

DH11

DH11 AUTO ECHO LOG
CZDHHC0

AH-FG27C-MC
1 OF 1 OCT 1985
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The image displays a grid of 12 columns and 12 rows of small, illegible data plots or charts, likely representing an auto-echo log. The plots are arranged in a regular grid on the left side of the page. Each plot appears to contain some form of data visualization, possibly a spectrum or a time-series plot, but the details are too small to discern. The overall appearance is that of a technical document or a data log.

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.REM !

IDENTIFICATION

PRODUCT CODE: AC-8472C-MC
PRODUCT NAME: CZDMMCO DH11 AUTO-ECHO TEST
DATE: JUNE 1985
MAINTAINER: NAC SOFTWARE ENGINEERING
AUTHOR: G. BAISLEY

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1.0 ABSTRACT

VERIFIES THAT THE AUTO ECHO FEATURE OF THE DH11 WORKS.

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP-11 FAMILY STANDARD COMPUTER WITH 4KW OF MEMORY
ASR-33 TELETYPE OR EQUIVALENT
DH11 ASYNCHRONOUS MULTIPLEXER
DH11 MAINTENANCE CARD INSTALLED

2.2 STORAGE

THE PROGRAM LOADS INTO 4KW OF MEMORY

3.0 LOADING PROCEDURE

THE STANDARD PROCEDURE FOR LOADING ABSOLUTE BINARY TAPES IS TO BE USED

4.0 STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

4.1.1 AFTER PROGRAM LOAD (INITIAL PROGRAM START)

ALL CONSOLE SWITCHES DOWN

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4.1.2 TO MODIFY DEVICE VECTOR AND CONTROL REGISTER ADDRESSES AFTER PROGRAM RESTART

SW00=1

4.1.3 TO START PROGRAM AT SELECTED TEST AFTER PROGRAM RESTART

SW01=1

4.2 STARTING ADDRESS

THE STARTING ADDRESS FOR ALL TESTS IS 000200
THE RESTART ADDRESS FOR ALL TESTS IS 000200
THE STARTING ADDRESS TO ENTER A SELECTED TEST IS 000200

4.3 PROGRAM AND/OR OPERATOR ACTION

4.3.1 INITIAL PROGRAM START

4.3.1.1 LOAD PROGRAM INTO MEMORY

4.3.1.2 LOAD ADDRESS 000200

4.3.1.3 CLEAR CONSOLE SWITCHES

4.3.1.4 PRESS START

4.3.1.5 THE PROGRAM WILL TYPE "DH11 AUTO-ECHO TEST" AND WILL THEN TYPE "VECTOR ADDRESS-" AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD.

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4 4.3.1.6 TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR FOR THE
5 DH11 TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>
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8 NOTE

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10 WORDS IN ANGLE BRACKETS, I.E. <CARRIAGE
11 RETURN> MEAN THAT THE TELETYPE KEY WITH
12 THE NAMED FUNCTION SHOULD BE STRUCK
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15 IF AN INCORRECT ADDRESS IS ENTERED, THE PROGRAM WILL TYPE "?" AND WILL
16 REPEAT THE SECOND MESSAGE OF 4.3.1.5
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20 4.3.1.7 THE PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-" AND WAIT
21 FOR AN INPUT FROM THE TELETYPE KEYBOARD
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25 4.3.1.8 TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER OF THE
26 DH11 TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>
27

28 IF AN INCORRECT ADDRESS IS TYPED, THE PROGRAM WILL TYPE "?" AND WILL
29 THEN REPEAT THE OF 4.3.1.7
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33 4.3.1.9 THE PROGRAM WILL TYPE "R" TO INDICATE THAT IT IS ABOUT TO
34 START TESTING, AND THEN TESTING WILL BEGIN
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38 4.3.2 PROGRAM RESTART WITH ALL SWITCHES DOWN
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42 4.3.2.1 PERFORM 4.3.1.2 TO 4.3.1.5
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46 4.3.2.2 THE PROGRAM WILL TYPE "DH11 AUTO-ECHO TEST" AND WILL
47 THEN CONTINUE AS DESCRIBED IN 4.3.1.9
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51 4.3.3 PROGRAM RESTART WITH SW00=1

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4.3.3.1 LOAD ADDRESS 000200

4.3.3.2 SET SW01=1

4.3.3.3 PRESS START

4.3.3.4 THE PROGRAM WILL PERFORM AS DESCRIBED IN 4.3.1.5 TO 4.3.1.9

4.3.4 PROGRAM RESTART WITH SW01=1

4.3.4.1 LOAD ADDRESS 000200

4.3.4.2 SET SW01=1

4.3.4.3 PRESS START

4.3.4.4 THE PROGRAM WILL TYPE "DH11 AUTO-ECHO TEST" AND WILL THEN TYPE "TEST PC-" AND WILL WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD

4.3.4.5 TYPE IN THE ADDRESS OF THE TEST AT WHICH THE PROGRAM IS TO BE STARTED FOLLOWED BY <CARRIAGE RETURN>

4.3.4.6 THE PROGRAM WILL TYPE R TO INDICATE THAT IT HAS STARTED AND WILL START TESTING AT THE SELECTED TEST.

NOTE

CARE MUST BE TAKEN WHEN THIS FEATURE IS USED, SINCE THERE IS NO PROTECTION AGAINST SELECTING AN ADDRESS THAT IS IN THE MIDDLE OF A TEST

NOTE

IF IT IS DESIRED TO LOOP ON THE TEST
THAT IS SELECTED SET SW14=1 BEFORE
ENTERING THE TEST ADDRESS

5.0 OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

SW15=1, HALT ON ERROR
SW14=1, LOOP ON CURRENT TEST
SW13=1, SUPPRESS ERROR TYPEOUT
SW11=1, INHIBIT ITERATIONS
SW10=1, ESCAPE TO NEXT TEST ON ERROR
SW09=1, FREEZE VARIABLE PARAMETER IN CURRENT TEST
SW01=1, START PROGRAM AT SELECTED TEST
SW00=1, CHANGE PARAMETERS AT PROGRAM RESTART

5.2 SUBROUTINE ABSTRACTS

5.2.1 TRAPCATCHER (LOCATIONS 000000-000776)

THIS ROUTINE IS USED TO INTERCEPT UNEXPECTED INTERRUPTS AND TRAPS.
THE AREA FROM 000000-000776 IS LOADED WITH THE FOLLOWING SEQUENCE

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772
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776
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IF AN UNEXPECTED INTERRUPT OR TRAP OCCURS, THE PROGRAM WILL HALT WITH
THE PC 2 GREATER THAN THE ADDRESS TO WHICH THE PROGRAM TRAPPED. THE
PROCESSOR STACK MAY BE EXAMINED TO DETERMINE WHERE THE PROGRAM WAS
WHEN THE TRAP OR INTERRUPT OCCURED.

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4 5.2.2 START (PROGRAM INITIALIZATION)

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6 THIS ROUTINE INITIALIZES ALL PROGRAM FLAGS AND COUNTERS, TYPES THE
7 PROGRAM TITLE MESSAGE, AND INPUTS THE VECTOR AND CONTROL REGISTER
8 ADDRESSES OF THE DM11 TO BE TESTED.
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12 5.2.3 BEGIN (PROGRAM START AND RESTART)

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14 THIS ROUTINE IS ENTERED IMMEDIATELY AFTER "START" AND EACH TIME A
15 PROGRAM PASS HAS BEEN COMPLETED. THE ROUTINE SETS UP THE PROCESSOR
16 STACK AND STATUS WORD AND THEN TRANSFERS CONTROL TO THE TEST AT WHICH
17 TESTING WILL BEGIN. IF SW01=0 WHEN THIS ROUTINE IS ENTERED TESTING
18 WILL START AT T1 (TEST 1). IF SW01=1 WHEN THIS ROUTINE IS ENTERED,
19 TESTING WILL START AT THE PC ENTERED FROM THE TELETYPE KEYBOARD.
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23 5.2.4 EOP (END OF PASS)

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25 THIS ROUTINE IS ENTERED ONCE PER PASS AFTER ALL TESTS HAVE BEEN
26 COMPLETED. THIS ROUTINE TYPES THE MAINDEC IDENTIFICATION CODE OF THE
27 PROGRAM, CLEARS ERROR FLAGS AND UPDATES THE PASS COUNT. IF THE
28 PROGRAM WAS LOADED UNDER ACT11 OR DDP, THE ROUTINE CHECKS FOR RETURN
29 TO THE ACT11 OR DDP MONITOR. IF THE PROGRAM IS NOT UNDER MONITOR
30 CONTROL, THE ROUTINE TRANSFERS TO BEGIN.
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34 5.2.5 SCOPER (SCOPE LOOP AND ITERATION HANDLER)

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36 THIS ROUTINE IS ENTERED EACH TIME A TEST IS COMPLETED. THE ROUTINE
37 CHECKS FOR THE FOLLOWING UPON ENTRY

- 38
39 1. IF SW10=1, THE ROUTINE WILL TRANSFER TO THE NEXT TEST IN
40 SEQUENCE, AFTER CLEARING ERROR FLAGS.
41
42 2. IF SW11=1, THE ROUTINE WILL TRANSFER TO THE NEXT TEST
43 SEQUENCE, AFTER CLEARING ERROR FLAGS.
44
45 3. IF SW14=1, THE ROUTINE WILL LOOP ON THE CURRENT TEST
46 REGARDLESS OF THE ITERATION COUNT.
47

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49 IF NONE OF THE ABOVE IS TRUE, THE ROUTINE WILL ADD 1 TO THE COUNT OF
50 TEST ITERATIONS, AND COMPARE THIS VALUE TO THE NUMBER OF ITERATIONS
51 THAT SHOULD BE PERFORMED. IF THESE NUMBERS ARE EQUAL, THE ROUTINE
52 WILL TRANSFER TO THE NEXT TEST IN SEQUENCE. IF THE NUMBERS ARE NOT
EQUAL, THE TEST CURRENTLY IN PROGRESS WILL BE REPEATED.

5.2.6 SCOP1R (FREEZE ON CURRENT DATA)

THE CALL TO THIS ROUTINE FOLLOWS IMMEDIATELY AFTER THE CALL TO THE ERROR HANDLER IN THOSE TESTS THAT HAVE VARIABLE PARAMETERS. THIS ROUTINE IS ALWAYS ENTERED IN THOSE TESTS, WHETHER OR NOT AN ERROR OCCURS. IF SW09=1, THE ROUTINE WILL TRANSFER CONTROL BACK TO THE TEST AT A POINT WHICH WILL ALLOW REPEATING THE FUNCTION UNDER TEST CONTINUOUSLY WITH THE SAME DATA. IF THIS OPTION IS SELECTED, THE ROUTINE "SCOPER" IS NEVER ENTERED AND ITERATION COUNTS WILL NOT BE UPDATED.

5.2.7 ERRORS (ERROR HANDLER)

THIS ROUTINE IS ENTERED UPON ERROR DETECTION ONLY. WITH ALL CONSOLE SWITCHES DOWN, THE ROUTINE PROCEEDS AS FOLLOWS:

1. THE PC OF THE INSTRUCTION THAT CALLED THE ERROR HANDLER IS ACCESSED THRU THE STACK, AND THEN THE EMT INSTRUCTION ITSELF IS FETCHED. THE 8 LSB OF THE EMT INSTRUCTION ARE THE ERROR CODE. THIS CODE IS USED TO ACCESS A TABLE OF ERROR MESSAGES AND ERROR DATA STORAGE LOCATIONS.
2. IF THE TEST THAT FAILED DID NOT FAIL PREVIOUSLY DURING THIS PASS, A COMPLETE ERROR REPORT IS MADE IF THE TEST THAT FAILED FAILED MORE THAN ONCE DURING THE CURRENT PASS, ONLY THE DATA RELATING TO THE FAILURE IS TYPED. IF SW13=1, NO ERROR TYPEOUT IS MADE.
3. THE ROUTINE NOW CHECKS FOR HALT ON ERROR. IF SW15=1 THE PROGRAM WILL HALT WITH THE PC OF THE CALL TO THE ERROR ROUTINE IN R0. IF SW15=0, THE PROGRAM WILL NOT HALT, BUT WILL CHECK FOR ESCAPE TO NEXT TEST.
4. IF SW10=0, THE ROUTINE WILL RETURN TO THE TEST IN PROGRESS. IF SW10=1, THE ROUTINE WILL ABORT THE CURRENT TEST, AND TRANSFER TO THE NEXT TEST IN SEQUENCE, THRU THE ROUTINE "SCOPER".

5.2.8 TRPSRV (TRAP DECODE AND DISPATCH)

THIS ROUTINE DECODES THE 8 LSB OF THE TRAP INSTRUCTION THAT CAUSED THE PROGRAM INTERRUPT, AND TRANSFERS CONTROL TO THE ROUTINE THRU THE TABLE "TRPTAB" USING THE 8 LSB OF THE TRAP INSTRUCTION AS AN OFFSET TO THE POINTER TO THE ROUTINE TO BE ENTERED.

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5.3 PROGRAM AND OR OPERATOR ACTION

5.3.1 PROGRAM START WITH ALL SWITCHES DOWN

5.3.1.1 REFER TO SECTIONS 4.3.1 AND 4.3.2 FOR INITIAL PROGRAM BEHAVIOR.

5.3.1.2 AFTER "R" HAS BEEN TYPED BY THE PROGRAM, TEST EXECUTION WILL BEGIN. EACH TEST WILL BE REPEATED A SELECTED NUMBER OF ITERATIONS (SEE LISTING FOR EXACT NUMBER FOR EACH TEST) AND THEN THE PROGRAM WILL PROCEED TO THE NEXT TEST.

5.3.1.3 WHEN ALL ITERATIONS HAVE BEEN COMPLETED, THE PROGRAM WILL TYPE "CZDHH-C" AND THEN RESTART TESTING AT TEST 1 (LOCATION T1 IN THE PROGRAM).

