT                     ;ALLOW OPERATOR TO CHANGE 176
004050  017737  175046  001116           3$:     MOV     @SWR,SO          ;READ SWS TO WORK COPY
004056  032737  001000  001116                   BIT     #BIT9,SO         ;PMT MODE ?
004064  001404                                   BEQ     1$               ;NO
004066  052737  100000  001176                   BIS     #BIT15,PMODE     ;YES- SET THE FLAG
004074  000402                                   BR      2$
004076  005037  001176                   1$:     CLR     PMODE
004102  000207                           2$:     RTS     PC

                                         ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                         ; ROUTINE TO HANDLE MODE CONFLICTS

004104  012737  004146  000060           ANYWAY: MOV     #3$,@#60         ;SET INTERRUPT TO 3$
004112  005005                                   CLR     R5
004114                                           SENDC   #MSGK5           ;RUN ANYWAY ? MSG
004114  012705  042426                           MOV     #MSGK5,R5                ;GET MESSAGE ADDRESS
004120  004737  020310                           JSR     PC,CSEND         ;SEND MESSAGE
004124                                           STALL   #10000.
004124  012705  023420                           MOV     #10000.,R5               ;SETUP STALL TIME CONSTANT
004130  004737  033676                           JSR     PC,MSTALL
004134  105705                                   TSTB    R5
004136  001002                                   BNE     2$
004140  112705  000116                   1$:     MOVB    #'N,R5           ;ASSUME NO OF NO ANS
004144  000207                           2$:     RTS     PC

004146  113705  177562                   3$:     MOVB    @#177562,R5      ;GET ANS
004152  012737  017240  000060                   MOV     #TTYIN,@#60      ;RESTORE TTY INTR HANDLER
004160  105737  177564                   4$:     TSTB    @#177564
004164  100375                                   BPL     4$               ;ECHO THE CHAR
004166  110537  177566                           MOVB    R5,@#177566
004172                                           SENDC   #MSG75
004172  012705  037370                           MOV     #MSG75,R5                ;GET MESSAGE ADDRESS
004176  004737  020310                           JSR     PC,CSEND         ;SEND MESSAGE
004202  005037  001146                           CLR     LOOPO            ;ABORT THE TIMEOUT
004206  012737  000101  177560                   MOV     #101,@#177560    ;ENABLE CONSOLE
004214  000002                                   RTI
```

```
 44900                                          ; THIS ROUTINE WILL SCAN ALL LINES FOR ACTIVE TERMINALS
 45000                                          ; BE REQUESTING AN ANSWERBACK FROM ALL LINES. THE SELECT
 45100                                          ; BIT WILL BE SET ACCORDINGLY IN THE DZLINE TABLE.
 45200
 45300
 45400 0042?6  012737  004410  001140  SCAN:   MOV     #5$,HOOK        ;LINK TO RECV ROUTINE
 45500 004224                                  SENDALL #MSG05          ;PROMPT TERMINALS
       004224  012705  035155                  MOV     #MSG05,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       00423C  005037  001174                  CLR     MODE
       004234  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 45600 004240                                  STALL   #6000.          ;WAIT A WHILE
       004240  012705  013560                  MOV     #6000.,R5               ;SETUP STALL TIME CONSTANT
       004244  004737  033676                  JSR     PC,MSTALL
 45700 004250  005037  C01160                  CLR     WORK
 45800 004254  023737  001160  001152  1$:     CMP     WORK,NUMLIN     ;ALL LINES DONE ?
 45900 004262  001424                          BEQ     4$              ;YES- EXIT
 46000 004264  013700  001160                  MOV     WORK,R0
 46100 004270  006300                          ASL     R0              ;X2 FOR WORD OFFSET
 46200 004272  005760  020634                  TST     DZLINE(R0)      ;BIT 15 SHOULD BE SET
 46300 004276  100006                          BPL     3$              ;NO RESPONSE- DESELECT
 46400 004300  042760  100200  020634          BIC     #100200,DZLINE(R0)
 46500 004306  005237  001160                  INC     WORK            ;CHECK NEXT LINE
 46600 004312  000760                          BR      1$
 46700 004314  052760  000200  020634  3$:     BIS     #BIT7,DZLINE(R0)        ;SET LINE INACTIVE
 46800 004322  005060  024054                  CLR     ACTIVE(R0)
 46900 004326  005237  001160                  INC     WORK
 47000 004332  000750                          BR      1$              ;CHECK NEXT LINE
 47100 004334  005037  001140  4$:     CLR     HOOK
 47200 004340  005037  001204                  CLR     ONLINE
 47300 004344  005037  001216                  CLR     UUT
 47400 004350  023737  001204  001152  6$:     CMP     ONLINE,NUMLIN
 47500 004356  001413                          BEQ     8$
 47600 004360  013700  001204                  MOV     ONLINE,R0
 47700 004364  006300                          ASL     R0
 47800 004366  105760  020634                  TSTB    DZLINE(R0)
 47900 004372  100402                          BMI     7$
 48000 004374  005237  001216                  INC     UUT
 48100 004400  005237  001204  7$:     INC     ONLINE
 48200 004404  000761                          BR      6$
 48300 004406  000207          8$:     RTS     PC
 48400
 48500
 48600 004410  004737  033446  5$:     JSR     PC,KBOUT                ;REMOVE CHAR FROM BUFFER
 48700 004414  052760  100000  020634          BIS     #BIT15,DZLINE(R0)       ;SET RESPONDED BIT
 48800 004422  000207                          RTS     PC
 48900
 49000
```

```
  100
  200                                   .SBTTL  TEST SEQUENCE TABLE
  300                                   ;ONE WORD OF TEST ADDRESS
  400                                   ;ONE WORD OF TEST DESCRIPTION DATA
  500                                   ;       BIT7   TEST MANUAL INTERVENTION
  600                                   ;       BIT4:0 TEST NUMBER
  700                                   ;ONE WORD OF PASS COUNT
  800
  900
 1000 004424                            TSTTBL:
 1100 004424  005410                            TEST00          ;DATA PATHS TEST
 1200 004426  000000                            000000
 1300 004430  000000                            000000
 1400 004432  005452                            TEST01          ;ALL PRINTABLE CHARACTERS TEST
 1500 004434  000001                            000001
 1600 004436  000000                            000000
 1700 004440  005700                            TEST02          ;NON-PRINTABLE CHARACTERS TEST
 1800 004442  000002                            000002
 1900 004444  000000                            000000
 2000 004446  005732                            TEST03          ;PRINTHEAD DOT MATRIX TEST
 2100 004450  000003                            000003
 2200 004452  000000                            000000
 2300 004454  006040                            TEST04          ;HORIZONTAL PITCH TEST
 2400 004456  000004                            000004
 2500 004460  000000                            000000
 2600 004462  006412                            TEST05          ;SPACE - BACKSPACE TEST
 2700 004464  000005                            000005
 2800 004466  000000                            000000
 2900 004470  006610                            TEST06          ;SET MARGINS TEST
 3000 004472  000006                            000006
 3100 004474  000000                            000000
 3200 004476  007520                            TEST07          ;HORIZONTAL TABS TEST
 3300 004500  000007                            000007
 3400 004502  000000                            000000
 3500 004504  010072                            TEST10          ;MULTIPLE LINE FEED TEST
 3600 004506  000010                            000010
 3700 004510  000000                            000000
 3800 004512  010464                            TEST11          ;HORIZONTAL MOTION TEST
 3900 004514  000011                            000011
 4000 004516  000000                            000000
 4100 004520  011164                            TEST12          ;BUFFER OVERRUN TEST
 4200 004522  000012                            000012
 4300 004524  000000                            000000
 4400 004526  011630                            TEST13          ;VERTICAL PITCH TEST
 4500 004530  000013                            000013
 4600 004532  000000                            000000
 4700 004534  012170                            TEST14          ;BELL TEST
 4800 004536  000014                            000014
 4900 004540  000000                            000000
 5000 004542  015676                            TEST15          ;LIFE TEST
 5100 004544  000015                            000015
 5200 004546  000000                            000000
 5300 004550  016340                            TEST16          ;DYNAMIC EXERCISOR
 5400 004552  000016                            000016
 5500 004554  000000                            000000
 5600 004556  004612                            TEST17          ;BAUD RATE TEST
 5700 004560  000217                            000217
```

```
 5800 004562  000000                    000000
 5900 004564  012260                    TEST20          ;DMT KEYBOARD ECHO TEST
 6000 004566  000220                    000220
 6100 004570  000000                    000000
 6200 004572  014412                    TEST21          ;DMT CHARACTER CODE ECHO TEST
 6300 004574  000221                    000221
 6400 004576  000000                    000000
 6500 004600  015214                    TEST22          ;DMT PITCH SETUP TEST
 6600 004602  000222                    000222
 6700 004604  000000                    000000
 6800 004606  177777                    177777  ;END OF TABLE FLAG
 6900 004610  000000                    000000
 7000
```

```
                                                .SBTTL  TESTS
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ;THIS IS A TEST OF THE VARIOUS BAUD RATES.
                                        ;MANUAL INTERVENTION IS REQUIRED
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
004612                                  TEST17: SENDALL #MSG27
004612  012705  035762                          MOV     #MSG27,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
004616  005037  001174                          CLR     MODE
004622  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
004626  012703  036052                          MOV     #MSG30,R3       ;SETUP ADDRESS OF 1ST PART OF MESSAGE
004632  012704  036074                          MOV     #MSG31,R4       ;SETUP ADDRESS OF "HIT RETURN WHEN DONE" MESSAGE
004636  012702  005374                          MOV     #T03TBL,R2      ;SETUP TABLE ADDRESS
004642  004737  033524                          JSR     PC,ANVENT       ;GO THRU ALL TABLE ENTRIES
004646                                          SENDALL #MSG88          ;PRINTED AT MSG
004646  012705  037677                          MOV     #MSG88,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
004652  005037  001174                          CLR     MODE
004656  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
004662                                          SENDALL #MSG32          ;110
004662  012705  036157                          MOV     #MSG32,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
004666  005037  001174                          CLR     MODE
004672  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
004676                                          SENDALL #MSG36          ;BAUD
004676  012705  036332                          MOV     #MSG36,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
004702  005037  001174                          CLR     MODE
004706  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
004712  004737  005004                          JSR     PC,5$           ;GET ANSWER BACK
004716  012702  005402                          MOV     #T03TB2,R2      ;SU NEXT PASS
004722  004737  033524                          JSR     PC,ANVENT       ;GO THRU TABLE AGAIN
004726                                          SENDALL #MSG88          ;PRINTED AT
004726  012705  037677                          MOV     #MSG88,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
004732  005037  001174                          CLR     MODE
004736  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
004742                                          SENDALL #MSG35          ;300
004742  012705  036326                          MOV     #MSG35,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
004746  005037  001174                          CLR     MODE
004752  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
004756                                          SENDALL #MSG36          ;BAUD
004756  012705  036332                          MOV     #MSG36,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
004762  005037  001174                          CLR     MODE
004766  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGF
004772  004737  005004                          JSR     PC,5$           ;GET ANSWER BACK
004776  005037  001140                          CLR     HOOK
005002  000207                                  RTS     PC

005004  000240                          5$:     NOP
005006  005037  001204                          CLR     ONLINE          ;INIT LINE 0
005012  012737  035162  001160                  MOV     #MSG06,WORK     ;SHOULD BE MESSAGE
005020  023737  001204  001152          6$:     CMP     ONLINE,NUMLIN   ;DO ALL LINES
005026  002402                                  BLT     66$
005030  000137  005372                          JMP     20$
005034  013700  001204                  66$:    MOV     ONLINE,R0
005040  006300                                  ASL     R0
005042  105760  020634                          TSTB    DZLINE(R0)      ;IS LINE SELECTED /
005046  100003                                  BPL     61$
005050  005237  001204                          INC     ONLINE          ;NO TRY AGAIN
005054  000761                                  BR      6$
005056  000240                          61$:    NOP
```

```
10800 005060 005037 010070                      CLR     COUNT           ;INPUT CHAR COUNT =0
10900 005064 012737 016324 001162               MOV     #T30BUF,WORK1   ;BORROW A BUFFER AREA
11000 005072 012737 177777 001136               MOV     #-1,NOTYET      ;GETS CLEARED WHENE DONE
11100 005100 012737 005220 001140               MOV     #10$,HOOK       ;LINK TO RECV ROUTINE
11200 005106                                    SENDI   #MSG05,ONLINE   ;ESCAPE SEQ TO TERMINAL
      005106 012705 035155                      MOV     #MSG05,R5               ;MESSAGE ADDRESS TO R5
      005112 112737 000010 001175               MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      005120 113737 001204 001174               MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      005126 004737 031706                      JSR     PC,SEND
11300 005132 004737 034250                      JSR     PC,QUIET
11400 005136                                    STALL   #2000.          ;ALLOW 2 SEC FOR ANSWERBACK
      005136 012705 003720                      MOV     #2000.,R5               ;SETUP STALL TIME CONSTANT
      005142 004737 033676                      JSR     PC,MSTALL
11500 005146 005737 001136                      TST     NOTYET          ;SHOULD BE CLR IF MSG RECVD
11600 005152 001004                             BNE     7$              ;GO REPORT ERROR
11700 005154 005237 001204                      INC     ONLINE          ;DO NEXT LINE
11800 005160 000137 005020                      JMP     6$
11900 005164 012746 035113              7$:     MOV     #MSG04,-(SP)            ;NO RESPONSE !
12000 005170 004737 020352                      JSR     PC,ERRORT
12100 005174 000240                             NOP
12200 005176 012746 035415              8$:     MOV     #MSG15,-(SP)    ;ERROR MESSAGE  ADDRESS
12300 005202 004737 020352                      JSR     PC,ERRORT       ;TO ERROR ROUTINE
12400 005206 000000                             HALT                    ;IF BIT15 IS SET
12500 005210 005237 001204                      INC     ONLINE          ;DO NEXT LINE
12600 005214 000137 005020                      JMP     6$
12700
12800 005220 000240                     10$:    NOP
12900 005222 042705 177600                      BIC     #177600,R5              ;CLEAR PARITY BIT
13000 005226 110577 173730                      MOVB    R5,@WORK1       ;SAVE IN BUFFER
13100 005232 005237 010070                      INC     COUNT           ;BUMP CHAR COUNT
13200 005236 005237 001162                      INC     WORK1           ;BUMP BUFFER POINTER
13300 005242 023727 010070 000007               CMP     COUNT,#7        ;LOOKING FOR 7 CHARS
13400 005250 001415                             BEQ     12$             ;GO COMPARE TO SHOULDBE
13500 005252 105760 031567                      TSTB    RECERR+1(R0)    ;ERROR SET ?
13600 005256 001407                             BEQ     11$
13700 005260 005060 031566                      CLR     RECERR(R0)      ;RESET THE ERROR FLAGS
13800 005264 012746 035415                      MOV     #MSG15,-(SP)    ;ERROR MSG ADDRESS
13900 005270 004737 020352                      JSR     PC,ERRORT       ;TO ERROR ROUTINE
14000 005274 000000                             HALT                    ;IF BIT15 IS SET
14100 005276 004737 033446              11$:    JSR     PC,KBOUT
14200 005302 000207                             RTS     PC                      ;WAIT FOR MORE
14300 005304 005037 001136              12$:    CLR     NOTYET          ;TURN OFF FOR NOW
14400 005310 012737 016324 001162               MOV     #T30BUF,WORK1   ;RESET BUFFER POINTER
14500 005316 005737 010070              13$:    TST     COUNT           ;COMPARE ALL 5 CHARS
14600 005322 001420                             BEQ     18$
14700 005324 127777 173630 173630               CMPB    @WORK,@WORK1
14800 005332 001007                             BNE     14$
14900 005334 005237 001160                      INC     WORK
15000 005340 005237 001162                      INC     WORK1
15100 005344 005337 010070                      DEC     COUNT
15200 005350 000762                             BR      13$
15300 005352 012746 041014              14$:    MOV     #MSG148,-(SP)
15400 005356 004737 020352                      JSR     PC,ERRORT
15500 005362 000240                             NOP
15600 005364 005237 001204              18$:    INC     ONLINE          ;TEST NEXT LINE
15700 005370 000613                             BR      6$
15800 005372 000207                     20$:    RTS     PC
```

```
005374  036157                        T03TBL: MSG32                   ;110 , ODD PARITY , 7 BIT
005376  011320                                11320
005400  000000                                000000
005402  036326                        T03TB2: MSG35                   ;300 BAUD , ODD PARITY , 7 BIT
005404  012720                                12720
005406  000000                                000000                  ;END OF TABLE

                              ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                      ;THIS IS THE TEST OF DATA PATHS WITHIN THE LA00
                                      ;THE *U*U PATTERN IS ALTERNATING 0 AND ONE BITS
                              ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
005410                                TEST00: SENDALL #MSG42          ;ANOUNCE TEST
005410  012705  036751                        MOV     #MSG42,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005414  005037  001174                        CLR     MODE
005420  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
005424                                        SENDR   #MSG43,#4
005424  012705  037005                        MOV     #MSG43,R5
005430  112737  000004  001174                MOVB    #4,MODE
005436  112737  000020  001175                MOVB    #20,MODE+1
005444  004737  031706                        JSR     PC,SEND
005450  000207                        4$:     RTS     PC
```

```
                                        ;*****************************************************************
                                        ;PRINTABLE CHARACTERS TEST
                                        ;THIS TEST PRINTS FOUR OF EACH PRINTABLE CHARACTER.
                                        ;ASCII CODES 04' THRU 176.
                                        ;*****************************************************************

005452                                  TEST01: SENDALL #MSG81          ;SEND TEST ID
005452  012705  037445                          MOV     #MSG81,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005456  005037  001174                          CLR     MODE
005462  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005466  013737  001172  001160                  MOV     WIDTH,WORK
005474  005037  010070                          CLR     COUNT
005500  162737  000006  001160          1$:     SUB     #6,WORK         ;WORK = WIDTH / 6
005506  003403                                  BLE     2$
005510  005237  010070                          INC     COUNT
005514  000771                                  BR      1$
005516  012737  000041  001164          2$:     MOV     #41,WORK2               ;INIT ASCII CODES
005524  013737  010070  001160                  MOV     COUNT,WORK
005532  123727  001164  000177          3$:     CMPB    WORK2,#177              ;DO WHILE CHAR < 177
005540  002050                                  BGE     8$
005542  005737  001160                  4$:     TST     WORK            ;DO WHILE WORK > 0
005546  003433                                  BLE     6$
005550                                  5$:     SENDC2  WORK2,#4        ;SEND CHAR 4 TIMES
005550  013705  001164                          MOV     WORK2,R5                ;GET CHAR TO R5
005554  012737  000004  001174                  MOV     #4,MODE         ;GET REPEAT COUNT
005562  112737  000020  001175                  MOVB    #20,MODE+1      ;SET REPEAT MODE
005570  004737  032310                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
005574                                          SENDC2  #40,#2          ;SEND 2 SPACES
005574  012705  000040                          MOV     #40,R5          ;GET CHAR TO R5
005600  012737  000002  001174                  MOV     #2,MODE         ;GET REPEAT COUNT
005606  112737  000020  001175                  MOVB    #20,MODE+1      ;SET REPEAT MODE
005614  004737  032310                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
005620  004737  034250                          JSR     PC,QUIET
005624  105237  001164                          INCB    WORK2           ;NEXT ASCII CODE
005630  005337  001160                          DEC     WORK
005634  000736                                  BR      3$
005636                                  6$:     SENDALL #MSG75          ;CRLF
005636  012705  037370                          MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005642  005037  001174                          CLR     MODE
005646  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005652  013737  010070  001160                  MOV     COUNT,WORK      ;RESTORE WIDTH/6
005660  000724                                  BR      3$
005662                                  8$:     SENDALL #MSG77          ;SKIP 3 LINES
005662  012705  037373                          MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005666  005037  001174                          CLR     MODE
005672  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005676  000207                                  RTS     PC
```

```
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ;THIS IS THE NON PRINTING CHARACTER TEST.
                                        ;ALL NON-PRINTING CHARS ARE SENT TO THE LA00. THE RESULT SHOULD BE
                                        ;A BLANK LINE.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
005700                                  TEST02: SENDALL #MSG44
005700  012705  037104                          MOV     #MSG44,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005704  005037  001174                          CLR     MODE
005710  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005714                                          SENDALL #MSG45
005714  012705  037214                          MOV     #MSG45,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005720  005037  001174                          CLR     MODE
005724  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005730  000207                                  RTS     PC





                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ;DOT MATRIX TEST
                                        ;THIS TEST PRINTS FIVE CHARACTERS "ZH*#$" IN LINE.
                                        ;A LINE OF Z'S AND SPACES IS PRINTED, THEN THIS
                                        ;LINE IS OVERPRINTED WITH A LINE OF H'S AND SPACES,
                                        ;*'S AND SPACES , AND #'S AND SPACES. THIS OVERPRINT
                                        ;CREATES TEN BOXES THAT SHOULD BE ALL BLACK.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

005732                                  TEST03: SENDALL #MSG83          ;SEND TEST ID
005732  012705  037511                          MOV     #MSG83,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005736  005037  001174                          CLR     MODE
005742  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005746                                          SENDALL #MSG77          ;SKIP 3 LINES
005746  012705  037373                          MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005752  005037  001174                          CLR     MODE
005756  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005762                                          SENDALL #MSG84          ;SEND THE CHARS
005762  012705  037536                          MOV     #MSG84,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
005766  005037  001174                          CLR     MODE
005772  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
005776                                  2$:     SENDR   #MSG85,#4       ;MAKE 4 LINES OF 10 BOXES
005776  012705  037550                          MOV     #MSG85,R5
006002  112737  000004  001174                  MOVB    #4,MODE
006010  112737  000020  001175                  MOVB    #20,MODE+1
006016  004737  031706                          JSR     PC,SEND
006022                                  5$:     SENDALL #MSG77          ;SKIP 3 LINES
006022  012705  037373                          MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006026  005037  001174                          CLR     MODE
006032  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
006036  000207                                  RTS     PC
```

```
                                      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                      ;HORIZONTAL PITCH TEST
                                      ;SETUP FOR THIS TEST IS DOWN LINE LOADED FROM THE PROGRAM.
                                      ;A MESSAGE WILL BE PRINTED IDENTIFYING THE CURRENT PITCH,
                                      ;FOLLOWED BY THREE LINES OF  A..Z AT THE CURRENT PITCH.
                                      ;PITCHES TESTED : 10, 12, 13.2, 16.5 CPI. ALL AT  6 LPI.
                                      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

006040                                TEST04: SENDALL #MSG109         ;SEND TEST ID
006040  012705  040120                        MOV     #MSG109,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
006044  005037  001174                        CLR     MODE
006050  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
006054                                        SENDALL #MSG77                  ;3 LINES
006054  012705  037373                        MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006060  005037  001174                        CLR     MODE
006064  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
006070  005037  001160                        CLR     WORK
006074  023727  001160  000006        1$:     CMP     WORK,#6.
006102  003122                                BGT     4$              ;DO WHILE WORK > 0
006104  005037  001164                        CLR     WORK2
006110  005037  006366                        CLR     T11A
006114  005037  006370                        CLR     T11B
006120  013737  001160  006366                MOV     WORK,T11A               ;GET TABLE OFFSET
006126  013737  006366  006370                MOV     T11A,T11B
006134  062737  006402  006370                ADD     #TABLHF,T11B            ;POINTER TO FORMAT CMD
006142  062737  006372  006366                ADD     #TABLH,T11A             ;POINTER TO ID MSG
006150                                        SENDALL @T11B           ;SETUP HORIZ PITCH
006150  017705  000214                        MOV     @T11B,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
006154  005037  001174                        CLR     MODE
006160  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
006164                                        STALL   #250
006164  012705  000250                        MOV     #250,R5         ;SETUP STALL TIME CONSTANT
006170  004737  033676                        JSR     PC,MSTALL
006174                                2$:     SENDALL #MSG75          ;SEND CRLF
006174  012705  037370                        MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006200  005037  001174                        CLR     MODE
006204  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
006210                                        SENDALL #MSG88                  ;SEND ID MESSAGE
006210  012705  037677                        MOV     #MSG88,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006214  005037  001174                        CLR     MODE
006220  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
006224                                        SENDALL @T11A
006224  017705  000136                        MOV     @T11A,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
006230  005037  001174                        CLR     MODE
006234  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
006240                                        SENDALL #MSG93
006240  012705  037753                        MOV     #MSG93,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006244  005037  001174                        CLR     MODE
006250  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
006254                                        SENDALL #MSG96
006254  012705  037771                        MOV     #MSG96,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006260  005037  001174                        CLR     MODE
006264  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
006270                                        SENDALL #MSG98
006270  012705  040001                        MOV     #MSG98,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006274  005037  001174                        CLR     MODE
006300  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
```

```
 28100 006304                                                   SENDALL #MSG107
       006304  012705  040056                                   MOV     #MSG107,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       006310  005037  001174                                   CLR     MODE
       006314  004737  031706                                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
 28200 006320  023727  001164  000003                           CMP     WORK2,#3
 28300 006326  003003                                           BGT     3$
 28400 006330  005237  001164                                   INC     WORK2
 28500 006334  000717                                           BR      2$
 28600 006336  062737  000002  001160          3$:              ADD     #2,WORK                 ;GET NEXT PITCH
 28700 006344  000137  006074                                   JMP     1$
 28800 006350                                  4$:              SENDAL  #MSG77
       006350  012705  037373                                   MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       006354  005037  001174                                   CLR     MODE
       006360  004737  031706                                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
 28900 006364  000207                                           RTS     PC                      ;EXIT...
 29000
 29100 006366  000000                          T11A:    .WORD   000000
 29200 006370  000000                          T11B:    .WORD   000000
 29300 006372  037746  037741  037734          TABLH:   .WORD   MSG92,MSG91,MSG90,MSG89
       006400  037727
 29400 006402  040006  040013  040020          TABLHF:  .WORD   MSG99,MSG100,MSG101,MSG108
       006410  040113
 29500
 29600
 29700
```

