LA00,34,38

LA00 DMT DIAG

CZLAIB0

AH-E150B-MC

FICHE 1 OF 1

SEP 1979

digital

MADE IN USA

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.

TABLE OF CONTENTS

1.0 ABSTRACT
1.1 FUNCTIONAL DESCRIPTION
1.2 INTENDED USERS

2.0 REQUIREMENTS
2.1 EQUIPMENT
2.2 RELATED PROGRAMS
2.3 TERMINAL CONFIGURATION

3.0 LOADING AND INITIALIZATION
3.1 STARTING ADDRESSES
3.2 MODIFICATIONS TO PROGRAM
3.3 EXECUTION TIME

4.0 CONTROL AND TEST SELECTION
4.1 SWITCH REGISTER CONTROL
4.2 CONSOLE CONTROL
4.2.1 COMMANDS

5.0 TEST GROUPS
5.1 TERMINAL TESTS
5.2 INTERVENTION TESTS
5.3 EXERCISORS

6.0 TEST DESCRIPTIONS
6.1 TEST00 DATA PATHS TEST
6.2 TEST01 PRINTABLE CHARACTERS TEST
6.3 TEST02 NONPRINTABLE CHARACTERS TEST
6.4 TEST03 DOT MATRIX TEST
6.5 TEST04 HORIZONTAL PITCH TEST
6.6 TEST05 SPACE BACKSPACE TEST
6.7 TEST06 SET MARGINS TEST
6.8 TEST07 HORIZONTAL TABS TEST
6.9 TEST10 MULTIPLE LINE FEED TEST
6.10 TEST11 HORIZONTAL MOTION TEST
6.11 TEST12 BUFFER OVERRUN TEST
6.12 TEST13 VERTICAL PITCH TEST
6.13 TEST14 BELL TEST
6.14 TEST15 LIFE TEST
6.15 TEST16 DYNAMIC EXERCISOR
6.16 TEST17 INTERFACE SPEEDS TEST
6.17 TEST20 KEYBOARD ECHO TEST
6.18 TEST21 CHARACTER CODE ECHO TEST
6.19 TEST22 PITCH SETUP TEST

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 PAT-
TERN. 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

SEQ 0014

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.

100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
4600
4700

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
```

```
                                        .TITLE  CZLAIBO LA00, LA34 DMT PROG
                                        ;
                                        .SBTTL  DMT/PMT PROGRAM FOR LA00 TERMINAL
                                        ; PATCHED QUIET SUBROUTINE TO TIMEOUT IF XON NOT RECVD
                                        ; 23-FEB-79   R.SCHAUBER
000000                                  .ENABL  ABS
                                        .ENABLE AMA
                                        .LIST MC,ME

                                        ;SOME DEFINITIONS

                000060                  DLRVEC=60
                000064                  DLTVEC=64
                000000                  PRI0=000000
                000200                  PRI4=200
                000340                  PRI7=340

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

                000005                  DZCON=5.        ;MAX NO. OF DZ11'S  THIS COMPILE

000000                                  .ASECT

                000000                  .=0
000000  000002  000000                          .WORD   2,0             ;START OF TRAP CATCHER AREA
                000004                  .=4
000004  000006  000000  000012         TRAP4:   .WORD   6,0,12,0,16,0,22,0
        000012  000000  000016  000000
        000020  000022  000000
                000024                  .=24
000024  001220  000000                 PFAIL:   .WORD   START,PRI0
                000041                  .=41
000041    000  ACTDVC:  .BYTE   0       ;ACT11 LOAD MEDIUM
000042  000000          .WORD   0       ;ACT11 MODE  0 IS MANUAL MODE
000044  001000          .WORD   APTHDR  ;APT11 HEADER BLOCK ADDRESS
000046  003634          .WORD   EOP     ;ACT11 END OF PASS HOOK ROUTINE
000050  000000          .WORD   0
000052  020000          .WORD   20000   ;ACT11 MANUAL MODE ONLY
```

```
 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
```

```
001220  012706  001000                     START:  MOV     #1000,SP          ;SETUP STACK POINTER
001224  052737  100000  001120                     BIS     #BIT15,SRCONT     ;SET SWITCH CONTROL
001232  004737  003754                             JSR     PC,SWRTST
001236  000137  001342                             JMP     INIT

                                           ;START HERE IF IN CONSOLE CONTROL

001242  012706  001000                     KSTART: MOV     #1000,SP          ;INIT THE STACK
001246  004737  003754                             JSR     PC,SWRTST
001252  012737  017240  000060                     MOV     #TTYIN,@#60       ;INIT CONSOLE VECTOR AREAS
001260  012737  000200  000062                     MOV     #PRI4,@#62        ;COMMANDS HAVE PRIORITY
001266  012737  000066  000064                     MOV     #66,64
001274  012737  000200  000066                     MOV     #PRI4,@#66
001302  012737  000101  177560                     MOV     #101,@#177560     ;TURN ON THE CONSOLE
001310  005037  001210                             CLR     TMPTST
001314  005037  001120                             CLR     SRCONT
001320  012737  020332  001206                     MOV     #TKBUF,PNTR       ;INPUT BUFFER POINTER
001326                                             SENDC   #MSG00            ;SEND TEST ID
001326  012705  034650                             MOV     #MSG00,R5                 ;GET MESSAGE ADDRESS
001332  004737  020310                             JSR     PC,CSEND          ;SEND MESSAGE
001336  000137  001342                             JMP     INIT



                                           ;HERE WE INIT THE DZ11 ROUTINES
001342  000240                             INIT:   NOP
001344  005037  001216                             CLR     UUT
001350  012737  001402  000004                     MOV     #2$,TRAP4         ;SU TRAP CATCHER
001356  013700  001074                             MOV     DZADDR,R0         ;GET FIRST DZ ADDRESS
001362  005037  001202                             CLR     DZNUM
001366  005710                             1$:     TST     (R0)              ;DZ PRESENT ?
001370  005237  001202                             INC     DZNUM             ;YES COUNT IT
001374  062700  000010                             ADD     #10,R0            ;POINT TO NEXT ADDRESS
001400  000772                                     BR      1$