5.3.1.4 IF AN ERROR OCCURS, THE PROGRAM WILL TYPE AN APPROPRIATE ERROR MESSAGE, AND THEN CONTINUE THE TEST IN PROGRESS.

5.3.2 PROGRAM START WITH SW00=1

THE PROGRAM WILL PERFORM AS DESCRIBED IN 4.3.1 AND 5.3.1

5.3.3 PROGRAM START WITH SW01=1

5.3.3.1 REFER TO SECTION 4.3.4 FOR INITIAL PROGRAM BEHAVIOR

5.3.3.2 TEST EXECUTION WILL START AT THE ADDRESS SPECIFIED AND WILL CONTINUE AS DESCRIBED IN 5.3.1.2

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5.3.3.3 AFTER "CZDHH-C" HAS BEEN TYPED, THE PROGRAM WILL RESUME TESTING AT TEST 1

5.3.4 PROGRAM OPERATION WITH SW15=1

SAME AS 5.3.1, EXCEPT THAT IN THE CASE OF AN ERROR, THE PROGRAM WILL HALT AFTER THE ERROR TYPEOUT, AND THE PC+2 OF THE CALL TO THE ERROR ROUTINE WILL BE DISPLAYED IN RO.

5.3.5 PROGRAM OPERATION WITH SW13=1

SAME AS 5.3.1 EXCEPT THAT NO ERROR TYPEOUTS WILL OCCUR

5.3.6 PROGRAM OPERATION WITH SW11=1

SAME AS 5.3.1 EXCEPT THAT EACH TEST WILL BE REPEATED ONCE ONLY

5.3.7 PROGRAM OPERATION WITH SW10=1

SAME AS 5.3.1, EXCEPT THAT IN THE CASE OF AN ERROR THE CURRENT TEST WILL BE ABORTED, AND THE PROGRAM WILL PROCEED TO THE NEXT TEST IN SEQUENCE.

5.3.8 PROGRAM OPERATION WITH SW14=1, OR SW09=1

THESE FUNCTIONS ARE NORMALLY USED FOR TROUBLE SHOOTING. SEE SECTION 6.3 FOR THEIR USE.

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6.0 ERRORS

6.1 ERROR HALTS

THE ERROR MESSAGE FORMAT FOR ALL ERROR TYPEOUTS IS AS FOLLOWS

```
PC+2          MESSAGE
              HEADER (IF APPLICABLE)
              DATA  (IF APPLICABLE)
```

WHERE

PC+2 IS THE ADDRESS OF THE CALL TO THE ERROR HANDLER + 2;
MESSAGE IS AN ASCII MESSAGE DESCRIBING (BRIEFLY) THE FAILURE;
HEADER IS A DESCRIPTION OF THE DATA TO FOLLOW;
DATA IS OCTAL INFORMATION RELATING TO THE CAUSE OF THE FAILURE. IF

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THE SAME ERROR OCCURS IN A GIVEN TEST ON THE SAME PASS, AND IF DATA IS ASSOCIATED WITH THAT ERROR, ONLY DATA IS TYPE ON SUCCEEDING ERROR TYPEOUTS.

IF NO DATA IS ASSOCIATED WITH THE ERROR THE COMPLETE ERROR MESSAGE IS TYPED.

6.1.1 ERROR DESCRIPTIONS

SEE LISTING FOR DETAILS OF ERRORS

6.2 ERROR RECOVERY

6.2.1 SW15=0

IF THE PROGRAM IS RUN WITH SW15=0, NO OPERATOR ACTION IS REQUIRED TO CONTINUE TESTING

6.2.2 SW15=1

IF THE PROGRAM IS RUN WITH SW15=1, TO CONTINUE TESTING AFTER THE PROGRAM HAS HALTED, PRESS THE PROCESSOR CONSOLE CONTINUE SWITCH

6.2.3 ILLEGAL INTERRUPTS

IF AN INTERRUPT OCCURS TO A VECTOR ADDRESS NOT SELECTED DURING PROGRAM INITIALIZATION, THE PROGRAM WILL HALT IN THE TRAPCATCHER. THE ADDRESS AT WHICH THE PROGRAM HALTS IS 2 GREATER THAN THE ADDRESS TO WHICH THE INTERRUPT OCCURED. THE PROGRAM MUST BE RESTARTED AT 200 TO RECOVER FROM THIS ERROR.

6.3 SCOPE LOOPING

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6.3.1 TO SCOPE ON A SPECIFIC TEST, SET SW14=1 AND SW13=1. THIS WILL CAUSE THE PROGRAM TO CONTINUOUSLY LOOP ON THE SAME TEST, AND WILL CAUSE ALL ERROR TYPEOUTS TO BE INHIBITED

6.3.2 TO SCOPE ON A SPECIFIC VALUE OF A PARAMETER WITHIN A TEST, SET SW09=1 TO FREEZE THE DATA. (SEE LISTING FOR THOSE TESTS THAT INCORPORATE THIS FEATURE)

6.3.3 PROGRAM START TO SCOPE LOOP ON SELECTED TEST
PERFORM SECTION 4.3.4 WITH SW14=1

7.0 RESTRICTIONS

7.1 STARTING

THE DH11 TEST CARD MUST BE INSTALLED

7.2 RUNNING

NONE

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8.0 MISCELLANEOUS

8.1 EXECUTION TIME

THE TIME FOR ONE PASS OF THE PROGRAM (END OF TYPEOUT OF CZDHH-C TO END OF TYPEOUT OF CZDHH-C) IS GIVEN FOR VARIOUS PROCESSORS IN THE TABLE BELOW

	TIME
PROCESSOR	
PDP-11/05.10	
PDP-11/20	
PDP-11/40	
PDP-11/45	

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9.0 PROGRAM DESCRIPTION

FIRST, VERIFY THAT AUTO-ECHO WORKS ON ALL LINES BY TRANSMITTING ONE CHARACTER WITH AUTO ECHO ENABLED.

THEN A BINARY PATTERN IS TRANSMITTED ON ALL LINES EXCEPT THE ON WITH AUTO-ECHO ENABLED. A SINGLE CHARACTER IS TRANSMITTED ON THAT LINE. ALL DATA IS VERIFIED TO BE CORRECT.

10.0 LISTING

!

1 ; DHMAC-A - DH11 MACRO LIBRARY
 2 ; COPYRIGHT 1985, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
 3

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 5 .LIST ME
 6 .NLIST MC,MD,CND
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TRAPS."

749
 750
 CLEAN END OF PASS
 MESSAGE.

751
 752
 753
 TCH REGISTER"
 754

; CMS REPLACEMENT HISTORY

; *9 SKONETSKI 26-APR-1985 16:23:08 "FIXED TYPO CAUSING ASSEMBLY ERRORS"
 ; *8 SKONETSKI 22-APR-1985 16:48:03 "TYPO ERROR IN VECTOR CHANGE CODE SOURCE FIXED"
 ; *7 SKONETSKI 22-APR-1985 16:26:04 "ADDED CODE TO SET VECTORS FOR PWR FAIL, ERRORS, AND EMT
 ; *6 SKONETSKI 22-APR-1985 14:22:35 "FIXED BRANCH ERROR IN END OF PASS ROUTINE"
 ; *5 SKONETSKI 22-APR-1985 08:28:54 "FIXED BUG (AN OCTASC MACRO CALL WAS WRONG) AND ADDED A
 ; *4 SKONETSKI 18-APR-1985 14:20:15 "ADDED SOFTWARE SWITCH REG SUPPORT, BUT UNTESTED"
 ; *3 SKONETSKI 12-APR-1985 10:34:52 "FIXED PROBLEMS WITH SPURIOUS CR/LFS"
 ; *2 SKONETSKI 11-APR-1985 16:00:24 "ADDED MACRO FROM SYSMAC.SML THAT SIZES FOR SOFTWARE SWI
 ; *1 SKONETSKI 11-APR-1985 15:49:05 "LIBRARY FOR DH11 DIAGNOSTICS"

; 3

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5 000000

.LIST ME
.NLIST MC,MD,CND
.HEADER †/1972,1985/,†/DH11 AUTO-ECHO TEST/,†/CZDHH-CO/

;STARTING PROCEDURE
;LOAD PROGRAM
;LOAD ADDRESS 000200
;PRESS START
;PROGRAM WILL TYPE DH11 AUTO-ECHO TEST
;PROGRAM WILL TYPE "VECTOR ADDRESS-"
;TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
;FOR THE DH11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
;PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
;TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
;FOR THE DH11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
;AT THE END OF A PASS, PROGRAM WILL TYPE " CZDHH-CO "
;AND THEN RESUM TESTING

; 3

000000

.TITLE CZDHH-CO
.ENABLE ABS
.NLIST MC,MD,CND
.LIST ME
.SYMBOLS

6 000000

;SWITCH REGISTER OPTIONS

100000
040000
020000
010000
004000
002000
001000
000400
000100
000040
000020
000010
000004
000002
000001

SW15=100000 ;=1,HALT ON ERROR
SW14=40000 ;=1,LOOP ON CURRENT TEST
SW13=20000 ;=1,INHIBIT ERROR TYPEOUT
SW12=10000
SW11=4000 ;=1,INHIBIT ITERATIONS
SW10=2000 ;=1,ESCAPE TO NEXT TEST ON ERROR
SW09=1000 ;=1,LOOP WITH CURRENT DATA
SW08=400
SW06=100
SW05=40
SW04=20
SW03=10
SW02=4
SW01=2
SW00=1

; 3

;RESTART PROGRAM AT SELECTED TEST
;RESELECT VECTOR AND CONTROL REGISTER
;ADDRESS AFTER PROGRAM RESTART

0

;REGISTER DEFINITIONS

```

000000      R0=#0      ;GENERAL REGISTER
000001      R1=#1      ;GENERAL REGISTER
000002      R2=#2      ;GENERAL REGISTER
000003      R3=#3      ;GENERAL REGISTER
000004      R4=#4      ;GENERAL REGISTER
000005      R5=#5      ;GENERAL REGISTER
000006      SP=#6      ;PROCESSOR STACK POINTER
000007      PC=#7      ;PROGRAM COUNTER

```

;LOCATION EQUIVALENCIES

```

;SWR=177570 ;CONSOLE SWITCH REGISTER ; 3
;LIGHTS=177570 ;PDP-11/45 DISPLAY REGISTER ; 4
177776      PS=177776 ;PROCESSOR STATUS WORD ; 4
015644      STACK=ENDCOO+200 ;START OF PROCESSOR STACK ; 3

```

;INSTRUCTION DEFINITIONS

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005746      PUSH1SP=5746 ;DECREMENT PROCESSOR STACK 1 WORD
005726      POP1SP=5726  ;INCREMENT PROCESSOR STACK 1 WORD
010046      PUSHRO=10046 ;SAVE R0 ON STACK
012600      POPRO=12600  ;RESTORE R0 FROM STACK
024646      PUSH2SP=24646 ;DECREMENT STACK TWICE
022626      POP2SP=22626 ;INCREMENT STACK TWICE

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;
.MACRO HLT      $A
          EMT    $A
.ENDM HLT
;
;