```
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ;SPACE - BACKSPACE TEST
                                        ;THIS TEST PRINTS A LINE OF ALTERNATING SLASHES AND APACES.
                                        ;THEN BACKSPACES THROUGH THE LINE OVERPRINTING THE '/' S
                                        ;WITH '\'S. THE RESULTING LINE SHOULD BE A LINE OF ALTERNATING
                                        ;X'S AND SPACES. TWO LINES ARE PRINTED PER PASS.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

006412                                  TEST05: SENDALL #MSG78          ;SEND TEST ID
006412  012705  037400                          MOV     #MSG78,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006416  005037  001174                          CLR     MODE
006422  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
006426  012737  000002  010070                  MOV     #2,COUNT        ;SU FOR 2 LINES
006434  005737  010070                  2$:     TST     COUNT
006440  003454                                  BLE     7$              ;DO UNTIL COUNT =0
006442  013737  001172  001160                  MOV     WIDTH,WORK
006450  006237  001160                          ASR     WORK
006454  162737  000002  001160                  SUB     #2,WORK         ;MAKE SHURE WE'RE NOT AT MARGIN
006462                                          SENDR   #MSG79,WORK     ;SEND "/ "
006462  012705  037435                          MOV     #MSG79,R5
006466  113737  001160  001174                  MOVB    WORK,MODE
006474  112737  000020  001175                  MOVB    #20,MODE+1
006502  004737  031706                          JSR     PC,SEND
006506  000240                                  NOP
006510  000240                                  NOP
006512  013737  001172  001160          4$:     MOV     WIDTH,WORK
006520  006237  001160                          ASR     WORK            ;RESET COLM COUNT
006524                                          SENDR   #MSG80,WORK     ;SEND "BS BS \ BS"
006524  012705  037440                          MOV     #MSG80,R5
006530  113737  001160  001174                  MOVB    WORK,MODE
006536  112737  000020  001175                  MOVB    #20,MODE+1
006544  004737  031706                          JSR     PC,SEND
006550                                  6$:     SENDALL #MSG75          ;CRLF
006550  012705  037370                          MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006554  005037  001174                          CLR     MODE
006560  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
006564  005337  010070                          DEC     COUNT
006570  000721                                  BR      2$
006572                                  7$:     SENDALL #MSG77          ;SKIP 3 LINES
006572  012705  037373                          MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006576  005037  001174                          CLR     MODE
006602  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
006606  000207                                  RTS     PC              ;EXIT...
```

```
 32900
 33000                          ;*****************************************************************
 33100                          ;SET MARGINS TEST
 33200                          ;       THIS TEST WILL SET 4 PAIRS OF L & R MARGINS
 33300                          ;       THEN WILL PRINT A LINE OF = SIGNS THAT SHOULD
 33400                          ;       BE WITHIN THOSE MARGINS. ALSO A MESSAGE WILL BE
 33500                          ;       SENT SPECIFYING AN ERROR IF IT'S NOT AT THE LH
 33600                          ;       MARGIN.
 33700                          ;       A REFERENCE LINE WILL BE PRINTED SHOWING THE
 33800                          ;       MARGIN LIMITS BEING SET UP.
 33900                          ;       ALL HORIZ PITCH SETTINGS WILL BE TESTED.
 34000
 34100                          ;EXAMPLE :      ......V.....................V........
 34200                          ;                     ==== ====-========--======
 34300                          ;                     ERROR IF NOT AT LH MARGIN
 34400
 34500                          ;*****************************************************************
 34600
 34700 006610                   TEST06: SENDALL #MSG111         ;SEND TEST ID
       006610  012705  040204           MOV     #MSG111,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       006614  005037  001174           CLR     MODE
       006620  004737  031706           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 34800 006624  005037  001160           CLR     WORK
 34900 006630  005037  001162           CLR     WORK1
 35000 006634  005037  007512           CLR     W1              ;DO 4 PITCH SETTINGS
 35100 006640  023727  007512  000003 1$:      CMP     W1,#3           ;IF DONE GOTO 30
 35200 006646  003402                     BLE     4$
 35300 006650  000137  007432             JMP     30$
 35400 006654  006337  007512     4$:     ASL     W1              ;*2 FOR WORD OFFSET
 35500 006660  012737  006402  007516     MOV     #TABLHF,W3      ;PITCH MSG TABLE
 35600 006666  063737  007512  007516     ADD     W1,W3
 35700 006674                           SENDALL @W3             ;SETUP H PITCH
       006674  017705  000616           MOV     @W3,R5  ;BUILD SEND CALL USING MESSAGE ADDRESS
       006700  005037  001174           CLR     MODE
       006704  004737  031706           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 35800 006710  006237  007512           ASR     W1
 35900 006714  005037  007514           CLR     W2              ;DO 5 MARGINS TESTS
 36000 006720  023727  007514  000004 2$:      CMP     W2,#4
 36100 006726  003402                     BLE     5$
 36200 006730  000137  007422             JMP     20$
 36300 006734                           5$:     SENDALL #T12FIX         ;RESET MARGINS
       006734  012705  007500           MOV     #T12FIX,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       006740  005037  001174           CLR     MODE
       006744  004737  031706           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 36400 006750  013737  007514  007516     MOV     W2,W3
 36500 006756  006337  007516           ASL     W3
 36600 006762  013701  007516           MOV     W3,R1
 36700 006766  062701  007454           ADD     #TBL12A,R1      ;POINT TO SETUP ADDR
 36800 006772  013737  007514  007516     MOV     W2,W3
 36900 007000  062737  007466  007516     ADD     #TBL12B,W3      ;POINT TO LH MARGIN
 37000 007006  117737  000504  001160     MOVB    @W3,WORK        ;GET LH MARGIN
 37100 007014  013737  007514  007516     MOV     W2,W3
 37200 007022  062737  007473  007516     ADD     #TBL12C,W3      ;POINT TO RH MARGIN
 37300 007030  117737  000462  001162     MOVB    @W3,WORK1       ;GET RH MARGIN
 37400 007036  123737  001162  001172     CMPB    WORK1,WIDTH     ;WITHIN RANGE OF PAPER ?
 37500 007044  103405                     BLO     3$
 37600 007046  012737  000005  007514     MOV     #5,W2           ;NO DO NEXT PITCH GROUP
```

```
 37700 007054  000137  007422                    JMP     20$
 37800 007060  113737  001160  001164    3$:     MOVB    WORK,WORK2
 37900 007066  005337  001164                    DEC     WORK2
 38000 007072                                    SENDALL #MSG75          ;SEND CRLF
       007072  012705  037370                    MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       007076  005037  001174                    CLR     MODE
       007102  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 38100 007106                                    SENDR   #MSG62,WORK2    ;PRINT PERIODS....
       007106  012705  037307                    MOV     #MSG62,R5
       007112  113737  001164  001174            MOVB    WORK2,MODE
       007120  112737  000020  001175            MOVB    #20,MODE+1
       007126  004737  031706                    JSR     PC,SEND
 38200 007132                                    SENDCH  #'V             ;PRINT A 'V'
       007132  012705  000126                    MOV     #'V,R5          ;GET CHAR TO R5
       007136  005037  001174                    CLR     MODE            ;STD MODE
       007142  004737  032310                    JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 38300 007146  013737  001162  001164            MOV     WORK1,WORK2
 38400 007154  163737  001160  001164            SUB     WORK,WORK2      ; =RH-LH
 38500 007162  005337  001164                    DEC     WORK2
 38600 007166                                    SENDC2  #'.,WORK2       ;PRINT PERIODS
       007166  012705  000056                    MOV     #'.,R5          ;GET CHAR TO R5
       007172  013737  001164  001174            MOV     WORK2,MODE              ;GET REPEAT COUNT
       007200  112737  000020  001175            MOVB    #20,MODE+1      ;SET REPEAT MODE
       007206  004737  032310                    JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 38700 007212                                    SENDCH  #'V             ;PRINT A 'V'
       007212  012705  000126                    MOV     #'V,R5          ;GET CHAR TO R5
       007216  005037  001174                    CLR     MODE            ;STD MODE
       007222  004737  032310                    JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 38800 007226  013737  001172  001164            MOV     WIDTH,WORK2
 38900 007234  163737  001162  001164            SUB     WORK1,WORK2
 39000 007242                                    SENDC2  #'.,WORK2       ;PRINT MORE PERIODS
       007242  012705  000056                    MOV     #'.,R5          ;GET CHAR TO R5
       007246  013737  001164  001174            MOV     WORK2,MODE              ;GET REPEAT COUNT
       007254  112737  000020  001175            MOVB    #20,MODE+1      ;SET REPEAT MODE
       007262  004737  032310                    JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 39100 007266  011137  001164                    MOV     (R1),WORK2
 39200 007272                                    SENDALL WORK2           ;SETUP MARGINS
       007272  013705  001164                    MOV     WORK2,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
       007276  005037  001174                    CLR     MODE
       007302  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39300 007306  004737  034250                    JSR     PC,QUIET                ;WAIT FOR CATCHUP
 39400 007312                                    SENDALL #MSG75          ;SEND CRLF
       007312  012705  037370                    MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       007316  005037  001174                    CLR     MODE
       007322  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39500 007326                                    SENDR   #MSG115,#25.    ;SEND '=' 25 TIMES
       007326  012705  040257                    MOV     #MSG115,R5
       007332  112737  000031  001174            MOVB    #25.,MODE
       007340  112737  000020  001175            MOVB    #20,MODE+1
       007346  004737  031706                    JSR     PC,SEND
 39600 007352                                    SENDALL #MSG116         ;AND ERROR IF  MSG
       007352  012705  040261                    MOV     #MSG116,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       007356  005037  001174                    CLR     MODE
       007362  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39700 007366                                    SENDALL #MSG75          ;SEND CRLF
       007366  012705  037370                    MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       007372  005037  001174                    CLR     MODE
```

```
        007376  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39800  007402                                   STALL   #300
        007402  012705  000300                  MOV     #300,R5         ;SETUP STALL TIME CONSTANT
        007406  004737  033676                  JSR     PC,MSTALL
 39900  007412  005237  007514                  INC     W2              ;NEXT MARGIN PAIR
 40000  007416  000137  006720                  JMP     2$
 40100  007422  005237  007512          20$:    INC     W1              ;NEXT H PITCH
 40200  007426  000137  006640                  JMP     1$
 40300  007432  004737  033062          30$:    JSR     PC,RESETO       ;RESET THE TERMINAL
 40400  007436                                   SENDALL #MSG77          ;SKIP 3 LINES
        007436  012705  037373                  MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
        007442  005037  001174                  CLR     MODE
        007446  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 40500  007452  000207                          RTS     PC              ;BYE....
 40600
 40700
 40800  007454  041450  041460  041471  TBL12A: .WORD   MSG180,MSG181,MSG182,MSG183,MSG184
        007462  041502  041514
 40900
 41000  007466     002     032     064  TBL12B: .BYTE   2,26.,52.,78.,100.
        007471     116     144
 41100  007473     032     062     114  TBL12C: .BYTE   26.,50.,76.,102.,124.
        007476     146     174
 41200  007500     033     133     061  T12FIX: .BYTE   33,133,61,73,61,63,62,163,0
        007503     073     061     063
        007506     062     163     000
 41300                                    .EVEN
 41400  007512  000000                   W1:     .WORD   0
 41500  007514  000000                   W2:     .WORD   0
 41600  007516  000000                   W3:     .WORD   0
 41700
 41800                                    .EVEN
 41900
 42000
```

```
                                 ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                 ;HORIZONTAL TABS TEST.
                                 ;A REFERENCE LINE IS PRINTED, MADE UP OF PERIODS AND V'S
                                 ;TAB STOPS ARE THEN SET CORRESPONDING TO THE POSITION OF
                                 ;THE V'S. THREE LINES OF TABS AND I'S ARE PRINTED, WHERE
                                 ;THE I'S SHOULD LINE UP UNDER THE V'S.
                                 ;THIS IS REPEATED FOR TAB SETTINGS OF 4,8,9,16,18,32, AND
                                 ;64 CHARACTER SPACES.
                                 ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

007520                           TEST07: SENDALL #MSG60  ;SEND TEST ID
007520  012705  037245                   MOV     #MSG60,R5          ;BUILD SEND CALL USING MESSAGE ADDRESS
007524  005037  001174                   CLR     MODE
007530  004737  031706                   JSR     PC,SEND            ;NOW SEND THE MESSAGE
007534  012737  010050  001164   1$:     MOV     #TABL13,WORK2
007542  013737  001172  001162   2$:     MOV     WIDTH,WORK1
007550                                   SENDALL #MSG61             ;ESC-2 RESETS TABS
007550  012705  037304                   MOV     #MSG61,R5          ;BUILD SEND CALL USING MESSAGE ADDRESS
007554  005037  001174                   CLR     MODE
007560  004737  031706                   JSR     PC,SEND            ;NOW SEND THE MESSAGE
007564  117737  171374  010066           MOVB    @WORK2,TAB
007572  005237  001164                   INC     WORK2
007576  105077  171362                   CLRB    @WORK2
007602  013701  010066                   MOV     TAB,R1
007606                                   SENDALL #MSG75             ;SEND CRLF
007606  012705  037370                   MOV     #MSG75,R5          ;BUILD SEND CALL USING MESSAGE ADDRESS
007612  005037  001174                   CLR     MODE
007616  004737  031706                   JSR     PC,SEND            ;NOW SEND THE MESSAGE
007622  163737  010066  001162   3$:     SUB     TAB,WORK1          ;SU TAB COUNT PER LINE
007630  002433                           BLT     6$
007632  005301                   4$:     DEC     R1                 ;PRINT TAB -1 PERIODS
007634                                   SENDC2  #'.,R1             ;PRINT PERIODS
007634  012705  000056                   MOV     #'.,R5             ;GET CHAR TO R5
007640  010137  001174                   MOV     R1,MODE            ;GET REPEAT COUNT
007644  112737  000020  001175           MOVB    #20,MODE+1         ;SET REPEAT MODE
007652  004737  032310                   JSR     PC,CHROUT          ;CALL CHAR OUTPUT ROUTINE
007656                           5$:     SENDALL #MSG63             ;SET TAB STOP
007656  012705  037311                   MOV     #MSG63,R5          ;BUILD SEND CALL USING MESSAGE ADDRESS
007662  005037  001174                   CLR     MODE
007666  004737  031706                   JSR     PC,SEND            ;NOW SEND THE MESSAGE
007672                                   SENDCH  #'V                ;PRINT A 'V'
007672  012705  000126                   MOV     #'V,R5             ;GET CHAR TO R5
007676  005037  001174                   CLR     MODE               ;STD MODE
007702  004737  032310                   JSR     PC,CHROUT          ;CALL CHAR OUTPUT ROUTINE
007706  105277  171252                   INCB    @WORK2
007712  013701  010066                   MOV     TAB,R1
007716  000741                           BR      3$
                                                        ;....V....V....V....V....V....V
007720  012737  000003  010070   6$:     MOV     #3,COUNT
007726  117737  171232  010066   7$:     MOVB    @WORK2,TAB
007734  001430                           BEQ     11$
007736                                   SENDALL #MSG75
007736  012705  037370                   MOV     #MSG75,R5          ;BUILD SEND CALL USING MESSAGE ADDRESS
007742  005037  001174                   CLR     MODE
007746  004737  031706                   JSR     PC,SEND            ;NOW SEND THE MESSAGE
007752                           8$:     SENDALL #MSG65             ;ISSUE A TAB
007752  012705  037316                   MOV     #MSG65,R5          ;BUILD SEND CALL USING MESSAGE ADDRESS
```

```
        007756  005037  001174                         CLR     MODE
        007762  004737  031706                         JSR     PC,SEND         ;NOW SEND THE MESSAGE
 45600  007766                                         SENDCH  #'I             ;PRINT AN ''I''
        007766  012705  000111                         MOV     #'I,R5          ;GET CHAR TO R5
        007772  005037  001174                         CLR     MODE            ;STD MODE
        007776  004737  032310                         JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 45700  010002  005337  010066                         DEC     TAB
 45800  010006  001361                                 BNE     8$
 45900  010010  005337  010070              10$:       DEC     COUNT
 46000  010014  001344                                 BNE     7$
 46100  010016                                 11$:     SENDALL #MSG77
        010016  012705  037373                         MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
        010022  005037  001174                         CLR     MODE
        010026  004737  031706                         JSR     PC,SEND         ;NOW SEND THE MESSAGE
 46200  010032  005237  001164                         INC     WORK2
 46300  010036  023727  001164  010066                 CMP     WORK2,#TAB
 46400  010044  001236                                 BNE     2$
 46500  010046  000207                                 RTS     PC              ;EXIT
 46600
 46700
 46800  010050  000004              TABL13:    .WORD   4
 46900  010052  000010                         .WORD   8.
 47000  010054  000011                         .WORD   9.
 47100  010056  000020                         .WORD   16.
 47200  010060  000022                         .WORD   18.
 47300  010062  000040                         .WORD   32.
 47400  010064  000100                         .WORD   64.
 47500  010066  000000              TAB:       .WORD   0
 47600  010070  000002              COUNT:     .WORD   2
 47700
 47800
```

```
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ;MULTIPLE LINE FEED TEST
                                        ;       THIS TEST WILL PRINT A REFERENCE LINE OF DASHES
                                        ;       THEN SKIP N LINES AND PRINT THE NUMBER  OF LINES
                                        ;       SKIPPED, ALONG WITH SOME DASHES FOR VISUAL
                                        ;       REFERENCE. EACH SKIP COUNT N IS DONE TWICE FOR N
                                        ;       = 1 TO 7. AT 6 LINES PER INCH.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

010072                                  TEST10: SENDALL #MSG123         ;SEND TEST ID
010072  012705  040355                          MOV     #MSG123,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
010076  005037  001174                          CLR     MODE
010102  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010106                                          SENDALL #MSG77          ;SKIP 3 LINES
010106  012705  037373                          MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010112  005037  001174                          CLR     MODE
010116  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010122  012737  000001  001160                  MOV     #1,WORK
010130  012737  000012  001164                  MOV     #12,WORK2
010136                                          SENDALL #MSG124         ;SEND LINE OF DASHES
010136  012705  040412                          MOV     #MSG124,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
010142  005037  001174                          CLR     MODE
010146  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010152  023727  001160  000010          1$:     CMP     WORK,#10        ;ALL DONE ?
010160  001532                                  BEQ     4$              ;YES- JUMP
010162  013737  001160  001162                  MOV     WORK,WORK1
010170                                          SENDR   #WORK2,WORK1    ;SEND LINE FEEDS
010170  012705  001164                          MOV     #WORK2,R5
010174  113737  001162  001174                  MOVB    WORK1,MODE
010202  112737  000020  001175                  MOVB    #20,MODE+1
010210  004737  031706                          JSR     PC,SEND
010214  013700  001162                          MOV     WORK1,R0
010220  062700  041274                          ADD     #MSG160,R0      ;GET NUMERIC CHARACTER
010224  111037  001166                          MOVB    (R0),WORK3
010230                                          SENDC2  #'-,#6          ;SEND 6 DASHES
010230  012705  000055                          MOV     #'-,R5          ;GET CHAR TO R5
010234  012737  000006  001174                  MOV     #6,MODE         ;GET REPEAT COUNT
010242  112737  000020  001175                  MOVB    #20,MODE+1      ;SET REPEAT MODE
010250  004737  032310                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010254                                          SENDCH  #'0             ;AND A ZERO
010254  012705  000060                          MOV     #'0,R5          ;GET CHAR TO R5
010260  005037  001174                          CLR     MODE            ;STD MODE
010264  004737  032310                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010270                                          SENDCH  WORK3           ;AND THE NUMBER FROM ABOVE
010270  013705  001166                          MOV     WORK3,R5                ;GET CHAR TO R5
010274  005037  001174                          CLR     MODE            ;STD MODE
010300  004737  032310                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010304                                          SENDALL #MSG66          ;NOW RETURN CHAR
010304  012705  037320                          MOV     #MSG66,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010310  005037  001174                          CLR     MODE
010314  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010320                                  3$:     SENDR   #WORK2,WORK1    ;SKIP A LINE
010320  012705  001164                          MOV     #WORK2,R5
010324  113737  001162  001174                  MOVB    WORK1,MODE
010332  112737  000020  001175                  MOVB    #20,MODE+1
010340  004737  031706                          JSR     PC,SEND
```

```
 50700 010344
       010344  012705  000055
       010350  012737  000006  001174
       010356  112737  000020  001175
       010364  004737  032310
 50800 010370
       010370  012705  000060
       010374  005037  001174
       010400  004737  032310
 50900 010404
       010404  013705  001166
       010410  005037  001174
       010414  004737  032310
 51000 010420
       010420  012705  037320
       010424  005037  001174
       010430  004737  031706
 51100 010434  005237  001160
 51200 010440  004737  034250
 51300 010444  000642
 51400 010446
       010446  012705  037373
       010452  005037  001174
       010456  004737  031706
 51500 010462  000207
 51600
 51700
 51800
```

```
SENDC2  #'-,#6          ;SEND 6 DASHES
MOV     #'-,R5          ;GET CHAR TO R5
MOV     #6,MODE         ;GET REPEAT COUNT
MOVB    #20,MODE+1      ;SET REPEAT MODE
JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
SEND_H  #'0
MOV     #'0,R5          ;GET CHAR TO R5
CLR     MODE            ;STD MODE
JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
SENDCH  WORK3
MOV     WORK3,R5                ;GET CHAR TO R5
CLR     MODE            ;STD MODE
JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
SENDALL #MSG66          ;SEND CR
MOV     #MSG66,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
CLR     MODE
JSR     PC,SEND         ;NOW SEND THE MESSAGE
INC WORK                ;CHANGE NO OF LF'S
JSR     PC,QUIET
BR      1$
4$:     SENDALL #MSG77          ;SKIP 3 LINES
MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
CLR     MODE
JSR     PC,SEND         ;NOW SEND THE MESSAGE
RTS     PC
```

```
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ; HORIZONTAL MOVEMENT TEST
                                        ;       X'S ARE PRINTED AT RANDOM COLUMN POSITIONS
                                        ;       UNTIL THE LINE IS FULL. CONTROLLED BY THE
                                        ;       'WIDTH'' AS DETERMINED AT STARTUP.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

010464                                  TEST11: SENDALL #MSG28          ;SEND TEST ID
010464  012705  036007                          MOV     #MSG28,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010470  005037  001174                          CLR     MODE
010474  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010500  012703  010756                          MOV     #COLTBL,R3      ;POINTER TO TABLE OF COLUMNS
010504  012737  000001  001160                  MOV     #1,WORK         ;PRESENT POSITION
010512  112337  001162                  1$:     MOVB    (R3)+,WORK1     ;DESTINATION POSITION
010516  001510                                  BEQ     9$              ;BR IF END OF TABLE
010520  123737  001162  001172                  CMPB    WORK1,WIDTH     ;IN RANGE OF PAPER ?
010526  101371                                  BHI     1$              ;NO GET NEW DEST.
010530  123737  001162  001160          2$:     CMPB    WORK1,WORK      ;IF DEST > POS THEN SPACE
010536  001462                                  BEQ     8$              ;IF DECT = POS THEN PRINT X
010540  101023                                  BHI     4$              ;IF DEST < POS THEN
010542  013737  001162  001164                  MOV     WORK1,WORK2     ;IF DEST < POS-12 DO CR FIRST
010550  162737  000012  001164                  SUB     #12,WORK2       ;THEN SPACES
010556  123737  001160  001164                  CMPB    WORK,WORK2
010564  103435                                  BLO     6$
010566                                          SENDALL #MSG08          ;ELSE BACKSPACE 1
010566  012705  035172                          MOV     #MSG08,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010572  005037  001174                          CLR     MODE
010576  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010602  005337  001160                          DEC     WORK            ;POS = POS-1
010606  000750                                  BR      2$

010610  013737  001162  001166          4$:     MOV     WORK1,WORK3     ;CALCULATE # OF SPACES
010616  163737  001160  001166                  SUB     WORK,WORK3      ;DEST - POSITION
010624                                          SENDC2  #40,WORK3       ;SEND SPACES
010624  012705  000040                          MOV     #40,R5          ;GET CHAR TO R5
010630  013737  001166  001174                  MOV     WORK3,MODE              ;GET REPEAT COUNT
010636  112737  000020  001175                  MOVB    #20,MODE+1      ;SET REPEAT MODE
010644  004737  032310                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010650  013737  001162  001160                  MOV     WORK1,WORK      ;POS = DEST
010656  000412                                  BR      8$

010660                                  6$:     SENDALL #MSG09          ;SEND RETURN FIRST
010660  012705  035174                          MOV     #MSG09,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
010664  005037  001174                          CLR     MODE
010670  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
010674  012737  000001  001160                  MOV     #1,WORK         ;POS - 1
010702  000712                                  BR      2$

010704                                  8$:     SENDCH  #'H             ;PRINT AN H
010704  012705  000110                          MOV     #'H,R5          ;GET CHAR TO R5
010710  005037  001174                          CLR     MODE            ;STD MODE
010714  004737  032310                          JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
010720  004737  034250                          JSR     PC,QUIET
010724  005237  001160                          INC     WORK            ;NEW POSITION
010730  005037  001162                          CLR     WORK1
010734  000137  010512                          JMP     1$              ;GET NEW DEST COLMN
```