001402  012737  000006  000004             2$:     MOV     #6,TRAP4          ;FIX TRAP CATCHER
001410  005737  001202                             TST     DZNUM             ;ANY DZ'S ?
001414  001002                                     BNE     3$
001416  000000                                     HALT                      ;NO- NOTHING TO TEST
001420  000776                                     BR      .-2
001422  012706  001000                     3$:     MOV     #1000,SP          ;CLEAR THE STACK POINTER
001426  013701  001202                             MOV     DZNUM,R1          ;GET DZ COUNT
001432  006301                                     ASL     R1
001434  006301                                     ASL     R1
001436  006301                                     ASL     R1                ;8 LINES PER DZ
001440  010137  001152                             MOV     R1,NUMLIN         ;SAVE TOTAL NO OF LINES
001444  005000                                     CLR     R0
001446  012702  020754                             MOV     #DZCOMB,R2        ;START OF COMMAND BUFFERS
001452  010260  025134                     4$:     MOV     R2,COMIN(R0)
001456  010260  025254                             MOV     R2,COMOUT(R0)
001462  010260  025374                             MOV     R2,COMEND(R0)
001466  062760  000050  025374                     ADD     #50,COMEND(R0)    ;END IS 20 WORDS AWAY
001474  005060  025014                             CLR     COMCNT(R0)
001500  005060  024174                             CLR     CURREP(R0)
001504  005060  024674                             CLR     CURADD(R0)
001510  005060  024314                             CLR     CURTER(R0)
001514  005060  024554                             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
 8000 001614  013701  001152                ;INIT DZ11 RECIEVE
 8100 001620  012702  026454    INIT2:  MOV     NUMLIN,R1       ;GET # OF LINES
 8200 001624  005000            MOV     #KBBUF,R2       ;SETUP FIRST KEYBOARD BUFFER AREA ADDRESS
 8300 001626  005060  025634    CLR     R0
 8400 001632  010260  026074    1$:     CLR     KBCNT(R0)       ;ZERO CHAR COUNT
 8500 001636  010260  026214    MOV     R2,KBBUFB(R0)   ;DEFINE BEGINING OF BUFFER
 8600 001642  010260  026334    MOV     R2,KBBUFI(R0)   ;INIT PUT IN POINTER
 8700 001646  010260  025754    MOV     R2,KBBUFO(R0)   ;AND TAKE OUT POINTER
 8800 001652  062760  000016  025754  MOV     R2,KBBUFE(R0)   ;DEFINE END OF BUFFER
 8900 001660  062700  000002    ADD     #16,KBBUFE(R0)  ;AS 16 BYTES PAST BEGINING
 9000 001664  062702  000020    ADD     #2,R0           ;NEXT LINE PLEASE
 9100 001670  005301            ADD     #20,R2          ;BUFFER AREAS ARE 20 BYTES LONG EACH
 9200 001672  001355            DEC     R1              ;ANY  MORE TO SETUP?
 9300                           BNE     1$              ;YES. DO SO
 9400
 9500 001674  013700  001202                ;INIT DZ11 CSR REGISTER TABLE
 9600 001700  012701  031554    INIT3:  MOV     DZNUM,R0        ;COUNT OF DZS
 9700 001704  013702  001074    MOV     #DZCSR,R1       ;SETUP ADDRESS OF TABLE
 9800 001710  010221            MOV     DZADDR,R2       ;SETUP ADDRESS OF 1ST CSR
 9900 001712  012712  000020    1$:     MOV     R2,(R1)+        ;PUT A CSR ADDRESS INTO THE TABLE
10000 001716  062702  000010    MOV     #20,(R2)                ;CLEAR THE DZ
10100 001722  005300            ADD     #10,R2          ;CSRS ARE 4 WORDS APPART
10200 001724  001371            DEC     R0              ;ANY MORE TO DO?
10300                           BNE     1$              ;YES. DO EM.
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
```

```
                                        ;INITIAL TEST STARTUP SEQUENCE
                                        
002450  005737  001120          LSEQ:   TST     SRCONT                  ;SWITCH CONTROL ?
002454  001471                          BEQ     20$                     ;NO-JUMP TO 20
002456  004737  004036                  JSR     PC,GETSWS               ;READ SWITCH REG.
002462  032737  002000  001116    1$:   BIT     #BIT10,SO               ;TEST NO. IN SWS ?
002470  001452                          BEQ     13$                     ;NO- GOTO 13
002472  004737  003302                  JSR     PC,VALID                ;CHECK VALIDITY
002476  005737  001214                  TST     GO
002502  001433                          BEQ     10$                     ;NO GOOD GOTO 10
002504  004737  003356                  JSR     PC,GETTST               ;TEST ADDR & INFO
002510  004737  003460                  JSR     PC,MODCON               ;MODE CONFLICT ?
002514  005737  001214                  TST     GO
002520  001402                          BEQ     3$                      ;YES- GOTO 3
002522  000137  002730          2$:     JMP     40$                     ;OK- GO START TEST
002526  032737  010000  001116    3$:   BIT     #BIT12,SO               ;SEQUENCE TESTS ?
002534  001412                          BEQ     5$              ;YES GOTO 5
002536  005037  001214          4$:     CLR     GO
002542                                  SENDALL #MSGS2          ;ERROR MODE CONFLICT *****
002542  012705  042552                  MOV     #MSGS2,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
002546  005037  001174                  CLR     MODE
002552  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
002556  000137  002730                  JMP     40$
002562  105237  001116          5$:     INCB    SO                      ;TRY NEXT TEST
002566  000137  002462                  JMP     1$
                                        
002572                          10$:    SENDALL #MSGS1          ;ERROR INVALID TEST NO. *****
002572  012705  042514                  MOV     #MSGS1,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
002576  005037  001174                  CLR     MODE
002602  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
002606  005037  001214                  CLR     GO
002612  000137  002730                  JMP     40$
                                        
002616  105037  001116          13$:    CLRB    SO              ;SU FOR TEST 0
002622  004737  003356                  JSR     PC,GETTST               ;TEST ADDR & INFO
002626  012737  000001  001214          MOV     #1,GO
002634  000137  002730                  JMP     40$
                                        
                                        ; CONSOLE CONTROL SECTION
                                        
002640  004737  003356          20$:    JSR     PC,GETTST               ;GET TEST ADDR & INFO
002644  004737  003460                  JSR     PC,MODCON               ;MODE CONFLICT ?
002650  005737  001214                  TST     GO
002654  001402                          BEQ     25$                     ;YES- GOTO 25
002656  000137  002730          21$:    JMP     40$                     ;GO START TEST
002662  004737  004104          25$:    JSR     PC,ANYWAY               ;RUN ANYWAY ?
002666  042705  000240                  BIC     #240,R5
002672  122705  000131                  CMPB    #'Y,R5
002676  001411                          BEQ     27$                     ;YES GOTO 27
002700                                  SENDC   #MSGK1                  ;SEND 'READY'
002700  012705  042327                  MOV     #MSGK1,R5               ;GET MESSAGE ADDRESS
002704  004737  020310                  JSR     PC,CSEND        ;SEND MESSAGE
002710  012737  177777  001214          MOV     #-1,GO                  ;GO BACK TO WAIT
002716  000137  002730                  JMP     40$
002722  112737  000001  001214  27$:    MOVB    #1,GO
002730  005737  001214          40$:    TST     GO
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, &8
 28600 003070  053737  001160  001116                   BIS     WORK,S0
 28700 003076  005137  001160                           COM     WORK
 28800 003102  042737  007377  001160                   BIC     #007377,WORK
 28900 003110  043737  001160  001116                   BIC     WORK,S0
 29000 003116  032737  010000  001116          5$:     BIT     #BIT12,S0       ;SEQUENCE TESTS ?
 29100 003124  001423                                   BEQ     10$             ;YES- JUMP TO 10
 29200 003126  032737  000400  001116          6$:     BIT     #BIT8,S0        ;END OF TEST HALT ?
 29300 003134  001406                                   BEQ     9$              ;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    S0              ;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$:    BIT     #BIT8,S0        ;END OF PASS HALT ?
 31500 003250  001406                                   BEQ     19$             ;NO- JUMP
 31600 003252  005737  001120                           TST     SRCONT          ;SWITCH CONTROL ?
 31700 003256  001401                                   BEQ     17$             ;NO JUMP
```