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100000      BIT15=100000
040000      BIT14=40000 ; 3
020000      BIT13=20000
010000      BIT12=10000
004000      BIT11=4000
002000      BIT10=2000
001000      BIT09=1000
000400      BIT08=400
000200      BIT07=200
000100      BIT06=100
000040      BIT05=40
000020      BIT04=20
000010      BIT03=10
000004      BIT02=4
000002      BIT01=2
000001      BIT00=1
1 000000    .CA1CH

```


000146	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000150	000152	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000152	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000154	000156	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000156	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000160	000162	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000162	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000164	000166	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000166	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000170	000172	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000172	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000174	000176	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000176	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000200	000202	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000202	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000204	000206	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000206	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000210	000212	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000212	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000214	000216	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000216	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000220	000222	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000222	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000224	000226	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000226	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000230	000232	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000232	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000234	000236	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000236	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000240	000242	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000242	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000244	000246	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000246	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000250	000252	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000252	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000254	000256	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000256	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000260	000262	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000262	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000264	000266	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000266	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000270	000272	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000272	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000274	000276	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000276	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000300	000302	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000302	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000304	000306	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000306	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000310	000312	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000312	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000314	000316	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000316	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000320	000322	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000322	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000324	000326	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000326	000000	HALT	;EXAMINE STACK TO FIND CAUSE

000330	000332	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000332	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000334	000336	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000336	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000340	000342	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000342	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000344	000346	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000346	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000350	000352	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000352	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000354	000356	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000356	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000360	000362	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000362	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000364	000366	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000366	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000370	000372	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000372	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000374	000376	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000376	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000400	000402	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000402	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000404	000406	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000406	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000410	000412	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000412	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000414	000416	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000416	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000420	000422	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000422	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000424	000426	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000426	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000430	000432	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000432	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000434	000436	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000436	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000440	000442	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000442	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000444	000446	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000446	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000450	000452	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000452	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000454	000456	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000456	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000460	000462	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000462	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000464	000466	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000466	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000470	000472	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000472	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000474	000476	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000476	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000500	000502	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000502	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000504	000506	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000506	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000510	000512	.+2	;UNEXPECTED TRAP TO THIS LOCATION

000512	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000514	000516	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000516	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000520	000522	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000522	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000524	000526	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000526	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000530	000532	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000532	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000534	000536	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000536	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000540	000542	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000542	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000544	000546	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000546	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000550	000552	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000552	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000554	000556	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000556	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000560	000562	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000562	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000564	000566	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000566	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000570	000572	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000572	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000574	000576	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000576	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000600	000602	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000602	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000604	000606	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000606	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000610	000612	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000612	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000614	000616	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000616	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000620	000622	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000622	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000624	000626	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000626	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000630	000632	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000632	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000634	000636	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000636	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000640	000642	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000642	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000644	000646	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000646	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000650	000652	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000652	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000654	000656	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000656	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000660	000662	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000662	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000664	000666	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000666	000000	HALT	;EXAMINE STACK TO FIND CAUSE
000670	000672	.+2	;UNEXPECTED TRAP TO THIS LOCATION
000672	000000	HALT	;EXAMINE STACK TO FIND CAUSE

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000674 000676      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000676 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000700 000702      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000702 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000704 000706      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000706 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000710 000712      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000712 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000714 000716      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000716 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000720 000722      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000722 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000724 000726      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000726 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000730 000732      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000732 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000734 000736      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000736 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000740 000742      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000742 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000744 000746      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000746 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000750 000752      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000752 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000754 000756      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000756 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000760 000762      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000762 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000764 000766      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000766 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000770 000772      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000772 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
000774 000776      .+2      ;UNEXPECTED TRAP TO THIS LOCATION
000776 000000      HALT      ;EXAMINE STACK TO FIND CAUSE
1 001000      .SETVEC
```



```

0          ;STANDARD INTERRUPT VECTORS
000200    000200    000167    000600    .-200    JMP      START          ;GO TO START OF PROGRAM

1 000204    .TRPDEF

          ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
          ;POINTERS TO SUBROUTINES CAN BE FOUND STARTING
          ;AT LOCATION "TRPTAB"

000204    TRPDEF  SCOPE,+/SCOPE LOOP AND ITERATION HANDLER/
          104400    SCOPE=TRAP+Y          ;SCOPE LOOP AND ITERATION HANDLER
          000001    Y=Y+1

000204    TRPDEF  TYPE,+/TELETYPE OUTPUT ROUTINE/
          104401    TYPE=TRAP+Y          ;TELETYPE OUTPUT ROUTINE
          000002    Y=Y+1

000204    TRPDEF  OCTASC,+/OCTAL TO ASCII CONVERSION/
          104402    OCTASC=TRAP+Y        ;OCTAL TO ASCII CONVERSION
          000003    Y=Y+1

000204    TRPDEF  INSTR,+/INPUT ASCII STRING/
          104403    INSTR=TRAP+Y        ;INPUT ASCII STRING
          000004    Y=Y+1

000204    TRPDEF  INSTER,+/STRING INPUT ERROR/
          104404    INSTER=TRAP+Y       ;STRING INPUT ERROR
          000005    Y=Y+1

000204    TRPDEF  PARAM,+/CONVERT STRING TO OCTAL, CHECK LIMITS/
          104405    PARAM=TRAP+Y       ;CONVERT STRING TO OCTAL, CHECK LIMITS
          000006    Y=Y+1

000204    TRPDEF  SAVOSP,+/SAVE R0-R5, PC/
          104406    SAVOSP=TRAP+Y      ;SAVE R0-R5, PC
          000007    Y=Y+1

000204    TRPDEF  RESO5,+/RESTORE R0-R5/
          104407    RESO5=TRAP+Y      ;RESTORE R0-R5
          000010    Y=Y+1

000204    TRPDEF  SCOPE1,+/CHECK FOR FREEZE ON CURRENT DATA/
          104410    SCOPE1=TRAP+Y     ;CHECK FOR FREEZE ON CURRENT DATA
          000011    Y=Y+1

2          .MACRO  CODEM1
3          MOV     DHSSR,DHSLR          ;SET UP ADDRESS OF SILO
4          INC     DHSLR                ;STATUS REGISTER HIGH BYTE
5          .ENDM  CODEM1
6 000204    .START DHRVEC,3,4,DHSCR,0,177776,7,10,...1

```



```

.ENDC
.IF NB <>
TRACER: MOV #18,0#10 ;SET UP ILLEGAL INSTRUCTION TRAP RETURN
SXT RO ;DO 11/40, 11/45 INSTRUCTION
MOV #RTT,TRTRET ;11/40,45 RTT RETURN FROM TRACE TRAP
BR 2#
1# : MOV #RTI,TRTRET ;1105,10,20 RTI RETURN FROM TRACE TRAP
MOV #12,0#10 ;RESTROE TRAPCATCHER
MOV #TRTRET,0#16 ;SET UP TRACE TRAP VECTOR

.ENDC
.IF NB <DHRVEC>
.IF B <>
001162 000404 BR VEC2 ; 3
.IFF
TST INIFLG ;IF INITIALIZE FLAG=0
BEQ VEC2 ;GET VECTOR AND CSR ADDRESS

.ENDC
VEC1: BIT #SW00,0SWR ;IF SW00=1, GET NEW VECTOR ; 4
BEQ BEGIN ;AND CSR ; 4
VEC2: MOV #300,R1 ; 4
MOV #302,R2 ; 4
MOV #4,R3
1# : MOV R2,(R1) ;RESTORE TRAPCATCHER
CLR (R2) ;IN FLOATING VECTOR AREA
ADD R3,R1
ADD R3,R2
001220 020127 001000 CMP R1,#1000
001224 001371 BNE 1#
001226 104403 INSTR ;INPUT ADDRESS OF DEVICE VECTOR
001230 014712 MVECTOR ;MESSAGE "VECTOR ADDRESS-"
001232 104405 PARAM ;CONVERT STRING TO OCTAL
001234 000300 300 ;LOW LIMIT
001236 000770 770 ;HIGH LIMIT ; 3
001240 013562 DHRVEC ;LOCATIONS TO BE FILLED
001242 003 .BYTE 3 ;NUMBER OF LOCATIONS
001243 004 .BYTE 4 ;LSB MASK
001244 104403 INSTR ;INPUT ADDRESS OF DEVICE CSR
001246 014734 MREGAD ;MESSAGE "CONTROL REGISTER ADDRESS-"
001250 104405 PARAM ;CONVERT STRING TO OCTAL
001252 000000 0 ;LOW LIMIT
001254 177776 177776 ;HIGH LIMIT
001256 013540 DHSCR ;LOCATIONS TO BE FILLED
001260 007 .BYTE 7 ;NUMBER OF LOCATIONS
001261 010 .BYTE 10 ;LSB MASK

.ENDC
.IF NB <1>
001262 CODEM1
001262 016767 012270 012270 MOV DHSSR,DHSLR ;SET UP ADDRESS OF SILO
001270 005267 012264 INC DHSLR ;STATUS REGISTER HIGH BYTE

.ENDC
TST INIFLG ;IF INITIALIZATION FLAG
BNE BEGIN ;IS CLEARED
001274 005767 012332 COM INIFLG ;SET IT
001300 001002
001302 005167 012324

;PROGRAM START
;CHECK FOR PROGRAM START AT SELECTED ADDRESS ; 3

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```

1      .MACRO  AUTO1  XLINE,XBIT,K
2
3      ;ENABLE AUTO ECHO ON LINE 'XLINE'
4      ;TRANSMIT ONE CHARACTER ON LINE 'XLINE'
5      ;AT 9600 BAUD, 8 BITS.
6      ;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
7      ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
8      ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.
9
10     TS  \XN,100,4#
11     MOV    #BIT11,@DHSCR      ;MASTER CLEAR INTERFACE
12     1#:   JSR    PC,CLRALL     ;CLEAR ALL BYTE COUNT AN
13         ;BUS ADDRESS REGISTERS
14         MOV    #'XLINE',@DHSCR ;SELECT LINE 'XLINE'
15         MOV    #-1,@DHBC      ;SET BYTE COUNT TO 1
16         MOV    #TWRD'K',@DHBA ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
17         MOV    #100,R0        ;SET UP TO RECEIVE 64 CHARACTERS
18         CLR    R1             ;COUNT OF CHARACTERS RECEIVED
19         MOV    #133503,@DHLPR ;SET UP SPEED FOR 9600 BAUD
20         ;8 BITS PER CHARACTER,
21         ;AUTO ECHO ENABLED ON LINE 'XLINE'
22     2#:   MOV    #'XBIT',@DHBAR ;SET BAR BIT FOR LINE 'K'
23         TSTB  @DHSCR          ;WAIT FOR CHARACTER TO
24         BPL   2#              ;BE RECEIVED
25         INC   R1              ;UPDATE RECEIVED CHARACTER COUNT
26         MOV   @DHNR,R4        ;READ CHARACTER
27         CMP   R4,TWRD'K'      ;IS CHARACTER CORRECT
28         BEQ   3#              ;
29         MOV   TWRD'K',R5      ;(R5)=EXPECTED CHARACTER
30         CLR   @DHLPR          ;SHUT OFF AUTO ECHO
31         HLT   0               ;CHARACTER ECHOED INCORRECTLY
32         BR    4#              ;RESTART TEST
33     3#:   DEC   R0             ;IF 64 CHARACTERS HAVE NOT
34         BGT   2#              ;BEEN RECEIVED, CONTINUE
35         BMI   4#              ;
36         BIC   #100000,@DHLPR ;SHLT OFF AUTO-ECHO
37         BR    2#              ;GET 1 MORE CHARACTER
38     4#:   SCOPE  AUTO1        ;CHECK FOR ITERATIONS. LOOP
39     .ENDM

```

```

1      .MACRO  AUTO2  XLINE,XBIT,K
2
3      ;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 'K'
4      ;TRANSMIT 1 CHARACTER ON LINE 'K' WITH AUTO ECHO ENABLED
5      ;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
6      ;CHARACTER LENGTH IS 8 BITS
7      ;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES
8
9      TS \XN,10,5$
10     MOV     @BIT11,@DHSCR      ;MASTER CLEAR INTERFACE
11     JSR     PC,SETALL         ;SET UP ALL LINES TO TRANSMIT
12                                     ;400 (OCTAL) CHARACTERS
13     MOV     #'K',@DHSCR      ;SELECT LINE XLINE FOR TESTING
14     MOV     @TWRD'K',@DHBA   ;CHARACTER TO BE TRANSMITTED
15                                     ;ON LINE XLINE IN AUTO ECHO MODE
16     MOV     @-1,@DHBC        ;TRANSMIT ONLY 1 CHARACTER ON LINE XLINE
17     MOV     @133503,@DHLPR   ;SET AUTO ECHO FOR LINE XLINE
18     BIC     #'XBIT',LINACT   ;CLEAR LINE ACTIVE BIT
19     MOV     @-1,@DHBAR      ;SET BAR BITS FOR ALL LINES
20     CLR     R0               ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
21     1$:    MOV     @DHNRC,R4   ;GET A CHARACTER FROM SILO
22     BPL     1$              ;IF NOT VALID DATA, TRY AGAIN
23     MOV     R4,R3           ;EXTRACT LINE NUMBER FORM CHARACTER
24     SWAB   R3
25     BIC     @177760,R3      ;CLEAR STATUS BITS
26     MOV     R3,R2
27     ASL     R2
28     CMP     R3, #'K'       ;IF LINE NUMBER IS XLINE
29     BEQ     4$              ;CHECK FOR CORRECT ECHOED CHARACTER
30     CMP     RBUF(R2),R4     ;IF NOT LINE XLINE, CHECK DATA
31     BEQ     2$              ;
32     MOV     RBUF(R2),R5     ;(R5)=EXPECTED NON ECHOED DATA
33     HLT     1              ;NON ECHOED DATA ERROR
34     BR     4$
35     2$:    INCB   RBUF(R2)   ;UPDATE EXPECTED RECEIVED DATA
36     BNE     1$              ;CONTINUE IF NOT DONE
37     BIC     LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
38     3$:    TST     LINACT     ;IF ALL LINES ARE DONE
39     BNE     1$              ;EXIT
40     MOV     #'K',@DHSCR      ;SELECT LINE XLINE
41     BIC     @100000,@DHLPR   ;CLEAR AUTO ECHO FOR LINE XLINE
42     TSTB   @DHSLR          ;GET REST OF CHARACTERS
43     BNE     1$              ;AND CHECK
44     BR     5$
45     4$:    INC     R0         ;UPDATE ECHOED CHARACTER COUNT
46     CMP     R4,TWRD'K'     ;CHECK ECHOED DATA
47     BEQ     3$              ;
48     MOV     TWRD'K',R5     ;(R5)=EXPECTED ECHOED DATA
49     HLT     2              ;ECHOED DATA ERROR
50     5$:    SCOPE   AUTO2     ;CHECK FOR ITERATIONS, LOOP
51     .ENDM

```

```

1      .MACRO SSETALL
2
3          ;SET BYTE COUNT FOR ALL LINES TO 400
4          ;SET BUS ADDRESS FOR ALL LINES TO TBUF
5          ;CLEAR EXPECTED CHARACTER BUFFERS
6          ;SET LINE ACTIVE BITS FOR ALL LINES
7
8      SETALL: MOV     #20,R0          ;SET UP TO LOAD 16
9                                     ;BYTE COUNT AND BUS ADDRESS
10                                    ;MEMORY LOCATIONS
11          CLR      R1              ;SET UP TO GENERATE EXPECTED
12                                     ;RECEIVED CHARACTER BUFFER
13          MOV      #200,R2         ;WILL BE HIGH BYTE
14                                     ;OF EXPECTED RECEIVED CHARACTER
15          MOV      #1,R3           ;OFFSET FOR HIGH BYTE
16      1$: MOV      #TBUF,@DHBA     ;LOAD BUS ADDRESS
17          MOV      #-400,@DHBC     ;LOAD BYTE COUNT
18          MOV      #31403,@DHLPR  ;SET LINE SPEED TO 4800 BAUD
19          CLRB     RBUF(R1)        ;RECEIVED CHARACTER
20                                     ;LOAD HIGH BYTE
21          MOVB    R2,RBUF(R3)      ;ADVANCE LINE NUMBER TO NEXT LINE
22          INC     @DHSCR           ;UPDATE POINTERS
23          INC     R2
24          ADD     #2,R1
25          ADD     #2,R3
26          DEC    R0                ;CONTINUE IF NOT DONE
27          BNE    1$
28          MOV     #-1,LINACT        ;SET ACTIVE FLAGS FOR ALL LINES
29          RTS    PC                ;RETURN TO CALLING ROUTINE
30      .ENDM SSETALL
31
32      .MACRO CCLRALL
33
34          ;CLEAR ALL BYTE COUNT AND BUS ADDRESS REGISTERS
35
36      CLRALL: MOV     #20,R0         ;SET UP TO CLEAR 16
37      1$: CLR     @DHBA             ;CLEAR BUS ADDRESS
38          CLR     @DHBC             ;CLEAR BYTE COUNT
39          INC     @DHSCR            ;ADVANCE LINE NUMBER
40          DEC    R0                ;CONTINUE IF NOT DONE
41          BNE    1$
42          RTS    PC                ;RETURN TO CALLING ROUTINE
43      .ENDM CCLRALL