```
 56100 010740                                 9$:     SENDALL #MSG77          ;SKIP 3 LINES
       010740  012705  037373                         MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       010744  005037  001174                         CLR     MODE
       010750  004737  031706                         JSR     PC,SEND         ;NOW SEND THE MESSAGE
 56200 010754  000207                                 RTS     PC
 56300
 56400
 56500         000012                         .RADIX 10
 56600 010756     035     134     050         COLTBL: .BYTE   29,92,40,128,62,102,110,24,22,9,89,74,126
       010761     200     076     146
       010764     156     030     026
       010767     011     131     112
       010772     176
 56700 010773     151     126     173                 .BYTE   105,86,123,119,129,107,132,91,82,1,101,37,97
       010776     167     201     153
       011001     204     133     122
       011004     001     145     045
       011007     141
 56800 011010     166     130     070                 .BYTE   118,88,56,96,76,38,21,81,32,94,60,17,61
       011013     140     114     046
       011016     025     121     040
       011021     136     074     021
       011024     075
 56900 011025     165     031     105                 .BYTE   117,25,69,114,65,30,98,90,125,12,120,10,70
       011030     162     101     036
       011033     142     132     175
       011036     014     170     012
       011041     106
 57000 011042     037     016     027                 .BYTE   31,14,23,121,6,35,2,13,8,63,67,106,122
       011045     171     006     043
       011050     002     015     010
       011053     077     103     152
       011056     172
 57100 011057     202     044     113                 .BYTE   130,36,75,18,99,16,42,113,5,49,112,33,15
       011062     022     143     020
       011065     052     161     005
       011070     061     160     041
       011073     017
 57200 011074     066     115     047                 .BYTE   54,77,39,73,87,95,115,108,41,124,48,19,4
       011077     111     127     137
       011102     163     154     051
       011105     174     060     023
       011110     004
 57300 011111     177     065     147                 .BYTE   127,53,103,52,93,85,83,50,43,116,59,57,7
       011114     064     135     125
       011117     123     062     053
       011122     164     073     071
       011125     007
 57400 011126     067     107     104                 .BYTE   55,71,68,3,111,100,45,78,11,131,28,84,72
       011131     003     157     144
       011134     055     116     013
       011137     203     034     124
       011142     110
 57500 011143     072     042     054                 .BYTE   58,34,44,47,27,20,79,109,66,64,104,80,26
       011146     057     033     024
       011151     117     155     102
       011154     100     150     120
```

```
        011157      032
 57600  011160      063     C56     000                     .BYTE   51,46,0
 57700
 57800                                               .EVEN
 57900          000010                               .RADIX 8
 58000
```

```
 58200
 58300                          ;.....................................................................
 58400                          ; BUFFER OVERRUN TEST
 58500                          ;       THIS TEST WILL FORCE THE TERMINAL TO TRANSMIT AN XOFF
 58600                          ;       BY JAMMING A SERIES OF TIME CONSUMEING MOVEMENT CHARS
 58700                          ;       INTO THE BUFFER , FOLLOWED BY ENOUGH CHARS TO FILL
 58800                          ;       THE BUFFER. WHEN THE TERMINAL HAS EMPTIED THE BUFFER
 58900                          ;       TO 10 CHARS IT SHOULD SEND AN XON.
 59000                          ;.....................................................................
 59100 011164                   TEST12: SENDALL #MSG37
       011164  012705  036342           MOV     #MSG37,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011170  005037  001174           CLR     MODE
       011174  004737  031706           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 59200 011200                           SENDALL #MSG61          ;CLEAR ALL TAB STOPS
       011200  012705  037304           MOV     #MSG61,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011204  005037  001174           CLR     MODE
       011210  004737  031706           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 59300 011214                           SENDALL #MSG38          ;SET TABS AT COL 1 & 132
       011214  012705  036373           MOV     #MSG38,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011220  005037  001174           CLR     MODE
       011224  004737  031706           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 59400 011230  013737  001152  001166   MOV     NUMLIN,WORK3
 59500 011236  006337  001166           ASL     WORK3
 59600 011242  062737  024554  001166   ADD     #STOP,WORK3
 59700 011250                           SENDALL #MSG41          ;STUFF THE BUFFER FULL
       011250  012705  036477           MOV     #MSG41,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011254  005037  001174           CLR     MODE
       011260  004737  031706           JSR     PC,SEND         ;NOW SEND THE MESSAGE
 59800 011264                           STALL   #9000.          ;SHOULD GET XOFF FROM ALL
       011264  012705  021450           MOV     #9000.,R5               ;SETUP STALL TIME CONSTANT
       011270  004737  033676           JSR     PC,MSTALL
 59900 011274  005037  001160           CLR     WORK            ;CHECK ALL LINES FOR XOFF
 60000 011300  012700  024554   1$:     MOV     #STOP,R0
 60100 011304  063700  001160           ADD     WORK,R0
 60200 011310  020037  001166           CMP     R0,WORK3
 60300 011314  103034                   BHIS    5$
 60400 011316  105710                   TSTB    (R0)    ;BIT7 SET ?
 60500 011320  100006                   BPL     3$              ;NO- POSSABLE ERROR
 60600 011322  042710  000200           BIC     #BIT7,(R0)
 60700 011326  062737  000002  001160   ADD     #2,WORK         ;OK- CHECK NEXT LINE
 60800 011334  000761                   BR      1$
 60900 011336  012702  020634   3$:     MOV     #DZLINE,R2      ;IS LINE ACTIVE ?
 61000 011342  063702  001160           ADD     WORK,R2
 61100 011346  105712                   TSTB    (R2)
 61200 011350  100001                   BPL     4$              ;YES- REAL ERROR NO XOFF
 61300 011352  000765                   BR      2$              ;NO- CHECK NEXT LINE
 61400 011354  006237  001160   4$:     ASR     WORK            ;GET REAL LINE NO.
 61500 011360  013737  001160  001204   MOV     WORK,ONLINE
 61600 011366  012746  036441           MOV     #MSG40,-(SP)    ;MSG ADDR FOR ERROR REPORT
 61700 011372  004737  020352           JSR     PC,ERRORT       ;REPORT ERROR
 61800 011376  000000                   HALT                    ;IF BIT15 IS SET
 61900 011400  006337  001160           ASL     WORK            ;RESTORE POINTER
 62000 011404  000750                   BR      2$              ;CHECK NEXT LINE
 62100 011406                   5$:     STALL   #4000.          ;WAIT FOR TERMINALS TO CATCH UP
       011406  012705  007640           MOV     #4000.,R5               ;SETUP STALL TIME CONSTANT
       011412  004737  033676           JSR     PC,MSTALL
 62200 011416  000240                   NOP
```

```
 62300 011420  005037  001160                    CLR     WORK            ;CHECK ALL LINES FOR XON
 62400 011424  012700  024554              6$:   MOV     #STOP,R0
 62500 011430  063700  001160                    ADD     WORK,R0
 62600 011434  020037  001166                    CMP     R0,WORK3
 62700 011440  103037                            BHIS    15$
 62800 011442  032710  000001                    BIT     #BIT0,(R0)      ;HAS XON BEEN RECVD ?
 62900 011446  001406                            BEQ     8$              ;NO- POSSABLE ERROR
 63000 011450  042710  000001                    BIC     #BIT0,(R0)
 63100 011454  062737  000002  001160        7$: ADD     #2,WORK         ;CHECK NEXT LINE
 63200 011462  000760                            BR      6$
 63300 011464  012702  020634              8$:   MOV     #DZLINE,R2      ;IS LINE ACTIVE ?
 63400 011470  063702  001160                    ADD     WORK,R2
 63500 011474  105712                            TSTB    (R2)            ;TEST BIT 7
 63600 011476  100001                            BPL     9$              ;YES ERROR, NO XON
 63700 011500  000765                            BR      7$              ;NO CONTINUE
 63800 011502  006237  001160              9$:   ASR     WORK            ;GET REAL LINE NO.
 63900 011506  013737  001160  001204            MOV     WORK,ONLINE
 64000 011514  012746  036404                    MOV     #MSG39,-(SP)    ;MSG ADDRESS FOR ERROR REPORT
 64100 011520  004737  020352                    JSR     PC,ERROFT       ;REPORT ERROR NOW
 64200 011524  000000                            HALT                    ;IF BIT15 IS SET
 64300 011526  006337  001160                    ASL     WORK            ;RESTORE POINTER
 64400 011532  052712  000200                    BIS     #BIT7,(R2)      ;DESELECT LINE IT S DEAD.
 64500 011536  000746                            BR      7$
 64600 011540                              15$:  SENDALL #MSG09          ;SEND <CR>
       011540  012705  035174                    MOV     #MSG09,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011544  005037  001174                    CLR     MODE
       011550  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 64700 011554  005037  001160                    CLR     WORK
 64800 011560  012700  024554              16$:  MOV     #STOP,R0        ;CLEAR BITS 7 & 0 IN TABLE
 64900 011564  063700  001160                    ADD     WORK,R0
 65000 011570  020037  001166                    CMP     R0,WORK3
 65100 011574  103006                            BHIS    20$
 65200 011576  042710  000201                    BIC     #201,(R0)       ;CLEAR THE FLAG BITS
 65300 011602  062737  000002  001160            ADD     #2,WORK         ;DO NEXT LINE
 65400 011610  000763                            BR      16$
 65500 011612                              20$:  SENDALL #MSG61          ;CLEAR ALL TABS
       011612  012705  037304                    MOV     #MSG61,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       011616  005037  001174                    CLR     MODE
       011622  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
```

```
100 011626  000207                          RTS     PC
```

```
                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                    ;VERTICAL PITCH TEST
                                    ;SET UP FOR THIS TEST IS DOWN LINE LOADED FROM
                                    ;THE HOST. 6 LINES ARE PRINTED AT EACH OF THE FOLLOWING :
                                    ; 12,8,6,4,3, AND 2 LINES PER INCH.
                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
011630                              TEST13: SENDALL #MSG110         ;SEND TEST ID
011630  012705  040153                      MOV     #MSG110,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
011634  005037  001174                      CLR     MODE
011640  004737  031706                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
011644                                      SENDALL #MSG77          ;SKIP 3 LINES
011644  012705  037373                      MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
011650  005037  001174                      CLR     MODE
011654  004737  031706                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
011660  005037  001160                      CLR     WORK
011664  023727  001160  000012      1$:     CMP     WORK,#12
011672  003111                              BGT     4$
011674  005037  001164                      CLR     WORK2
011700  005037  012134                      CLR     T17A
011704  005037  012136                      CLR     T17B
011710  013737  001160  012134              MOV     WORK,T17A
011716  013737  012134  012136              MOV     T17A,T17B       ;GET TABLE OFFSET
011724  062737  012154  012136              ADD     #TABLVF,T17B
011732  062737  012140  012134              ADD     #TABLV,T17A
011740                                      SENDALL @T17B
011740  017705  000172                      MOV     @T17B,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
011744  005037  001174                      CLR     MODE
011750  004737  031706                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
011754                                      STALL   #250
011754  012705  000250                      MOV     #250,R5         ;SETUP STALL TIME CONSTANT
011760  004737  033676                      JSR     PC,MSTALL
011764  023727  001164  000006      2$:     CMP     WORK2,#6
011772  001445                              BEQ     3$
011774                                      SENDALL #MSG88          ;PRINT MESSAGE LINE
011774  012705  037677                      MOV     #MSG88,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
012000  005037  001174                      CLR     MODE
012004  004737  031706                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
012010                                      SENDALL #MSG89
012010  012705  037727                      MOV     #MSG89,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
012014  005037  001174                      CLR     MODE
012020  004737  031706                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
012024                                      SENDALL #MSG93
012024  012705  037753                      MOV     #MSG93,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
012030  005037  001174                      CLR     MODE
012034  004737  031706                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
012040                                      SENDALL @T17A
012040  017705  000070                      MOV     @T17A,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
012044  005037  001174                      CLR     MODE
012050  004737  031706                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
012054                                      SENDALL #MSG98
012054  012705  040001                      MOV     #MSG98,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
012060  005037  001174                      CLR     MODE
012064  004737  031706                      JSR     PC,SEND         ;NOW SEND THE MESSAGE
012070                                      STALL   #200
012070  012705  000200                      MOV     #200,R5         ;SETUP STALL TIME CONSTANT
012074  004737  033676                      JSR     PC,MSTALL
```

```
012100  005237  001164                          INC      WORK2
012104  000727                                  BR       2$
012106  062737  000002  001160          3$:     ADD      #2,WORK
012114  000663                                  BR       1$
012116                                  4$:     SENDALL  #MSG77          ;SKIP 3 LINES
012116  012705  037373                          MOV      #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
012122  005037  001174                          CLR      MODE
012126  004737  031706                          JSR      PC,SEND         ;NOW SEND THE MESSAGE
012132  000207                                  RTS      PC

012134  000000                          T17A:   .WORD    000000
012136  000000                          T17B:   .WORD    000000
012140  037734  037775  037771          TABLV:  .WORD    MSG90,MSG97,MSG96,MSG95,MSG94,MSG118
012146  037765  037761  040322
012154  040037  040051  040032          TABLVF: .WORD    MSG104,MSG106,MSG103,MSG117,MSG105,MSG102
012162  040315  040044  040025



                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                        ;PRINTER BELL TEST
                                        ;       THIS TEST WILL ISSUE 8 BELL CODES, WITH A DELAY
                                        ;       OF  .1 SEC BETWEEN EACH BELL.
                                        ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

012170                                  TEST14: SENDALL  #MSG120         ;SEND TEST ID
012170  012705  040326                          MOV      #MSG120,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
012174  005037  001174                          CLR      MODE
012200  004737  031706                          JSR      PC,SEND         ;NOW SEND THE MESSAGE
012204  012737  000010  001160                  MOV      #10,WORK        ;8 BELL COUNT
012212  005037  001164                          CLR      WORK2
012216  112737  000007  001164                  MOVB     #7,WORK2
012224                                  1$:     SENDALL  #WORK2
012224  012705  001164                          MOV      #WORK2,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
012230  005037  001174                          CLR      MODE
012234  004737  031706                          JSR      PC,SEND         ;NOW SEND THE MESSAGE
012240                                          STALL    #100
012240  012705  000100                          MOV      #100,R5         ;SETUP STALL TIME CONSTANT
012244  004737  033676                          JSR      PC,MSTALL
012250  005337  001160                          DEC      WORK
012254  001363                                  BNE      1$
012256  000207                                  RTS      PC
```

```
 5900
 6000
 6100                    ;.....................................................................
 6200                    ;MAIN KEYBOARD TEST
 6300                    ;       THIS TEST WILL REQUIRE THE OPERATOR TO TYPE ALL
 6400                    ;       THE PRINTING KEYS ON THE KEYBOARD. IF ANY KEYS ARE
 6500                    ;       NOT SEEN BY THE PROGRAM THEY WILL BE REQUESTED
 6600                    ;       AGAIN, AND A THIRD TIME IF NECESSARY.
 6700                    ;       INSTRUCTIONS WILL BE TYPED TO PRESS THE SHIFTS
 6800                    ;       CAPS-LOC, ECS, AND FUNCTION KEYS.
 6900                    ;       FIVE SECONDS IS ALLOWED PER KEY .
 7000                    ;.....................................................................
 7100 012260  005037  001204          TEST20: CLR     ONLINE          ;SET CURRENT LINE TO ZERO
 7200 012264  013737  001204  001160  1$:     MOV     ONLINE,WORK
 7300 012272  006337  001160                  ASL     WORK
 7400 012276  013702  001160                  MOV     WORK,R2
 7500 012302  023737  001204  001152          CMP     ONLINE,NUMLIN   ;ALL DONE  ?
 7600 012310  103402                          BLO     .+6
 7700 012312  000137  014370                  JMP     END22           ;YES EXIT
 7800 012316  105762  020634                  TSTB    DZLINE(R2)      ;IS THIS LINE SELECTED ?
 7900 012322  100003                          BPL     2$              ;YES DO TEST
 8000 012324  005237  001204                  INC     ONLINE          ;NO GET NEXT LINE NO
 8100 012330  000755                          BR      1$
 8200 012332                          2$:     SENDI   #MSG164,ONLINE          ;SEND TEST ID
      012332  012705  041344                  MOV     #MSG164,R5              ;MESSAGE ADDRESS TO R5
      012336  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      012344  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      012352  004737  031706                  JSR     PC,SEND
 8300 012356  005037  014302                  CLR     FLAG21          ;CLEAR TEST FLAG BITS
 8400 012362                                  SENDI   #MSG140,ONLINE          ;PRINT INSTRUCTIONS
      012362  012705  040442                  MOV     #MSG140,R5              ;MESSAGE ADDRESS TO R5
      012366  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      012374  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      012402  004737  031706                  JSR     PC,SEND
 8500 012406  012737  012734  001140  3$:     MOV     #6$,HOOK        ;LINKAGE TO RECV ROUTINE
 8600 012414  042737  004000  014302          BIC     #BIT11,FLAG21           ;RESET LEFTOVER FLAG
 8700 012422  004737  034250                  JSR     PC,QUIET
 8800 012426                                  STALL   #5000.          ;5 SECOND TIMEOUT
      012426  012705  011610                  MOV     #5000.,R5               ;SETUP STALL TIME CONSTANT
      012432  004737  033676                  JSR     PC,MSTALL
 8900 012436  032737  020000  014302          BIT     #BIT13,FLAG21   ;CHAR IN SET ?
 9000 012444  001445                          BEQ     4$
 9100 012446  012703  014140                  MOV     #KEYTBL,R3      ;POINT TO KEY TABLE
 9200 012452  020327  014300          7$:     CMP     R3,#KEYEND      ;ALL DONE ?
 9300 012456  103405                          BLO     8$              ;NO
 9400 012460  004737  013772                  JSR     PC,T21E         ;REPORT ERROR.....
 9500 012464  005237  001110                  INC     ERROR
 9600 012470  000746                          BR      3$
 9700 012472  123713  001170          8$:     CMPB    CHARIN,(R3)             ;COMPARE TO TABLE
 9800 012476  001403                          BEQ     9$
 9900 012500  062703  000002                  ADD     #2,R3           ;POINT TO NEXT ENTRY
10000 012504  000762                          BR      7$              ;KEEP LOOKING
10100 012506  052713  100000          9$:     BIS     #BIT15,(R3)     ;SET CHAR IN FLAG
10200 012512  113737  001170  001162          MOVB    CHARIN,WORK1    ;ECHO THE CHARACTER
10300 012520                                  SENDI   #WORK1,ONLINE
      012520  012705  001162                  MOV     #WORK1,R5               ;MESSAGE ADDRESS TO R5
      012524  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
```

```
 012532  113737  001204  001174              MOVB    ONLINE,MODE                 ;SELECTED LINE NO.
 012540  004737  031706                      JSR     PC,SEND
 012544  032737  010000  014302              BIT     #BIT12,FLAG21     ;CHECK FOR DONE BIT
 012552  001715                              BEQ     3$
 012554  000137  013010                      JMP     11$               ;ELSE TIMEOUT ERROR
 012560  105737  014302              4$:     TSTB    FLAG21            ;FIRST TIMEOUT ?
 012564  100045                              BPL     5$                ;YES TRY AGAIN
 012566                                      SENDI   #MSG146,ONLINE              ;NO SPACE MSG.....
 012566  012705  041001                      MOV     #MSG146,R5                  ;MESSAGE ADDRESS TO R5
 012572  112737  000010  001175              MOVB    #10,MODE+1        ;SET SINGLE LINE MODE
 012600  113737  001204  001174              MOVB    ONLINE,MODE                 ;SELECTED LINE NO.
 012606  004737  031706                      JSR     PC,SEND
 012612                                      SENDI   #MSG165,ONLINE
 012612  012705  041374                      MOV     #MSG165,R5                  ;MESSAGE ADDRESS TO R5
 012616  112737  000010  001175              MOVB    #10,MODE+1        ;SET SINGLE LINE MODE
 012624  113737  001204  001174              MOVB    ONLINE,MODE                 ;SELECTED LINE NO.
 012632  004737  031706                      JSR     PC,SEND
 012636                                      SENDI   #MSG143,ONLINE
 012636  012705  040730                      MOV     #MSG143,R5                  ;MESSAGE ADDRESS TO R5
 012642  112737  000010  001175              MOVB    #10,MODE+1        ;SET SINGLE LINE MODE
 012650  113737  001204  001174              MOVB    ONLINE,MODE                 ;SELECTED LINE NO.
 012656  004737  031706                      JSR     PC,SEND
 012662  042737  000200  014302              BIC     #BIT7,FLAG21
 012670  005237  001110                      INC     ERROR
 012674  000137  013374                      JMP     17$               ;GO TO SECTN-2
 012700                              5$:     SENDI   #MSG142,ONLINE              ;HIT SPACE MSG.....
 012700  012705  040666                      MOV     #MSG142,R5                  ;MESSAGE ADDRESS TO R5
 012704  112737  000010  001175              MOVB    #10,MODE+1        ;SET SINGLE LINE MODE
 012712  113737  001204  001174              MOVB    ONLINE,MODE                 ;SELECTED LINE NO.
 012720  004737  031706                      JSR     PC,SEND
 012724  052737  000200  014302              BIS     #BIT7,FLAG21      ;SET 2ND TRY FLAG
 012732  000625                              BR      3$

                                     ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                     ;  SCAN ROUTINE

 012734  005037  001146              6$:     CLR     LOOPO             ;RESET TIMEOUT COUNT
 012740  005037  001162                      CLR     WORK1
 012744  042705  177600                      BIC     #177600,R5                  ;CLEAR PARITY BIT
 012750  010537  001170                      MOV     R5,CHARIN
 012754  052737  020000  014302              BIS     #BIT13,FLAG21     ;SET CHAR IN FLAG
 012762  120527  000040                      CMPB    R5,#40            ;IS CHAR A SPACE ?
 012766  001403                              BEQ     111$
 012770  004737  033446              10$:    JSR     PC,KBOUT          ;REMOVE CHAR FROM BUFFER
 012774  000207                              RTS     PC
 012776  000240                      111$:   NOP
 013000  052737  010000  014302              BIS     #BIT12,FLAG21     ;SET DONE FLAG
 013006  000770                              BR      10$

                                     ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;.
                                     ; LEFTOVERS SCAN ROUTINE

 013010                              11$:    SENDI   #MSG75,ONLINE               ;CRLF
 013010  012705  037370                      MOV     #MSG75,R5                   ;MESSAGE ADDRESS TO R5
 013014  112737  000010  001175              MOVB    #10,MODE+1        ;SET SINGLE LINE MODE
 013022  113737  001204  001174              MOVB    ONLINE,MODE                 ;SELECTED LINE NO.
 013030  004737  031706                      JSR     PC,SEND
```