```
 31800 003260  000000                          HALT            ;END OF PASS .....................
 31900 003262  000137  002450          17$:    JMP     LSEQ            ;GET NEW TEST NO. ETC.
 32000
 32100 003266  105037  001116          19$:    CLRB    SO              ;SET TEST 0
 32200 003272  004737  003356                  JSR     PC,GETTST
 32300 003276  000137  002754          22$:    JMP     RSEQ            ;START TEST.....
 32400
 32500
 32600 003302  005037  001214          VALID:  CLR     GO
 32700 003306  105737  001116                  TSTB    SO
 32800 003312  002407                          BLT     4$
 32900 003314  123727  001116  000022          CMPB    SO,#22
 33000 003322  003003                          BGT     4$
 33100 003324  012737  000001  001214          MOV     #1,GO
 33200 003332  000207                  4$:     RTS     PC
 33300
 33400 003334  105037  001214          REAL:   CLRB    GO
 33500 003340  005737  001212                  TST     TSTTYP
 33600 003344  100403                          BMI     1$
 33700 003346  012737  000001  001214          MOV     #1,GO
 33800 003354  000207                  1$:     RTS     PC
 33900
 34000 003356  005037  001160          GETTST: CLR     WORK
 34100 003362  005037  001112                  CLR     SEQ
 34200 003366  113737  001116  001160          MOVB    SO,WORK
 34300 003374  006337  001160                  ASL     WORK
 34400 003400  063737  001160  001112          ADD     WORK,SEQ
 34500 003406  006337  001112                  ASL     SEQ
 34600 003412  063737  001160  001112          ADD     WORK,SEQ
 34700 003420  062737  004424  001112          ADD     #TSTTBL,SEQ
 34800 003426  017737  175460  001114          MOV     @SEQ,TEST
 34900 003434  062737  000002  001112          ADD     #2,SEQ
 35000 003442  017737  175444  001212          MOV     @SEQ,TSTTYP
 35100 003450  062737  000002  001112          ADD     #2,SEQ          ;POINT TO PASS NO.
 35200 003456  000207                          RTS     PC
 35300
 35400 003460  112737  000001  001214  MODCON: MOVB    #1,GO
 35500 003466  005737  001176                  TST     PMODE
 35600 003472  001405                          BEQ     2$
 35700 003474  105737  001212                  TSTB    TSTTYP
 35800 003500  100002                          BPL     2$
 35900 003502  005037  001214                  CLR     GO
 36000 003506  000207                  2$:     RTS     PC
 36100
 36200                                 ;END OF TEST PASS ROUTINE
 36300
 36400 003510  005037  001134          EOPT:   CLR TEMP                ;CONVERT TEST NO TO ASCII
 36500 003514  113737  001116  001134          MOVB    SO,TEMP
 36600 003522  012705  020600                  MOV     #EBUF,R5
 36700 003526  004737  033730                  JSR     PC,BIOCT
 36800 003532  113737  020604  035106          MOVB    EBUF+4,MSG03+23.        ;PUT IN MSG03
 36900 003540  113737  020605  035107          MOVB    EBUF+5,MSG03+24.
 37000 003546  017737  175340  001134          MOV     @SEQ,TEMP               ;CONVERT PASS NO.
 37100 003554  012705  020600                  MOV     #EBUF,R5
 37200 003560  004737  033730                  JSR     PC,BIOCT
 37300 003564  113737  020603  035075          MOVB    EBUF+3,MSG03+14.        ;PUT IN MSG03
 37400 003572  113737  020604  035076          MOVB    EBUF+4,MSG03+15.
```

```
 003600  113737  020605  035077            MOVB     EBUF+5,MSG03+16.
 003606                                    SENDALL  #MSG03                  ;REPORT END OF TEST PASS
 003606  012705  035057                    MOV      #MSG03,R5          ;BUILD SEND CALL USING MESSAGF ADDRESS
 003612  005037  001174                    CLR      MODE
 003616  004737  031706                    JSR      PC,SEND            ;NOW SEND THE MESSAGE
 003622                                    SENDC    #MSG03
 003622  012705  035057                    MOV      #MSG03,R5                ;GET MESSAGE ADDRESS
 003626  004737  020310                    JSR      PC,CSEND           ;SEND MESSAGE
 003632  000207                            RTS      PC




                                   ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                   ;END OF PASS SUBROUTINE
 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
 003650                                    SENDC    #MSG01
 003650  012705  035040                    MOV      #MSG01,R5                ;GET MESSAGE ADDRESS
 003654  004737  020310                    JSR      PC,CSEND           ;SEND MESSAGE
 003660  013737  001124  001134            MOV      PASSNO,TEMP        ;CONVERT PASS NO TO ASCII
 003666  012705  020600                    MOV      #EBUF,R5
 003672  004737  033730                    JSP      PC,BIOCT
 003676  105037  020606                    CLRB     EBUF+6             ;PRINT PASS NO.
 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
 003716                                    SENDC    #EBUF
 003716  012705  020600                    MOV      #EBUF,R5                 ;GET MESSAGE ADDRESS
 003722  004737  020310                    JSR      PC,CSEND           ;SEND MESSAGE
 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
 003742                                    SENDC    #MSG75
 003742  012705  037370                    MOV      #MSG75,R5                ;GET MESSAGE ADDRESS
 003746  004737  020310                    JSR      PC,CSEND           ;SEND MESSAGE
 003752  000207                            RTS      PC                 ;RETURN



                                   ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                   ;  TEST FOR HARDWARE SWITCH REGISTER
                                   ;  SWR =  176 IF NONE ON SYSTEM

 003754  012737  004002  000004    SWRTST: MOV      #2$,TRAP4
 003762  012737  000340  000006            MOV      #PRI7,TRAP4+2
 003770  017737  175126  001116    1$:     MOV      @SWR,S0
 003776  000240                            NOP
 004000  000407                    BR      3$
 004002  012737  000176  001122    2$:     MOV      #176,SWR           ;TRAPPED TO 4 SET UP FOR
 004010  017737  175106  001116            MOV      @SWR,S0            ;SOFTWARE SWITCH REG.
 004016  000002                            RTI
 004020  012737  000006  000004    3$:     MOV      #6,TRAP4           ;RESET TRAP CATCHER
 004026  012737  000000  000006            MOV      #0,TRAP4+2
 004034  000207                            RTS      PC
```

```
                                               ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                               ; 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$,HOOK        ;LINK TO RECV ROUTINE
 45500 004224                                  SENDALL #MSG05          ;PROMPT TERMINALS
       004224  012705  035155                  MOV     #MSG05,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       004230  005037  001174                  CLR     MODE
       004234  004737  031706                  JSR     PC,SEND         ;NOW SEND THE MESSAGE
 45600 004240                                  STALL   #6000.          ;WAIT A WHILE
       004240  012705  013560                  MOV     #6000.,R5               ;SETUP STALL TIME CONSTANT
       004244  004737  033676                  JSR     PC,MSTALL
 45700 004250  005037  001160                  CLR     WORK
 45800 004254  023737  001160  001152  1$:     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
```

```
 25300                                         ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
 25400                                         ;HORIZONTAL PITCH TEST
 25500                                         ;SETUP FOR THIS TEST IS DOWN LINE LOADED FROM THE PROGRAM.
 25600                                         ;A MESSAGE WILL BE PRINTED IDENTIFYING THE CURRENT PITCH,
 25700                                         ;FOLLOWED BY THREE LINES OF  A..Z AT THE CURRENT PITCH.
 25800                                         ;PITCHES TESTED : 10, 12, 13.2, 16.5 CPI. ALL AT  6 LPI.
 25900                                         ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
 26000
 26100 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
 26200 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
 26300 006070  005037  001160                          CLR     WORK
 26400 006074  023727  001160  000006          1$:     CMP     WORK,#6.
 26500 006102  003122                                  BGT     4$               ;DO WHILE WORK > 0
 26600 006104  005037  001164                          CLR     WORK2
 26700 006110  005037  006366                          CLR     T11A
 26800 006114  005037  006370                          CLR     T11B
 26900 006120  013737  001160  006366                  MOV     WORK,T11A                ;GET TABLE OFFSET
 27000 006126  013737  006366  006370                  MOV     T11A,T11B
 27100 006134  062737  006402  006370                  ADD     #TABLHF,T11B             ;POINTER TO FORMAT CMD
 27200 006142  062737  006372  006366                  ADD     #TABLH,T11A              ;POINTER TO ID MSG
 27300 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
 27400 006164                                          STALL   #250
       006164  012705  000250                          MOV     #250,R5          ;SETUP STALL TIME CONSTN.T
       006170  004737  033676                          JSR     PC,MSTALL
 27500 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
 27600 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
 27700 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
 27800 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
 27900 006254                                          SENDALL #MSG96
       006254  012/05  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
 28000 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...
```

```
                                                   ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                                   ;SET MARGINS TEST
                                                   ;       THIS TEST WILL SET 4 PAIRS OF L & R MARGINS
                                                   ;       THEN WILL PRINT A LINE OF = SIGNS THAT SHOULD
                                                   ;       BE WITHIN THOSE MARGINS. ALSO A MESSAGE WILL BE
                                                   ;       SENT SPECIFYING AN ERROR IF IT'S NOT AT THE LH
                                                   ;       MARGIN.
                                                   ;       A REFERENCE LINE WILL BE PRINTED SHOWING THE
                                                   ;       MARGIN LIMITS BEING SET UP.
                                                   ;       ALL HORIZ PITCH SETTINGS WILL BE TESTED.