```

```

2      000020      XLINE=LINE
3      000000      XBIT=BITX
4      000020      K=KX
5      000000      LINE=0
6      000001      BITX=1
7      000000      KX=0
9      000020      .REPT 20
10     AUTO1 \LINE,\BITX,\KX
11     .NLIST
12     LINE=LINE+1
13     BITX=BITX+BITX
14     KX=KX+1
15     .LIST
16     .ENDR
001400 AUTO1 \LINE,\BITX,\KX

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```

;ENABLE AUTO ECHO ON LINE 0
;TRANSMIT ONE CHARACTER ON LINE 0
;AT 9600 BAUD, 8 BITS.
;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

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001400 012767 000340 176370 TS \XN,100,4;
001400 012767 000100 012172 T1:  MOV  #340,PS ;DISABLE ALL INTERRUPTS
001414 012767 001554 012160      MOV  #100,ICOUNT ;SET UP FOR 100 ITERATIONS
      .IF NB <>      MOV  #4,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
      .ENDC      MOV  #.FREEZ1 ;SET UP TO LOOP WITH DATA ; 3
      XN=XN+1
001422 012777 004000 012110      MOV  #BIT11,SDHSCR ;MASTER CLEAR INTERFACE
001430 004767 011744      JSR  PC,CLRALL ;CLEAR ALL BYTE COUNT AND
      ;BUS ADDRESS REGISTERS
001434 012777 000000 012076      MOV  #0,SDHSCR ;SELECT LINE 0
001442 012777 177777 012100      MOV  #-1,SDHBC ;SET BYTE COUNT TO 1
001450 012777 014310 012070      MOV  #TWRD0,SDHBA ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
001456 012700 000100      MOV  #100,R0 ;SET UP TO RECEIVE 64 CHARACTERS
001462 005001      CLR  R1 ;COUNT OF CHARACTERS RECEIVED
001464 012777 133503 012052      MOV  #133503,SDHLPR ;SET UP SPEED FOR 9600 BAUD
      ;8 BITS PER CHARACTER,
      ;AUTO ECHO ENABLED ON LINE 0
001472 012777 000001 012052      MOV  #1,SDHBAR ;SET BAR BIT FOR LINE 0
001500 105777 012034      2#: TSTB SDHSCR ;WAIT FOR CHARACTER TO
001504 100375      BPL  2# ;BE RECEIVED
001506 005201      INC  R1 ;UPDATE RECEIVED CHARACTER COUNT
001510 017704 012026      MOV  SDHRC,R4 ;READ CHARACTER
001514 020467 012570      CMP  R4,TWRD0 ;IS CHARACTER CORRECT
001520 001406      BEQ  3#
001522 016705 012562      MOV  TWRD0,R5 ;(R5)=EXPECTED CHARACTER
001526 005077 012012      CLR  SDHLPR ;SHUT OFF AUTO ECHO
001532      HLT  0 ;CHARACTER ECHOED INCORRECTLY
001532 104000      EMT  0
001534 000407      BR  4# ;RESTART TEST
001536 005300      3#: DEC  R0 ;IF 64 CHARACTERS HAVE NOT
001540 003357      BGT  2# ;BEEN RECEIVED, CONTINUE
001542 100404      BMI  4#

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```

001544 042777 100000 011772      BIC      #100000, @DHLPR      ;SHUT OFF AUTO-ECHO
001552 000752                      BR        2#                ;GET 1 MORE CHARACTER
001554 104400      4#:      SCOPE                    ;CHECK FOR ITERATIONS, LOOP
      000001      LINE=LINE+1
      000002      BITX=BITX+BITX
      000001      KX=KX+1
001556                      AUTO1  \LINE, \BITX, \KX

      ;ENABLE AUTO ECHO ON LINE 1
      ;TRANSMIT ONE CHARACTER ON LINE 1
      ;AT 9600 BAUD, 8 BITS.
      ;RECEIVE AND VERIFY CHAPACTERS UNTIL 64 HAVE BEEN RECEIVED.
      ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
      ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

001556                      TS  \XN, 100, 4#
001556 012767 000340 176212      T2:      MOV      #340, PS      ;DISABLE ALL INTERRUPTS
001564 012767 000100 012014      MOV      #100, ICOUNT      ;SET UP FOR 100 ITERATIONS
001572 012767 001732 012002      MOV      #4#, ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB <>
      MOV      #, FREEZ1      ;SET UP TO LOOP WITH DATA      ; 3
      .ENDC
      XN=XN+1
001600 012777 004000 011732      MOV      #BIT11, @DHSCR      ;MASTER CLEAR INTERFACE
001606 004767 011566      1#:      JSR      PC, CLRALL      ;CLEAR ALL BYTE COUNT AN
      ;BUS ADDRESS REGISTERS
001612 012777 000001 011720      MOV      #1, @DHSCR      ;SELECT LINE 1
001620 012777 177777 011722      MOV      #-1, @DHBC      ;SET BYTE COUNT TO 1
001626 012777 014312 011712      MOV      #TWRD1, @DHBA      ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
001634 012700 000100      MOV      #100, R0      ;SET UP TO RECEIVE 64 CHARACTERS
001640 005001      CLR      R1      ;COUNT OF CHARACTERS RECEIVED
001642 012777 133503 011674      MOV      #133503, @DHLPR      ;SET UP SPEED FOR 9600 BAUD
      ;8 BITS PER CHARACTER.
      ;AUTO ECHO ENABLED ON LINE 1
001650 012777 000002 011674      MOV      #2, @DHBAR      ;SET BAR BIT FOR LINE 1
001656 105777 011656      2#:      TSTB      @DHSCR      ;WAIT FOR CHARACTER TO
001662 100375                      BPL      2#                ;BE RECEIVED
001664 005201                      INC      R1      ;UPDATE RECEIVED CHARACTER COUNT
001666 017704 011650      MOV      @DHNR, R4      ;READ CHARACTER
001672 020467 012414      CMP      R4, TWRD1      ;IS CHARACTER CORRECT
001676 001406                      BEQ      3#
001700 016705 012406      MOV      TWRD1, R5      ;(R5)=EXPECTED CHARACTER
001704 005077 011634      CLR      @DHLPR      ;SHUT OFF AUTO ECHO
001710                      HLT      0      ;CHARACTER ECHOED INCORRECTLY
001710 104000                      EMT      0
001712 000407                      BR      4#
001714 005300      3#:      DEC      R0      ;RESTART TEST
001716 003357                      BGT      2#                ;IF 64 CHARACTERS HAVE NOT
001720 100404                      BHI      4#                ;BEEN RECEIVED, CONTINUE
001722 042777 100000 011614      BIC      #100000, @DHLPR      ;SHUT OFF AUTO-ECHO
001730 000752                      BR        2#                ;GET 1 MORE CHARACTER
001732 104400      4#:      SCOPE                    ;CHECK FOR ITERATIONS, LOOP
      000002      LINE=LINE+1
      000004      BITX=BITX+BITX
      000002      KX=KX+1
001734                      AUTO1  \LINE, \BITX, \KX

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```

;ENABLE AUTO ECHO ON LINE 2
;TRANSMIT ONE CHARACTER ON LINE 2
;AT 9600 BAUD, 8 BITS.
;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

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001734      000004      TS \XN,100,4#
001734 012767 000340 176034 T3:  MOV    #340,PS          ;DISABLE ALL INTERRUPTS
001742 012767 000100 011636      MOV    #100,ICOUNT      ;SET UP FOR 100 ITERATIONS
001750 012767 002110 011624      MOV    #4#,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                MOV    #,FREEZ1          ;SET UP TO LOOP WITH DATA          ; 3
                                .ENDC
                                XN=XN+1
001756 012777 004000 011554      MOV    #BIT11,@DHSCR    ;MASTER CLEAR INTERFACE
001764 004767 011410      1#:  JSR    PC,CLRALL     ;CLEAR ALL BYTE COUNT AN
                                ;BUS ADDRESS REGISTERS
001770 012777 000002 011542      MOV    #2,@DHSCR       ;SELECT LINE 2
001776 012777 177777 011544      MOV    #-1,@DHBC       ;SET BYTE COUNT TO 1
002004 012777 014314 011534      MOV    #TWRD2,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
002012 012700 000100      MOV    #100,R0         ;SET UP TO RECEIVE 64 CHARACTERS
002016 005001      CLR    R1              ;COUNT OF CHARACTERS RECEIVED
002020 012777 133503 011516      MOV    #133503,@DHLPR  ;SET UP SPEED FOR 9600 BAUD
                                ;8 BITS PER CHARACTER,
                                ;AUTO ECHO ENABLED ON LINE 2
002026 012777 000004 011516      MOV    #4,@DHBAR       ;SET BAR BIT FOR LINE 2
002034 105777 011500      2#:  TSTB   @DHSCR        ;WAIT FOR CHARACTER TO
002040 100375      BPL    2#              ;BE RECEIVED
002042 005201      INC    R1              ;UPDATE RECEIVED CHARACTER COUNT
002044 017704 011472      MOV    @DHNR,R4        ;READ CHARACTER
002050 020467 012240      CMP    R4,TWRD2        ;IS CHARACTER CORRECT
002054 001406      BEQ    3#              ;(R5)=EXPECTED CHARACTER
002056 016705 012232      MOV    TWRD2,R5        ;SHUT OFF AUTO ECHO
002062 005077 011456      CLR    @DHLPR         ;CHARACTER ECHOED INCORRECTLY
002066      HLT    0
002066 104000      EMT    0
002070 000407      BR    4#              ;RESTART TEST
002072 005300      3#:  DEC    R0          ;IF 64 CHARACTERS HAVE NOT
002074 003357      BGT    2#              ;BEEN RECEIVED, CONTINUE
002076 100404      BMI    4#
002100 042777 100000 011436      BIC    #100000,@DHLPR  ;SHUT OFF AUTO-ECHO
002106 000752      BR    2#              ;GET 1 MORE CHARACTER
002110 104400      4#:  SCOPE
                                LINE=LINE+1
                                BITX=BITX+BITX
                                KX=KX+1
002112      AUTO1  \LINE,\BITX,\KX

;ENABLE AUTO ECHO ON LINE 3
;TRANSMIT ONE CHARACTER ON LINE 3
;AT 9600 BAUD, 8 BITS.
;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

002112      TS \XN,100,4#

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002112 012767 000340 175656 T4:  MOV  #340,PS          ;DISABLE ALL INTERRUPTS
002120 012767 000100 011460      MOV  #100,ICOUNT      ;SET UP FOR 100 ITERATIONS
002126 012767 002266 011446      MOV  #4#,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                <>
                                .IF NB
                                MOV  #,FREEZ1          ;SET UP TO LOOP WITH DATA          ; 3
                                .ENDC
                                XN=XN+1
002134 012777 004000 011376      MOV  #BIT11,@DHSCR    ;MASTER CLEAR INTERFACE
002142 004767 011232 1#:  JSR  PC,CLRALL        ;CLEAR ALL BYTE COUNT AN
                                ;BUS ADDRESS REGISTERS
002146 012777 000003 011364      MOV  #3,@DHSCR        ;SELECT LINE 3
002154 012777 177777 011366      MOV  #-1,@DHBC        ;SET BYTE COUNT TO 1
002162 012777 014316 011356      MOV  #TWRD3,@DHBA     ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
002170 012700 000100      MOV  #100,R0          ;SET UP TO RECEIVE 64 CHARACTERS
002174 005001      CLR  R1                ;COUNT OF CHARACTERS RECEIVED
002176 012777 133503 011340      MOV  #133503,@DHLPR   ;SET UP SPEED FOR 9600 BAUD
                                ;8 BITS PER CHARACTER.
                                ;AUTO ECHO ENABLED ON LINE 3
                                ;SET BAR BIT FOR LINE 3
002204 012777 000010 011340      MOV  #10,@DHBAR       ;WAIT FOR CHARACTER TO
002212 105777 011322 2#:  TSTB  @DHSCR          ;BE RECEIVED
002216 100375      BPL  2#                ;UPDATE RECEIVED CHARACTER COUNT
002220 005201      INC  R1                ;READ CHARACTER
002222 017704 011314      MOV  @DHNR,R4         ;IS CHARACTER CORRECT
002226 020467 012064      CMP  R4,TWRD3
002232 001406      BEQ  3#
002234 016705 012056      MOV  TWRD3,R5         ;(R5)-EXPECTED CHARACTER
002240 005077 011300      CLR  @DHLPR          ;SHUT OFF AUTO ECHO
002244      HLT  0              ;CHARACTER ECHOED INCORRECTLY
002244 104000      EMT  0
002246 000407      BR   4#
002250 005300 3#:  DEC  R0              ;RESTART TEST
002252 003357      BGT  2#              ;IF 64 CHARACTERS HAVE NOT
002254 100404      BMI  4#              ;BEEN RECEIVED, CONTINUE
002256 042777 100000 011260      BIC  #100000,@DHLPR  ;SHUT OFF AUTO-ECHO
002264 000752      BR   2#              ;GET 1 MORE CHARACTER
002266 104400 4#:  SCOPE          ;CHECK FOR ITERATIONS, LOOP
                                000004
                                000020
                                000004
002270      AUT01  \LINE,\BITX,\KX
                                ;ENABLE AUTO ECHO ON LINE 4
                                ;TRANSMIT ONE CHARACTER ON LINE 4
                                ;AT 9600 BAUD, 8 BITS.
                                ;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
                                ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
                                ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.
002270      TS  \XN,100,4#
002270 012767 000340 175500 T5:  MOV  #340,PS          ;DISABLE ALL INTERRUPTS
002276 012767 000100 011302      MOV  #100,ICOUNT      ;SET UP FOR 100 ITERATIONS
002304 012767 002444 011270      MOV  #4#,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                <>
                                .IF NB
                                MOV  #,FREEZ1          ;SET UP TO LOOP WITH DATA          ; 3
                                .ENDC
                                XN=XN+1
002312 000006 004000 011220      MOV  #BIT11,@DHSCR    ;MASTER CLEAR INTERFACE