```
013034 012703 014140                    MOV     #KEYTBL,R3      ;POINT TO TABLE
013040 042737 010000 014302             BIC     #BIT12,FLAG21
013046 005037 001162                    CLR     WORK1
013052 020327 014300            12$:    CMP     R3,#KEYEND      ;DONE YET ?
013056 001431                           BEQ     13$             ;YES ..GO TO 13$
013060 005723                           TST     (R3)+           ;CHECK CHAR IN FLAG(BIT 15)
013062 100773                           BMI     12$
013064 005037 001160                    CLR     WORK
013070 052737 004000 014302             BIS     #BIT11,FLAG21   ;SET LEFTOVER KEY FLAG
013076 005303                           DEC     R3
013100 114337 041307                    MOVB    -(R3),MSG162    ;PUT CHAR IN MSG
013104                                  SENDI   #MSG162,ONLINE          ;AND TYPE IT OUT
013104 012705 041307                    MOV     #MSG162,R5              ;MESSAGE ADDRESS TO R5
013110 112737 000010 001175             MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
013116 113737 001204 001174             MOVB    ONLINE,MODE             ;SELECTED LINE NO.
013124 004737 031706                    JSR     PC,SEND
013130 004737 034250                    JSR     PC,QUIET
013134 062703 000002                    ADD     #2,R3           ;GET NEXT TABLE ENTRY
013140 000744                           BR      12$             ;KEEP SCANNING FOR LEFTOVERS
013142 032737 004000 014302     13$:    BIT     #BIT11,FLAG21   ;ANY LEFTOVERS ?
013150 001465                           BEQ     15$             ;NO GO CLEAN THE TABLE ETC.
013152                                  SENDI   #MSG143,ONLINE          ;NOT SEEN MSG.....
013152 012705 040730                    MOV     #MSG143,R5              ;MESSAGE ADDRESS TO R5
013156 112737 000010 001175             MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
013164 113737 001204 001174             MOVB    ONLINE,MODE             ;SELECTED LINE NO.
013172 004737 031706                    JSR     PC,SEND
013176 012703 014276                    MOV     #KEYEND-2,R3
013202 042713 100000                    BIC     #BIT15,(R3)     ;RESET SPACE  IN FLAG
013206 005237 014302                    INC     FLAG21          ;OPERATOR GETS THREE TRIES
013212 013737 014302 001160             MOV     FLAG21,WORK
013220 042737 177770 001160             BIC     #-8.,WORK
013226 023727 001160 000003             CMP     WORK,#3
013234 003026                           BGT     14$             ;3 STRIKES YOU'RE OUT !!!
013236                                  SENDI   #MSG144,ONLINE          ;TRY AGAIN MSG.....
013236 012705 040764                    MOV     #MSG144,R5              ;MESSAGE ADDRESS TO R5
013242 112737 000010 001175             MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
013250 113737 001204 001174             MOVB    ONLINE,MODE             ;SELECTED LINE NO.
013256 004737 031706                    JSR     PC,SEND
013262                                  SENDI   #MSG145,ONLINE  ;HIT SPACE LAST MSG.....
013262 012705 040632                    MOV     #MSG145,R5              ;MESSAGE ADDRESS TO R5
013266 112737 000010 001175             MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
013274 113737 001204 001174             MOVB    ONLINE,MODE             ;SELECTED LINE NO.
013302 004737 031706                    JSR     PC,SEND
013306 000137 012406                    JMP     3$
                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
013312 012746 040730            14$:    MOV     #MSG143,-(SP)           ;NEVER RECVD  ERROR MSG....
013316 004737 020352                    JSR     PC,ERRORT
013322 000000                           HALT
013324 012703 014140            15$:    MOV     #KEYTBL,R3      ;CLEAN THE TABLE FLAGS
013330 042723 100000            16$.    BIC     #BIT15,(R3)+
013334 020327 014300                    CMP     R3,#KEYEND
013340 103773                           BLO     16$
013342 005037 014302                    CLR     FLAG21
013346                                  SENDI   #MSG77,ONLINE           ;SKIP 3 LINES
013346 012705 037373                    MOV     #MSG77,R5               ;MESSAGE ADDRESS TO R5
013352 112737 000010 001175             MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
013360 113737 001204 001174             MOVB    ONLINE,MODE             ;SELECTED LINE NO.
```

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 013366  004737  031706                 JSR     PC,SEND
 013372  000240                         NOP

                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                ; SECTION - 2  SHIFT,CAPS-LOC, ESC, CTL.

 013374  012737  014304  001166  17$:   MOV     #CTLTBL,WORK3
 013402  012703  014312                 MOV     #SHITBL-2,R3
 013406  012704  014352                 MOV     #CODTBL,R4
 013412  012737  013740  001140         MOV     #22$,HOOK
 013420  005777  165542          18$:   TST     @WORK3          ;END OF CTLTBL  ?
 013424  001004                         BNE     19$
 013426  005237  001204                 INC     ONLINE          ;SELECT NEXT LINE
 013432  000137  012264                 JMP     1$              ;YES EXIT TEST
 013436  062703  000002          19$:   ADD     #2,R3
 013442  005713                         TST     (R3)    ;END OF SHITBL ?
 013444  001004                         BNE     20$
 013446  062737  000002  001166         ADD     #2,WORK3
 013454  000761                         BR      18$
 013456  042737  000200  014302  20$:   BIC     #BIT7,FLAG21            ;CLEAR DONE FLAG
 013464                                 SENDI   #MSG150,ONLINE                  ;SEND INSTRUNTIONS
 013464  012705  041055                 MOV     #MSG150,R5              ;MESSAGE ADDRESS TO R5
 013470  112737  000010  001175         MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
 013476  113737  001204  001174         MOVB    ONLINE,MODE             ;SELECTED LINE NO.
 013504  004737  031706                 JSR     PC,SEND
 013510                                 SENDI   @WORK3,ONLINE   ;SEND INSTRUCTION #2
 013510  017705  165452                 MOV     @WORK3,R5               ;MESSAGE ADDRESS TO R5
 013514  112737  000010  001175         MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
 013522  113737  001204  001174         MOVB    ONLINE,MODE             ;SELECTED LINE NO.
 013530  004737  031706                 JSR     PC,SEND
 013534                                 SENDI   (R3),ONLINE
 013534  011305                         MOV     (R3),R5         ;MESSAGE ADDRESS TO R5
 013536  112737  000010  001175         MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
 013544  113737  001204  001174         MOVB    ONLINE,MODE             ;SELECTED LINE NO.
 013552  004737  031706                 JSR     PC,SEND
 013556  004737  034250                 JSR     PC,QUIET
 013562                                 STALL   #5000.                  ;WAIT 5 SECONDS
 013562  012705  011610                 MOV     #5000.,R5               ;SETUP STALL TIME CONSTANT
 013566  004737  033676                 JSR     PC,MSTALL
 013572  105737  014302                 TSTB    FLAG21                  ;DONE FLAG SET  ?
 013576  100445                         BMI     21$                     ;YES  BRANCH
 013600                                 SENDI   #MSG146,ONLINE          ;ERROR DIDN'T RECV CHAR
 013600  012705  041001                 MOV     #MSG146,R5              ;MESSAGE ADDRESS TO R5
 013604  112737  000010  001175         MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
 013612  113737  001204  001174         MOVB    ONLINE,MODE             ;SELECTED LINE NO.
 013620  004737  031706                 JSR     PC,SEND
 013624  162703  000002                 SUB     #2,R3
 013630                                 SENDI   (R3)+,ONLINE
 013630  012305                         MOV     (R3)+,R5                ;MESSAGE ADDRESS TO R5
 013632  112737  000010  001175         MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
 013640  113737  001204  001174         MOVB    ONLINE,MODE             ;SELECTED LINE NO.
 013646  004737  031706                 JSR     PC,SEND
 013652                                 SENDI   #MSG143,ONLINE
 013652  012705  040730                 MOV     #MSG143,R5              ;MESSAGE ADDRESS TO R5
 013656  112737  000010  001175         MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
 013664  113737  001204  001174         MOVB    ONLINE,MODE             ;SELECTED LINE NO.
 013672  004737  031706                 JSR     PC,SEND
```

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013676  005237  001110                    INC     ERROR
013702  005737  001116                    TST     SO              ;HALT ON ERROR ?
013706  100253                            BPL     19$
013710  000000                            HALT                    ;IF BIT 15 SET
013712  000240                    21$:    NOP
013714  123724  001170                    CMPB    CHARIN,(R4)+    ;CHECK FOR CORRECT CODE
013720  001646                            BEQ     19$
013722  004737  013772                    JSR     PC,T21E         ;CALL ERROR ROUTINE
013726  005304                            DEC     R4
013730  162703  000002                    SUB     #2,R3
013734  000137  013436                    JMP     19$

                                  ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                  ; CODE CHECKER ROUTINE

013740  000240                    22$:    NOP             ;GET CHAR FROM FIFO
013742  052737  000200  014302            BIS     #BIT7,FLAG21    ;SET DONE FLAG
013750  042705  177600                    BIC     #177600,R5              ;CLEAR PARITY BIT
013754  010537  001170                    MOV     R5,CHARIN
013760  005037  001146            23$:    CLR     LOOPO           ;TURN OFF TIMER
013764  004737  033446                    JSR     PC,KBOUT
013770  000207                            RTS     PC

                                  ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                  ;BAD CHAR CODE ROUTINE

013772  032737  020000  001116    T21E:   BIT     #BIT13,SO       ;CHECK SW 13
014000  001056                            BNE     26$
014002  013737  001170  001134            MOV     CHARIN,TEMP             ;SET UP CONVERTER
014010  012705  020600                    MOV     #EBUF,R5
014014  004737  033730                    JSR     PC,BIOCT        ;CONVERT TO ASCII
014020  113737  020603  041132            MOVB    EBUF+3,MSG149
014026  113737  020604  041133            MOVB    EBUF+4,MSG149+1.
014034  113737  020605  041134            MOVB    EBUF+5,MSG149+2.
014042                                    SENDI   #MSG146,ONLINE
014042  012705  041001                    MOV     #MSG146,R5              ;MESSAGE ADDRESS TO R5
014046  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
014054  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
014062  004737  031706                    JSR     PC,SEND
014066                                    SENDI   #MSG148,ONLINE
014066  012705  041014                    MOV     #MSG148,R5              ;MESSAGE ADDRESS TO R5
014072  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
014100  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
014106  004737  031706                    JSR     PC,SEND
014112                                    SENDI   #MSG149,ONLINE
014112  012705  041132                    MOV     #MSG149,R5              ;MESSAGE ADDRESS TO R5
014116  112737  000010  001175            MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
014124  113737  001204  001174            MOVB    ONLINE,MODE             ;SELECTED LINE NO.
014132  004737  031706                    JSR     PC,SEND
014136  000207                    26$:    RTS     PC


014140  000054  000055  000056    KEYTBL: .WORD   54,55,56,57,60,61,62,63,64,73,47
014146  000057  000060  000061
014154  000062  000063  000064
014162  000073  000047
014166  000065  000066  000067            .WORD   65,66,67,70,71,75,133,134,135
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```
        014174  000070  000071  000075
        014202  000133  000134  000135
 24900  014210  000140  000141  000142          .WORD   140,141,142,143,144,145,146,147
        014216  000143  000144  000145
        014224  000146  000147
 25000  014230  000150  000151  000152          .WORD   150,151,152,153,154,155,156,157
        014236  000153  000154  000155
        014244  000156  000157
 25100  014250  000160  000161  000162          .WORD   160,161,162,163,164,165,166,167
        014256  000163  000164  000165
        014264  000166  000167
 25200  014270  000170  000171  000172          .WORD   170,171,172,40
        014276  000040
 25300  014300  000000                  KEYEND: .WORD   0
 25400  014302  000000                  FLAG21: .WORD   0
 25500
 25600  014304  041446  041110  041212  CTLTBL: .WORD   MSG170,MSG156,MSG157,0
        014312  000000
 25700
 25800  014314  041136  041066  041255  SHITBL: .WORD   MSG151,MSG152,MSG158,MSG159,MSG154,MSG166
        014322  041263  041167  041402
 25900  014330  041416  041431  000000          .WORD   MSG167,MSG168,000000,MSG169,MSG153,000000
        014336  041442  041163  000000
 26000  014344  041442  041163  000000          .WORD   MSG169,MSG153,000000
 26100
 26200  014352     101     102     011  CODTBL: .BYTE   101,102,011,015,020,010,012,177,104,044,104,064,0
        014355     015     020     010
        014360     012     177     104
        014363     044     104     064
        014366     000
 26300                               .EVEN
 26400
 26500  014370  005037  001146          END22:  CLR     LOOPO
 26600  014374  005037  001204                  CLR     ONLINE
 26700  014400  005037  014302                  CLR     FLAG21
 26800  014404  005037  001140                  CLR     HOOK
 26900  014410  000207                          RTS     PC
 27000
```

```
                                          ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                          ; CHARACTER CODE ECHO TEST 21
                                          ;       THIS TEST WILL ECHO THE OCTAL CODE OF THE CHARACTER
                                          ;       RECIEVED, ALONG WITH THE CHARACTER IF IT IS PRINTABLE.
                                          ;       IF NONPRINTABLE THE MNEMONIC WILL BE RETURNED.
                                          ;       TYPE A DELETE TO EXIT THIS TEST.
                                          ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

014412  005037  001204                    TEST21: CLR ONLINE                     ;SU FOR LINE 0
014416  005037  014302                            CLR FLAG21
014422  013700  001204                    1$:     MOV     ONLINE,R0
014426  006300                                    ASL     R0                     ;MAKE WORD OFFSET TO TABLES
014430  023737  001204  001152                    CMP     ONLINE,NUMLIN          ;DONE YET ?
014436  103402                                    BLO     4$
014440  000137  015146                            JMP     20$
014444  105760  020634                    4$:     TSTB    DZLINE(R0)             ;IS LINE SELECTED ?
014450  100003                                    BPL     2$                     ;YES- GO TEST LINE
014452  005237  001204                            INC     ONLINE                 ;NO- TRY NEXT LINE
014456  000761                                    BR      1$

014460                                    2$:     SENDI   #MSG18,ONLINE          ;SEND TEST ID MSG
014460  012705  035524                            MOV     #MSG18,R5                      ;MESSAGE ADDRESS TO R5
014464  112737  000010  001175                    MOVB    #10,MODE+1             ;SET SINGLE LINE MODE
014472  113737  001204  001174                    MOVB    ONLINE,MODE                    ;SELECTED LINE NO.
014500  004737  031706                            JSR     PC,SEND
014504  012737  015164  001140                    MOV     #30$,HOOK
014512  004737  034250                    3$:     JSR     PC,QUIET               ;WAIT FOR PRINTING TO FINISH
014516                                            STALL   #10000                 ;THEN WAIT 10 SECONDS
014516  012705  010000                            MOV     #10000,R5                      ;SETUP STALL TIME CONSTANT
014522  004737  033676                            JSR     PC,MSTALL
014526  032737  000004  014302                    BIT     #BIT2,FLAG21           ;CHAR RECVD FLAG SET ?
014534  001013                                    BNE     5$                     ;YES GOTO 5
014536                                            SENDI   #MSGK3,ONLINE          ;NO- PROMPT OPERATOR
014536  012705  042366                            MOV     #MSGK3,R5                      ;MESSAGE ADDRESS TO R5
014542  112737  000010  001175                    MOVB    #10,MODE+1             ;SET SINGLE LINE MODE
014550  113737  001204  001174                    MOVB    ONLINE,MODE                    ;SELECTED LINE NO.
014556  004737  031706                            JSR     PC,SEND
014562  000753                                    BR      3$