                                                   ;EXAMPLE :        ......V.......................V........
                                                   ;                       ==== ===================
                                                   ;                       ERROR IF NOT AT LH MARGIN

                                                   ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

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
006624  005037  001160                                     CLR     WORK
006630  005037  001162                                     CLR     WORK1
006634  005037  007512                                     CLR     W1               ;DO 4 PITCH SETTINGS
006640  023727  007512  000003                     1$:     CMP     W1,#3            ;IF DONE GOTO 30
006646  003402                                             BLE     4$
006650  000137  007432                                     JMP     30$
006654  006337  007512                             4$:     ASL     W1               ;*2 FOR WORD OFFSET
006660  012737  006402  007516                             MOV     #TABLHF,W3       ;PITCH MSG TABLE
006666  063737  007512  007516                             ADD     W1,W3
006674                                                     SENDALL @W3              ;SETUP H PITCH
006674  017705  000616                                     MOV     @W3,R5  ;BUILD SEND CALL USING MESSAGE ADDRESS
006700  005037  001174                                     CLR     MODE
006704  004737  031706                                     JSR     PC,SEND          ;NOW SEND THE MESSAGE
006710  006237  007512                                     ASR     W1
006714  005037  007514                                     CLR     W2               ;DO 5 MARGINS TESTS
006720  023727  007514  000004                     2$:     CMP     W2,#4
006726  003402                                             BLE     5$
006730  000137  007422                                     JMP     20$
006734                                             5$:     SENDALL #T12FIX          ;RESET MARGINS
006734  012705  007500                                     MOV     #T12FIX,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
006740  005037  001174                                     CLR     MODE
006744  004737  031706                                     JSR     PC,SEND          ;NOW SEND THE MESSAGE
006750  013737  007514  007516                             MOV     W2,W3
006756  006337  007516                                     ASL     W3
006762  013701  007516                                     MOV     W3,R1
006766  062701  007454                                     ADD     #TBL12A,R1       ;POINT TO SETUP ADDR
006772  013737  007514  007516                             MOV     W2,W3
007000  062737  007466  007516                             ADD     #TBL12B,W3       ;POINT TO LH MARGIN
007006  117737  000504  001160                             MOVB    @W3,WORK         ;GET LH MARGIN
007014  013737  007514  007516                             MOV     W2,W3
007022  062737  007473  007516                             ADD     #TBL12C,W3       ;POINT TO RH MARGIN
007030  117737  000462  001162                             MOVB    @W3,WORK1        ;GET RH MARGIN
007036  123737  001162  001172                             CMPB    WORK1,WIDTH      ;WITHIN RANGE OF PAPER ?
007044  103405                                             BLO     3$
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
```

```
 48000
 48100                  ;::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
 48200                  ;MULTIPLE LINE FEED TEST
 48300                  ;       THIS TEST WILL PRINT A REFERENCE LINE OF DASHES
 48400                  ;       THEN SKIP N LINES AND PRINT THE NUMBER  OF LINES
 48500                  ;       SKIPPED, ALONG WITH SOME DASHES FOR VISUAL
 48600                  ;       REFERENCE. EACH SKIP COUNT N IS DONE TWICE FOR N
 48700                  ;       = 1 TO 7. AT 6 LINES PER INCH.
 48800                  ;::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
 48900
 49000 010072
       010072  012705  040355          TEST10: SENDALL #MSG123          ;SEND TEST ID
       010076  005037  001174                  MOV     #MSG123,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       010102  004737  031706                  CLR     MODE
 49100 010106                                   JSR     PC,SEND          ;NOW SEND THE MESSAGE
       010106  012705  037373                  SENDALL #MSG77           ;SKIP 3 LINES
       010112  005037  001174                  MOV     #MSG77,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
       010116  004737  031706                  CLR     MODE
 49200 010122  012737  000001  001160         JSR     PC,SEND          ;NOW SEND THE MESSAGE
 49300 010130  012737  000012  001164         MOV     #1,WORK
 49400 010136                                   MOV     #12,WORK2
       010136  012705  040412                  SENDALL #MSG124          ;SEND LINE OF DASHES
       010142  005037  001174                  MOV     #MSG124,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
       010146  004737  031706                  CLR     MODE
 49500 010152  023727  001160  000010         JSR     PC,SEND          ;NOW SEND THE MESSAGE
 49600 010160  001532                   1$:     CMP     WORK,#10         ;ALL DONE ?
 49700 010162  013737  001160  001162         BEQ     4$               ;YES- JUMP
 49800 010170                                   MOV     WORK,WORK1
       010170  012705  001164                  SENDR   #WORK2,WORK1     ;SEND LINE FEEDS
       010174  113737  001162  001174         MOV     #WORK2,R5
       010202  112737  000020  001175         MOVB    WORK1,MODE
       010210  004737  031706                  MOVB    #20,MODE+1
 49900 010214  013700  001162                  JSR     PC,SEND
 50000 010220  062700  041274                  MOV     WORK1,R0
 50100 010224  111037  001166                  ADD     #MSG160,R0       ;GET NUMERIC CHARACTER
 50200 010230                                   MOVB    (R0),WORK3
       010230  012705  000055                  SENDC2  #'-,#6           ;SEND 6 DASHES
       010234  012737  000006  001174         MOV     #'-,R5           ;GET CHAR TO R5
       010242  112737  000020  001175         MOV     #6,MODE          ;GET REPEAT COUNT
       010250  004737  032310                  MOVB    #20,MODE+1       ;SET REPEAT MODE
 50300 010254                                   JSR     PC,CHROUT        ;CALL CHAR OUTPUT ROUTINE
       010254  012705  000060                  SENDCH  #'0              ;AND A ZERO
       010260  005037  001174                  MOV     #'0,R5           ;GET CHAR TO R5
       010264  004737  032310                  CLR     MODE             ;STD MODE
 50400 010270                                   JSR     PC,CHROUT        ;CALL CHAR OUTPUT ROUTINE
       010270  013705  001166                  SENDCH  WORK3            ;AND THE NUMBER FROM ABOVE
       010274  005037  001174                  MOV     WORK3,R5                 ;GET CHAR TO R5
       010300  004737  032310                  CLR     MODE             ;STD MODE
 50500 010304                                   JSR     PC,CHROUT        ;CALL CHAR OUTPUT ROUTINE
       010304  012705  037320                  SENDALL #MSG66           ;NOW RETURN CHAR
       010310  005037  001174                  MOV     #MSG66,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
       010314  004737  031706                  CLR     MODE
 50600 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
```