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002320 004767 011054      1$: JSR    PC,CLRALL      ;CLEAR ALL BYTE COUNT AN
                                ;BUS ADDRESS REGISTERS
002324 012777 000004 011206      MOV    #4,@DHSCR      ;SELECT LINE 4
002332 012777 177777 011210      MOV    #-1,@DHBL      ;SET BYTE COUNT TO 1
002340 012777 014320 011206      MOV    @TWRD4,@DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
002346 012700 000100      MOV    #100,R0        ;SET UP TO RECEIVE 64 CHARACTERS
002352 005001      CLR    R1              ;COUNT OF CHARACTERS RECEIVED
002354 012777 133503 011162      MOV    #133503,@DHLPR  ;SET UP SPEED FOR 9600 BAUD
                                ;8 BITS PER CHARACTER,
                                ;AUTO ECHO ENABLED ON LINE 4
002362 012777 000020 011162      MOV    #20,@DHBAR      ;SET BAR BIT FOR LINE 4
002370 105777 011144      2$: TSTB   @DHSCR        ;WAIT FOR CHARACTER TO
002374 100375      BPL    2$              ;BE RECEIVED
002376 005201      INC    R1              ;UPDATE RECEIVED CHARACTER COUNT
002400 017704 011136      MOV    @DMNRC,R4      ;READ CHARACTER
002404 020467 011710      CMP    R4,TWRD4       ;IS CHARACTER CORRECT
002410 001406      BEQ    3$              ;
002412 016705 011702      MOV    TWRD4,R5      ;(R5)=EXPECTED CHARACTER
002416 005077 011122      CLR    @DHLPR        ;SHUT OFF AUTO ECHO
002422      HLT    0              ;CHARACTER ECHOED INCORRECTLY
002422 104000      EMT    0              ;
002424 000407      BR     4$              ;RESTART TEST
002426 005300      3$: DEC    R0              ;IF 64 CHARACTERS HAVE NOT
002430 003357      BGT    2$              ;BEEN RECEIVED, CONTINUE
002432 100404      BMI    4$              ;
002434 042777 100000 011102      BIC    #100000,@DHLPR ;SHUT OFF AUTO-ECHO
002442 000752      BR     2$              ;GET 1 MORE CHARACTER
002444 104400      4$: SCOPE              ;CHECK FOR ITERATIONS, LOOP
      000005      LINE=LINE+1
      000040      BITX=BITX+BITX
      000005      KX=KX+1
002446      AUTO1  \LINE,\BITX,\KX

                                ;ENABLE AUTO ECHO ON LINE 5
                                ;TRANSMIT ONE CHARACTER ON LINE 5
                                ;AT 9600 BAUD, 8 BITS.
                                ;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
                                ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
                                ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

002446      TS  \XN,100,4$
002446 012767 000340 175322      T6:  MOV    #340,PS      ;DISABLE ALL INTERRUPTS
002454 012767 000100 011124      MOV    #100,ICOUNT    ;SET UP FOR 100 ITERATIONS
002462 012767 002622 011112      MOV    #41,ESCAPE     ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB <>
002470 000007      MOV    #.FREEZ1      ;SET UP TO LOOP WITH DATA      3
                                .ENDC
                                XN=XN+1
002470 012777 004000 011042      MOV    @BIT11,@DHSCR  ;MASTER CLEAR INTERFACE
002476 004767 010676      1$: JSR    PC,CLRALL    ;CLEAR ALL BYTE COUNT AN
                                ;BUS ADDRESS REGISTERS
002502 012777 000065 011030      MOV    #5,@DHSCR     ;SELECT LINE 5
002510 012777 177777 011032      MOV    #-1,@DHBC     ;SET BYTE COUNT TO 1
002516 012777 014322 011022      MOV    @TWRD5,@DHBA  ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
002524 012700 000100      MOV    #100,R0       ;SET UP TO RECEIVE 64 CHARACTERS
002530 005001      CLR    R1              ;COUNT OF CHARACTERS RECEIVED
002532 012777 133503 011004      MOV    #133503,@DHLPR ;SET UP SPEED FOR 9600 BAUD

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002540 012777 000040 011004      MOV    #40, @DHBAR
002546 105777 010766      2#:   TSTB   @DHSCR
002552 100375                BPL    2#
002554 005201                INC    R1
002556 017704 010760      MOV    @DHNRC, R4
002562 020467 011534      CMP    R4, TWRD5
002566 001406                BEQ    3#
002570 016705 011526      MOV    TWRD5, R5
002574 005077 010744      CLR    @DHLPR
002600                HLT    0
002600 104000                EMT    0
002602 000407                BR     4#
002604 005300      3#:   DEC    R0
002606 003357                BGT    2#
002610 100404                BMI    4#
002612 042777 100000 010724      BIC    #100000, @DHLPR
002620 000752                BR     2#
002622 104400      4#:   SCOPE
                LINE=LINE+1
                BITX=BITX+BITX
                KX=KX+1
002624                AUTO1  \LINE, \BITX, \KX

                ;8 BITS PER CHARACTER,
                ;AUTO ECHO ENABLED ON LINE 5
                ;SET BAR BIT FOR LINE 5
                ;WAIT FOR CHARACTER TO
                ;BE RECEIVED
                ;UPDATE RECEIVED CHARACTER COUNT
                ;READ CHARACTER
                ;IS CHARACTER CORRECT

                ;(R5)=EXPECTED CHARACTER
                ;SHUT OFF AUTO ECHO
                ;CHARACTER ECHOED INCORRECTLY

                ;RESTART TEST
                ;IF 64 CHARACTERS HAVE NOT
                ;BEEN RECEIVED, CONTINUE

                ;SHUT OFF AUTO-ECHO
                ;GET 1 MORE CHARACTER
                ;CHECK FOR ITERATIONS, LOOP

                ;ENABLE AUTO ECHO ON LINE 6
                ;TRANSMIT ONE CHARACTER ON LINE 6
                ;AT 9600 BAUD, 8 BITS.
                ;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
                ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
                ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

002624                TS \XN, 100, 4#
002624 012767 000340 175144      T7:   MOV    #340, PS
002632 012767 000100 010746      MOV    #100, ICOUNT
002640 012767 003000 010734      MOV    #4#, C$CAPE
                .IF NB <>
                MOV    #, FREEZ1
                .ENDC
                ;SET UP TO LOOP WITH DATA ; 3
                XN=XN+1
002646 012777 004000 010664      MOV    @BIT11, @DHSCR
002654 004767 010520      1#:   JSR    PC, CLRALL
                ;MASTER CLEAR INTERFACE
                ;CLEAR ALL BYTE COUNT AN
                ;BUS ADDRESS REGISTERS
002660 012777 000006 010652      MOV    #6, @DHSCR
002666 012777 177777 010654      MOV    #-1, @DHBC
002674 012777 014324 010644      MOV    @TWRD6, @DHBA
002702 012700 000100      MOV    #100, R0
002706 005001      CLR    R1
002710 012777 133503 010626      MOV    #133503, @DHLPR
                ;SET UP SPEED FOR 9600 BAUD
                ;8 BITS PER CHARACTER,
                ;AUTO ECHO ENABLED ON LINE 6
                ;SET BAR BIT FOR LINE 6
                ;WAIT FOR CHARACTER TO
                ;BE RECEIVED
                ;UPDATE RECEIVED CHARACTER COUNT
                ;READ CHARACTER
                ;IS CHARACTER CORRECT

002716 012777 000100 010626      MOV    #100, @DHBAR
002724 105777 010610      2#:   TSTB   @DHSCR
002730 100375                BPL    2#
002732 005201                INC    R1
002734 017704 010602      MOV    @DHNRC, R4
002740 020467 011360      CMP    R4, TWRD6

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002744 001406          BEQ      3#
002746 016705 011352  MOV      TWRD6,R5      ;(R5)=EXPECTED CHARACTER
002752 005077 010566  CLR      @DHLPR        ;SHUT OFF AUTO ECHO
002756          HLT      0          ;CHARACTER ECHOED INCORRECTLY
002756 104000          EMT      0
002760 000407          BR       4#            ;RESTART TEST
002762 005300          3#:    DEC      R0      ;IF 64 CHARACTERS HAVE NOT
002764 003357          BGT      2#            ;BEEN RECEIVED, CONTINUE
002766 100404          BMI      4#
002770 042777 100000 010546 BIC      @100000,@DHLPR ;SHUT OFF AUTO-ECHO
002776 000752          BR       2#            ;GET 1 MORE CHARACTER
003000 104400          4#:    SCOPE          ;CHECK FOR ITERATIONS, LOOP
          000007
          000200
          000007
003002          AUTO1   \LINE,\BITX,\KX

          ;ENABLE AUTO ECHO ON LINE 7
          ;TRANSMIT ONE CHARACTER ON LINE 7
          ;AT 9600 BAUD, 8 BITS.
          ;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
          ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
          ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

003002          TS      \XN,100,4#
003002 012767 000340 174766 T10:    MOV      @340,PS      ;DISABLE ALL INTERRUPTS
003010 012767 000100 010570  MOV      @100,ICOUNT    ;SET UP FOR 100 ITERATIONS
003016 012767 003156 010556  MOV      @4#,ESCAPE    ;SET UP TO ESCAPE TO NEXT TEST
          .IF NB <>
          MOV      @,FREEZ1 ;SET UP TO LOOP WITH DATA      ; 3
          .ENDC
          XN=XN+1
003024 012777 004000 010506 1#:    MOV      @BIT11,@DHSCR ;MASTER CLEAR INTERFACE
003032 004767 010342          JSR      PC,CLRALL     ;CLEAR ALL BYTE COUNT AN
          ;BUS ADDRESS REGISTERS
003036 012777 000007 010474  MOV      @7,@DHSCR    ;SELECT LINE 7
003044 012777 177777 010476  MOV      @-1,@DHBC    ;SET BYTE COUNT TO 1
003052 012777 014326 010466  MOV      @TWRD7,@DHBA ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
003060 012700 000100          MOV      @100,R0      ;SET UP TO RECEIVE 64 CHARACTERS
003064 005001          CLR      R1          ;COUNT OF CHARACTERS RECEIVED
003066 012777 133503 010450  MOV      @133503,@DHLPR ;SET UP SPEED FOR 9600 BAUD
          ;8 BITS PER CHARACTER,
          ;AUTO ECHO ENABLED ON LINE 7
          ;SET BAR BIT FOR LINE 7
003074 012777 000200 010450  MOV      @200,@DHBAR  ;WAIT FOR CHARACTER TO
003102 105777 010432          2#:    TSTB    @DHSCR      ;BE RECEIVED
003106 100375          BPL      2#
003110 005201          INC      R1          ;UPDATE RECEIVED CHARACTER COUNT
003112 017704 010424          MOV      @DHNR,R4    ;READ CHARACTER
003116 020467 011204          CMP     R4,TWRD7     ;IS CHARACTER CORRECT
003122 001406          BEQ     3#
003124 016705 011176          MOV     TWRD7,R5     ;(R5)=EXPECTED CHARACTER
003130 005077 010410          CLR     @DHLPR      ;SHUT OFF AUTO ECHO
003134          HLT     0          ;CHARACTER ECHOED INCORRECTLY
003134 104000          EMT     0
003136 000407          BR     4#            ;RESTART TEST
003140 005300          3#:    DEC     R0      ;IF 64 CHARACTERS HAVE NOT
003142 003357          BGT     2#            ;BEEN RECEIVED, CONTINUE

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003144 100404          BMI      4#
003146 042777 100000 010370      BIC      @100000,@DHLPR      ;SHUT OFF AUTO-ECHO
003154 000752          BR       2#                  ;GET 1 MORE CHARACTER
003156 104400          4#:      SCOPE                  ;CHECK FOR ITERATIONS, LOOP
      000010      LINE=LINE+1
      000400      BITX=BITX+BITX
      000010      KX=KX+1
003160          AUTO1   \LINE,\BITX,\KX

      ;ENABLE AUTO ECHO ON LINE 10
      ;TRANSMIT ONE CHARACTER ON LINE 10
      ;AT 9600 BAUD, 8 BITS.
      ;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
      ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
      ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

003160          TS \XN,100,4#
003160 012767 000340 174610      T11:     MOV      @340,PS      ;DISABLE ALL INTERRUPTS
003166 012767 000100 010412      MOV      @100,ICOUNT      ;SET UP FOR 100 ITERATIONS
003174 012767 003334 010400      MOV      @4#,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB      <>
      MOV      @,FREEZ1      ;SET UP TO LOOP WITH DATA      ; 3
      .ENDC
      XN=XN+1
003202 012777 004000 010330      MOV      @BIT11,@DHSCR      ;MASTER CLEAR INTERFACE
003210 004767 010164          1#:     JSR      PC,CLRALL      ;CLEAR ALL BYTE COUNT AN
      ;BUS ADDRESS REGISTERS
003214 012777 000010 010316      MOV      @10,@DHSCR      ;SELECT LINE 10
003222 012777 177777 010320      MOV      @-1,@DHBC      ;SET BYTE COUNT TO 1
003230 012777 014330 010310      MOV      @TMRD10,@DHBA      ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
003236 012700 000100          MOV      @100,R0      ;SET UP TO RECEIVE 64 CHARACTERS
003242 005001          CLR      R1      ;COUNT OF CHARACTERS RECEIVED
003244 012777 133503 010272      MOV      @133503,@DHLPR      ;SET UP SPEED FOR 9600 BAUD
      ;8 BITS PER CHARACTER.
      ;AUTO ECHO ENABLED ON LINE 10
003252 012777 000400 010272          MOV      @400,@DHBAR      ;SET BAR BIT FOR LINE 10