014564  005037  014302                    5$:     CLR     FLAG21
014570  123727  001170  000177                    CMPB    CHARIN,#177                    ;DELETE CHAR ?
014576  001557                                    BEQ     10$                    ;YES JUMP TO 10
014600  005037  001160                            CLR     WORK
014604  113737  001170  001160                    MOVB    CHARIN,WORK                    ;SAVE CHAR
014612  113737  001160  001134                    MOVB    WORK,TEMP                      ;SU TO CONVERT TO OCTAL/ASCII
014620  105037  001135                            CLRB    TEMP+1
014624  012705  016324                            MOV     #T30BUF,R5
014630  004737  033730                            JSR     PC,BIOCT               ;CONVERT & STORE AT T30BUF
014634  113737  016327  041132                    MOVB    T30BUF+3,MSG149
014642  113737  016330  041133                    MOVB    T30BUF+4,MSG149+1
014650  113737  016331  041134                    MOVB    T30BUF+5,MSG149+2
014656                                            SENDI   #MSG149,ONLINE         ;SEND OCTAL DATA
014656  012705  041132                            MOV     #MSG149,R5                     ;MESSAGE ADDRESS TO R5
014662  112737  000010  001175                    MOVB    #10,MODE+1             ;SET SINGLE LINE MODE
014670  113737  001204  001174                    MOVB    ONLINE,MODE                    ;SELECTED LINE NO.
014676  004737  031706                            JSR     PC,SEND
014702                                            SENDI   #MSG115,ONLINE         ;AND AN '='
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                014702  012705  040257                  MOV     #MSG115,R5              ;MESSAGE ADDRESS TO R5
                014706  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
                014714  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
                014722  004737  031706                  JSR     PC,SEND
 31500          014726  004737  034250                  JSR     PC,QUIET
 31600          014732  123727  001160  000040          CMPB    WORK,#40        ;PRINTABLE CHARACTER ?
 31700          014740  101034                          BHI     7$              ;YES- GOTO 7
 31800
 31900          014742  012704  041132          6$:     MOV     #MSG149,R4
 32000          014746  005003                          CLR     R3
 32100          014750  113703  001160                  MOVB    WORK,R3
 32200          014754  006337  001160                  ASL     WORK
 32300          014760  063703  001160                  ADD     WORK,R3         ;CODE *3 FOR TABLE OFFSET
 32400          014764  116324  036163                  MOVB    MSG33(R3),(R4)+
 32500          014770  005203                          INC     R3
 32600          014772  116324  036163                  MOVB    MSG33(R3),(R4)+
 32700          014776  005203                          INC     R3
 32800          015000  116314  036163                  MOVB    MSG33(R3),(R4)  ;GET MNEMONIC CHARS
 32900          015004                                  SENDI   #MSG149,ONLINE          ;PRINT CHAR MNEMONIC
                015004  012705  041132                  MOV     #MSG149,R5              ;MESSAGE ADDRESS TO R5
                015010  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
                015016  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
                015024  004737  031706                  JSR     PC,SEND
 33000          015030  000415                          BR      8$
 33100
 33200          015032  113737  001170  037330  7$:     MOVB    CHARIN,MSG70    ;ECHO RECVD CHARACTER
 33300          015040                                  SENDI   #MSG70,ONLINE
                015040  012705  037330                  MOV     #MSG70,R5               ;MESSAGE ADDRESS TO R5
                015044  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
                015052  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
                015060  004737  031706                  JSR     PC,SEND
 33400          015064  032760  040000  031566  8$:     BIT     #BIT14,RECERR(R0)       ;PARITY OK ?
 33500          015072  001405                          BEQ     9$
 33600          015074  012746  035415                  MOV     #MSG15,-(SP)    ;NO CALL ERROR RTN.
 33700          015100  004737  020352                  JSR     PC,ERRORT
 33800          015104  000000                          HALT                    ;IF BIT 15 SET IN SWR
 33900          015106                          9$:     SENDI   #MSG75,ONLINE
                015106  012705  037370                  MOV     #MSG75,R5               ;MESSAGE ADDRESS TO R5
                015112  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
                015120  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
                015126  004737  031706                  JSR     PC,SEND
 34000          015132  000137  014512                  JMP     3$
 34100          015136  005237  001204          10$:    INC     ONLINE          ;TEST NEXT LINE
 34200          015142  000137  014422                  JMP     1$
 34300
 34400          015146                          20$:    SENDALL #MSG77
                015146  012705  037373                  MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
                015152  005037  001174                  CLR     MODE
                015156  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 34500          015162  000207                          RTS     PC
 34600
 34700          015164  005037  001146          30$:    CLR     LOOPO           ;ABORT TIMEOUT
 34800          015170  052737  000004  014302          BIS     #BIT2,FLAG21    ;SET CHAR RECVD FLAG
 34900          015176  042705  177600                  BIC     #177600,R5
 35000          015202  010537  001170                  MOV     R5,CHARIN
 35100          015206  004737  033446                  JSR     PC,KBOUT
 35200          015212  000207                          RTS     PC              ;TO RECV RTN.
```

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                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                    ; PITCH SETUP TEST
                                    ;       THIS TEST WILL REQUIRE THE OPERATOR TO ENTER
                                    ;       SETUP MODE, AND CHANGE THE MODE TO THAT SPECIFIED.
                                    ;       A LINE OR LINES OF DATA WILL BE PRINTED AND
                                    ;       SHOULD BE AT THE NEW PITCH.
                                    ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

015214  005037  001204              TEST22: CLR     ONLINE          ;START ON LINE 0
015220  012701  015622                      MOV     #TABL24,R1
015224  005037  001160                      CLR     WORK
015230  012737  015602  001140              MOV     #11$,HOOK               ;SET INTR CATCHER
015236  013700  001204              1$:     MOV     ONLINE,R0
015242  006300                              ASL     R0
015244  023737  001204  001152              CMP     ONLINE,NUMLIN           ;DONE ALL LINES ?
015252  001550                              BEQ     10$                     ;YES JUMP
015254  105760  020634                      TSTB    DZLINE(R0)              ;ACTIVE LINE ?
015260  100003                              BPL     2$                      ;YES- START TESTS
015262  005237  001204                      INC     ONLINE                  ;NO- TRY NEXT LINE
015266  000763                              BR      1$
015270                              2$:     SENDI   #MSG320,ONLINE          ;SEND TEST ID
015270  012705  042136                      MOV     #MSG320,R5              ;MESSAGE ADDRESS TO R5
015274  112737  000010  001175              MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
015302  113737  001204  001174              MOVB    ONLINE,MODE             ;SELECTED LINE NO.
015310  004737  031706                      JSR     PC,SEND
015314  005037  001164                      CLR     WORK2                   ;SUBTEST 0 OF 9
015320  023727  001164  000012      3$:     CMP     WORK2,#10.              ;DONE 10 YET?
015326  002403                              BLT     4$                      ;NO KEEP TESTING
015330  005237  001204                      INC     ONLINE                  ;YES GET NEXT LINE
015334  000740                              BR      1$
015336                              4$:     SENDI   #MSG303,ONLINE          ;SEND INSTRUCTIONS
015336  012705  041617                      MOV     #MSG303,R5              ;MESSAGE ADDRESS TO R5
015342  112737  000010  001175              MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
015350  113737  001204  001174              MOVB    ONLINE,MODE             ;SELECTED LINE NO.
015356  004737  031706                      JSR     PC,SEND
015362  013701  001164                      MOV     WORK2,R1                ;POINT TO MSG TABLE
015366  006301                              ASL     R1
015370                                      SENDI   TABL24(R1),ONLINE       ;SEND MSG FOR SUBTEST
015370  016105  015622                      MOV     TABL24(R1),R5           ;MESSAGE ADDRESS TO R5
015374  112737  000010  001175              MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
015402  113737  001204  001174              MOVB    ONLINE,MODE             ;SELECTED LINE NO.
015410  004737  031706                      JSR     PC,SEND
015414                                      SENDI   #MSG304,ONLINE
015414  012705  041676                      MOV     #MSG304,R5              ;MESSAGE ADDRESS TO R5
015420  112737  000010  001175              MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
015426  113737  001204  001174              MOVB    ONLINE,MODE             ;SELECTED LINE NO.
015434  004737  031706                      JSR     PC,SEND
015440  012737  177777  001136              MOV     #-1,NOTYET      ;GETS CLEARED BY XON MSG
015446                              5$:     STALL   #15000.         ;ALLOW SETUP TIME 15 SEC
015446  012705  035230                      MOV     #15000.,R5              ;SETUP STALL TIME CONSTANT
015452  004737  033676                      JSR     PC,MSTALL
015456  005737  001136                      TST     NOTYET          ;SEEN XON YET ?
015462  001420                              BEQ     7$              ;YES CONTINUE
015464  105761  024554                      TSTB    STOP(R1)        ;LINE SELECTED ?
015470  100410                              BMI     6$              ;YES WAIT MORE TIME
015472  012746  036441                      MOV     #MSG40,-(SP)    ;REPORT ERROR
015476  004737  020352                      JSR     PC,ERRORT
```

```
 39300 015502  000000                          HALT                    ;IF SW 15 SET
 39400 015504  005237  001204                  INC     ONLINE          ;TRY NEXT LINE
 39500 015510  000652                          BR      1$
 39600 015512  000240                  6$:     NOP
 39700 015514  105062  024554                  CLRB    STOP(R2)
 39800 015520  000137  015446                  JMP     5$
 39900 015524  000240                  7$:     NOP
 40000 015526  005761  015650                  TST     TAB24B(R1)
 40100 015532  001414                          BEQ     9$              ;YES    JUMP
 40200 015534                                  SENDI   TAB24B(R1),ONLINE       ;SEND THE MSG
       015534  016105  015650                  MOV     TAB24B(R1),R5           ;MESSAGE ADDRESS TO R5
       015540  112737  000010  001175          MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
       015546  113737  001204  001174          MOVB    ONLINE,MODE             ;SELECTED LINE NO.
       015554  004737  031706                  JSR     PC,SEND
 40300 015560  004737  034250                  JSR     PC,QUIET
 40400 015564  005237  001164          9$:     INC     WORK2           ;SU NEXT SUBTEST
 40500 015570  000137  015320                  JMP     3$
 40600 015574  005037  001140          10$.    CLR     HOOK            ;RELEASE INTR CATCHER
 40700 015600  000207                          RTS     PC              ;EXIT.......
 40800
 40900
 41000 015602  122705  000021          11$:    CMPB    #21,R5          ;XON ?
 41100 015606  001004                          BNE     12$
 41200 015610  005037  001136                  CLR     NOTYET          ;CLEAR IN XON
 41300 015614  005037  001146                  CLR     LOOPO           ;ABORT TIMEOUT
 41400 015620  000207                  12$:    RTS     PC
 41500
 41600
 41700 015622  041755  041767  042001  TABL24: .WORD   MSG309,MSG310,MSG311,MSG312,MSG317,MSG314
       015630  042013  042075  042037
 41800 015636  042025  041743  042063          .WORD   MSG313,MSG308,MSG316,MSG315,000000
       015644  042051  000000
 41900
 42000 015650  040056  040056  040056  TAB24B: .WORD   MSG107,MSG107,MSG107,MSG107,MSG321
       015656  040056  042164
 42100 015662  042224  042244  042264          .WORD   MSG322,MSG323,MSG324,MSG325,MSG326,000000
       015670  042274  042304  000000
```

```
                                         ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                         ; LIFE TEST  #15
                                         ;             THIS TEST WILL PRINT A CONTINUOUS PATTERN
                                         ;             OF ALL PRINTABLE CHARACTERS. EACH CHARACTER
                                         ;             WILL BE PRINTED ON 2 FULL LINES,
                                         ;             WITH THE PASS COUNT INBEDDED IN THE LINES.
                                         ;             THIS PATTERN WILL PRECESS 1 CHAR POSITION
                                         ;             EACH LINE PRINTED.
                                         ;             LOOPING IS CONTROLLED BY SWITCH #12.
                                         ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

015676                                   TEST15: SENDALL #MSG270        ;SEND TEST ID
015676  012705  041527                           MOV     #MSG270,R5     ;BUILD SEND CALL USING MESSAGE ADDRESS
015702  005037  001174                           CLR     MODE
015706  004737  031706                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
015712  005037  001124                           CLR     PASSNO         ; START WITH PASS 0
015716  032737  010000  001116                   BIT     #BIT12,SO      ;IF LOOPING GO TO SECTION 4
015724  001021                                   BNE     3$
015726                                           SENDC2  #'A,WIDTH      ;PRINT A FULL LINE OF A'S
015726  012705  000101                           MOV     #'A,R5         ;GET CHAR TO R5
015732  013737  001172  001174                   MOV     WIDTH,MODE             ;GET REPEAT COUNT
015740  112737  000020  001175                   MOVB    #20,MODE+1     ;SET REPEAT MODE
015746  004737  032310                           JSR     PC,CHROUT      ;CALL CHAR OUTPUT ROUTINE
015752                                   2$:     SENDALL #MSG77         ;SKIP 3 LINES
015752  012705  037373                           MOV     #MSG77,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
015756  005037  001174                           CLR     MODE
015762  004737  031706                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
015766  000207                                   RTS     PC             ;EXIT...............

015770  013737  001172  001160           3$:     MOV     WIDTH,WORK     ;GET WIDTH
015776  162737  000005  001160                   SUB     #5,WORK        ;PRECESS LIMIT
016004  113737  001160  007512                   MOVB    WORK,W1        ;SAVE IN W1
016012  012737  000041  001160                   MOV     #41,WORK       ;PRINTING CHAR CODE
016020  112737  000002  007514                   MOVB    #2,W2          ;SU 2 LINES PER CHAR
016026  005037  001162                           CLR     WORK1          ;CURRENT PRECESS COUNT
016032  004737  016270                           JSR     PC,GETPN       ;CONVERT PASSNO TO ASCII
016036  032737  010000  001116           4$:     BIT     #BIT12,SO      ;DO WHILE BIT 12 - 1
016044  001742                                   BEQ     2$
016046  013737  001162  007516                   MOV     WORK1,W3       ;GET PRECESS COUNT
016054  001412                                   BEQ     6$
016056                                           SENDC2  WORK,W3        ;PRINT THE CHARACTER
016056  013705  001160                           MOV     WORK,R5        ;GET CHAR TO R5
016062  013737  007516  001174                   MOV     W3,MODE        ;GET REPEAT COUNT
016070  112737  000020  001175                   MOVB    #20,MODE+1     ;SET REPEAT MODE
016076  004737  032310                           JSR     PC,CHROUT      ;CALL CHAR OUTPUT ROUTINE
016102                                   6$:     SENDALL #MSG271        ;PRINT THE PASS COUNT
016102  012705  041612                           MOV     #MSG271,R5     ;BUILD SEND CALL USING MESSAGE ADDRESS
016106  005037  001174                           CLR     MODE
016112  004737  031706                           JSR     PC,SEND        ;NOW SEND THE MESSAGE
016116  005003                                   CLR     R3
016120  113737  007512  007516           MOVB    W1,W3          ;CHAR COUNT = WIDTH - 5 - PRECESS CNT
016126  163737  001162  007516                   SUB     WORK1,W3
016134  001412                                   BEQ     8$
016136                                           SENDC2  WORK,W3        ;PRINT CHARS TO END
016136  013705  001160                           MOV     WORK,R5        ;GET CHAR TO R5
016142  013737  007516  001174                   MOV     W3,MODE        ;GET REPEAT COUNT
016150  112737  000020  001175                   MOVB    #20,MODE+1     ;SET REPEAT MODE
```

```
        016156  004737  032310                  JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 46000  016162                          8$:     SENDALL #MSG75          ;SEND CRLF
        016162  012705  037370                  MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
        016166  005037  001174                  CLR     MODE
        016172  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 46100  016176  005237  001162                  INC     WORK1           ;NEW PRECESS COUNT
 46200  016202  123737  001162  007512          CMPB    WORK1,#1        ;RESET TO 0 IF MAX
 46300  016210  103402                          BLO     9$
 46400  016212  005037  001162                  CLR     WORK1
 46500  016216  105337  007514          9$:     DECB    W2              ;2 LINE DONE YET?
 46600  016222  001020                          BNE     10$
 46700  016224  112737  000002  007514          MOVB    #2,W2           ;YES RESET LINE COUNT
 46800  016232  005237  001160                  INC     WORK            ;GET NEXT CHAR CODE
 46900  016236  123727  001160  000177          CMPB    WORK,#177       ;UNLESS ALL DONE
 47000  016244  001007                          BNE     10$
 47100  016246  012737  000041  001160          MOV     #41,WORK        ;THEN RESET CHAR CODE AND
 47200  016254  005237  001124                  INC     PASSNO          ;INC PASS COUNT
 47300  016260  004737  016270                  JSR     PC,GETPN        ;REFORMAT MSG
 47400  016264  000137  016036          10$:    JMP     4$              ;GO CHECK SW 11
 47500
 47600
 47700  016270  013737  001124  001134  GETPN:  MOV     PASSNO,TEMP
 47800  016276  012705  016324                  MOV     #T30BUF,R5
 47900  016302  004737  033730                  JSR     PC,BIOCI        ;CONVERT TO ASCII
 48000  016306  113737  016330  041613          MOVB    T30BUF+4,MSG271+1
 48100  016314  113737  016331  041614          MOVB    T30BUF+5,MSG271+2
 48200  016322  000207                          RTS     PC
 48300
 48400
 48500
 48600
 48700  016324                  T30BUF: .BLKW   6
```

```
                                       ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                       ; PRINTER EXERCISOR
                                       ;       THIS TEST WILL PRINT A 10 BY 6 INCH MATRIX OF CHARACTERS
                                       ;       UTILIZING ALL POSSABLE COMBINATIONS OF PITCH SETTINGS.
                                       ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
016340                                 TEST16: SENDALL #MSG280          ;SEND TEST ID
016340  012705  041547                         MOV     #MSG280,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
016344  005037  001174                         CLR     MODE
016350  004737  031706                         JSR     PC,SEND          ;NOW SEND THE MESSAGE
016354  112703  000011                         MOVB    #9.,R3           ;IF 80 COL MAKE 6X8 MATRIX
016360  123727  001172  000120                 CMPB    WIDTH,#120
016366  101002                                 BHI     7$
016370  112703  000007                         MOVB    #7,R3
016374                                 7$:     SENDALL #MSG77           ;SKIP 3 LINES
016374  012705  037373                         MOV     #MSG77,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
016400  005037  001174                         CLR     MODE
016404  004737  031706                         JSR     PC,SEND          ;NOW SEND THE MESSAGE
016410                                         SENDALL #MSG104          ;SET H-PITCH TO 16.5
016410  012705  040037                         MOV     #MSG104,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
016414  005037  001174                         CLR     MODE
016420  004737  031706                         JSR     PC,SEND          ;NOW SEND THE MESSAGE
016424  005037  007512                         CLR     W1               ;DO 6 V PITCH GROUPS
016430  023727  007512  000005         1$:     CMP     W1,#5            ;IF W1 > 5 GOTO 50
016436  003402                                 BLE     2$
016440  000137  017002                         JMP     50$
016444  013700  007512                 2$:     MOV     W1,R0            ;GET V GROUP NO.
016450  006300                                 ASL     R0
016452  016001  012154                         MOV     TABLVF(R0),R1    ;POINT TO V PITCH SETUP
016456                                         SENDALL R1               ;SETUP V PITCH
016456  010105                                 MOV     R1,R5    ;BUILD SEND CALL USING MESSAGE ADDRESS
016460  005037  001174                         CLR     MODE
016464  004737  031706                         JSR     PC,SEND          ;NOW SEND THE MESSAGE
016470  016037  017154  007514                 MOV     TBL31E(R0),W2    ;GET LINE COUNT FOR THIS PITCH
016476  005737  007514                 3$:     TST     W2               ;IF ALL LINES DONE GOTO 40
016502  001002                                 BNE     4$
016504  000137  016772                         JMP     40$
016510  005037  007516                 4$:     CLR     W3               ;DO 10 H PITCH GROUPS PER LINE
016514  004737  034250                         JSR     PC,QUIET
016520                                         SENDALL #MSG75           ;SEND A  CRLF
016520  012705  037370                         MOV     #MSG75,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
016524  005037  001174                         CLR     MODE
016530  004737  031706                         JSR     PC,SEND          ;NOW SEND THE MESSAGE
016534  023703  007516                 5$:     CMP     W3,R3            ;IF 10 DONE GOTO 30
016540  003402                                 BLE     6$
016542  000137  016762                         JMP     30$
016546  013700  007516                 6$:     MOV     W3,R0            ;POINT TO H PITCH SETUP
016552  006300                                 ASL     R0
016554  016001  017120                         MOV     TBL31C(R0),R1    ;ADDRESS IN R1
016560                                         SENDALL R1               ;SETUP H PITCH
016560  010105                                 MOV     R1,R5    ;BUILD SEND CALL USING MESSAGE ADDRESS
016562  005037  001174                         CLR     MODE
016566  004737  031706                         JSR     PC,SEND          ;NOW SEND THE MESSAGE
016572  004737  034250                         JSR     PC,QUIET
016576  000240                                 NOP
016600  000240                                 NOP
```

```
 4000 016602  013700  007512                    MOV     W1,R0           ;GET ADDRESS OF CHARACTER
 4100 016606  006300                            ASL     R0
 4200 016610  010037  001166                    MOV     R0,WORK3
 4300 016614  006337  001166                    ASL     WORK3
 4400 016620  006337  001166                    ASL     WORK3
 4500 016624  063700  001166                    ADD     WORK3,R0                ;R0= W1*10.
 4600 016630  063700  007516                    ADD     W3,R0           ;R0- V ROW + COLM OFFSET
 4700 016634  116037  017024  001160            MOVB    TBL31A(R0),WORK ;PUT CHAR IN WORK
 4800 016642  013737  007516  001162            MOV     W3,WORK1        ;GET FORMAT SELECTOR
 4900 016650  006337  001162                    ASL     WORK1
 5000 016654  062737  017214  001162            ADD     #TBL31G,WORK1
 5100 016662  017700  162274                    MOV     @WORK1,R0       ;R0 HAS SELECTOR
 5200 016666  016001  017144                    MOV     TBL31D(R0),R1   ;R1 HAS OUTPUT MSG ADDRESS
 5300 016672  013737  007516  001162            MOV     W3,WORK1
 5400 016700  006337  001162                    ASL     WORK1           ;GET PRINT REPEAT COUNT
 5500 016704  062737  017170  001162            ADD     #TBL31F,WORK1
 5600 016712  017737  162244  001164            MOV     @WORK1,WORK2    ;WORK2 HAS REPEAT COUNT
 5700 016720  113711  001160                    MOVB    WORK,(R1)       ;PUT CHAR IN OUTPUT MSG
 5800 016724                                    SENDR   R1,WORK2                ;PRINT H GROUP OF CHARS
      016724  010105                            MOV     R1,R5
      016726  113737  001164  001174            MOVB    WORK2,MODE
      016734  112737  000020  001175            MOVB    #20,MODE+1
      016742  004737  031706                    JSR     PC,SEND
 5900 016746  004737  034250                    JSR     PC,QUIET
 6000 016752  005237  007516                    INC     W3              ;NEXT H GROUP
 6100 016756  000137  016534                    JMP     5$
 6200 016762  005337  007514            30$:    DEC     W2              ;ADJUST LINE COUNT -1
 6300 016766  000137  016476                    JMP     3$              ;DO NEXT LINE
 6400 016772  005237  007512            40$:    INC     W1              ;NEXT V GROUP
 6500 016776  000137  016430            41$:    JMP     1$              ;DO NEXT V GROUP
 6600 017002  004737  033062            50$:    JSR     PC,RESETO       ;RESET THE TERMINALS
 6700 017006                                    SENDALL #MSG77
      017006  012705  037373                    MOV     #MSG77,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      017012  005037  001174                    CLR     MODE
      017016  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 6800 017022  000207                            RTS     PC              ;ALL DONE...BYE
 6900
 7000
 7100
 7200
```

```
 7400
 7500                                          ; TBL31A        6 GROUPS OF 10 CHARACTER CODES
 7600                                          ; TBL31C        TABLE OF 10 H PITCH MESSAGE ADDRESSES
 7700                                          ; TBL31D        TABLE OF 4 OUTPUT MESSAGE ADDRESSES
 7800                                          ; TBL31E        TABLE OF 6 LINE COUNTS PER V PITCH
 7900                                          ; TBL31F        TABLE OF 10 PRINT REPEAT COUNTS
 8000                                          ; TBL31G        TABLE OF 10 SELECTORD TO TBL31D
 8100
 8200
 8300 017024   052    141    142              TBL31A: .BYTE   52,141,142,143,144,145,146,53,101,102
      017027   143    144    145
      017032   146    053    101
      017035   102
 8400 017036   147    150    151                      .BYTE   147,150,151,152,153,154,44,103,104,105
      017041   152    153    154
      017044   044    103    104
      017047   105
 8500 017050   155    156    157                      .BYTE   155,156,157,160,161,100,106,107,110,111
      017053   160    161    100
      017056   106    107    110
      017061   111
 8600 017062   162    163    164                      .BYTE   162,163,164,165,75,112,113,114,115,116
      017065   165    075    112
      017070   113    114    115
      017073   116
 8700 017074   166    167    170                      .BYTE   166,167,170,45,117,120,121,122,123,124
      017077   045    117    120
      017102   121    122    123
      017105   124
 8800 017106   171    172    043                      .BYTE   171,172,43,72,125,126,127,130,131,132
      017111   072    125    126
      017114   127    130    131
      017117   132
 8900                                          .EVEN
 9000
 9100
 9200 017120   040006 040013 040020           TBL31C: .WORD   MSG99,MSG100,MSG101,MSG108,MSG99
      017126   040113 040006
 9300 017132   040013 040020 040113                   .WORD   MSG100,MSG101,MSG108,MSG101,MSG101
      017140   040020 040020
 9400
 9500 017144   041610 037330 037333           TBL31D: .WORD   MSG281,MSG70,MSG71,MSG72
      017152   037337
 9600
 9700 017154   000014 000010 000006           TBL31E: .WORD   12.,8.,6,4,3,2
      017162   000004 000003 000002
 9800
 9900 017170   000020 000014 000014           TBL31F: .WORD   16.,12.,12.,10.,8.,6,6,5,4,4
      017176   000012 000010 000006
      017204   000006 000005 000004
      017212   000004
10000
10100 017214   000000 000000 000000           TBL31G: .WORD   0,0,0,0,2,2,2,2,4,6
      017222   000000 000002 000002
      017230   000002 000002 000004
      017236   000006
10200
```

```
                                        .SBTTL  CONSOLE DRIVER ROUTINES

                                ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                ; CONSOLE RECV INTERRUPT HANDLER

017240  105737  177560          TTYIN:  TSTB    @#177560        ;READY ?
017244  100402                          BMI     1$
017246  000137  017376                  JMP     211$            ;FALSE INTERRUPT
017252  113777  177562  161726  1$:     MOVB    @#177562,@PNTR  ;READ CHAR INTO BUFFER
017260  142777  000200  161720          BICB    #200,@PNTR      ;STRIP PARITY BIT
017266  122777  000033  161712          CMPB    #33,@PNTR       ;DECODE INPUT IF ESCAPE
017274  001002                          BNE     111$
017276  000137  020150                  JMP     18$
017302  105737  177564          111$:   TSTB    @#177564        ;ECHO THE CHAR
017306  100375                          BPL     111$
017310  117737  161672  177566          MOVB    @PNTR,@#177566
017316  122777  000003  161662          CMPB    #03,@PNTR       ;CTL-C ?
017324  001010                          BNE     113$
017326                                  SENDC   #MSGK1          ;SEND READY
017326  012705  042327                  MOV     #MSGK1,R5               ;GET MESSAGE ADDRESS
017332  004737  020310                  JSR     PC,CSEND        ;SEND MESSAGE
017336  012716  002336                  MOV     #WSEQ,(SP)      ;RETURN TO WAIT STATE
017342  000137  017376                  JMP     211$
017346  122777  000015  161632  113$:   CMPB    #15,@PNTR       ;DECODE INPUT IF  CR
017354  001006                          BNE     2$
017356                                  SENDC   #MSG75          ;ECHO CRLF
017356  012705  037370                  MOV     #MSG75,R5               ;GET MESSAGE ADDRESS
017362  004737  020310                  JSR     PC,CSEND        ;SEND MESSAGE
017366  000137  017406                  JMP     3$
017372  005237  001206          2$:     INC     PNTR            ;GET NEXT BUFFER SPACE
017376  012737  000101  177560  211$:   MOV     #101,@#177560   ;TURN CONSOLE ON AGAIN
017404  000002                          RTI                     ;RETURN
017406  012737  020332  001206  3$:     MOV     #TKBUF,PNTR
017414  127727  161566  000071  4$:     CMPB    @PNTR,#71
017422  002403                          BLT     5$
017424  142777  000040  161554          BICB    #40,@PNTR       ;RESET LC BIT IF ALFA
017432  127727  161550  000015  5$:     CMPB    @PNTR,#15       ;STOP DECODE IF CR
017440  001005                          BNE     6$
017442  012737  020332  001206          MOV     #TKBUF,PNTR     ;RESET BUFFER POINTER FIRST
017450  000137  017376                  JMP     211$
017454  122777  000110  161524  6$:     CMPB    #'H,@PNTR       ;HALT COMMAND?
017462  001012                          BNE     7$
017464  052737  100000  001116          BIS     #BIT15,SO       ;YES- SET BIT 15
017472  052737  100000  001210          BIS     #BIT15,TMPTST
017500  005237  001206                  INC     PNTR
017504  000137  017414                  JMP     4$
017510  122777  000114  161470  7$:     CMPB    #'L,@PNTR       ;LOOP COMMAND ?
017516  001012                          BNE     8$
017520  052737  040000  001116          BIS     #BIT14,SO       ;YES- SET BIT 14
017526  052737  040000  001210          BIS     #BIT14,TMPTST
017534  005237  001206                  INC     PNTR
017540  000137  017414                  JMP     4$
017544  122777  000103  161434  8$:     CMPB    #'C,@PNTR       ;CLEAR COMMAND ?
017552  001012                          BNE     9$
017554  042737  140400  001116          BIC     #140400,SO      ;RESET THE BITS
017562  042737  140400  001210          BIC     #140400,TMPTST
017570  005237  001206                  INC     PNTR
```

```
 5400 017574  000137  017414                    JMP     4$
 5500 017600  122777  000127  161400    9$:     CMPB    #'W,@PNTR       ;SET WIDTH ?
 5600 017606  001035                            BNE     10$
 5700 017610  010046                            MOV     R0,-(SP)         ;SAVE R0
 5800 017612  005000                            CLR     R0
 5900 017614  004737  020060                    JSR     PC,15$  ;CONVER NEXT CHARS TO OCTAL
 6000 017620  010037  001172                    MOV     R0,WIDTH         ;SET NEW WIDTH LIMIT
 6100 017624  012600                            MOV     (SP)+,R0
 6200 017626  005737  001172                    TST     WIDTH
 6300 017632  001003                            BNE     25$
 6400 017634  012737  000204  001172            MOV     #204,WIDTH
 6500 017642  023727  001172  000204    25$:    CMP     WIDTH,#204
 6600 017650  003403                            BLE     26$
 6700 017652  012737  000204  001172            MOV     #204,WIDTH
 6800 017660  023727  001172  000040    26$:    CMP     WIDTH,#32.
 6900 017666  002003                            BGE     27$
 7000 017670  012737  000040  001172            MOV     #32.,WIDTH
 7100 017676  000137  017414            27$:    JMP     4$
 7200 017702  122777  000122  161276    10$:    CMPB    #'R,@PNTR        ;RUN TEST COMMAND ?
 7300 017710  001014                            BNE     11$
 7400 017712  052737  010000  001210            BIS     #BIT12,TMPTST            ;SET THE CNTL BITS
 7500 017720  010046                            MOV     R0,-(SP)
 7600 017722  005000                            CLR     R0
 7700 017724  004737  020060                    JSR     PC,15$           ;CONVERT NEXT TO OCTAL
 7800 017730  004737  020234                    JSR     PC,NUMCHK
 7900 017734  012600                            MOV     (SP)+,R0
 8000 017736  000137  017414                    JMP     4$
 8100 017742  122777  000123  161236    11$:    CMPB    #'S,@PNTR        ;SEQUENCE COMMAND ?
 8200 017750  001014                            BNE     12$
 8300 017752  042737  012000  001210            BIC     #012000,TMPTST
 8400 017760  010046                            MOV     R0,-(SP)
 8500 017762  005000                            CLR     R0
 8600 017764  004737  020060                    JSR     PC,15$           ;CONVERT NEXT TO OCTAL
 8700 017770  004737  020234                    JSR     PC,NUMCHK
 8800 017774  012600                            MOV     (SP)+,R0
 8900 017776  000137  017414                    JMP     4$
 9000 020002  122777  000056  161176    12$:    CMPB    #'.,@PNTR        ;TERMINATOR ?
 9100 020010  001012                            BNE     14$
 9200 020012  052737  000400  001116            BIS     #BIT8,S0
 9300 020020  052737  000400  001210            BIS     #BIT8,TMPTST
 9400 020026  005237  001206            131$:   INC     PNTR
 9500 020032  000137  017414                    JMP     4$
 9600 020036                            14$:    SENDC   #MSGK3           ;UNDEFINED COMMAND CHAR
      020036  012705  042366                    MOV     #MSGK3,R5                ;GET MESSAGE ADDRESS
      020042  004737  020310                    JSR     PC,CSEND         ;SEND MESSAGE
 9700 020046  012737  020332  001206    141$:   MOV     #TKBUF,PNTR
 9800 020054  000137  017376                    JMP     211$
 9900
10000
10100 020060  005237  001206            15$:    INC     PNTR             ;POINT TO NEXT CHAR IN BUFFER
10200 020064  127727  161116  000060            CMPB    @PNTR,#60        ;EXIT IF NOT NUMERIC
10300 020072  002425                            BLT     16$
10400 020074  127727  161106  000071            CMPB    @PNTR,#71
10500 020102  003021                            BGT     16$
10600 020104  127727  161076  000070            CMPB    @PNTR,#70        ;DECIMAL OR OCTAL ?
10700 020112  002404                            BLT     17$
10800 020114  112700  000077                    MOVB    #77,R0           ;DECIMAL ; INVALID
```

```
020120  000137  020146                      JMP     16$
020124  142777  000370  161054     17$:     BICB    #370,@PNTR        ;STRIP AWAY ASCII BITS
020132  006300                              ASL     R0
020134  006300                              ASL     R0
020136  006300                              ASL     R0                ;MAKE ROOM FOR NEW DIGIT
020140  157700  161042                      BISB    @PNTR,R0          ;ADD NEW LSD
020144  000745                              BR      15$               ;GET NEXT CHAR
020146  000207                     16$:     RTS     PC                ;EXIT OCTAL IN R0

020150                             18$:     SENDC   #MSG22            ;ECHO $ AND CRLF
020150  012705  035657                      MOV     #MSG22,R5                  ;GET MESSAGE ADDRESS
020154  004737  020310                      JSR     PC,CSEND          ;SEND MESSAGE
020160  013737  001210  001116              MOV     TMPTST,S0         ;PUT TEST NO IN S0
020166  062706  000002                      ADD     #2,SP             ;FIX RETURN PC
020172  012746  002450                      MOV     #LSEQ,-(SP)       ;TO TEST SEQUENCER
020176  012737  020332  001206              MOV     #TKBUF,PNTR       ;RESTORE BUFFER POINTER
020204                                      SENDC   #MSGK1            ;SEND 'READY'
020204  012705  042327                      MOV     #MSGK1,R5                  ;GET MESSAGE ADDRESS
020210  004737  020310                      JSR     PC,CSEND          ;SEND MESSAGE
020214  012737  000101  177560              MOV     #101,@#177560     ;ENABLE CONSOLE
020222                                      STALL   #100
020222  012705  000100                      MOV     #100,R5           ;SETUP STALL TIME CONSTANT
020226  004737  033676                      JSR     PC,MSTALL
020232  000002                              RTI                       ;TO TEST SEQUENCER

020234  105700                     NUMCHK:  TSTB    R0                ;TEST NO. ENTERED ?
020236  001006                              BNE     3$
020240  105037  001210                      CLRB    TMPTST
020244  042737  002000  001210     1$:      BIC     #BIT10,TMPTST     ;NO SELECT
020252  000207                     2$:      RTS     PC                ;BYE
020254  120027  000022             3$:      CMPB    R0,#22            ;TOO BIG ?
020260  003006                              BGT     4$                ;YES
020262  052737  002000  001210              BIS     #BIT10,TMPTST     ;OK SELECT TEST
020270  110037  001210                      MOVB    R0,TMPTST         ;SAVE TEST NO.
020274  000766                              BR      2$
020276                             4$:      SENDC   #MSGK3            ;? ? ? ?
020276  012705  042366                      MOV     #MSGK3,R5                  ;GET MESSAGE ADDRESS
020302  004737  020310                      JSR     PC,CSEND          ;SEND MESSAGE
020306  000756                              BR      1$

                                   ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                   ; CONSOLE TRANSMIT ROUTINE

020310  105715                     CSEND:   TSTB    (R5)              ; NULL?
020312  001406                              BEQ     2$                ;YES- ALL DONE
020314  105737  177564             1$:      TSTB    @#177564          ;WAIT FOR READY BIT
020320  100375                              BPL     1$
020322  112537  177566                      MOVB    (R5)+,@#177566    ;SEND CHARACTER
020326  000770                              BR      CSEND
020330  000207                     2$:      RTS     PC

020332                             TKBUF:   .BLKW   10        ;CONSOLE INPUT BUFFER AREA
```

```
                                           .SBTTL  ERROR HANDLER
                                           ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                           ; ERRORT
                                           ;       THIS ROUTINE WILL HANDLE THE PRINTING OF
                                           ;       ERROR MESSAGES, UPDATE ERROR COUNTS, AND
                                           ;       CHECK ON SWITCH 13.
                                           ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

020352  032737  020000  001116             ERRORT: BIT     #BIT13,SO                       ;INHIBIT PRINT ?
020360  001073                                     BNE     1$                              ;YES JUMP
020362  013737  001204  001134                     MOV     ONLINE,TEMP                     ;CONVERT LINE NO. TO ASCII
020370  012705  020600                             MOV     #EBUF,R5
020374  004737  033730                             JSR     PC,BIOCT                        ;CALL CONVERTER
020400  113737  020604  020626                     MOVB    EBUF+4,MSGE+14.                 ;FORMAT ERROR MSG
020406  113737  020605  020627                     MOVB    EBUF+5,MSGE+15.
020414  013737  001212  001134                     MOV     TSTTYP,TEMP                     ;GET TEST NO.
020422  042737  177700  001134                     BIC     #177700,TEMP
020430  012705  020600                             MOV     #EBUF,R5                        ;CONVERT IT TO ASCII
020434  004737  033730                             JSR     PC,BIOCT
020440  113737  020604  020615                     MOVB    EBUF+4,MSGE+5                   ;FORMAT ERROR MSG
020446  113737  020605  020616                     MOVB    EBUF+5,MSGE+6
020454                                             SENDI   #MSGE,ONLINE                    ;TEST AND LINE NO'S
020454  012705  020610                             MOV     #MSGE,R5                        ;MESSAGE ADDRESS TO R5
020460  112737  000010  001175                     MOVB    #10,MODE+1              ;SET SINGLE LINE MODE
020466  113737  001204  001174                     MOVB    ONLINE,MODE                     ;SELECTED LINE NO.
020474  004737  031706                             JSR     PC,SEND
020500  010346                                     MOV     R3,-(SP)                        ;SAVE R3
020502  016603  000004                             MOV     4(SP),R3                        ;GET MSG ADDRESS FROM STACK
020506                                             SENDI   R3,ONLINE                       ;SEND ERROR MSG
020506  010305                                     MOV     R3,R5                   ;MESSAGE ADDRESS TO R5
020510  112737  000010  001175                     MOVB    #10,MODE+1              ;SET SINGLE LINE MODE
020516  113737  001204  001174                     MOVB    ONLINE,MODE                     ;SELECTED LINE NO.
020524  004737  031706                             JSR     PC,SEND
020530                                             SENDC   #MSGE                           ;SAME THING TO CONSOLE
020530  012705  020610                             MOV     #MSGE,R5                        ;GET MESSAGE ADDRESS
020534  004737  020310                             JSR     PC,CSEND                ;SEND MESSAGE
020540                                             SENDC   R3
020540  010305                                     MOV     R3,R5                   ;GET MESSAGE ADDRESS
020542  004737  020310                             JSR     PC,CSEND                ;SEND MESSAGE
020546  012603                                     MOV     (SP)+,R3                        ;RESTORE R3
020550  011666  000002                     1$:     MOV     (SP),2(SP)                      ;ERASE ADDR FROM STACK
020554  062706  000002                             ADD     #2,SP                           ;ADJUST STACK POINTER
020560  005237  001110                             INC     ERROR                           ;FLAG THE ERROR
020564  005737  001116                             TST     SO                              ;HALT ON ERROR SET ?
020570  100402                                     BMI     2$
020572  062716  000002                             ADD     #2,(SP)                 ;JUMP OVER ERROR HALT
020576  000207                             2$:     RTS     PC                              ;RETURN


020600  000000  000000  000000             EBUF:   .WORD   0,0,0,0                 ;BUFFER AREA
020606  000000
020610     124     105     123             MSGE:   .ASCIZ  /TEST 00, LINE 00 /<15><12>     ;STD MSG HEADER
020613     124     040     060
020616     060     054     040
020621     114     111     116
020624     105     040     060
020627     060     040     015
```

```
        020632      012      000
 19700
 19800                                          .FVEN
```

```
                        .SBTTL   DZ11 DRIVER ROUTINES
                        ;THSES ROUTINES WILL HANDLE FROM 1 TO 8 DZ11'S
                        ;JOHN COMEAU INVENTED THESE WONDERFULL ROUTINES


                        ;NOW A BUNCH OF TABLES

                        ;HERE IS A ONE WORD PER LINE TABLE. IT HOLDS LINE PARAMETERS

                        ;THE PROGRAM IS RESPONSIBLE FOR SETTING IT UP.
                        ;THE DZ11 ROUTINES SIMPLY READ IT.
                        ;
                        ;BIT 7 IN EACH BYTE, IS THE INACTIVE BIT. IF SET, THE LINE
                        ;WILL BE IGNORED BY THE DRIVER ROUTINES

                        ;BITS 3-0  HOLD THE LINES BAUD RATE INFO
                        ;                       BITS 3-0/BAUD
                        ;                         0000    50
                        ;                         0001    75
                        ;                         0010    110
                        ;                         0011    134.5
                        ;                         0100    150
                        ;                         0101    300
                        ;                         0110    600
                        ;                         0111    1200
                        ;                         1000    1800
                        ;                         1001    2000
                        ;                         1010    2400
                        ;                         1011    3600
                        ;                         1100    4800
                        ;                         1101    7200
                        ;                         1110    9600
                        ;                         1111    RESERVED
                        ;BIT 6 SELECTS THE TYPE OF PARITY,  0= EVEN  1=ODD
                        ;BIT 5 IT THE PARITY ENABLING BIT, 0 IF NO PARITY, 1 IF PARITY
                        ;
020634                  DZLINE: .BLKW   DZCON*8.                ; NO. OF DZ'S TIMES 8 LINES PER DZ-# WORDS



                        ;HERE ARE THE DZ11 COMMAND BUFFER AREAS
                        ;THERE IS ONE FOR EACH LINE.
                        ;EACH OF 20 WORDS LONG
                        ;THE COMMAND FORMAT IS AS FOLLOWS.
                        ;1ST WORD IS THE ADDRESS OF THE MESSAGE BEING TYPED
                        ;THE 2ND WORD. IF 0, STANDARD MEGSSAGE
                        ;IF HIGH BYTE IS 10, LOW BYTE HOLDS LINE NO TO SEND TO
                        ;IF HIGH BYTE IS 20 LOW BYTE HOLDS REPEAT COUNT
                        ;IF HIGH BYTE IS 30 LOW BYTE HOLDS SPECIAL TERMINATOR.
020754                  DZCOMB: .BLKW   DZCON*8.*20.            ; 8 LINES PER DZ TIMES 20. WORDS PER LINE *I
```

```
 5400                                   ;TABLE OF FLAGS FOR ACTIVE LINES
 5500 024054                            ACTIVE: .BLKW   DZCON*8.
 5600
 5700
 5800                                   ;HERE IS THE TABLE OF CURRENT REPEAT COUNTS.
 5900 024174                            CURREP: .BLKW   DZCON*8.
 6000
 6100                                   ;HERE IF THE TABLE OF CURRENT TERMINATORS
 6200 024314                            CURTER: .BLKW   DZCON*8.
 6300
 6400                                   ;HERE IS THE LINE REPLY TABLE
 6500 024434                            REPTBL: .BLKW   DZCON*8.
 6600
 6700                                   ;HERE IS A TABLE OF SWITCH WORDS SET TO CLEAR TCR REG
 6800 024554                            STOP:   .BLKW   DZCON*8.
 6900
 7000                                   ;HERE IS THE TABLE OF CURRENT TEXT ADDRESSES
 7100 024674                            CURADD: .BLKW   DZCON*8.
 7200
 7300                                   ;HERE ARE THE PRINTING COMMAND BUFFER POINTERS
 7400 025014                            COMCNT: .BLKW   DZCON*8.
 7500 025134                            COMIN:  .BLKW   DZCON*8.
 7600 025254                            COMOUT: .BLKW   DZCON*8.
 7700 025374                            COMEND: .BLKW   DZCON*8.
 7800
 7900 025514                            TCRBIT: .BLKW   DZCON*8.        ;LINE1=1, LINE2-2, LINE3 4, LINE4-10
 8000
 8100                                   ;CHAR COUNT
 8200 025634                            KBCNT:  .BLKW   DZCON*8.
 8300
 8400                                   ;END OF BUFFER TABLE
 8500 025754                            KBBUFE: .BLKW   DZCON*8.
 8600
 8700                                   ;BEGIN OF BUFFER TABLE
 8800 026074                            KBBUFB: .BLKW   DZCON*8.
 8900
 9000                                   ,BUFFER PUT IN POINTER
 9100 026214                            KBBUFI: .BLKW   DZCON*8.
 9200
 9300                                   ;BUFFER TAKE OUT POINTER
 9400 026334                            KBBUFO: .BLKW   DZCON*8.
 9500
 9600
 9700                                   ;HERE IF THE KEYBOARD BUFFER AREA
 9800 026454                            KBBUF:  .BLKW   DZCON*8.*20.            ;8 WORDS TIMES 8 LINES TIMES # OF DZS
 9900
10000
10100                                   ;DZ11 STATUS REG ADDRESS TABLE
10200 031554                            DZCSR:  .BLKW   DZCON           ;ONE CSR PER DZ11(REALLY.)
10300
10400                                   ;DZ11 RECIEVE ERROR BIT TABLE
10500 031566                            RECERR: .BLKW   DZCON*8.
```

```
                                          ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                          ;DZ SEND ROUTINE
                                          ;CALLING SEQUENCES
                                          ;        JSR     PC,SEND           ;CALL
                                          ;        R5                        ;THIS IS THE MESSAGE ADDRESS
                                          ;        MODE                      ;THIS SPECIFIES THE TYPE OF MESSAGE AS FOLLOWS...
                                          ; MODE        HIGH BYTE        LOW BYTE
                                          ;                 0                0        SEND TO ALL ACTIVE DZ LINES
                                          ;                 10               SELECT   ;SEND TO SELECTED LINE
                                          ;                                           ;USE LOW BYTE AS LINE NO.
                                          ;                 20               REPEAT   SEND TO ALL ACTIVE LINES
                                          ;                                           USE LOW BYTE AS THE MESSAGE REPEAT COUNT
                                          ;                 30               TERMIN   SEND TO ALL ACTIVE LINES
                                          ;                                           USE LOW BYTE AS MESSAGE TERMINATOR
                                          ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

031706  010046                            SEND:   MOV     R0,-(SP)          ;SAVE R0
031710  010146                                    MOV     R1,-(SP)          ;AND R1
031712  010246                                    MOV     R2,-(SP)          ;AND R2
031714  010537  001104                            MOV     R5,MSGADR
031720  122737  000010  001175                    CMPB    #10,MODE+1        ;IS THIS MESSAGE MEANT FOR ONLY 1 TERMINAL?
031726  001014                                    BNE     2$                ;NO.
031730  105037  001175                            CLRB    MODE+1            ;YES
031734  013700  001174                            MOV     MODE,R0           ;GET LINE #
031740  006300                                    ASL     R0                ;MAKE WORD OFFSET
031742  005037  001174                            CLR     MODE              ;NO SPECIAL STUFF FOR INDIVIDUAL LINES
031746  012737  000001  001106                    MOV     #1,SENDTM         ;COUNT = 1 LINE ONLY
031754  000137  031770                            JMP     SEND1             ;DO DO IT
031760  013737  001152  001106            2$:     MOV     NUMLIN,SENDTM     ; A COUNT OF LINES SO WE KNOW WHEN WE ARE THROUGH
031766  005000                                    CLR     R0                ;START WITH THE 1ST LINE
031770  105760  020634                    SEND1:  TSTB    DZLINE(R0)        ;IS THE LINE INACTIVE?
031774  100534                                    BMI     7$                ;IF SO, DONT TRY TO SEND IT ANYTHING.
031776  026027  025014  000010                    CMP     COMCNT(R0),#8.    ;ALREADY FULL?
032004  002463                                    BLT     4$                ;IF ROOM IS THERE, PUT STUFF IN.
032006  005760  024054                            TST     ACTIVE(R0)        ;IS THE LINE ACTIVE ?
032012  100017                                    BPL     2$                ;NO- DESELECT THE LINE
032014                                            STALL   100.              ;WAIT A SHORT TIME THEN RETRY
032014  013705  000144                            MOV     100.,R5           ;SETUP STALL TIME CONSTANT
032020  004737  033676                            JSR     PC,MSTALL
032024  005760  024554                            TST     STOP(R0)          ;IS LINE WAITING FOR XON
032030  100006                                    BPL     1$                ;NO-
032032  105260  024054                            INCB    ACTIVE(R0)        ;COUNT THIS PASS THRU
032036  126027  024054  000144                    CMPB    ACTIVE(R0),#100.          ;CHECK FOR EXCESSIVE DELAY
                                                                                    ;ALLOW 10 SECONDS MAX.
032044  103002                                    BHIS    2$                ;TOO LONG- ABORT WAIT
032046  000137  031770                    1$:     JMP     SEND1
032052  052760  000200  020634            2$:     BIS     #BIT7,DZLINE(R0)          ;DESELECT THE LINE
032060  005337  001216                            DEC     UUT               ;ONE LESS UNIT TO TEST
032064  005060  024554                            CLR     STOP(R0)
032070  005060  024054                            CLR     ACTIVE(R0)
032074  012705  036404                            MOV     #MSG39,R5
032100  004737  020310                            JSR     PC,CSEND          ; REPORT NO XON
032104  010037  001134                            MOV     R0,TEMP
032110  006237  001134                            ASR     TEMP
032114  012705  020600                            MOV     #EBUF,R5

032120  004737  033730                            JSR     PC,BIOCT
```

```
 16200 032124  113737  020604  020626                MOVB    FBUF+4,MSGE+14.
 16300 032132  113737  020605  020627                MOVB    EBUF+5,MSGE+15.
 16400 032140  012705  020620                        MOV     #MSGE+10,R5
 16500 032144  004737  020310                        JSR     PC,CSEND
 16600 032150  000137  032266                        JMP     7$                      ;TRY THE NEXT LINE
 16700 032154  013770  001104  025134        4$:     MOV     MSGADR,@COMIN(R0);PUT MESSAGE ADDRESS INTO THE COMMAND BUFFER
 16800 032162  105060  024054                        CLRB    ACTIVE(R0)              ;ERASE ANY DELAY COUNT
 16900 032166  062760  000002  025134                ADD     #2,COMIN(R0)            ;BUMP POINTER
 17000 032174  013770  001174  025134                MOV     MODE,@COMIN(R0) ;PUT PRINTING MODE INTO THE BUFFER ALSO
 17100 032202  062760  000002  025134                ADD     #2,COMIN(R0)            ;BUMP POINTER
 17200 032210  026060  025374  025134                CMP     COMEND(R0),COMIN(R0);IN POINTER AT END OF COMMAND BUFFER?
 17300 032216  101003                                BHI     6$                      ;IF NOT.
 17400 032220  162760  000050  025134                SUB     #50,COMIN(R0)   ;YES, AT END. RESET IT TO THE BEGINING
 17500 032226  005260  025014                6$:     INC     COMCNT(R0)              ;ADD 1 TO COUNT OF COMMANDS IN THERE
 17600 032232  005760  024554                        TST     STOP(R0)                ;IS THE LINE WAITING FOR XON?
 17700 032236  100413                                BMI     7$                      ;YES. DONT SET TCR BIT
 17800 032240  010001                                MOV     R0,R1
 17900 032242  006201                                ASR     R1
 18000 032244  006201                                ASR     R1
 18100 032246  006201                                ASR     R1
 18200 032250  042701  177761                        BIC     #177761,R1
 18300 032254  016101  031554                        MOV     DZCSR(R1),R1    ;GET CSR ADDRESS
 18400 032260  156061  025514  000004                BISB    TCRBIT(R0),4(R1);SET THE LINES TCR BIT
 18500 032266  062700  000002                7$:     ADD     #2,R0                   ;NEXT LINE #
 18600 032272  005337  00110e                        DEC     SENDTM                  ;DONE ALL OF THEM?
 18700 032276  001234                                BNE     SEND1                   ;NO, GO DO ANOTHER
 18800 032300  012602                                MOV     (SP)+,R2                ;NOW ALL WE HAVE TO DO IS
 18900 032302  012601                                MOV     (SP)+,R1                ;RESTORE REGS WE
 19000 032304  012600                                MOV     (SP)+,R0                ;SAVED UPON ENTRY
 19100 032306  000207                                RTS     PC                      ;RETURN
 19200
 19300
 19400                                      ; SINGLE CHARACTER OUTPUT ROUTINE ALL TERMINALS
 19500
 19600 032310  162705  000040                CHROUT: SUB     #40,R5                  ;CHARACTER TABLE STARTS AT 40
 19700 032314  006305                                ASL     R5                      ;MAKE WORD OFFSET
 19800 032316  062705  042604                        ADD     #PCTABL,R5              ;ADD PRINT CHAR TABLE ADDRESS
 19900 032322  004737  031706                        JSR     PC,SEND                 ;SEND MESSAGE WORD
 20000
 20100 032326  000207                                RTS     PC
 20200
```

```
 20400
 20500
 20600 032330
 20700           000000
 20800           000005
 20900
 21000
 21100
 21200
 21300
       032330  010046                    ;HERE ARE THE TRANSMIT INTERRUPT ROUTINES
       032332  012700  000000            DZTINT:
       032336  000137  032474            X=0
                       000002            .REPT   DZCON
       032342  010046                            MOV     R0,-(SP)        ;SAVE R0
       032344  012700  000002                    MOV     #X,R0           ;PUT DZ # IN R0
       032350  000137  032474                    JMP     TXINT           ;GO TO MAIN ROUTINE
                       000004            X=X+2
       032354  010046                    .ENDR
       032356  012700  000004                    MOV     R0,-(SP)        ;SAVE R0
       032362  000137  032474                    MOV     #X,R0           ;PUT DZ # IN R0
                       000006                    JMP     TXINT           ;GO TO MAIN ROUTINE
       032366  010046            X=X+2
       032370  012700  000006                    MOV     R0,-(SP)        ;SAVE R0
       032374  000137  032474                    MOV     #X,R0           ;PUT DZ # IN R0
                       000010                    JMP     TXINT           ;GO TO MAIN ROUTINE
       032400  010046            X=X+2
       032402  012700  000010                    MOV     R0,-(SP)        ;SAVE R0
       032406  000137  032474                    MOV     #X,R0           ;PUT DZ # IN R0
                       000012                    JMP     TXINT           ;GO TO MAIN ROUTINE
 21400                             X=X+2
 21500
```

```
21700
21800 032412                            ;HERE ARE THE RECIEVE INTERRUPT ROUTINES
21900                                   DZRINT:
22000                                   X=0
22100                                   .REPT   DZCON
22200                                           MOV     R0,-(SP)        ;SAVE R0
22300                                           MOV     #X,R0           ;PUT DZ # IN R0
22400                                           JMP     RCINT           ;GO TO MAIN ROUTINE
22500                                   X=X+2
                                        .ENDR
032412  010046                                  MOV     R0,-(SP)        ;SAVE R0
032414  012700  000000                          MOV     #X,R0           ;PUT DZ # IN R0
032420  000137  033164                          JMP     RCINT           ;GO TO MAIN ROUTINE
        000002                          X=X+2
032424  010046                                  MOV     R0,-(SP)        ;SAVE R0
032426  012700  000002                          MOV     #X,R0           ;PUT DZ # IN R0
032432  000137  033164                          JMP     RCINT           ;GO TO MAIN ROUTINE
        000004                          X=X+2
032436  010046                                  MOV     R0,-(SP)        ;SAVE R0
032440  012700  000004                          MOV     #X,R0           ;PUT DZ # IN R0
032444  000137  033164                          JMP     RCINT           ;GO TO MAIN ROUTINE
        000006                          X=X+2
032450  010046                                  MOV     R0,-(SP)        ;SAVE R0
032452  012700  000006                          MOV     #X,R0           ;PUT DZ # IN R0
032456  000137  033164                          JMP     RCINT           ;GO TO MAIN ROUTINE
        000010                          X=X+2
032462  010046                                  MOV     R0,-(SP)        ;SAVE R0
032464  012700  000010                          MOV     #X,R0           ;PUT DZ # IN R0
032470  000137  033164                          JMP     RCINT           ;GO TO MAIN ROUTINE
        000012                          X=X+2
22600
22700
```

```
 22900
 23000                                          ;HERE IS THE MAIN TRANSMIT INTERRUPT ROUTINE
 23100 032474  010146                   TXINT:  MOV     R1,-(SP)        ;SAVE ALL OF
 23200 032476  010246                           MOV     R2,-(SP)        ;REGS WE INTEND TO USE
 23300 032500  000240                           NOP
 23400 032502  016001  031554                   MOV     DZCSR(R0),R1    ;DZ11 CSR ADDRESS
 23500 032506  006300                           ASL     R0
 23600 032510  006300                           ASL     R0
 23700 032512  011137  001100                   MOV     (R1),DXTMP      ;GET LINE #
 23800 032516  113737  001101  001100           MOVB    DXTMP+1,DXTMP   ;MOVE INTO LOW BYTE
 23900 032524  042737  177770  001100           BIC     #177770,DXTMP   ;CLEAR ALL BITS EXCEPT LINE # BITS
 24000 032532  063700  001100                   ADD     DXTMP,R0        ;BIG LINE # IF DZ# PLUS LINE #
 24100 032536  006300                           ASL     R0              ;(DZ# *8 + LINE NO.)*2 FOR OFFSET
 24200 032540  005760  024554                   TST     STOP(R0)
 24300 032544  100005                           BPL     1$
 24400 032546  146061  025514  000004           BICB    TCRBIT(R0),4(R1)
 24500 032554  000137  033056                   JMP     9$
 24600 032560  052760  100000  024054     1$:   BIS     #BIT15,ACTIVE(R0)       ;SET LINE ACTIVE FLAG
 24700 032566  005760  024674                   TST     CURADD(R0)
 24800 032572  001012                           BNE     2$
 24900 032574  005760  025014                   TST     COMCNT(R0)
 25000 032600  001051                           BNE     4$
 25100 032602  146061  025514  000004           BICB    TCRBIT(R0),4(R1)
 25200 032610  005060  024054                   CLR     ACTIVE(R0)              ;CLEAR THE LINES ACTIVE FLAG
 25300 032614  000137  033052                   JMP     9$
 25400 032620  117037  024674  001100     2$:   MOVB    @CURADD(R0),DXTMP
 25500 032626  005260  024674                   INC     CURADD(R0)      ;POINT AT THE NEXT NEXT CHAR
 25600 032632  123760  001100  024314           CMPB    DXTMP,CURTER(R0);IS IT THE TERMINATOR?
 25700 032640  001101                           BNE     8$              ;NO. GO XMIT IT.
 25800 032642  005360  024174                   DEC     CURREP(R0)
 25900 032646  003071                           BGT     7$
 26000 032650  005060  024674                   CLR     CURADD(R0)
 26100 032654  062760  000004  025254           ADD     #4,COMOUT(R0)
 26200 032662  026060  025254  025374           CMP     COMOUT(R0),COMEND(R0)
 26300 032670  103403                           BLO     3$
 26400 032672  162760  000050  025254           SUB     #50,COMOUT(R0)
 26500 032700  005360  025014             3$:   DEC     COMCNT(R0)
 26600 032704  001007                           BNE     4$
 26700 032706  146061  025514  000004           BICB    TCRBIT(R0),4(R1)
 26800 032714  005060  024054                   CLR     ACTIVE(R0)
 26900 032720  000137  033052                   JMP     9$
 27000 032724  017060  025254  024674     4$:   MOV     @COMOUT(R0),CURADD(R0)
 27100 032732  005060  024174                   CLR     CURREP(R0)
 27200 032736  005060  024314                   CLR     CURTER(R0)
 27300 032742  016002  025254                   MOV     COMOUT(R0),R2   ;GET ADDR OF ADDR
 27400 032746  062702  000002                   ADD     #2,R2
 27500 032752  011237  001100                   MOV     (R2),DXTMP
 27600 032756  001416                           BEQ     6$
 27700 032760  122737  000020  001101           CMPB    #20,DXTMP+1
 27800 032766  001412                           BEQ     6$
 27900 032770  122737  000030  001101           CMPB    #30,DXTMP+1
 28000 032776  001401                           BEQ     5$
 28100 033000  000000                           HALT                    ;*********
 28200 033002  113760  001100  024314     5$:   MOVB    DXTMP,CURTER(R0)
 28300 033010  000137  032560                   JMP     1$
 28400 033014  105037  001101             6$:   CLRB    DXTMP+1
 28500 033020  013760  001100  024174           MOV     DXTMP,CURREP(R0)
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 28600 033026  000137  032560                    JMP     1$
 28700 033032  017060  025254  024674      7$:   MOV     @COMOUT(R0),CURADD(R0)
 28800 033040  000137  032560                    JMP     1$
 28900 033044  113761  001100  000006      8$:   MOVB    DXTMP,6(R1)     ;PUT CHAR INTO XMIT BUFFER
 29000 033052  012602                      9$:   MOV     (SP)+,R2        ;RESTORE THE
 29100 033054  012601                            MOV     (SP)+,R1        ;REGISTERS THAT WE
 29200 033056  012600                            MOV     (SP)+,R0        ;DESTROYED
 29300 033060  000002                            RTI
 29400
 29500
 29600
 29700                                  ; THIS ROUTINE IS USED TO RESET ALL TERMINALS
 29800
 29900 033062                           RESET0: SENDALL #MSG103         ;SET 6 LPI.
       033062  012705  040032                    MOV     #MSG103,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       033066  005037  001174                    CLR     MODE
       033072  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 30000 033076                                    SENDALL #MSG108         ;SET 10 CPI.
       033076  012705  040113                    MOV     #MSG108,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       033102  005037  001174                    CLR     MODE
       033106  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 30100 033112                                    SENDALL #T12FIX         ;RESET MARGINS
       033112  012705  007500                    MOV     #T12FIX,R5      ;BUILD SEND CALL USING MESSAGE ADDRESS
       033116  005037  001174                    CLR     MODE
       033122  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 30200 033126                                    SENDALL #MSG61          ;RESET ALL TABS
       033126  012705  037304                    MOV     #MSG61,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       033132  005037  001174                    CLR     MODE
       033136  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 30300 033142                                    SENDALL #MSG10          ;SET TABS EVERY 8
       033142  012705  035176                    MOV     #MSG10,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       033146  005037  001174                    CLR     MODE
       033152  004737  031706                    JSR     PC,SEND         ;NOW SEND THE MESSAGE
 30400 033156  004737  034250                    JSR     PC,QUIET
 30500 033162  000207                            RTS     PC
 30600
```

```
30800
30900                                   ;HERE IS THE MAIN RECIEVE INTERRUPT ROUTINE
31000 033164 010546                     RCINT:  MOV     R5,-(SP)
31100 033166 010246                             MOV     R2,-(SP)
31200 033170 010146                             MOV     R1,-(SP)
31300 033172 016001 031554                      MOV     DZCSR(R0),R1
31400 033176 016105 000002                      MOV     2(R1),R5
31500 033202 100401                             BMI     1$
31600 033204 000000                             HALT    ;INVALID DATA FROM DZ ? ? ? ? ? ? ?
31700 033206 010537 001200              1$:     MOV     R5,RCTMP
31800 033212 113737 001201 001200               MOVB    RCTMP+1,RCTMP
31900 033220 042737 177770 001200               BIC     #177770,RCTMP
32000 033226 006300                             ASL     R0
32100 033230 006300                             ASL     R0
32200 033232 063700 001200                      ADD     RCTMP,R0
32300 033236 006300                             ASL     R0
32400 033240 050560 031566                      BIS     R5,RECERR(R0)           ;COPY ERROR BITS
32500 033244 042760 107777 031566               BIC     #107777,RECERR(R0)      ;DATA VALID,LINE NO.,DATA
32600 033252 042705 177400                      BIC     #177400,R5              ;CLEAR ERROR BITS
32700 033256 032760 000200 020634               BIT     #BIT7,DZLINE(R0)        ;IS UNIT SELECTED ?
32800 033264 001405                             BEQ     6$
32900 033266 042760 000200 020634               BIC     #BIT7,DZLINE(R0)        ;SELECT THE LINE
33000 033274 005237 001216                      INC     UUT                     ;ADD TO UNIT COUNT
33100 033300 122705 000023              6$:     CMPB    #23,R5
33200 033304 001010                             BNE     7$
33300 033306 052760 100200 024554               BIS     #100200,STOP(R0);SET STOP FLAG & XOFF FLAGS
33400 033314 146061 025514 000004               BICB    TCRBIT(R0),4(R1)        ;DISABLE TX INTR
33500 033322 000137 033422                      JMP     RCRTN
33600 033326 122705 000021              7$:     CMPB    #21,R5
33700 033332 001013                             BNE     KBN
33800
33900 033334 156061 025514 000004       9$:     BISB    TCRBIT(R0),4(R1)        ;ENABLE TX INTR
34000 033342 042760 100000 024554               BIC     #BIT15,STOP(R0) ;CLEAR STOP FLAG
34100 033350 052760 000001 024554               BIS     #BIT0,STOP(R0)  ;SET XON FLAG
34200 033356 000137 033422              8$:     JMP     RCRTN
34300 033362 010570 026214              KBN:    MOV     R5,@KBBUFI(R0)  ;STICK IT IN THERE
34400 033366 062760 000002 026214               ADD     #2,KBBUFI(R0)   ;GIVE THE POINTER A LITTLE PUSH TO THE NEXT EMPTY PL
34500 033374 026060 026214 025754               CMP     KBBUFI(R0),KBBUFE(R0)   ;IS THAT THE END?
34600 033402 001003                             BNE     1$              ;IF NOT,
34700 033404 016060 026074 026214               MOV     KBBUFB(R0),KBBUFI(R0);YES IT WAS AT THE END. RESET IT
34800 033412 105260 025634              1$:     INCB    KBCNT(R0)       ;TALLY UP ONE MORE ENTRY
34900 033416 001001                             BNE     RCRTN           ;AND GO RETURN IF WE HAVE LESS THAN 377 OF THEM
35000 033420 000000                             HALT                    ;400 ENRTYS IS TOO MANY. LET THIS HALT SERVE AS WARN
35100 033422 005737 001140              RCRTN:  TST     HOOK            ;DOES ANOTHER ROUTINE WANT TO SEE CHARS IMMEDIATLY?
35200 033426 001402                             BEQ     2$              ;NO. GO RETURN
35300 033430 004777 145504                      JSR     PC,@HOOK        ;YES. GO OFF TO SOME MYSTERIOUS PLACE
35400 033434 012601                     2$:     MOV     (SP)+,R1
35500 033436 012602                             MOV     (SP)+,R2
35600 033440 012605                             MOV     (SP)+,R5
35700 033442 012600                             MOV     (SP)+,R0        ;FROM INTERRUPT CATCHER
35800 033444 000002                             RTI
35900
36000
36100
36200
```

```
 36400                                          ;THIS IS THE TAKE STUFF OUT OF THE KBFO BUFFER ROUTINE
 36500                                          ;CALL USING A "JSR PC".
 36600                                          ;IT RETURNS WITH R5 = THE KBRST ENTRY
 36700 033446  105760  025634                   KBOUT:  TSTB    KBCNT(R0)       ;ANYTHING THERE?
 36800 033452  001003                                  BNE     1$              ;I HOPE SO
 36900 033454  012705  177777                          MOV     #-1,R5
 37000 033460  000420                                  BR      2$
 37100 033462  005360  025634                   1$:     DEC     KBCNT(R0)       ;REDUCE COUNT OF # ENTRYS IN THERE
 37200 033466  017005  026334                           MOV     @KBBUFO(R0),R5  ;GET KBRST ENTRY
 37300 033472  042705  000400                           BIC     #400,R5
 37400 033476  062760  000002  026334                   ADD     #2,KBBUFO(R0)   ;BUMP POINTER TO NEXT ENTRY
 37500 033504  022760  025754  026334                   CMP     #KBBUFE,KBBUFO(R0);REACHED THE END OF THE BUFFER SPACE?
 37600 033512  001003                                  BNE     2$              ;IF NOT, JUST RETURN
 37700 033514  016060  026074  026334                   MOV     KBBUFB(R0),KBBUFO(R0);YES, REACHED END. RESET POINTER TO THE BEGININ
 37800 033522  000207                           2$:     RTS     PC              ;RETURN
 37900
```

```
 38100
 38200                                  ;THIS SUBROUTINE DOES MANUAL INTERVENTION TESTING, WHERE A CARRIAGE RETURN
 38300                                  ;MUST BE SEEN TO CONTINUE
 38400                                  ;CALL WITH R3=ADDRESS OF 1ST PART OF REPEATING MESSAGE
 38500                                  ;          R4=ADDRESS OF 3RD PART OF REPEATING MESSAGE
 38600                                  ;          R2=ADDRESS OF TABLE OF 2ND PART OF MESSAGE
 38700                                  ;THE TABLE CONSISTS OF 2WORD ENTRIES. 1ST WORD IS MESSAGE ADDRESS
 38800                                  ;2ND WORD IS PARAMETER TO BE SEND TO THE DZ11 LINE
 38900                                  ;A 000000 WORD MARKS THE END OF THE TABLE.
 39000                                  ;CALL THIS SUBROUTINE WITH A JSR,PC
 39100 033524  005712                   ANVENT: TST     (R2)            ;TABLE FINISHED ?
 39200 033526  001462                           BEQ     4$              ;YES BRANCH
 39300 033530                                   SENDALL R3              ;SEND FIRST PART
       033530  010305                           MOV     R3,R5   ;BUILD SEND CALL USING MESSAGE ADDRESS
       033532  005037  001174                   CLR     MODE
       033536  004737  031706                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39400 033542                                   SENDALL (R2)+           ;SEND FROM TABLE
       033542  012205                           MOV     (R2)+,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
       033544  005037  001174                   CLR     MODE
       033550  004737  031706                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39500 033554                                   SENDALL R4              ;SEND LAST PART
       033554  010405                           MOV     R4,R5   ;BUILD SEND CALL USING MESSAGE ADDRESS
       033556  005037  001174                   CLR     MODE
       033562  004737  031706                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39600 033566  004737  034250                   JSR     PC,QUIET        ;WAIT TILL DONE
 39700 033572  005000                           CLR     R0
 39800 033574  013700  001202                   MOV     DZNUM,R0        ;GET DZ NO.
 39900 033600  006300                           ASL     R0
 40000 033602  162700  000002           1$:     SUB     #2,R0
 40100 033606  100424                           BMI     3$
 40200 033610  016001  031554                   MOV     DZCSR(R0),R1    ;GET DZ CSR ADDRESS
 40300 033614  005037  001126                   CLR     ANTMP0
 40400 033620  013737  001126  001130   2$:     MOV     ANTMP0,ANTMP1
 40500 033626  061237  001130                   ADD     (R2),ANTMP1
 40600 033632  013761  001130  000002           MOV     ANTMP1,2(R1)
 40700 033640  005237  001126                   INC     ANTMP0
 40800 033644  022737  000010  001126           CMP     #10,ANTMP0
 40900 033652  001362                           BNE     2$
 41000 033654  000137  033602                   JMP     1$
 41100 033660  004737  034574           3$:     JSR     PC,AWAIT
 41200 033664  062702  000002                   ADD     #2,R2
 41300 033670  000137  033524                   JMP     ANVENT          ;DO FOR NEXT TABLE ENTRY
 41400 033674  000207                   4$:     RTS     PC              ;DONE ALL LINES ON ALL DZ'S. RETURN
 41500
```