```
52000                                       ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
52100                                       ; HORIZONTAL MOVEMENT TEST
52200                                       ;       X'S ARE PRINTED AT RANDOM COLUMN POSITIONS
52300                                       ;       UNTIL THE LINE IS FULL. CONTROLLED BY THE
52400                                       ;       'WIDTH'' AS DETERMINED AT STARTUP.
52500                                       ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
52600
52700 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
52800 010500  012703  010756                        MOV     #COLTBL,R3      ;POINTER TO TABLE OF COLUMNS
52900 010504  012737  000001  001160                MOV     #1,WORK         ;PRESENT POSITION
53000 010512  112337  001162                1$:     MOVB    (R3)+,WORK1     ;DESTINATION POSITION
53100 010516  001510                                BEQ     9$              ;BR IF END OF TABLE
53200 010520  123737  001162  001172                CMPB    WORK1,WIDTH     ;IN RANGE OF PAPER ?
53300 010526  101371                                BHI     1$              ;NO GET NEW DEST.
53400 010530  123737  001162  001160        2$:     CMPB    WORK1,WORK      ;IF DEST > POS THEN SPACE
53500 010536  001462                                BEQ     8$              ;IF DECT = POS THEN PRINT X
53600 010540  101023                                BHI     4$              ;IF DEST < POS THEN
53700 010542  013737  001162  001164                MOV     WORK1,WORK2     ;IF DEST < POS-12 DO CR FIRST
53800 010550  162737  000012  001164                SUB     #12,WORK2       ;THEN SPACES
53900 010556  123737  001160  001164                CMPB    WORK,WORK2
54000 010564  103435                                BLO     6$
54100 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
54200 010602  005337  001160                        DEC     WORK            ;POS = POS-1
54300 010606  000750                                BR      2$
54400
54500 010610  013737  001162  001166        4$:     MOV     WORK1,WORK3     ;CALCULATE # OF SPACES
54600 010616  163737  001160  001166                SUB     WORK,WORK3      ;DEST - POSITION
54700 010624                                        SENDC2  #40,WORK3       ;SEND SPACES
      010624  012705  000040                        MOV     #40,R5          ;GET CHAR TO R5
      010630  013737  001166  001174                MOV     WORK3,MODE              ;GET REPEAT COUNT
      010636  112737  000020  001175                MOVB    #20,MODE+1      ;SET REPEAT MODE
      010644  004737  032310                        JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINF
54800 010650  013737  001162  001160                MOV     WORK1,WORK      ;POS = DEST
54900 010656  000412                                BR      8$
55000
55100 010660                                6$:     SENDALL #MSG09          ;SEND RETURN FIRST
      010660  012705  035174                        MOV     #MSG09,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      010664  005037  001174                        CLR     MODE
      010670  004737  031706                        JSR     PC,SEND         ;NOW SEND THE MESSAGE
55200 010674  012737  000001  001160                MOV     #1,WORK         ;POS - 1
55300 010702  000712                                BR      2$
55400
55500 010704                                8$:     SENDCH  #'H             ;PRINT AN H
      010704  012705  000110                        MOV     #'H,R5          ;GET CHAR TO R5
      010710  005037  001174                        CLR     MODE            ;STD MODE
      010714  004737  032310                        JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
55600 010720  004737  034250                        JSR     PC,QUIET
55700 010724  005237  001160                        INC     WORK            ;NEW POSITION
55800 010730  005037  001162                        CLR     WORK1
55900 010734  000137  010512                        JMP     1$              ;GET NEW DEST COLMN
56000
```

```
 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                                              .EVEN
 57800          000010                              .RADIX 8
 57900
 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   2$:     ADD     #2,WORK         ;OK- CHECK NEXT LINE
 60800 011334  000761                   BR      1$
 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
```

```
                                              ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
                                              ;MAIN KEYBOARD TEST
                                              ;       THIS TEST WILL REQUIRE THE OPERATOR TO TYPE ALL
                                              ;       THE PRINTING KEYS ON THE KEYBOARD. IF ANY KEYS ARE
                                              ;       NOT SEEN BY THE PROGRAM THEY WILL BE REQUESTED
                                              ;       AGAIN, AND A THIRD TIME IF NECESSARY.
                                              ;       INSTRUCTIONS WILL BE TYPED TO PRESS THE SHIFTS
                                              ;       CAPS-LOC, ECS, AND FUNCTION KEYS.
                                              ;       FIVE SECONDS IS ALLOWED PER KEY .
                                              ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
012260  005037  001204                        TEST20: CLR     ONLINE          ;SET CURRENT LINE TO ZERO
012264  013737  001204  001160                1$:     MOV     ONLINE,WORK
012272  006337  001160                                ASL     WORK
012276  013702  001160                                MOV     WORK,R2
012302  023737  001204  001152                        CMP     ONLINE,NUMLIN   ;ALL DONE  ?
012310  103402                                        BLO     .+6
012312  000137  014370                                JMP     END22           ;YES EXIT
012316  105762  020634                                TSTB    DZLINE(R2)      ;IS THIS LINE SELECTED ?
012322  100003                                        BPL     2$              ;YES DO TEST
012324  005237  001204                                INC     ONLINE          ;NO GET NEXT LINE NO
012330  000755                                        BR      1$
012332                                        2$:     SENDI   #MSG164,ONLINE          ;SEND TEST ID
012332  012705  041344                                MOV     #MSG164,R5              ;MESSAGE ADDRESS TO R5
012336  112737  000010  001175                        MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
012344  113737  001204  001174                        MOVB    ONLINE,MODE             ;SELECTED LINE NO.
012352  004737  031706                                JSR     PC,SEND
012356  005037  014302                                CLR     FLAG21          ;CLEAR TEST FLAG BITS
012362                                                SENDI   #MSG140,ONLINE          ;PRINT INSTRUCTIONS
012362  012705  040442                                MOV     #MSG140,R5              ;MESSAGE ADDRESS TO R5
012366  112737  000010  001175                        MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
012374  113737  001204  001174                        MOVB    ONLINE,MODE             ;SELECTED LINE NO.
012402  004737  031706                                JSR     PC,SEND
012406  012737  012734  001140                3$:     MOV     #6$,HOOK        ;LINKAGE TO RECV ROUTINE
012414  042737  004000  014302                        BIC     #BIT11,FLAG21           ;RESET LEFTOVER FLAG
012422  004737  034250                                JSR     PC,QUIET
012426                                                STALL   #5000.          ;5 SECOND TIMEOUT
012426  012705  011610                                MOV     #5000.,R5               ;SETUP STALL TIME CONSTANT
012432  004737  033676                                JSR     PC,MSTALL
012436  032737  020000  014302                        BIT     #BIT13,FLAG21   ;CHAR IN SET ?
012444  001445                                        BEQ     4$
012446  012703  014140                                MOV     #KEYTBL,R3      ;POINT TO KEY TABLE
012452  020327  014300                        7$:     CMP     R3,#KEYEND      ;ALL DONE ?
012456  103405                                        BLO     8$              ;NO
012460  004737  013772                                JSR     PC,T21E         ;REPORT ERROR.....
012464  005237  001110                                INC     ERROR
012470  000746                                        BR      3$
012472  123713  001170                        8$:     CMPB    CHARIN,(R3)             ;COMPARE TO TABLE
012476  001403                                        BEQ     9$
012500  062703  000002                                ADD     #2,R3           ;POINT TO NEXT ENTRY
012504  000762                                        BR      7$              ;KEEP LOOKING
012506  052713  100000                        9$:     BIS     #BIT15,(R3)     ;SET CHAR IN FLAG
012512  113737  001170  001162                        MOVB    CHARIN,WORK1    ;ECHO THE CHARACTER
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$:     TSTB    FLAG21          ;FIRST TIMFOUT ?
      012564  100045                              BPL     5$              ;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
```