003260 105777 010254          2#:     TSTB     @DHSCR      ;WAIT FOR CHARACTER TO
003264 100375          BPL      2#      ;BE RECEIVED
003266 005201          INC      R1      ;UPDATE RECEIVED CHARACTER COUNT
003270 017704 010246          MOV      @DHNR,R4      ;READ CHARACTER
003274 020467 011030          CMP      R4,TMRD10      ;IS CHARACTER CORRECT
003300 001406          BEQ      3#
003302 016705 011022          MOV      TMRD10,R5      ;(R5)=EXPECTED CHARACTER
003306 005077 010232          CLR      @DHLPR      ;SHUT OFF AUTO ECHO
003312          HLT      0      ;CHARACTER ECHOED INCORRECTLY
003312 104000          EMT      0
003314 000407          BR       4#
003316 005300          3#:     DEC      R0      ;RESTART TEST
003320 003357          BGT      2#      ;IF 64 CHARACTERS HAVE NOT
003322 100404          BMI      4#      ;BEEN RECEIVED, CONTINUE
003324 042777 100000 010212      BIC      @100000,@DHLPR      ;SHUT OFF AUTO-ECHO
003332 000752          BR       2#                  ;GET 1 MORE CHARACTER
003334 104400          4#:     SCOPE                  ;CHECK FOR ITERATIONS, LOOP
      000011      LINE=LINE+1
      001000      BITX=BITX+BITX
      000011      KX=KX+1
003336          AUTO1   \LINE,\BITX,\KX

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;ENABLE AUTO ECHO ON LINE 11
;TRANSMIT ONE CHARACTER ON LINE 11
;AT 9600 BAUD, 8 BITS.
;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

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003336      TS \XN,100,4#
003336 012767 000340 174432 T12:  MOV    #340,PS           ;DISABLE ALL INTERRUPTS
003344 012767 000100 010234      MOV    #100,ICOUNT       ;SET UP FOR 100 ITERATIONS
003352 012767 003512 010222      MOV    #4#,ESCAPE       ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                MOV    #,FREEZ1           ;SET UP TO LOOP WITH DATA           ; 3
                                .ENDC
                                XN=XN+1
003360      000013
003360 012777 004000 010152 1#:  MOV    #BIT11,SDHSCR      ;MASTER CLEAR INTERFACE
003366 004767 010006      JSR    PC,CLRALL         ;CLEAR ALL BYTE COUNT AN
                                ;BUS ADDRESS REGISTERS
003372 012777 000011 010140      MOV    #11,SDHSCR       ;SELECT LINE 11
003400 012777 177777 010142      MOV    #-1,SDHBC        ;SET BYTE COUNT TO 1
003406 012777 014332 010132      MOV    #TMRD11,SDHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
003414 012700 000100      MOV    #100,R0         ;SET UP TO RECEIVE 64 CHARACTERS
003420 005001      CLR    R1              ;COUNT OF CHARACTERS RECEIVED
003422 012777 133503 010114      MOV    #133503,SDHLPR   ;SET UP SPEED FOR 9600 BAUD
                                ;8 BITS PER CHARACTER,
                                ;AUTO ECHO ENABLED ON LINE 11
003430 012777 001000 010114      MOV    #1000,SDHBAR     ;SET BAR BIT FOR LINE 11
003436 105777 010076 2#:  TSTB   SDHSCR           ;WAIT FOR CHARACTER TO
003442 100375      BPL    2#              ;BE RECEIVED
003444 005201      INC    R1              ;UPDATE RECEIVED CHARACTER COUNT
003446 017704 010070      MOV    #SDHRC,R4       ;READ CHARACTER
003452 020467 010654      CMP    R4,TMRD11       ;IS CHARACTER CORRECT
003456 001406      BEQ    3#              ;
003460 016705 010646      MOV    TMRD11,R5       ;(R5)=EXPECTED CHARACTER
003464 005077 010054      CLR    SDHLPR          ;SHUT OFF AUTO ECHO
003470      HLT    0            ;CHARACTER ECHOED INCORRECTLY
003470 104000      ENT    0
003472 000407      BR    4#              ;RESTART TEST
003474 005300 3#:  DEC    R0              ;IF 64 CHARACTERS HAVE NOT
003476 003357      BGT    2#              ;BEEN RECEIVED, CONTINUE
003500 100404      BMI    4#
003502 042777 100000 010034      BIC    #100000,SDHLPR  ;SHUT OFF AUTO-ECHO
003510 000752      BR    2#              ;GET 1 MORE CHARACTER
003512 104400 4#:  SCOPE              ;CHECK FOR ITERATIONS, LOOP
                                LINE=LINE+1
                                BITX=BITX+BITX
                                KX=KX+1
003514      AUTO1  \LINE,\BITX,\KX

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;ENABLE AUTO ECHO ON LINE 12
;TRANSMIT ONE CHARACTER ON LINE 12
;AT 9600 BAUD, 8 BITS.
;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

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003514      TS \XN,100,4#
003514 012767 000340 174254 T13:  MOV    #340,PS          ;DISABLE ALL INTERRUPTS
003522 012767 000100 010056      MOV    #100,ICOUNT      ;SET UP FOR 100 ITERATIONS
003530 012767 003670 010044      MOV    #4#,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                .IF NB  <>
                MOV    #,FREEZ1          ;SET UP TO LOOP WITH DATA          ; 3
                .ENDC
                XN=XN+1
003536 012777 004000 007774      MOV    #BIT11,@DHSCR    ;MASTER CLEAR INTERFACE
003544 004767 007630 1#:      JSR    PC,CLRALL       ;CLEAR ALL BYTE COUNT AN
                                ;BUS ADDRESS REGISTERS
003550 012777 000012 007762      MOV    #12,@DHSCR      ;SELECT LINE 12
003556 012777 177777 007764      MOV    #-1,@DHBC       ;SET BYTE COUNT TO 1
003564 012777 014334 007754      MOV    #TWRD12,@DHBA   ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
003572 012700 000100      MOV    #100,R0         ;SET UP TO RECEIVE 64 CHARACTERS
003576 005001      CLR    R1              ;COUNT OF CHARACTERS RECEIVED
003600 012777 133503 007736      MOV    #133503,@DHLPR  ;SET UP SPEED FOR 9600 BAUD
                                ;8 BITS PER CHARACTER,
                                ;AUTO ECHO ENABLED ON LINE 12
003606 012777 002000 007736      MOV    #2000,@DHBAR    ;SET BAR BIT FOR LINE 12
003614 105777 007720 2#:      TSTB  @DHSCR          ;WAIT FOR CHARACTER TO
003620 100375      BPL    2#              ;BE RECEIVED
003622 005201      INC    R1              ;UPDATE RECEIVED CHARACTER COUNT
003624 017704 007712      MOV    @DHNR,R4        ;READ CHARACTER
003630 020467 010500      CMP    R4,TWRD12       ;IS CHARACTER CORRECT
003634 001406      BEQ    3#              ;
003636 016705 010472      MOV    TWRD12,R5       ;(R5)=EXPECTED CHARACTER
003642 005077 007676      CLR    @DHLPR         ;SHUT OFF AUTO ECHO
003646      HLT    0              ;CHARACTER ECHOED INCORRECTLY
003646 104000      EMT    0
003650 000407      BR     4#              ;RESTART TEST
003652 005300 3#:      DEC    R0              ;IF 64 CHARACTERS HAVE NOT
003654 003357      BGT    2#              ;BEEN RECEIVED, CONTINUE
003656 100404      BMI    4#              ;
003660 042777 100000 007656      BIC    #100000,@DHLPR  ;SHUT OFF AUTO-ECHO
003666 000752      BR     2#              ;GET 1 MORE CHARACTER
003670 104400 4#:      SCOPE
                LINE=LINE+1
                BITX=BITX+BITX
                KX=KX+1
                AUTO1 \LINE,\BITX,\KX
                ;ENABLE AUTO ECHO ON LINE 13
                ;TRANSMIT ONE CHARACTER ON LINE 13
                ;AT 9600 BAUD, 8 BITS.
                ;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
                ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
                ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

003672      TS \XN,100,4#
003672 012767 000340 174076 T14:  MOV    #340,PS          ;DISABLE ALL INTERRUPTS
003700 012767 000100 007700      MOV    #100,ICOUNT      ;SET UP FOR 100 ITERATIONS
003706 012767 004046 007666      MOV    #4#,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                .IF NB  <>
                MOV    #,FREEZ1          ;SET UP TO LOOP WITH DATA          ; 3
                .ENDC
                XN=XN-1
000015

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003714 012777 004000 007616      MOV    #BIT11,@DHSCR      ;MASTER CLEAR INTERFACE
003722 004767 007452      1$:   JSR    PC,CLRALL      ;CLEAR ALL BYTE COUNT AN
                                ;BUS ADDRESS REGISTERS
003726 012777 000013 007604      MOV    #13,@DHSCR      ;SELECT LINE 13
003734 012777 177777 007606      MOV    #-1,@DHBC      ;SET BYTE COUNT TO 1
003742 012777 014336 007576      MOV    #TWRD13,@DHBA   ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
003750 012700 000100      MOV    #100,R0        ;SET UP TO RECEIVE 64 CHARACTERS
003754 005001      CLR    R1             ;COUNT OF CHARACTERS RECEIVED
003756 012777 133503 007560      MOV    #133503,@DHLPR  ;SET UP SPEED FOR 9600 BAUD
                                ;8 BITS PER CHARACTER,
                                ;AUTO ECHO ENABLED ON LINE 13
003764 012777 004000 007560      MOV    #4000,@DHBAR    ;SET BAR BIT FOR LINE 13
003772 105777 007542      2$:   TSTB  @DHSCR          ;WAIT FOR CHARACTER TO
003776 100375      BPL    2$            ;BE RECEIVED
004000 005201      INC    R1            ;UPDATE RECEIVED CHARACTER COUNT
004002 017704 007534      MOV    @CHNRC,R4      ;READ CHARACTER
004006 020467 010324      CMP    R4,TWRD13     ;IS CHARACTER CORRECT
004012 001406      BEQ    3$            ;
004014 016705 010316      MOV    TWRD13,R5     ;(R5)=EXPECTED CHARACTER
004020 005077 007520      CLR    @DHLPR        ;SHUT OFF AUTO ECHO
004024      HLT    0            ;CHARACTER ECHOED INCORRECTLY
004024 104000      EMT    0            ;
004026 000407      BR    4$            ;RESTART TEST
004030 005300      3$:   DEC    R0        ;IF 64 CHARACTERS HAVE NOT
004032 003357      BGT    2$            ;BEEN RECEIVED, CONTINUE
004034 100404      BMI    4$            ;
004036 042777 100000 007500      BIC    #100000,@DHLPR ;SHUT OFF AUTO-ECHO
004044 000752      BR    2$            ;GET 1 MORE CHARACTER
004046 104400      4$:   SCOPE          ;CHECK FOR ITERATIONS, LOOP
      000014
      010000
      000014
004050      AUT01  \LINE,\BITX,\KX

      ;ENABLE AUTO ECHO ON LINE 14
      ;TRANSMIT ONE CHARACTER ON LINE 14
      ;AT 9600 BAUD, 8 BITS.
      ;RECEIVE AND VERIFY CHARACTERS UNIL 64 HAVE BEEN RECEIVED.
      ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
      ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

004050      TS  \XN,100,4$
004050 012767 000340 173720      T15:  MOV    #340,PS    ;DISABLE ALL INTERRUPTS
004056 012767 000100 007522      MOV    #100,ICOUNT   ;SET UP FOR 100 ITERATIONS
004064 012767 004224 007510      MOV    #4$,ESCAPE   ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB  <>
      MOV    #,FREEZ1  ;SET UP TO LOOP WITH DATA      : 3
      .ENDC
      XN=XN-1
004072 012777 004000 007440      MOV    #BIT11,@DHSCR ;MASTER CLEAR INTERFACE
004100 004767 007274      1$:   JSR    PC,CLRALL  ;CLEAR ALL BYTE COUNT AN
                                ;BUS ADDRESS REGISTERS
004104 012777 000014 007426      MOV    #14,@DHSCR   ;SELECT LINE 14
004112 012777 177777 007430      MOV    #-1,@DHBC    ;SET BYTE COUNT TO 1
004120 012777 014340 007420      MOV    #TWRD14,@DHBA ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
004126 012700 000100      MOV    #100,R0      ;SET UP TO RECEIVE 64 CHARACTERS
004132 005001      CLR    R1           ;COUNT OF CHARACTERS RECEIVED

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004342 020467 007774      CMP      R4,TWRD15      ;IS CHARACTER CORRECT
004346 001406              BEQ      3$
004350 016705 007766      MOV      TWRD15,R5      ;(R5)=EXPECTED CHARACTER
004354 005077 007164      CLR      @DHLPR        ;SHUT OFF AUTO ECHO
004360              HLT      0              ;CHARACTER ECHOED INCORRECTLY
004360 104000              EMT      0
004362 000407              BR       4$
004364 005300      3$:  DEC      R0          ;RESTART TEST
004366 003357              BGT      2$            ;IF 64 CHARACTERS HAVE NOT
004370 100404              BMI      4$            ;BEEN RECEIVED, CONTINUE
004372 042777 100000 007144  BIC      @100000,@DHLPR ;SHUT OFF AUTO-ECHO
004400 00J752              BR       2$            ;GET 1 MORE CHARACTER
004402 104400      4$:  SCOPE          ;CHECK FOR ITERATIONS, LOOP
      000016      LINE=LINE+1
      040000      BITX=BITX+BITX
      000016      KX=KX+1
004404              AUTO1  \LINE,\BITX,\KX

      ;ENABLE AUTO ECHO ON LINE 16
      ;TRANSMIT ONE CHARACTER ON LINE 16
      ;AT 9600 BAUD, 8 BITS.
      ;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
      ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
      ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