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 41700
 41800                                  ;STALL ROUTINE
 41900                                  ;CALL WITH JSR,PC
 42000                                  ;THE LOCATION FOLLOWING THE CALL SHOULD CONTAIN
 42100                                  ;THE AMOUNT OF MILLISECONDS TO HANG IN A NULL LOOP
 42200                                  ,RETURN IS TO THE LOCATION +4 OF THE CALL
 42300 033676  010537  001146           MSTALL: MOV     R5,LOOPO        ;GET # OF MILLISECONDS
 42400 033702  013737  001142  001'44   1$:     MOV     LOOPC,LOOPI     ;SETUP CONSTANTFOR CORRECT STALLING TIME
 42500 033710  000240                   2$:     NOP
 42600 033712  005337  001144                   DEC     LOOPI
 42700 033716  001374                           BNE     2$
 42800 033720  005337  001146                   DEC     LOOPO           ;ONE MILLISECOND DOWN
 42900 033724  003366                           BGT     1$              ;SOME MORE TO GO
 43000 033726  000207                           RTS     PC              ;RETURN
 43100
 43200
 43300                                  ;BINARY TO ASCII CONVERT SUBROUTINE.
 43400                                  ;CALL USING A 'JSR PC'
 43500                                  ;DERIVES ASCII CHARACTERS REPRESENTING THE CONTENTS
 43600                                  ;OF LOCATION 'TEMP', AND PUTS THEM INTO THE 6 BYTES POINTED TO
 43700                                  ;BY R5
 43800                                  ;THIS IS A STOLLEN ROUTINE. IT IS ROTTENLY WRITEN
 43900
 44000 033730  113765  001134  000005   BIOCT:  MOVB    TEMP,5(R5)
 44100 033736  006037  001134                   ROR     TEMP
 44200 033742  113765  001135  000002           MOVB    TEMP+1,2(R5)
 44300 033750  006037  001134                   ROR     TEMP
 44400 033754  006037  001134                   ROR     TEMP
 44500 033760  113765  001134  000004           MOVB    TEMP,4(R5)
 44600 033766  006037  001134                   ROR     TEMP
 44700 033772  113765  001135  000001           MOVB    TEMP+1,1(R5)
 44800 034000  006037  001134                   ROR     TEMP
 44900 034004  006037  001134                   ROR     TEMP
 45000 034010  113765  001134  000003           MOVB    TEMP,3(R5)
 45100 034016  006037  001134                   ROR     TEMP
 45200 034022  113715  001135                   MOVB    TEMP+1,(R5)
 45300 034026  142715  000376                   BICB    #376,(R5)
 45400 034032  142765  000370  000001           BICB    #370,1(R5)
 45500 034040  142765  000370  000002           BICB    #370,2(R5)
 45600 034046  142765  000370  000003           BICB    #370,3(R5)
 45700 034054  142765  000370  000004           BICB    #370,4(R5)
 45800 034062  142765  000370  000005           BICB    #370,5(R5)
 45900 034070  152715  000060                   BISB    #60,(R5)
 46000 034074  152765  000060  000001           BISB    #60,1(R5)
 46100 034102  152765  000060  000002           BISB    #60,2(R5)
 46200 034110  152765  000060  000003           BISB    #60,3(R5)
 46300 034116  152765  000060  000004           BISB    #60,4(R5)
 46400 034124  152765  000060  000005           BISB    #60,5(R5)
 46500 034132  000207                           RTS     PC              ;YEAH
 46600
```