```
 13900 013034  012703  014140                        MOV     #KEYTBL,R3      ;POINT TO TABLE
 14000 013040  042737  010000  014302                BIC     #BIT12,FLAG21
 14100 013046  005037  001162                        CLR     WORK1
 14200 013052  020327  014300              12$:      CMP     R3,#KEYEND      ;DONE YET ?
 14300 013056  001431                              BEQ     13$             ;YES ..GO TO 13$
 14400 013060  005723                              TST     (R3)+           ;CHECK CHAR IN FLAG(BIT 15)
 14500 013062  100773                              BMI     12$
 14600 013064  005037  001160                        CLR     WORK
 14700 013070  052737  004000  014302                BIS     #BIT11,FLAG21   ;SET LEFTOVER KEY FLAG
 14800 013076  005303                              DEC     R3
 14900 013100  114337  041307                        MOVB    -(R3),MSG162    ;PUT CHAR IN MSG
 15000 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
 15100 013130  004737  034250                      JSR     PC,QUIET
 15200 013134  062703  000002                      ADD     #2,R3           ;GET NEXT TABLE ENTRY
 15300 013140  000744                              BR      12$             ;KEEP SCANNING FOR LEFTOVERS
 15400 013142  032737  004000  014302    13$:      BIT     #BIT11,FLAG21   ;ANY LEFTOVERS ?
 15500 013150  001465                              BEQ     15$             ;NO GO CLEAN THE TABLE ETC.
 15600 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
 15700 013176  012703  014276                      MOV     #KEYEND-2,R3
 15800 013202  042713  100000                      BIC     #BIT15,(R3)     ;RESET SPACE  IN FLAG
 15900 013206  005237  014302                      INC     FLAG21          ;OPERATOR GETS THREE TRIES
 16000 013212  013737  014302  001160              MOV     FLAG21,WORK
 16100 013220  042737  177770  001160              BIC     #-8.,WORK
 16200 013226  023727  001160  000003              CMP     WORK,#3
 16300 013234  003026                              BGT     14$             ;3 STRIKES YOU'RE OUT !!!
 16400 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
 16500 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
 16600 013306  000137  012406                      JMP     3$
 16700                                     ;.....
 16800 013312  012746  040730              14$:    MOV     #MSG143,-(SP)           ;NEVER RECVD  ERROR MSG....
 16900 013316  004737  020352                      JSR     PC,ERRORT
 17000 013322  000000                              HALT
 17100 013324  012703  014140              15$:    MOV     #KEYTBL,R3      ;CLEAN THE TABLE FLAGS
 17200 013330  042723  100000              16$.    BIC     #BIT15,(R3)+
 17300 013334  020327  014300                      CMP     R3,#KEYEND
 17400 013340  103773                              BLO     16$
 17500 013342  005037  014302                      CLR     FLAG21
 17600 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.
```

```
 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   (P3)+,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
```

```
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     LOOP0           ;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
```

```
                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 '='
```

```
        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.
```

```
35400
35500                   ;::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
35600                   ; PITCH SETUP TEST
35700                   ;       THIS TEST WILL REQUIRE THE OPERATOR TO ENTER
35800                   ;       SETUP MODE, AND CHANGE THE MODE TO THAT SPECIFIED.
35900                   ;       A LINE OR LINES OF DATA WILL BE PRINTED AND
36000                   ;       SHOULD BE AT THE NEW PITCH.
36100                   ;::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
36200 015214 005037 001204          TEST22: CLR     ONLINE          ;START ON LINE 0
36300 015220 012701 015622                  MOV     #TABL24,R1
36400 015224 005037 001160                  CLR     WORK
36500 015230 012737 015602 001140           MOV     #11$,HOOK               ;SET INTR CATCHER
36600 015236 013700 001204          1$:     MOV     ONLINE,R0
36700 015242 006300                         ASL     R0
36800 015244 023737 001204 001152           CMP     ONLINE,NUMLIN           ;DONE ALL LINES ?
36900 015252 001550                         BEQ     10$                     ;YES JUMP
37000 015254 105760 020634                  TSTB    DZLINE(R0)              ;ACTIVE LINE ?
37100 015260 100003                         BPL     2$                      ;YES- START TESTS
37200 015262 005237 001204                  INC     ONLINE                  ;NO- TRY NEXT LINE
37300 015266 000763                         BR      1$
37400 015270                        2$:     SENDI   #MSG320,ONLINE          ;SEND TEST ID
      015270 012705 042136                  MOV     #MSG320,R5              ;MESSAGE ADDRESS TO R5
      015274 112737 000010 001175           MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      015302 113737 001204 001174           MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      015310 004737 031706                  JSR     PC,SEND
37500 015314 005037 001164                  CLR     WORK2                   ;SUBTEST 0 OF 9
37600 015320 023727 001164 000012   3$:     CMP     WORK2,#10.              ;DONE 10 YET?
37700 015326 002403                         BLT     4$                      ;NO KEEP TESTING
37800 015330 005237 001204                  INC     ONLINE                  ;YES GET NEXT LINE
37900 015334 000740                         BR      1$
38000 015336                        4$:     SENDI   #MSG303,ONLINE          ;SEND INSTRUCTIONS
      015336 012705 041617                  MOV     #MSG303,R5              ;MESSAGE ADDRESS TO R5
      015342 112737 000010 001175           MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      015350 113737 001204 001174           MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      015356 004737 031706                  JSR     PC,SEND
38100 015362 013701 001164                  MOV     WORK2,R1                ;POINT TO MSG TABLE
38200 015366 006301                         ASL     R1
38300 015370                                SENDI   TABL24(R1),ONLINE       ;SEND MSG FOR SUBTEST
      015370 016105 015622                  MOV     TABL24(R1),R5           ;MESSAGE ADDRESS TO R5
      015374 112737 000010 001175           MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      015402 113737 001204 001174           MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      015410 004737 031706                  JSR     PC,SEND
38400 015414                                SENDI   #MSG304,ONLINE
      015414 012705 041676                  MOV     #MSG304,R5              ;MESSAGE ADDRESS TO R5
      015420 112737 000010 001175           MOVB    #10,MODE+1      ;SET SINGLE LINE MODE
      015426 113737 001204 001174           MOVB    ONLINE,MODE             ;SELECTED LINE NO.
      015434 004737 031706                  JSR     PC,SEND
38500 015440 012737 177777 001136           MOV     #-1,NOTYET      ;GETS CLEARED BY XON MSG
38600 015446                        5$:     STALL   #15000.         ;ALLOW SETUP TIME 15 SEC
      015446 012705 035230                  MOV     #15000.,R5              ;SETUP STALL TIME CONSTANT
      015452 004737 033676                  JSR     PC,MSTALL
38700 015456 005737 001136                  TST     NOTYET          ;SEEN XON YET ?
38800 015462 001420                         BEQ     7$              ;YES CONTINUE
38900 015464 105761 024554                  TSTB    STOP(R1)        ;LINE SELECTED ?
39000 015470 100410                         BMI     6$              ;YES WAIT MORE TIME
39100 015472 012746 036441                  MOV     #MSG40,-(SP)    ;REPORT ERROR
39200 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                  8$:     JSR     PC,CHROUT       ;CALL CHAR OUTPUT ROUTINE
 46000  016162                                          SENDALL #MSG75          ;SEND CRLF
        016162  012705  037370                          MOV     #MSG75,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
        016166  005037  001174                          CLR     MODE
        016172  004737  031706                          JSR     PC,SEND         ;NOW SEND THE MESSAGE
 46100  016176  005237  001162                          INC     WORK1           ;NEW PRECESS COUNT
 46200  016202  123737  001162  007512                  CMPB    WORK1,#1        ;RESET TO 0 IF MAX
 46300  016210  103402                                  BLO     9$
 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
```