004404              TS  \XN,100,4$
004404 012767 000340 173364  T17:  MOV      @340,PS      ;DISABLE ALL INTERRUPTS
004412 012767 000100 007166      MOV      @100,ICOUNT    ;SET UP FOR 100 ITERATIONS
004420 012767 004560 007154      MOV      @4$.ESCAPE     ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB <>
      MOV      @.FREEZ1    ;SET UP TO LOOP WITH DATA      ; 3
      .ENDC
      XN=XN+1
004426 012777 004000 007104      MOV      @BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
004434 004767 006740      1$:  JSR      PC,CLRALL    ;CLEAR ALL BYTE COUNT AN
      ;BUS ADDRESS REGISTERS
004440 012777 000016 007072      MOV      @16,@DHSCR     ;SELECT LINE 16
004446 012777 177777 007074      MOV      @-1,@DHBC      ;SET BYTE COUNT TO 1
004454 012777 014344 007064      MOV      @TWRD16,@DHBA  ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
004462 012700 000100      MOV      @100,R0        ;SET UP TO RECEIVE 64 CHARACTERS
004466 005001      CLR      R1              ;COUNT OF CHARACTERS RECEIVED
004470 012777 133503 007046      MOV      @133503,@DHLPR ;SET UP SPEED FOR 9600 BAUD
      ;8 BITS PER CHARACTER,
      ;AUTO ECHO ENABLED ON LINE 16
004476 012777 040000 007046      MOV      @40000,@DHBAR  ;SET BAR BIT FOR LINE 16
004504 105777 007030      2$:  TSTB    @DHSCR        ;WAIT FOR CHARACTER TO
004510 100375              BPL      2$            ;BE RECEIVED
004512 005201              INC      R1            ;UPDATE RECEIVED CHARACTER COUNT
004514 017704 007022      MOV      @DHNR,R4       ;READ CHARACTER
004520 020467 007620      CMP      R4,TWRD16     ;IS CHARACTER CORRECT
004524 001406              BEQ      3$
004526 016705 007612      MOV      TWRD16,R5     ;(R5)=EXPECTED CHARACTER
004532 005077 007006      CLR      @DHLPR        ;SHUT OFF AUTO ECHO
004536              HLT      0              ;CHARACTER ECHOED INCORRECTLY
004536 104000              EMT      0
004540 000407              BR       4$
004542 005300      3$:  DEC      R0          ;RESTART TEST
      ;IF 64 CHARACTERS HAVE NOT

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004544 003357          BGT      2#          ;BEEN RECEIVED, CONTINUE
004546 100404          BMI      4#
004550 042777 100000 006766 BIC      #100000, @DHLPR ;SHUT OFF AUTO-ECHO
004556 000752          BR       2#          ;GET 1 MORE CHARACTER
004560 104400          4#: SCOPE          ;CHECK FOR ITERATIONS, LOOP
      000017      LINE=LINE+1
      100000      BITX=BITX+BITX
      000017      KX=KX+1
004562          AUTO1  \LINE, \BITX, \KX

      ;ENABLE AUTO ECHO ON LINE 17
      ;TRANSMIT ONE CHARACTER ON LINE 17
      ;AT 9600 BAUD, 8 BITS.
      ;RECEIVE AND VERIFY CHARACTERS UNTIL 64 HAVE BEEN RECEIVED.
      ;AFTER 64 CHARACTERS HAVE BEEN RECEIVED, DISABLE AUTO ECHO.
      ;EXACTLY ONE MORE CHARACTER SHOULD BE RECEIVED.

004562          TS \XN,100,4#
004562 012767 000340 173206 T20:  MOV      #340,PS          ;DISABLE ALL INTERRUPTS
004570 012767 000100 007010      MOV      #100,ICOUNT      ;SET UP FOR 100 ITERATIONS
004576 012767 004736 006776      MOV      #4#,ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB      <>
      MOV      #,FREEZ1          ;SET UP TO LOOP WITH DATA          ; 3
      .ENDC
      XN=XN+1
004604 012777 004000 006726      MOV      #BIT11, @DHSCR      ;MASTER CLEAR INTERFACE
004612 004767 006562          1#:  JSR      PC,CLRALL        ;CLEAR ALL BYTE COUNT AN
      ;BUS ADDRESS REGISTERS
004616 012777 000017 006714      MOV      #17, @DHSCR        ;SELECT LINE 17
004624 012777 177777 006716      MOV      #-1, @DHBC        ;SET BYTE COUNT TO 1
004632 012777 014346 006706      MOV      #TWRD17, @DHBA    ;SET UP ADDRESS OF CHARACTER TO BE TRANSMITTED
004640 012700 000100          MOV      #100,R0           ;SET UP TO RECEIVE 64 CHARACTERS
004644 005001          CLR      R1               ;COUNT OF CHARACTERS RECEIVED
004646 012777 133503 006670      MOV      #133503, @DHLPR   ;SET UP SPEED FOR 9600 BAUD
      ;8 BITS PER CHARACTER,
      ;AUTO ECHO ENABLED ON LINE 17
004654 012777 100000 006670      MOV      #100000, @DHBAR   ;SET BAR BIT FOR LINE 17
004662 105777 006652          2#:  TSTB     @DHSCR          ;WAIT FOR CHARACTER TO
004666 100375          BPL      2#              ;BE RECEIVED
004670 005201          INC      R1              ;UPDATE RECEIVED CHARACTER COUNT
004672 017704 006644          MOV      @DHNR, R4        ;READ CHARACTER
004676 020467 007444          CMP      R4, TWRD17      ;IS CHARACTER CORRECT
004702 001406          BEQ      3#
004704 016705 007436          MOV      TWRD17, R5      ;(R5)=EXPECTED CHARACTER
004710 005077 006630          CLR      @DHLPR         ;SHUT OFF AUTO ECHO
004714          HLT      0           ;CHARACTER ECHOED INCORRECTLY
004714 104000          EMT      0
004716 000407          BR       4#
004720 005300          3#:  DEC      R0           ;RESTART TEST
004722 003357          BGT      2#              ;IF 64 CHARACTERS HAVE NOT
004724 100404          BMI      4#              ;BEEN RECEIVED, CONTINUE
004726 042777 100000 006610      BIC      #100000, @DHLPR   ;SHUT OFF AUTO-ECHO
004734 000752          BR       2#              ;GET 1 MORE CHARACTER
004736 104400          4#:  SCOPE          ;CHECK FOR ITERATIONS, LOOP
      000020      LINE=LINE+1
      000000      BITX=BITX+BITX
      000020      KX=KX+1

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18      000020      XLINE=LINE
19      000000      XBIT=BITX
20      000020      K=KX
21      000000      LINE=0
22      000001      BITX=1
23      000000      KX=0
25      000020      .REPT 20
26      AUTO2      \LINE,\BITX,\KX
27      .NLIST
28      LINE=LINE+1
29      BITX=BITX+BITX
30      KX=KX+1
31      .LIST
32      .ENDR
004740  AUTO2      \LINE,\BITX,\KX

;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 0
;TRANSMIT 1 CHARACTER ON LINE 0 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

004740  004740  012767  000340  173030  TS \XN,10,5#
004740  012767  000010  006632  T21:  MOV      #340,PS          ;DISABLE ALL INTERRUPTS
004746  012767  000010  006632      MOV      #10,ICOUNT        ;SET UP FOR 10 ITERATIONS
004754  012767  005174  006620      MOV      #5#,ESCAPE        ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB  <>
      MOV      #,FREEZ1      ;SET UP TO LOOP WITH DATA          ; 3
      .ENDC
      XN=XN+1
004762  012777  004000  006550      MOV      #BIT11,@DHSCR      ;MASTER CLEAR INTERFACE
004770  004767  006432      JSR      PC,SETALL          ;SET UP ALL LINES TO TRANSMIT
      ;400 (OCTAL) CHARACTERS
      ;SELECT LINE 0 FOR TESTING
004774  012777  000000  006536      MOV      #0,@DHSCR          ;CHARACTER TO BE TRANSMITTED
005002  012777  014310  006536      MOV      #TMRD0,@DHBA      ;ON LINE 0 IN AUTO ECHO MODE
      ;TRANSMIT ONLY 1 CHARACTER ON LINE 0
      ;SET AUTO ECHO FOR LINE 0
005010  012777  177777  006532      MOV      #-1,@DHBC          ;CLEAR LINE ACTIVE BIT
005016  012777  133503  006520      MOV      #133503,@DHLPR     ;SET BAR BITS FOR ALL LINES
005024  042767  000001  006610      BIC      #1,LINACT          ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
005032  012777  177777  006512      MOV      #-1,@DHBA         ;GET A CHARACTER FROM SILO
005040  005000      CLR      R0                 ;IF NOT VALID DATA, TRY AGAIN
005042  017704  006474      1#:  MOV      @DHNR,R4          ;EXTRACT LINE NUMBER FORM CHARACTER
005046  100375      BPL      1#
00505C  010403      MOV      R4,R3
005052  000303      SWAB    R3
005054  042703  177760      BIC      #177760,R3         ;CLEAR STATUS BITS
005060  010302      MOV      R3,R2
005062  006302      ASL     R2
005064  020327  000000      CMP      R3,#0             ;IF LINE NUMBER IS 0
005070  001432      BEQ     4#                 ;CHECK FOR CORRECT ECHOED CHARACTER
005072  026204  014246      CMP     RBUF(R2),R4        ;IF NOT LINE 0, CHECK DATA
005076  001404      BEQ     2#
005100  016205  014246      MOV     RBUF(R2),R5        ;(R5)=EXPECTED NON ECHOED DATA
005104      HLT     1                 ;NON ECHOED DATA ERROR
005104  104001      EMT     1
005106  000423      BR      4#
005110  105262  014246      2#:  INCB    RBUF(R2)        ;UPDATE EXPECTED RECEIVED DATA

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005114 001352          BNE      1#          ;CONTINUE IF NOT DONE
005116 046267 014450 006516 BIC      LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
005124 005767 006512 3# : TST      LINACT        ;IF ALL LINES ARE DONE
005130 001344          BNE      1#          ;EXIT
005132 012777 000000 006400 MOV      #0, @DHSCR      ;SELECT LINE 0
005140 042777 100000 006376 BIC      #100000, @DHLPR ;CLEAR AUTO ECHO FOR LINE 0
005146 105777 006406      TSTB     @DHSLR        ;GET REST OF CHARACTERS
005152 001333          BNE      1#          ;AND CHECK
005154 000407          BR       5#
005156 005200          4# : INC      R0          ;UPDATE ECHOED CHARACTER COUNT
005160 020467 007124      CMP      R4, TWRD0      ;CHECK ECHOED DATA
005164 001757          BEQ      3#
005166 016705 007116      MOV      TWRD0, R5      ;(R5)=EXPECTED ECHOED DATA
005172          HLT      2          ;ECHOED DATA ERROR
005172 104002          EMT      2
005174 104400          5# : SCOPE      ;CHECK FOR ITERATIONS, LOOP
          000001      LINE=LINE+1
          000002      BITX=BITX+BITX
          000001      KX=KX+1
005176          AUTO2   \LINE, \BITX, \KX

          ;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 1
          ;TRANSMIT 1 CHARACTER ON LINE 1 WITH AUTO ECHO ENABLED
          ;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
          ;CHARACTER LENGTH IS 8 BITS
          ;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

005176          TS \XN, 10, 5#
005176 012767 000340 172572 T22: MOV      #340, PS      ;DISABLE ALL INTERRUPTS
005204 012767 000010 006374      MOV      #10, ICOUNT ;SET UP FOR 10 ITERATIONS
005212 012767 005432 006362      MOV      #5#, ESCAPE  ;SET UP TO ESCAPE TO NEXT TEST
          .IF NB <>
          MOV      #, FREEZ1 ;SET UP TO LOOP WITH DATA ; 3
          .ENDC
          XN=XN+1
005220 012777 004000 006312      MOV      #BIT11, @DHSCR ;MASTER CLEAR INTERFACE
005226 004767 006174      JSR      PC, SETALL    ;SET UP ALL LINES TO TRANSMIT
          ;400 (OCTAL) CHARACTERS
005232 012777 000001 006300      MOV      #1, @DHSCR    ;SELECT LINE 1 FOR TESTING
005240 012777 014312 006300      MOV      @TWRD1, @DHBA ;CHARACTER TO BE TRANSMITTED
          ;ON LINE 1 IN AUTO ECHO MODE
005246 012777 177777 006274      MOV      #-1, @DHBC   ;TRANSMIT ONLY 1 CHARACTER ON LINE 1
005254 012777 133503 006262      MOV      #133503, @DHLPR ;SET AUTO ECHO FOR LINE 1
005262 042767 000002 006352      BIC      #2, LINACT    ;CLEAR LINE ACTIVE BIT
005270 012777 177777 006254      MOV      #-1, @DHBAR  ;SET BAR BITS FOR ALL LINES
005276 005000          CLR      R0          ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
005300 017704 006236 1# : MOV      @DHNR, R4      ;GET A CHARACTER FROM SILO
005304 106375          BPL      1#          ;IF NOT VALID DATA, TRY AGAIN
005306 010403          MOV      R4, R3      ;EXTRACT LINE NUMBER FORM CHARACTER
005310 000303          SWAB     R3
005312 042703 177760      BIC      #177760, R3   ;CLEAR STATUS BITS
005316 010302          MOV      R3, R2
005320 006302          ASL      R2
005322 020327 000001      CMP      R3, #1        ;IF LINE NUMBER IS 1
005326 001432          BEQ      4#          ;CHECK FOR CORRECT ECHOED CHARACTER
005330 026204 014246      CMP      RBUF(R2), R4 ;IF NOT LINE 1, CHECK DATA
005334 001404          BEQ      2#

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005336 016205 014246      MOV      RBUF(R2),R5      ;(R5)=EXPECTED NON ECHOED DATA
005342                                HLT      1                ;NON ECHOED DATA ERROR
005342 104001                                EMT      1
005344 000423                                BR       4$
005346 105262 014246      2$:      INCB     RBUF(R2)      ;UPDATE EXPECTED RECEIVED DATA
005352 001352                                BNE     1$                ;CONTINUE IF NOT DONE
005354 046267 014450 006260  BIC     LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
005362 005767 006254      3$:      TST     LINACT          ;IF ALL LINES ARE DONE