```
 46800
 46900                                          ;BINARY TO DECIMAL CONVERT ROUTINE
 47000                                          ;CALL WITH A JSR SP
 47100                                          ;WROTE THIS MYSELF. ITS WONDERFULL.
 47200 034134  010346                   BIDEC:  MOV     R3,-(SP)        ;SAVE R3
 47300 034136  010446                           MOV     R4,-(SP)        ;ALSO R4 WHICH WE WILL USE
 47400 034140  012704  034236                    MOV     #BIDECC,R4      ;POINT R4 AT SOME CONSTANTS
 47500 034144  112725  000260                    MOVB    #260,(R5)+      ;MAKE THE FIRTS DIGIT OF THE NUMBER 0
 47600 034150  100005                           BPL     1$              ;IS THE # POSITIVE?
 47700 034152  005137  001134                    COM     TEMP            ;NO. MAKE IT SO
 47800 034156  112763  000235  177777          MOVB    #235,-1(R3)     ;AND CHANGE THAT 1ST DIGIT TO A "-"
 47900 034164  112713  000257           1$:    MOVB    #257,(R3)       ;INIT A DIGIT
 48000 034170  105213                   2$:     INCB    (R3)            ;ADD 1 TO THE DIGIT
 48100 034172  161437  001134                    SUB     (R4),TEMP       ;KEEP SUBTRACTING CONSTANT TILL IT GOES NEGATIVE
 48200 034176  100374                           BPL     2$              ;IF WE ARE STILL POSITIVE, DO IT AGAIN
 48300 034200  005203                           INC     R3              ;NO WE WENT NEGATIVE. POINT AT THE NEXT DIGIT
 48400 034202  062437  001134                    ADD     (R4)+,TEMP      ;ADD BACK THE CONSTANT, AND GO ON TO THE NEXT CONSTA
 48500 034206  005714                           TST     (R4)            ;DONE THE 1ST 5 DIGITS YET?
 48600 034210  001365                           BNE     1$              ;IF NOT, GO BACK AND DO ANOTHER
 48700 034212  062737  000260  001134          ADD     #260,TEMP       ;YES. ONE REMAINS TO BE DONE
 48800 034220  113713  001134                    MOVB    TEMP,(R3)       ;SET THE LAST DIGIT NOW.
 48900 034224  012637  001134                    MOV     (SP)+,TEMP      ;RESTORE EVERYTHING
 49000 034230  012604                           MOV     (SP)+,R4        ;THAT WE USED TO
 49100 034232  012603                           MOV     (SP)+,R3        ;ITS ORIGINAL VALUE
 49200 034234  000206                           RTS     SP              ;AND RETURN
 49300
 49400                                          ;CONSTANTS
 49500 034236  023420                   BIDECC: 10000.
 49600 034240  001750                           1000.
 49700 034242  000144                           100.
 49800 034244  000012                           10.
 49900 034246  000000                           0.
 50000
 50100
 50200                                          ; WAIT FOR MESSAGE TO FINISH PRINTING
 50300
 50400 034250  010046                   QUIET:  MOV     R0,-(SP)
 50500 034252  010146                           MOV     R1,-(SP)
 50600 034254  010546                           MOV     R5,-(SP)
 50700 034256  013700  001152                    MOV     NUMLIN,R0       ;GET NO OF LINES
 50800 034262  006300                           ASL     R0
 50900 034264  005001                   1$:     CLR     R1
 51000 034266  020100                   2$:     CMP     R1,R0           ;IF DONE GO TO 5
 51100 034270  001466                           BEQ     5$
 51200 034272  005761  024054                    TST     ACTIVE(R1)      ;STILL WORKING ?
 51300 034276  100403                           BMI     4$              ;STILL SET -BRANCH
 51400 034300  062701  000002           3$:     ADD     #2,R1           ;TEST NEXT LINE
 51500 034304  000770                           BR      2$
 51600 034306  005761  024554           4$:     TST     STOP(R1)        ; WAITING FOR XON ?
 51700 034312  100047                           BPL     7$              ; NO
 51800 034314  105261  024054                    INCB    ACTIVE(R1)      ; COUNT OF PASSES
 51900 034320  126127  024054  000144          CMPB    ACTIVE(R1),#100.  ; ALLOW 10 SECONDS
 52000 034326  002441                           BLT     7$
 52100 034330  052761  000200  020634          BIS     #BIT7,DZLINE(R1)  ; DESELECT THE LINE
 52200 034336  005337  001216                   DEC     UUT
 52300 034342  005061  024554                   CLR     STOP(R1)
 52400 034346  005061  024054                   CLR     ACTIVE(R1)
```

```
 52500 034352  012705  036404                    MOV     #MSG39,R5
 52600 034356  004737  020310                    JSR     PC,CSEND        ; REPORT NO XON
 52700 034362  010137  001134                    MOV     R1,TEMP
 52800 034366  006237  001134                    ASR     TEMP
 52900 034372  012705  020600                    MOV     #EBUF,R5
 53000
 53100 034376  004737  033730                    JSR     PC,BIOCT
 53200 034402  113737  020604  020626            MOVB    EBUF+4,MSGE+14.
 53300 034410  113737  020605  020627            MOVB    EBUF+5,MSGE+15.
 53400 034416  012705  020620                    MOV     #MSGE+10,R5
 53500 034422  004737  020310                    JSR     PC,CSEND
 53600 034426  000137  034264                    JMP     1$
 53700 034432                            7$:     STALL   #100.           ; DELAY A WHILE
       034432  012705  000144                    MOV     #100.,R5                ;SETUP STALL TIME CONSTANT
       034436  004737  033676                    JSR     PC,MSTALL
 53800 034442  000137  034264                    JMP     1$
 53900 034446  012605                    5$:     MOV     (SP)+,R5
 54000 034450  012601                            MOV     (SP)+,R1
 54100 034452  012600                            MOV     (SP)+,R0
 54200 034454  000207                            RTS     PC
 54300
```

```
                                        ;THIS IS THE REPLY SUBROUTINE
                                        ;CALL WITH A JSR PC
                                        ;IT WILL WAIT .5 SECONDS FOR REPLYS FROM ON ALL LINES
                                        ;IF IT SEES A REPLY, THE WORD FOR THE LINE IN THE REPTBL IS SET
034456  010046                  REPLY:  MOV     R0,-(SP)
034460  010146                          MOV     R1,-(SP)        ;SAVE REGS WE USE
034462  013700  001152                  MOV     NUMLIN,R0
034466  006300                          ASL     R0
034470  162700  000002          1$:     SUB     #2,R0
034474  100404                          BMI     2$
034476  005060  024434                  CLR     REPTBL(R0)
034502  000137  034470                  JMP     1$
034506  012737  034540  001140  2$:     MOV     #9$,HOOK        ;PUT CLAWS INTO INPUT ROUTINE
034514                                  STALL   #500.           ;WAIT .5 SECONDS
034514  012705  000764                  MOV     #500.,R5                ;SET UP STALL TIME CONSTANT
034520  004737  033676                  JSR     PC,MSTALL
034524  012737  000000  001140          MOV     #0,HOOK         ;TAKE HOOK OUT OF INPUT ROUTINE
034532  012601                          MOV     (SP)+,R1
034534  012600                          MOV     (SP)+,R0
034536  000207                          RTS     PC              ;RETURN

034540  020527  000023          9$:     CMP     R5,#23          ;IS THE CHAR XOF?
034544  001007                          BNE     3$              ;NO.
034546  022705  000021                  CMP     #21,R5          ;IS THE CHAR XON?
034552  001407                          BEQ     4$              ;YES. LET RECIFVE ROUTINE HANDLE IT
034554  112760  000001  024435          MOVB    #1,REPTBL+1(R0) ;YES. SET HIGH BYTE
034562  000403                          BR      4$
034564  112760  000001  024434  3$:     MOVB    #1,REPTBL(R0)   ;SET LOW BYTE INDICATING NOT XON OR XOF
034572  000207                  4$:     RTS     PC


                                        ;THIS IS THE SUBROUTINE THAT WAITS FOR A CARRIAGE RETURN
034574  012737  000001  001136  AWAIT:  MOV     #1,NOTYET       ;SET NO CR YET SWITCH
034602  012737  034624  001140          MOV     #2$,HOOK        ;PUT HOOK INTO RECIEVE ROUTINE SO WE CAN TEST
034610  005737  001136          1$:     TST     NOTYET          ;SEEN A CARRIAGE RETURN YET?
034614  001375                          BNE     1$              ;NO, KEEP LOOKING
034616  005037  001140                  CLR     HOOK
034622  000207                          RTS     PC              ;RETURN