```
  100
  200
  300
  400
  500
  600
  700
  800 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
  900 016354  112703  000011                          MOVB    #9.,R3           ;IF 80 COL MAKE 6X8 MATRIX
 1000 016360  123727  001172  000120                  CMPB    WIDTH,#120
 1100 016366  101002                                  BHI     7$
 1200 016370  112703  000007                          MOVB    #7,R3
 1300 016374                                  7$:     SENDALL #MSG77           ;SKIP 3 LINES
      016374  012705  037373                          MOV     #MSG77,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
      016400  005037  001174                          CLR     MODE
      016404  004737  031706                          JSR     PC,SEND          ;NOW SEND THE MESSAGE
 1400 016410                                          SENDALL #MSG104          ;SET H-PITCH TO 16.5
      016410  012705  040037                          MOV     #MSG104,R5       ;BUILD SEND CALL USING MESSAGE ADDRESS
      016414  005037  001174                          CLR     MODE
      016420  004737  031706                          JSR     PC,SEND          ;NOW SEND THE MESSAGE
 1500 016424  005037  007512                          CLR     W1               ;DO 6 V PITCH GROUPS
 1600 016430  023727  007512  000005          1$:     CMP     W1,#5            ;IF W1 > 5 GOTO 50
 1700 016436  003402                                  BLE     2$
 1800 016440  000137  017002                          JMP     50$
 1900 016444  013700  007512                  2$:     MOV     W1,R0            ;GET V GROUP NO.
 2000 016450  006300                                  ASL     R0
 2100 016452  016001  012154                          MOV     TABLVF(R0),R1    ;POINT TO V PITCH SETUP
 2200 016456                                          SENDALL R1               ;SETUP V PITCH
      016456  010105                                  MOV     R1,R5    ;BUILD SEND CALL USING MESSAGE ADDRESS
      016460  005037  001174                          CLR     MODE
      016464  004737  031706                          JSR     PC,SEND          ;NOW SEND THE MESSAGE
 2300 016470  016037  017154  007514                  MOV     TBL31E(R0),W2    ;GET LINE COUNT FOR THIS PITCH
 2400 016476  005737  007514          3$:     TST     W2               ;IF ALL LINES DONE GOTO 40
 2500 016502  001002                                  BNE     4$
 2600 016504  000137  016772                          JMP     40$
 2700 016510  005037  007516          4$:     CLR     W3               ;DO 10 H PITCH GROUPS PER LINE
 2800 016514  004737  034250                          JSR     PC,QUIET
 2900 016520                                          SENDALL #MSG75           ;SEND A  CRLF
      016520  012705  037370                          MOV     #MSG75,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
      016524  005037  001174                          CLR     MODE
      016530  004737  031706                          JSR     PC,SEND          ;NOW SEND THE MESSAGE
 3000 016534  023703  007516          5$:     CMP     W3,R3            ;IF 10 DONE GOTO 30
 3100 016540  003402                                  BLE     6$
 3200 016542  000137  016762                          JMP     30$
 3300 016546  013700  007516          6$:     MOV     W3,R0            ;POINT TO H PITCH SETUP
 3400 016552  006300                                  ASL     R0
 3500 016554  016001  017120                          MOV     TBL31C(R0),R1    ;ADDRESS IN R1
 3600 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
 3700 016572  004737  034250                          JSR     PC,QUIET
 3800 016576  000240                                  NOP
 3900 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                                          .EVEN
 19800
```

```
                                .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 TI
```

```
 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  001106                        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                                          ;HERE ARE THE TRANSMIT INTERRUPT ROUTINES
 20600 032330                                   DZTINT:
 20700          000000                          X=0
 20800          000005                          .REPT   DZCON
 20900                                                  MOV     R0,-(SP)        ;SAVE R0
 21000                                                  MOV     #X,R0           ;PUT DZ # IN R0
 21100                                                  JMP     TXINT           ;GO TO MAIN ROUTINE
 21200                                          X=X+2
 21300                                          .ENDR
        032330  010046                                  MOV     R0,-(SP)        ;SAVE R0
        032332  012700  000000                          MOV     #X,R0           ;PUT DZ # IN R0
        032336  000137  032474                          JMP     TXINT           ;GO TO MAIN ROUTINE
                000002
                                               Y=X+2
        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                                  MOV     R0,-(SP)        ;SAVE R0
        032356  012700  000004                          MOV     #X,R0           ;PUT DZ # IN R0
        032362  000137  032474                          JMP     TXINT           ;GO TO MAIN ROUTINE
                000006
                                               X=X+2
        032366  010046                                  MOV     R0,-(SP)        ;SAVE R0
        032370  012700  000006                          MOV     #X,R0           ;PUT DZ # IN R0
        032374  000137  032474                          JMP     TXINT           ;GO TO MAIN ROUTINE
                000010
                                               X=X+2
        032400  010046                                  MOV     R0,-(SP)        ;SAVE R0
        032402  012700  000010                          MOV     #X,R0           ;PUT DZ # IN R0
        032406  000137  032474                          JMP     TXINT           ;GO TO MAIN ROUTINE
                000012
                                               X=X+2
 21400
 21500
```

```
 21700
 21800 032412
 21900                  000000
 22000                  000005
 22100
 22200
 22300
 22400
 22500
        032412  010046                          ;HERE ARE THE RECIEVE INTERRUPT ROUTINES
                                                DZRINT:
                                                X=0
                                                .REPT   DZCON
                                                        MOV     R0,-(SP)        ;SAVE R0
                                                        MOV     #X,R0           ;PUT DZ # IN R0
                                                        JMP     RCINT           ;GO TO MAIN ROUTINE
                                                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)
```

```
 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 033154 010546                     RCINT:  MOV     R5,-(SP)
31100 033156 010246                             MOV     R2,-(SP)
31200 033160 010146                             MOV     R1,-(SP)
31300 033162 016001 031554                      MOV     DZCSR(R0),R1
31400 033166 016105 000002                      MOV     2(R1),R5
31500 033172 100401                             BMI     1$
31600 033174 000000                             HALT    ;INVALID DATA FROM DZ ? ? ? ? ? ? ?
31700 033176 010537 001200              1$:     MOV     R5,RCTMP
31800 033202 113737 001201 001200               MOVB    RCTMP+1,RCTMP
31900 033210 042737 177770 001200               BIC     #177770,RCTMP
32000 033216 006300                             ASL     R0
32100 033220 006300                             ASL     R0
32200 033222 063700 001200                      ADD     RCTMP,R0
32300 033226 006300                             ASL     R0
32400 033230 050560 031566                      BIS     R5,RECERR(R0)           ;COPY ERROR BITS
32500 033234 042760 107777 031566               BIC     #107777,RECERR(R0)      ;DATA VALID,LINE NO.,DATA
32600 033242 042705 177400                      BIC     #177400,R5              ;CLEAR ERROR BITS
32700 033246 032760 000200 020634               BIT     #BIT7,DZLINE(R0)        ;IS UNIT SELECTED ?
32800 033254 001405                             BEQ     6$
32900 033256 042760 000200 020634               BIC     #BIT7,DZLINE(R0)        ;SELECT THE LINE
33000 033264 005237 001216                      INC     UUT                     ;ADD TO UNIT COUNT
33100 033270 122705 000023              6$:     CMPB    #23,R5
33200 033274 001010                             BNE     7$
33300 033276 052760 100200 024554               BIS     #100200,STOP(R0);SET STOP FLAG & XOFF FLAGS
33400 033304 146061 025514 000004               BICB    TCRBIT(R0),4(R1)        ;DISABLE TX INTR
33500 033312 000137 033422                      JMP     RCRTN
33600 033316 122705 000021              7$:     CMPB    #21,R5
33700 033322 001013                             BNE     KBN
33800
33900 033324 156061 025514 000004       9$:     BISB    TCRBIT(R0),4(R1)        ;ENABLE TX INTR
34000 033332 042760 100000 024554               BIC     #BIT15,STOP(R0) ;CLEAR STOP FLAG
34100 033340 052760 000001 024554               BIS     #BIT0,STOP(R0)  ;SET XON FLAG
34200 033346 000137 033422              8$:     JMP     RCRTN
34300 033352 010570 026214              KBN:    MOV     R5,@KBBUFI(R0)  ;STICK IT IN THERE
34400 033356 062760 000002 026214               ADD     #2,KBBUFI(R0)   ;GIVE THE POINTER A LITTLE PUSH TO THE NEXT EMPTY PL
34500 033364 026060 026214 025754               CMP     KBBUFI(R0),KBBUFE(R0)   ;IS THAT THE END?
34600 033372 001003                             BNE     1$              ;IF NOT.
34700 033374 016060 026074 026214               MOV     KBBUFB(R0),KBBUFI(R0);YES IT WAS AT THE END. RESET IT
34800 033402 105260 025634              1$:     INCB    KBCNT(R0)       ;TALLY UP ONE MORE ENTRY
34900 033406 001001                             BNE     RCRTN           ;AND GO RETURN IF WE HAVE LESS THAN 377 OF THEM
35000 033410 000000                             HALT                    ;400 ENRTYS IS TOO MANY. LET THIS HALT SERVE AS WARN
35100 033412 005737 001140              RCRTN:  TST     HOOK            ;DOES ANOTHER ROUTINE WANT TO SEE CHARS IMMEDIATELY?
35200 033416 001402                             BEQ     2$              ;NO. GO RETURN
35300 033420 004777 145504                      JSR     PC,@HOOK        ;YES. GO OFF TO SOME MYSTERIOUS PLACE
35400 033424 012601                     2$:     MOV     (SP)+,R1
35500 033426 012602                             MOV     (SP)+,R2
35600 033430 012605                             MOV     (SP)+,R5
35700 033432 012600                             MOV     (SP)+,R0        ;FROM INTERRUPT CATCHER
35800 033434 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                                  ;
 38800                                  ;THE TABLE CONSISTS OF 2WORD ENTRIES. 1ST WORD IS MESSAGE ADDRESS
 38900                                  ;2ND WORD IS PARAMETER TO BE SEND TO THE DZ11 LINE
 39000                                  ;A 000000 WORD MARKS THE END OF THE TABLE.
 39100 033524  005712                   ;CALL THIS SUBROUTINE WITH A JSR,PC
 39200 033526  001462                   ANVENT: TST     (R2)            ;TABLE FINISHED ?
 39300 033530                                   BEQ     4$              ;YES BRANCH
       033530  010305                           SENDALL R3              ;SEND FIRST PART
       033532  005037  001174                   MOV     R3,R5   ;BUILD SEND CALL USING MESSAGE ADDRESS
       033536  004737  031706                   CLR     MODE
 39400 033542                                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
       033542  012205                           SENDALL (R2)+           ;SEND FROM TABLE
       033544  005037  001174                   MOV     (R2)+,R5        ;BUILD SEND CALL USING MESSAGE ADDRESS
       033550  004737  031706                   CLR     MODE
 39500 033554                                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
       033554  010405                           SENDALL R4              ;SEND LAST PART
       033556  005037  001174                   MOV     R4,R5   ;BUILD SEND CALL USING MESSAGE ADDRESS
       033562  004737  031706                   CLR     MODE
 39600 033566  004737  034250                   JSR     PC,SEND         ;NOW SEND THE MESSAGE
 39700 033572  005000                           JSR     PC,QUIET        ;WAIT TILL DONE
 39800 033574  013700  001202                   CLR     R0
 39900 033600  006300                           MOV     DZNUM,R0        ;GET DZ NO.
 40000 033602  162700  000002                   ASL     R0
 40100 033606  100424                   1$:     SUB     #2,R0
 40200 033610  016001  031554                   BMI     3$
 40300 033614  005037  001126                   MOV     DZCSR(R0),R1    ;GET DZ CSR ADDRESS
 40400 033620  013737  001126  001130          CLR     ANTMP0
 40500 033626  061237  001130           2$:    MOV     ANTMP0,ANTMP1
 40600 033632  013761  001130  000002          ADD     (R2),ANTMP1
 40700 033640  005237  001126                   MOV     ANTMP1,2(R1)
 40800 033644  022737  000010  001126          INC     ANTMP0
 40900 033652  001362                          CMP     #10,ANTMP0
 41000 033654  000137  033602                   BNE     2$
 41100 033660  004737  034574           3$:    JMP     1$
 41200 033664  062702  000002                   JSR     PC,AWAIT
 41300 033670  000137  033524                   ADD     #2,R2
 41400 033674  000207                   4$:     JMP     ANVENT          ;DO FOR NEXT TABLE ENTRY
 41500                                          RTS     PC              ;DONE ALL LINES ON ALL DZ'S. RETURN
```

```
 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  001144           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
```

```
 54500                                          ;THIS IS THE REPLY SUBROUTINE
 54600                                          ;CALL WITH A JSR PC
 54700                                          ;IT WILL WAIT .5 SECONDS FOR REPLYS FROM ON ALL LINES
 54800                                          ;IF IT SEES A REPLY, THE WORD FOR THE LINE IN THE REPTBL IS SET
 54900 034456  010046                   REPLY:  MOV     R0,-(SP)
 55000 034460  010146                           MOV     R1,-(SP)        ;SAVE REGS WE USE
 55100 034462  013700  001152                   MOV     NUMLIN,R0
 55200 034466  006300                           ASL     R0
 55300 034470  162700  000002           1$:     SUB     #2,R0
 55400 034474  100404                           BMI     2$
 55500 034476  005060  024434                   CLR     REPTBL(R0)
 55600 034502  000137  034470                   JMP     1$
 55700 034506  012737  034540  001140   2$:     MOV     #9$,HOOK        ;PUT CLAWS INTO INPUT ROUTINE
 55800 034514                                   STALL   #500.           ;WAIT .5 SECONDS
       034514  012705  000764                   MOV     #500.,R5                ;SET UP STALL TIME CONSTANT
       034520  004737  033676                   JSR     PC,MSTALL
 55900 034524  012737  000000  001140          MOV     #0,HOOK         ;TAKE HOOK OUT OF INPUT ROUTINE
 56000 034532  012601                           MOV     (SP)+,R1
 56100 034534  012600                           MOV     (SP)+,R0
 56200 034536  000207                           RTS     PC              ;RETURN
 56300
 56400 034540  020527  000023           9$:     CMP     R5,#23          ;IS THE CHAR XOF?
 56500 034544  001007                           BNE     3$              ;NO.
 56600 034546  022705  000021                   CMP     #21,R5          ;IS THE CHAR XON?
 56700 034552  001407                           BEQ     4$              ;YES. LET RECIFVE ROUTINE HANDLE IT
 56800 034554  112760  000001  024435          MOVB    #1,REPTBL+1(R0) ;YES. SET HIGH BYTE
 56900 034562  000403                           BR      4$
 57000 034564  112760  000001  024434   3$:     MOVB    #1,REPTBL(R0)   ;SET LOW BYTE INDICATING NOT XON OR XOF
 57100 034572  000207                   4$:     RTS     PC
 57200
 57300
 57400
 57500                                          ;THIS IS THE SUBROUTINE THAT WAITS FOR A CARRIAGE RETURN
 57600 034574  012737  000001  001136   AWAIT:  MOV     #1,NOTYET       ;SET NO CR YET SWITCH
 57700 034602  012737  034624  001140           MOV     #2$,HOOK        ;PUT HOOK INTO RECIEVE ROUTINE SO WE CAN TEST
 57800 034610  005737  001136           1$:     TST     NOTYET          ;SEEN A CARRIAGE RETURN YET?
 57900 034614  001375                           BNE     1$              ;NO, KEEP LOOKING
 58000 034616  005037  001140                   CLR     HOOK
 58100 034622  000207                           RTS     PC              ;RETURN
 58200
 58300 034624  042705  177600           2$.     BIC     #177600,R5      ;REMOVE JUNK FROM DATA BITS
 58400 034630  122705  000015                   CMPB    #15,R5          ;CARRIAGE RETURN ?
 58500 034634  001002                           BNE     3$              ;NO.
 58600 034636  005037  001136                   CLR     NOTYET          ;YES. MAKE THE SWITCH REFLECT IT
 58700 034642  004737  033446           3$:     JSR     PC,KBOUT        ;REMOVE CHAR FROM BUFFER
 58800 034646  000207                           RTS     PC
 58900
 59000
 59100
```

```
                                                .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  /ERPOR * 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
```

```
                                                .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/<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 25,30,34,37,21,12,15,0
     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 /
```

```
 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 15/<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  / /
```

```
 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-O/<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
```

```
ACTDVC  000047      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      PRIO  = 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
```

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
SO	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
```