034624  042705  177600          2$.     BIC     #177600,R5      ;REMOVE JUNK FROM DATA BITS
034630  122705  000015                  CMPB    #15,R5          ;CARRIAGE RETURN ?
034634  001002                          BNE     3$              ;NO.
034636  005037  001136                  CLR     NOTYET          ;YES. MAKE THE SWITCH REFLECT IT
034642  004737  033446          3$:     JSR     PC,KBOUT        ;REMOVE CHAR FROM BUFFER
034646  000207                          RTS     PC
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                                                  .SBTTL  SYSTEM MESSAGES
                                                  .NLIST BEX
     034650   012   015   103          MSG00: .ASCII  <12><15>/CZLAIBO LA00, LA34 DMT PROG/<15><12>
     034707   124   110   111                 .ASCII  /THIS TEST ASSUMES ALL TERMINALS ARE SETUP FOR/<12><15>
     034766   063   060   060                 .ASCIZ  /300 BAUD, 1 STOP, ODD PARITY, XOFF-XON./<12><15>
     035040   012   015   105          MSG01: .ASCIZ  <12><15>/END OF PASS /
     035057   012   015   105          MSG03: .ASCIZ  <12><15>/END OF PASS 000 TEST 00/<12><15>
     035113   116   117   040          MSG04: .ASCIZ  /NO RESPONSE TO ATTRIBUTE PROMPT/<12><15>
     035155   033   133   060          MSG05: .BYTE   33,133,60,143,0 ;TERMINAL ATTRIBUTE PROMPT
     035162   033   133   077          MSG06: .BYTE   33,133,77,63,73,60,143,0;LA00 DEV ATTRIBUTE RESPONSE
     035172   010   000                MSG08: .ASCIZ  <10>
     035174   015   000                MSG09: .ASCIZ  <15>
     035176   033   133   070          MSG10: .BYTE   33,133,70,73,61,66,73,62,64,73,63,62,73
     035213   064   060   073                 .BYTE   64,60,73,64,70,73,65,66,73,66,64,73,67,62,73,70,60
     035234   073   070   070                 .BYTE   73,70,70,73,71,66,73,61,60,64,73,61,61,62
     035252   073   061   062                 .BYTE   73,61,62,60,73,61,62,70,165,0
     035264   120   101   122          MSG12: .ASCIZ  /PARITY TEST 24/<12><15>
     035305   120   114   105          MSG13: .ASCIZ  /PLEASE SETUP FOR /
     035327   110   111   124          MSG14: .ASCIZ /HIT RETURN KEY WHEN YOU ARE DONE WITH ALL TERMINALS/<12><15>
     035415   102   101   104          MSG15: .ASCIZ  /BAD PARITY RECIEVED FROM LA00/<12><15>
     035455   104   101   124          MSG16: .ASCIZ  /DATA OVERRUN ERROR /<12><15>
     035503   067   040   102          MSG17: .ASCIZ  /7 BIT AND SPACE./
     035524   103   110   101          MSG18: .ASCII  /CHAR CODE ECHO TEST 21/<12><15>
     035554   124   131   120          MSG19: .ASCIZ  /TYPE DELETE TO EXIT/<12><15>
     035602   067   040   102          MSG20: .ASCIZ  /7 BIT AND ODD PARITY./
     035630   067   040   102          MSG21: .ASCIZ  /7 BIT AND EVEN PARITY./
     035657   044   012   015          MSG22: .ASCIZ  /$/<12><15>
     035663   130   117   116          MSG25: .ASCIZ  /XON-XOFF TEST 23/<12><15>
     035706   124   125   122          MSG26: .ASCIZ  /TURN THIS TERMINAL OFF-LINE, THEN ON-LINE/<12><15>
     035762   102   101   125          MSG27: .ASCIZ  /BAUD RATE TEST 17./<12><15>
     036007   110   117   122          MSG28: .ASCIZ  /HORIZONTAL MOTION TEST 11/<12><15>
     036043   060   060   060          MSG29: .ASCIZ  /000   /
     036052   120   114   105          MSG30: .ASCIZ  /PLEASE SETUP FOR /
     036074   040   102   101          MSG31: .ASCIZ  / BAUD./<12><15>/ HIT RETURN WHEH DONE FOR ALL TERMINALS./<12><15>
     036157   061   061   060          MSG32: .ASCIZ  /110/
     036163   116   125   114          MSG33: .ASCII  /NULSOHSTXETXEOTENQACKBELBS HT LF /
     036224   126   124   040                 .ASCII  /VT FF CR SO SI DLEXONDC2XOFDC4NAK/
     036265   123   131   116                 .ASCII  /SYNETBCANEM SUBESCFS GS RS US SP /
     036326   063   060   060          MSG35: .ASCIZ  /300/
     036332   040   102   101          MSG36: .ASCIZ  / BAUD/<12><15>
     036342   102   125   106          MSG37: .ASCIZ  /BUFFER OVERRUN TEST 12/<12><15>
     036373   033   133   061          MSG38: .BYTE   33,133,61,73,61,63,62,165,0
     036404   105   122   122          MSG39. .ASCIZ  /ERROR * XON NEVER RECIEVED/<12><15>
     036441   105   122   122          MSG40: .ASCIZ  /ERROR * XOFF NEVER RECIEVED/<12><15>
     036477   000011                   MSG41: .REPT 9.
                                              .ASCII  /X/<11>/X/<12><15>
                                              .ENDR
     036477   130   011   130                 .ASCII  /X/<11>/X/<12><15>
     036504   130   011   130                 .ASCII  /X/<11>/X/<12><15>
     036511   130   011   130                 .ASCII  /X/<11>/X/<12><15>
     036516   130   011   130                 .ASCII  /X/<11>/X/<12><15>
     036523   130   011   130                 .ASCII  /X/<11>/X/<12><15>
     036530   130   011   130                 .ASCII  /X/<11>/X/<12><15>
     036535   130   011   130                 .ASCII  /X/<11>/X/<12><15>
     036542   130   011   130                 .ASCII  /X/<11>/X/<12><15>
     036547   130   011   130                 .ASCII  /X/<11>/X/<12><15>
              000003                          .REPT 3
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                                                    .ASCII  /                          /
                                                    .BYTE   10,10,10,10,10,10,10,10,10,10
                                                    .BYTE   10,10,10,10,10,10,10,10,10,10
                                                    .ENDR
        036554  040     040     040                 .ASCII  /                          /
        036600  010     010     010                 .BYTE   10,10,10,10,10,10,10,10,10,10
        036612  010     010     010                 .BYTE   10,10,10,10,10,10,10,10,10,10
        036624  040     040     040                 .ASCII  /                          /
        036650  010     010     010                 .BYTE   10,10,10,10,10,10,10,10,10,10
        036662  010     010     010                 .BYTE   10,10,10,10,10,10,10,10,10,10
        036674  040     040     040                 .ASCII  /                          /
        036720  010     010     010                 .BYTE   10,10,10,10,10,10,10,10,10,10
        036732  010     010     010                 .BYTE   10,10,10,10,10,10,10,10,10,10
        036744  012     012     012                 .ASCIZ  <12><12><12><15>
        036751  124     105     123         MSG42:  .ASCIZ  /TEST 00 - DATA PATH TEST/<12><15><12>
        037005  052     125     052         MSG43:  .ASCIZ  /*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U*U/<12><1
        037104  124     105     130         MSG44: .ASCIZ   /TEXT 02 - NON PRINTING CHARACTER TEXT. THE NEXT LINE SHOULD BE BLAN
        037214  002     006     020         MSG45:  .BYTE   2,6,20,23,26,31,35,177,21,24,27,32,36,22 25,30,34,37,2',12,15,0
        037242  130     040     000         MSG47:  .ASCIZ /X /
        037245  124     105     123         MSG60:  .ASCIZ  /TEST 07  HORIZONTAL TAB TEST/<12><15>
        037304  033     062     000         MSG61:  .ASCIZ  <33>/2/
        037307  056     000                 MSG62:  .ASCIZ  /./
        037311  033     110     000         MSG63:  .ASCIZ  <33>/H/
        037314  126     000                 MSG64:  .ASCIZ  /V/
        037316  011     000                 MSG65:  .ASCIZ  <11>
        037320  015     000                 MSG66:  .ASCIZ  <15>
        037322  130     000                 MSG67:  .ASCIZ  /X/
        037324  012     015     011         MSG68:  .BYTE   12,15,11,0
        037330  077     040     000         MSG70:  .ASCIZ  /? /
        037333  077     040     040         MSG71:  .ASCIZ  /?  /
        037337  077     040     040         MSG72:  .ASCIZ  /?   /
        037344  012     015     120         MSG73:  .ASCIZ  <12><15>/POWER FAIL TRAP/<12><15>
        037370  012     015     000         MSG75:  .ASCIZ  <12><15>
        037373  012     012     012         MSG77:  .ASCIZ  <12><12><12><15>

        037400  123     120     101         MSG78.  .ASCIZ  /SPACE - BACKSPACE TEST 05/<12><15><12>
        037435  057     040     000         MSG79:  .ASCIZ  */ *
        037440  010     010     134         MSG80:  .ASCIZ  <10><10>/\/<10>
        037445  101     114     114         MSG81:  .ASCIZ  /ALL PRINTABLE CHARACTERS TEST01/<12><15>
        037507  040     000                 MSG82:  .ASCIZ  / /
        037511  104     117     124         MSG83:  .ASCIZ  /DOT MATRIX TEST 03/<12><15>
        037536  132     110     052         MSG84:  .ASCIZ  /ZH*#$  /<12><15>
        037550  132     040     132         MSG85:  .ASCII  /Z ZZ  ZZZ   ZZZZ/<15>
        037571  110     040     110                 .ASCII  /H HH  HHH   HHHH/<15>
        037612  052     040     052                 .ASCII  /* **  ***   ****/<15>
        037633  043     040     043                 .ASCII  /# ##  ###   ####/<15>
        037654  044     040     044                 .ASCIZ  /$ $$  $$$   $$$$/<12><15>
        037677  012     015     124         MSG88:  .ASCIZ  <12><15>/THIS LINE PRINTED AT /
        037727  040     061     060         MSG89:  .ASCIZ  / 10 /
        037734  040     061     062         MSG90:  .ASCIZ  / 12 /
        037741  061     063     056         MSG91:  .ASCIZ  /13.2/
        037746  061     066     056         MSG92:  .ASCIZ  /16.5/
        037753  040     103     120         MSG93:  .ASCIZ  / CPI./
        037761  040     063     040         MSG94:  .ASCIZ  / 3 /
        037765  040     064     040         MSG95:  .ASCIZ  / 4 /
        037771  040     066     040         MSG96:  .ASCIZ  / 6 /
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 9700 037775  040  070  040        MSG97:  .ASCIZ  / 8 /
 9800 040001  114  120  111        MSG98:  .ASCIZ  /LPI./
 9900 040006  033  133  064        MSG99:  .BYTE   33,133,64,167,0
10000 040013  033  133  063        MSG100: .BYTE   33,133,63,167,0
10100 040020  033  133  062        MSG101: .BYTE   33,133,62,167,0
10200 040025  033  133  064        MSG102: .BYTE   33,133,64,172,0
10300 040032  033  133  061        MSG103: .BYTE   33,133,61,172,0
10400 040037  033  133  063        MSG104: .BYTE   33,133,63,172,0
10500 040044  033  133  065        MSG105: .BYTE   33,133,65,172,0
10600 040051  033  133  062        MSG106: .BYTE   33,133,62,172,0
10700 040056  012  015  101        MSG107: .ASCIZ  <12><15>/ABCDEFGHIJKLMNOPQRSTUVWXYZ/
10800 040113  033  133  061        MSG108: .BYTE   33,133,61,167,0
10900 040120  110  117  122        MSG109: .ASCIZ  /HORIZONTAL PITCH TEST 04/<12><15>
11000 040153  126  105  122        MSG110: .ASCIZ  /VERTICAL PITCH TEST 13/<12><15>
11100 040204  123  105  124        MSG111: .ASCIZ  /SET MARGINS TEST 06/<15>
11200 040231  033  133  060        MSG113: .BYTE   33,133,60,60,61,73,61,63,62,163,0
11300 040244  033  133  060        MSG114: .BYTE   33,133,60,60,60,73,60,60,60,163,0
11400 040257  075  000              MSG115: .ASCIZ  /=/
11500 040261  105  122  122        MSG116: .ASCIZ  /ERROR IF NOT AT LH MARGIN/<12><15>
11600 040315  033  133  066        MSG117: .BYTE   33,133,66,172,0
11700 040322  040  062  040        MSG118: .ASCIZ  / 2 /
11800 040326  120  122  111        MSG120: .ASCIZ  /PRINTER BELL TEST 14/<12><15>
11900 040355  115  125  114        MSG123: .ASCIZ  /MULTIPLE LINE FEED TEST 10/<12><15>
12000 040412  055  055  055        MSG124: .ASCIZ  /----------/<15>
12100 040430  055  055  055        MSG125: .ASCIZ  /------00/<15>
12200 040442  123  105  124        MSG140: .ASCII  /SET CAPS LOCK OFF, SHIFT LOCK OFF, THEN /
12300 040512  120  122  105                .ASCII  /PRESS ALL PRINTING KEYS./
12400 040542  012  015  104                .ASCII  <12><15>/DON'T PRESS  ESC, TAB, RETURN/
12500 040601  054  040  102                .ASCII  /, BS, OR FUNCTION KEYS./<12><15>
12600 040632  120  122  105        MSG145: .ASCIZ  /PRESS THE SPACE BAR LAST./<12><15>
12700 040666  120  122  105        MSG142: .ASCIZ  /PRESS THE SPACE BAR IF FINISHED/<12><15>
12800 040730  040  072  040        MSG143: .ASCIZ  / : KEYS WERE NOT RECIEVED/<12><15>
12900 040764  124  122  131        MSG144: .ASCIZ  /TRY AGAIN , /
13000 041001  012  015  105        MSG146: .ASCIZ  <12><15>/ERROR * /
13100 041014  111  116  126        MSG148: .ASCIZ  /INVALID CODE RECVD : /
13200 041042  124  105  123        MSG147: .ASCIZ  /TEST #21/<12><15>
13300 041055  120  122  105        MSG150: .ASCIZ  /PRESS /<12><15>
13400 041066  040  122  110        MSG152: .ASCIZ  / RH SHIFT AND B/<12><15>
13500 041110  123  105  124        MSG156: .ASCIZ  /SET SHIFT LOCK , /
13600 041132  077  077  077        MSG149: .ASCIZ  /???/
13700 041136  040  114  110        MSG151: .ASCIZ  / LH SHIFT  AND  'A/<12><15>
13800 041163  064  012  015        MSG153: .ASCIZ  /4/<12><15>
13900 041167  040  103  124        MSG154: .ASCIZ  / CTL-P/<12><15>
14000 041200  040  105  123        MSG155: .ASCIZ  / ESCAPE/<12><15>
14100 041212  122  105  123        MSG157: .ASCIZ  /RESET SHIFT LOCK, SET  CAPS LOCK, /
14200 041255  124  101  102        MSG158: .ASCIZ  /TAB/<12><15>
14300 041263  122  105  124        MSG159: .ASCIZ  /RETURN/<12><15>
14400 041274  060  061  062        MSG160: .ASCIZ  /0123456789/
14500 041307  077  012  015        MSG162: .ASCIZ  /?/<12><15>
14600 041313  111  116  126        MSG163: .ASCIZ  /INVALID SEQUENCE RECVD/<12><15>
14700 041344  115  111  101        MSG164: .ASCIZ  /MIAN KEYBOARD TEST 20/<12><15>
14800 041374  123  120  101        MSG165: .ASCIZ  /SPACE/
14900 041402  102  101  103        MSG166: .ASCIZ  /BACKSPACE/<12><15>
15000 041416  114  111  116        MSG167: .ASCIZ  /LINEFEED/<12><15>
15100 041431  104  105  114        MSG168: .ASCIZ  /DELETE/<12><15>
15200 041442  104  012  015        MSG169: .ASCIZ  /D/<12><15>
15300 041446  040  000              MSG170: .ASCIZ  / /
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 15400 041450      033      133      062          MSG180: .BYTE   33,133,62,73,62,66,163,0
 15500 041460      033      133      062          MSG181: .BYTE   33,133,62,66,73,65,60,163,0
 15600 041471      033      133      065          MSG182: .BYTE   33,133,65,62,73,67,66,163,0
 15700 041502      033      133      067          MSG183: .BYTE   33,133,67,70,73,61,60,62,163,0
 15800 041514      033      133      061          MSG184: .BYTE   33,133,61,60,60,73,61,62,64,163,0
 15900 041527      114      111      106          MSG270: .ASCIZ  /LIFE TEST #15/<12><15>
 16000 041547      114      101      060          MSG280: .ASCIZ  /LA00 DYNAMIC EXERCISOR TEST 16/<12><15>
 16100 041610      077      000                   MSG281: .ASCIZ  /?/
 16200 041612      040      060      060          MSG271: .ASCIZ  / 00 /
 16300 041617      012      015      105          MSG303: .ASCIZ  <12><15>/ENTER SETUP MODE  THEN TYPE THE FOLLOWING : /
 16400 041676      105      130      111          MSG304: .ASCIZ  /EXIT SETUP MODE , AND TYPE A CTL-Q/<12><15>
 16500 041743      126      075      106          MSG30?: .ASCIZ  /V=F(CR)/<12><15>
 16600 041755      110      075      104          MSG309: .ASCIZ  /H=D(CR)/<12><15>
 16700 041767      110      075      103          MSG310: .ASCIZ  /H=C(CR)/<12><15>
 16800 042001      110      075      102          MSG311: .ASCIZ  /H=B(CR)/<12><15>
 16900 042013      110      075      101          MSG312: .ASCIZ  /H=A(CR)/<12><15>
 17000 042025      126      075      101          MSG313: .ASCIZ  /V=A(CR)/<12><15>
 17100 042037      126      075      102          MSG314: .ASCIZ  /V=B(CR)/<12><15>
 17200 042051      126      075      104          MSG315: .ASCIZ  /V=D(CR)/<12><15>
 17300 042063      126      075      105          MSG316: .ASCIZ  /V=E(CR)/<12><15>
 17400 042075      126      075      103          MSG317: .ASCIZ  /V=C(CR)/<12><15>
 17500 042107      116      117      040          MSG318: .ASCIZ  /NO RESPONSE RECIEVED/<12><15>
 17600 042136      120      111      124          MSG320: .ASCIZ  /PITCH SETUP TEST 22/<12><15>
 17700 042164      133      055      055          MSG321: .ASCII  /[-----/<12><15>
 17800 042174      133      055      055                  .ASCII  /[-----/<12><15>
 17900 042204      133      055      055                  .ASCII  /[-----/<12><15>
 18000 042214      133      055      055                  .ASCII  /[-----/<12><15>
 18100 042224      133      055      055          MSG322: .ASCII  /[-----/<12><15>
 18200 042234      133      055      055                  .ASCII  /[-----/<12><15>
 18300 042244      133      055      055          MSG323: .ASCII  /[-----/<12><15>
 18400 042254      133      055      055                  .ASCII  /[-----/<12><15>
 18500 042264      133      055      055          MSG324: .ASCII  /[-----/<12><15>
 18600 042274      133      055      055          MSG325: .ASCII  /[-----/<12><15>
 18700 042304      133      055      055          MSG326: .ASCII  /[-----/<12><15>
 18800 042314      133      055      055                  .ASCIZ  /[-----/<12><15><12><12>
 18900 042327      012      015      122          MSGK1:  .ASCIZ  <12><15>/READY/<12><15>
 19000 042341      105      116      124          MSGK2:  .ASCIZ  /ENTER MODE  D OR P :/
 19100 042366      077      040      077          MSGK3:  .ASCIZ  /? ? ? ?/<12><15>
 19200 042400      012      015      105          MSGK4:  .ASCIZ  <12><15>/ENTER COMMAND(S) /<12><15>
 19300 042426      122      125      116          MSGK5:  .ASCIZ  /RUN INTERVENTION TEST ?/<12><15>
 19400 042460      007      012      015          MSGK6:  .ASCIZ  <007><12><15>/NO TERMINALS SELECTED/<007><12><15>
 19500 042514      012      015      105          MSGS1:  .ASCIZ  <12><15>/ERROR * INVALID TEST NO./<12><15><07>
 19600 042552      012      015      105          MSGS2:  .ASCIZ  <12><15>/ERROR * PMT CONFLICT/<12><15><07>
 19700                                            .EVEN
 19800 042604   000040   000041   000042          PCTABL: .WORD   40,41,42,43,44,45,46,47,50,51,52,53,54,55,56,57
 19900 042644   000060   000061   000062                  .WORD   60,61,62,63,64,65,66,67,70,71,72,73,74,75,76,77
 20000 042704   000100   000101   000102                  .WORD   100,101,102,103,104,105,106,107,110,111,112
 20100 042732   000113   000114   000115                  .WORD   113,114,115,116,117,120,121,122,123,124,125,126
 20200 042762   000127   000130   000131                  .WORD   127,130,131,132,133,134,135,136,137,140,141,142
 20300 043012   000143   000144   000145                  .WORD   143,144,145,146,147,150,151,152,153,154,155,156
 20400 043042   000157   000160   000161                  .WORD   157,160,161,162,163,164,165,166,167,170
 20500 043066   000171   000172   000173                  .WORD   171,172,173,174,175,176
 20600          001220                           .END    START
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ACTDVC  000041'     END22   014370      MSG101  040020      MSG180  041450      MSG63   037311
ACTIVE  024054      EOP     003634      MSG102  040025      MSG181  041460      MSG64   037314
ANTMP0  001126      EOPT    003510      MSG103  040032      MSG182  041471      MSG65   037316
ANTMP1  001130      ERROR   001110      MSG104  040037      MSG183  041502      MSG66   037320
ANTMP2  001132      ERRORT  020352      MSG105  040044      MSG184  041514      MSG67   037322
ANVENT  033524      FLAG21  014302      MSG106  040051      MSG19   035554      MSG68   037324
ANYWAY  004104      GETPN   016270      MSG107  040056      MSG20   035602      MSG70   037330
APTHDR  001000      GETSWS  004036      MSG108  040113      MSG21   035630      MSG71   037333
AWAIT   034574      GETTS'  003356      MSG109  040120      MSG22   035657      MSG72   037337
BIDEC   034134      GO      001214      MSG110  040153      MSG25   035663      MSG73   037344
BIDECC  034236      HOOK    001140      MSG111  040204      MSG26   035706      MSG75   037370
BIOCT   033730      INIT    001342      MSG113  040231      MSG27   035762      MSG77   037373
BIT0  = 000001      INIT1   001542      MSG114  040244      MSG270  041527      MSG78   037400
BIT1  = 000002      INIT2   001614      MSG115  040257      MSG271  041612      MSG79   037435
BIT10   002000      INIT3   001674      MSG116  040261      MSG28   036007      MSG80   037440
BIT11 = 004000      INIT4   001726      MSG117  040315      MSG280  041547      MSG81   037445
BIT12 = 010000      INIT5   001760      MSG118  040322      MSG281  041610      MSG82   037507
BIT13 = 020000      INIT6   002046      MSG12   035264      MSG29   036043      MSG83   037511
BIT14 = 040000      ISEQ    002220      MSG120  040326      MSG30   036052      MSG84   037536
BIT15 = 100000      KBBUF   026454      MSG123  040355      MSG303  041617      MSG85   037550
BIT2  = 000004      KBBUFB  026074      MSG124  040412      MSG304  041676      MSG88   037677
BIT3  = 000010      KBBUFE  025754      MSG125  040430      MSG308  041743      MSG89   037727
BIT4    000020      KBBUFI  026214      MSG13   035305      MSG309  041755      MSG90   037734
BIT5  = 000040      KBBUFO  026334      MSG14   035327      MSG31   036074      MSG91   037741
BIT6    000100      KBCNT   025634      MSG140  040442      MSG310  041767      MSG92   037746
BIT7    000200      KBN     033362      MSG142  040666      MSG311  042001      MSG93   037753
BIT8    000400      KBOUT   033446      MSG143  040730      MSG312  042013      MSG94   037761
BIT9    001000      KEYEND  014300      MSG144  040764      MSG313  042025      MSG95   037765
CHARIN  001170      KEYTBL  014140      MSG145  040632      MSG314  042037      MSG96   037771
CHROUT  032310      KSTART  001242      MSG146  041001      MSG315  042051      MSG97   037775
CODTBL  014352      LOOPC   001142      MSG147  041042      MSG316  042063      MSG98   040001
COLTBL  010756      LOOPI   001144      MSG148  041014      MSG317  042075      MSG99   040006
COMCNT  025014      LOOPO   001146      MSG149  041132      MSG318  042107      MSTALL  033676
COMEND  025374      LSEQ    002450      MSG15   035415      MSG32   036157      NOTYET  001136
COMIN   025134      MODCON  003460      MSG150  041055      MSG320  042136      NUMCHK  020234
COMOUT  025254      MODE    001174      MSG151  041136      MSG321  042164      NUMLIN  001152
COM1    001154      MSGADR  001104      MSG152  041066      MSG322  042224      ONLINE  001204
COM2    001156      MSGE    020610      MSG153  041163      MSG323  042244      PASSNO  001124
COUNT   010070      MSGK1   042327      MSG154  041167      MSG324  042264      PCTABL  042604
CSEND   020310      MSGK2   042341      MSG155  041200      MSG325  042274      PFAIL   000024
CTLTBL  014304      MSGK3   042366      MSG156  041110      MSG326  042304      PMODE   001176
CURADD  024674      MSGK4   042400      MSG157  041212      MSG33   036163      PNTR    001206
CURREP  024174      MSGK5   042426      MSG158  041255      MSG35   036326      PRI0  = 000000
CURTER  024314      MSGK6   042460      MSG159  041263      MSG36   036332      PRI4  = 000200
DLRVEC- 000060      MSGS1   042514      MSG16   035455      MSG37   036342      PRI7  = 000340
DLTVEC- 000064      MSGS2   042552      MSG160  041274      MSG38   036373      QUIET   034250
DXTMP   001100      MSGTYP  001102      MSG162  041307      MSG39   036404      RCINT   033164
DZADDR  001074      MSG00   034650      MSG163  041313      MSG40   036441      RCRTN   033422
DZCOMB  020754      MSG01   035040      MSG164  041344      MSG41   036477      RCTMP   001200
DZCON = 000005      MSG03   035057      MSG165  041374      MSG42   036751      REAL    003334
DZCSR   031554      MSG04   035113      MSG166  041402      MSG43   037005      RECERR  031566
DZLINE  020634      MSG05   035155      MSG167  041416      MSG44   037104      REPLY   034456
DZNUM   001202      MSG06   035162      MSG168  041431      MSG45   037214      REPTBL  024434
DZRINT  032412      MSG08   035172      MSG169  041442      MSG47   037242      RESET0  033062
DZTINT  032330      MSG09   035174      MSG17   035503      MSG60   037245      RSEQ    002754
DZVECT  001076      MSG10   035176      MSG170  041446      MSG61   037304      SCAN    004216
EBUF    020600      MSG100  040013      MSG18   035524      MSG62   037307      SEND    031706
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SYMBOL TABLE

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SENDTM  001106          TBL12B  007466          TEST12  011164          T12FIX  007500          $ETABL  001034
SEND1   031770          TBL12C  007473          TEST13  011630          T17A    012134          $ETEND  001074
SEQ     001112          TBL31A  017024          TEST14  012170          T17B    012136          $FATAL  001016
SEQMS   002342          TBL31C  017120          TEST15  015676          T21E    013772          $MAIL   001014
SEQ8    002316          TBL31D  017144          TEST16  016340          T30BUF  016324          $MEMAD  001044
SHITBL  014314          TBL31E  017154          TEST17  004612          UUT     001216          $MEMAR  001046
SQ      001116          TBL31F  017170          TEST20  012260          VALID   003302          $MEMA2  001050
SRCONT  001120          TBL31G  017214          TEST21  014412          WIDTH   001172          $MEMA3  001054
START   001220          TCRBIT  025514          TEST22  015214          WORK    001160          $MEMA4  001060
STOP    024554          TEMP    001134          TKBUF   020332          WORK1   001162          $MEMR2  001052
SWR     001122          TEST    001114          TMPTST  001210          WORK2   001164          $MEMR3  001056
SWRTST  003754          TEST00  005410          TRAP4   000004          WORK3   001166          $MEMR4  001062
TAB     010066          TEST01  005452          TSTMP   001150          WSEQ    002336          $MSGAD  001030
TABLH   006372          TEST02  005700          TSTTBL  004424          W1      007512          $MSGL   001032
TABLHF  006402          TEST03  005732          TSTTYP  001212          W2      007514          $PASNO  001022
TABLV   012140          TEST04  006040          TTYIN   017240          W3      007516          $SWREG  001036
TABLVF  012154          TEST05  006412          TXINT   032474          X     = 000012          $TSTNO  001020
TABL13  010050          TEST06  006610          T03TBL  005374          $BASE   001070          $UNIT   001026
TABL24  015622          TEST07  007520          T03TB2  005402          $CPU    001042          $VECT1  001064
TAB24B  015650          TEST10  010072          T11A    006366          $DEVCT  001024          $VECT2  001066
TBL12A  007454          TEST11  010464          T11B    006370          $DEVM   001072

. ABS.  043102      000
        000000      001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  21488 WORDS  ( 84 PAGES)
DYNAMIC MEMORY:  20620 WORDS  ( 79 PAGES)
ELAPSED TIME:  00:02:12
CZLAIB.BIN,CZLAIB.SEQ-CZLAIB.MAC
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