005366 001344                                BNE     1$                ;EXIT
005370 012777 000001 006142  MOV     #1, @DHSCR        ;SELECT LINE 1
005376 042777 100000 006140  BIC     #100000, @DHLPR   ;CLEAR AUTO ECHO FOR LINE 1
005404 105777 006150      TSTB    @DHSLR          ;GET REST OF CHARACTERS
005410 001333                                BNE     1$                ;AND CHECK
005412 000407                                BR       5$
005414 005200      4$:      INC     R0                ;UPDATE ECHOED CHARACTER COUNT
005416 020467 006670      CMP     R4, TWRD1        ;CHECK ECHOED DATA
005422 001757                                BEQ     3$
005424 016705 006662      MOV     TWRD1, R5        ;(R5)=EXPECTED ECHOED DATA
005430                                HLT     2                ;ECHOED DATA ERROR
005430 104002                                EMT     2
005432 104400      5$:      SCOPE          ;CHECK FOR ITERATIONS, LOOP
000002      LINE=LINE+1
000004      BITX=BITX+BITX
000002      KX=KX+1
005434      AUTO2  \LINE, \BITX, \KX

;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 2
;TRANSMIT 1 CHARACTER ON LINE 2 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

005434      TS  \XN,10,5$
005434 012767 000340 172334  T23:    MOV     #340, PS        ;DISABLE ALL INTERRUPTS
005442 012767 000010 006136  MOV     #10, ICOUNT      ;SET UP FOR 10 ITERATIONS
005450 012767 005670 006124  MOV     #5$, ESCAPE      ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB  <>
                                MOV     @, FREEZ1          ;SET UP TO LOOP WITH DATA      ; 3
                                .ENDC
                                XN=XN+1
005456 012777 004000 006054  MOV     @BIT11, @DHSCR   ;MASTER CLEAR INTERFACE
005464 004767 005736      JSR     PC, SETALL      ;SET UP ALL LINES TO TRANSMIT
                                ;400 (OCTAL) CHARACTERS
005470 012777 000002 006042  MOV     #2, @DHSCR      ;SELECT LINE 2 FOR TESTING
005476 012777 014314 006042  MOV     @TWRD2, @DHBA   ;CHARACTER TO BE TRANSMITTED
                                ;ON LINE 2 IN AUTO ECHO MODE
005504 012777 177777 006036  MOV     #-1, @DHBC      ;TRANSMIT ONLY 1 CHARACTER ON LINE 2
005512 012777 133503 006024  MOV     #133503, @DHLPR ;SET AUTO ECHO FOR LINE 2
005520 042767 000004 006114  BIC     #4, LINACT      ;CLEAR LINE ACTIVE BIT
005526 012777 177777 006016  MOV     #-1, @DHBAR     ;SET BAR BITS FOR ALL LINES
005534 005000                                CLR     R0                ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
005536 017704 006000      1$:      MOV     @DHNR, R4        ;GET A CHARACTER FROM SILO
005542 100375                                BPL     1$                ;IF NOT VALID DATA, TRY AGAIN
005544 010403                                MOV     R4, R3           ;EXTRACT LINE NUMBER FORM CHARACTER
005546 000303                                SWAB    R3
005550 042703 177760      BIC     #177760, R3     ;CLEAR STATUS BITS
005554 010302                                MOV     R3, R2

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005556 C06302          ASL      R2
005560 020327 000002    CMP      R3,#2          ;IF LINE NUMBER IS 2
005564 001432          BEQ      4#             ;CHECK FOR CORRECT ECHOED CHARACTER
005566 026204 014246    CMP      RBUF(R2),R4   ;IF NOT LINE 2, CHECK DATA
005572 001404          BEQ      2#
005574 016205 014246    MOV      RBUF(R2),R5   ;(R5)=EXPECTED NON ECHOED DATA
005600          HLT      1          ;NON ECHOED DATA ERROR
005600 104001          EMT      1
005602 000423          BR       4#
005604 105262 011246    2#:     INCB     RBUF(R2) ;UPDATE EXPECTED RECEIVED DATA
005610 001352          BNE     1#             ;CONTINUE IF NOT DONE
005612 046267 014450 006022 BIC     LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
005620 005767 006016    3#:     TST     LINACT   ;IF ALL LINES ARE DONE
005624 001344          BNE     1#             ;EXIT
005626 012777 000002 005704 MOV     #2,#DHSCR      ;SELECT LINE 2
005634 042777 100000 005702 BIC     #100000,#DHLPR ;CLEAR AUTO ECHO FOR LINE 2
005642 105777 005712    TSTB   #DHSLR        ;GET REST OF CHARACTERS
005646 001333          BNE     1#             ;AND CHECK
005650 000407          BR      5#
005652 005200          4#:     INC     R0        ;UPD,TE ECHOED CHARACTER COUNT
005654 020467 006434    CMP     R4,TWRD2      ;CHECK ECHOED DATA
005660 001757          BEQ     3#
005662 016705 006426    MOV     TWRD2,R5      ;(R5)=EXPECTED ECHOED DATA
005666          HLT     2          ;ECHOED DATA ERROR
005666 104002          EMT     2
005670 104400          5#:     SCOPE          ;CHECK FOR ITERATIONS, LOOP
          000003
          000010
          000003
005672          AUTO2  \LINE,\BITX,\KX

          ;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 3
          ;TRANSMIT 1 CHARACTER ON LINE 3 WITH AUTO ECHO ENABLED
          ;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
          ;CHARACTER LENGTH IS 8 BITS
          ;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

005672          TS \XN,10,5#
005672 012767 000340 172076 T24:    MOV     #340,PS      ;DISABLE ALL INTERRUPTS
005700 012767 000010 005700    MOV     #10,ICOUNT   ;SET UP FOR 10 ITERATIONS
005706 012767 006126 005666    MOV     #5#,ESCAPE   ;SET UP TO ESCAPE TO NEXT TEST
          .IF NB <>
          MOV     #,FREEZ1 ;SET UP TO LOOP WITH DATA ; 3
          .ENDC
          XN=XN+1
005714 012777 004000 005616    MOV     #BIT11,#DHSCR ;MASTER CLEAR INTERFACE
005722 004767 005500          JSR     PC,SETALL    ;SET UP ALL LINES TO TRANSMIT
          ;400 (OCTAL) CHARACTERS
          ;SELECT LINE 3 FOR TESTING
005726 012777 000003 005604    MOV     #3,#DHSCR    ;CHARACTER TO BE TRANSMITTED
005734 012777 014316 005604    MOV     #TWRD3,#DHBA ;ON LINE 3 IN AUTO ECHO MODE
          ;TRANSMIT ONLY 1 CHARACTER ON LINE 3
          ;SET AUTO ECHO FOR LINE 3
005742 012777 177777 005600    MOV     #-1,#DHBC    ;CLEAR LINE ACTIVE BIT
005750 012777 133503 005566    MOV     #133503,#DHLPR ;SET BAR BITS FOR ALL LINES
005756 042767 000010 005656    BIC     #10,LINACT   ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
005764 012777 177777 005560    MOV     #-1,#DHBAR   ;GET A CHARACTER FROM SILO
005772 005000          CLR     R0
005774 017704 005542    1#:     MOV     #DHNRC,R4

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006000 100375          BPL      1#          ;IF NOT VALID DATA, TRY AGAIN
006002 010403          MOV      R4,R3      ;EXTRACT LINE NUMBER FORM CHARACTER
006004 000303          SWAB     R3
006006 042703 177760   BIC      @177760,R3   ;CLEAR STATUS BITS
006012 010302          MOV      R3,R2
006014 006302          ASL      R2
006016 020327 000003   CMP      R3,@3       ;IF LINE NUMBER IS 3
006022 001432          BEQ      4#          ;CHECK FOR CORRECT ECHOED CHARACTER
006024 026204 014246   CMP      RBUF(R2),R4 ;IF NOT LINE 3, CHECK DATA
006030 001404          BEQ      2#
006032 016205 014246   MOV      RBUF(R2),R5 ;(R5)=EXPECTED NON ECHOED DATA
006036          HLT      1          ;NON ECHOED DATA ERROR
006036 104001          EMT      1
006040 000423          ER        4#
006042 105262 014246   2#:     INCB     RBUF(R2) ;UPDATE EXPECTED RECEIVED DATA
006046 001352          BNE      1#          ;CONTINUE IF NOT DONE
006050 046267 014450 005564 BIC      LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
006056 005767 005560   3#:     TST      LINACT ;IF ALL LINES ARE DONE
006062 001344          BNE      1#          ;EXIT
006064 012777 000003 005446 MOV      @3,@DHSCR   ;SELECT LINE 3
006072 042777 100000 005444 BIC      @100000,@DHLPR ;CLEAR AUTO ECHO FOR LINE 3
006100 105777 005454   TSTB     @DHSLR    ;GET REST OF CHARACTERS
006104 001333          BNE      1#          ;AND CHECK
006106 000407          BR       5#
006110 005200          4#:     INC      R0          ;UPDATE ECHOED CHARACTER COUNT
006112 020467 006200   CMP      R4,TWRD3   ;CHECK ECHOED DATA
006116 001757          BEQ      3#
006120 016705 006172   MOV      TWRD3,R5   ;(R5)=EXPECTED ECHOED DATA
006124          HLT      2          ;ECHOED DATA ERROR
006124 104002          EMT      2
006126 104400          5#:     SCOPE     ;CHECK FOR ITERATIONS. LOOP
          000004     LINE=LINE+1
          000020     BITX=BITX+BITX
          000004     KX=KX+1
006130          AUTO2  \LINE,\BITX,\KX

;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 4
;TRANSMIT 1 CHARACTER ON LINE 4 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

006130          TS \XN,10,5#
006130 012767 000340 171640 T25:    MOV      @340,PS   ;DISABLE ALL INTERRUPTS
006136 012767 000010 005442   MOV      @10,ICOUNT ;SET UP FOR 10 ITERATIONS
006144 012767 006364 005430   MOV      @5#,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
          .IF NB    <>
          MOV      @,FREEZ1 ;SET UP TO LOOP WITH DATA ; 3
          .ENDC
          XN=XN+1
006152 012777 004000 005360   MOV      @BIT11,@DHSCR ;MASTER CLEAR INTERFACE
006160 004767 005242   JSR      PC,SETALL  ;SET UP ALL LINES TO TRANSMIT
          ;400 (OCTAL) CHARACTERS
006164 012777 000004 005346   MOV      @4,@DHSCR   ;SELECT LINE 4 FOR TESTING
006172 012777 014320 005346   MOV      @TWRD4,@DHBA ;CHARACTER TO BE TRANSMITTED
          ;ON LINE 4 IN AUTO ECHO MODE
006200 012777 177777 005342   MOV      @-1,@DHBC  ;TRANSMIT ONLY 1 CHARACTER ON LINE 4

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006206 012777 133503 005330      MOV      #133503, @DHLPR      ;SET AUTO ECHO FOR LINE 4
006214 042767 000020 005420      BIC      #20, LINACT        ;CLEAR LINE ACTIVE BIT
006222 012777 177777 005322      MOV      #-1, @DHBAR        ;SET BAR BITS FOR ALL LINES
006230 005000                    CLR      R0                  ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
006232 017704 005304      1#:    MOV      @DHNRC, R4        ;GET A CHARACTER FROM SILO
006236 100375                    BPL      1#                  ;IF NOT VALID DATA, TRY AGAIN
006240 010403                    MOV      R4, R3              ;EXTRACT LINE NUMBER FORM CHARACTER
006242 000303                    SWAB    R3
006244 042703 177760      BIC      #177760, R3        ;CLEAR STATUS BITS
006250 010302                    MOV      R3, R2
006252 006302                    ASL     R2
006254 020327 000004      CMP      R3, #4              ;IF LINE NUMBER IS 4
006260 001432                    BEQ     4#                  ;CHECK FOR CORRECT ECHOED CHARACTER
006262 026204 014246      CMP      RBUF(R2), R4        ;IF NOT LINE 4, CHECK DATA
006266 001404                    BEQ     2#
006270 016205 014246      MOV      RBUF(R2), R5        ;(R5)=EXPECTED NON ECHOED DATA
006274                    HLT     1                    ;NON ECHOED DATA ERROR
006274 104001                    EMT     1
006276 000423                    BR      4#
006300 105262 014246      2#:    INCB    RBUF(R2)        ;UPDATE EXPECTED RECEIVED DATA
006304 001352                    BNE     1#                  ;CONTINUE IF NOT DONE
006306 046267 014450 005326      BIC      LINBIT(R2), LINACT  ;CLEAR ACTIVE BIT
006314 005767 005322      3#:    TST     LINACT          ;IF ALL LINES ARE DONE
006320 001344                    BNE     1#                  ;EXIT
006322 012777 000004 005210      MOV      #4, @DHSCR        ;SELECT LINE 4
006330 042777 100000 005206      BIC      #100000, @DHLPR    ;CLEAR AUTO ECHO FOR LINE 4
006336 105777 005216      TSTB    @DHSLR              ;GET REST OF CHARACTERS
006342 001333                    BNE     1#                  ;AND CHECK
006344 000407                    BR      5#
006346 005200      4#:    INC     R0                ;UPDATE ECHOED CHARACTER COUNT
006350 020467 005744      CMP      R4, TWRD4          ;CHECK ECHOED DATA
006354 001757                    BEQ     3#
006356 016705 005736      MOV      TWRD4, R5          ;(R5)=EXPECTED ECHOED DATA
006362                    HLT     2                    ;ECHOED DATA ERROR
006362 104002                    EMT     2
006364 104400      5#:    SCOPE
000005      LINE=LINE+1
000040      BITX=BITX+BITX
000005      KX=KX+1
006366      AUTO2  \LINE, \BITX, \KX

;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 5
;TRANSMIT 1 CHARACTER ON LINE 5 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

006366      TS \XN, 10, 5#
006366 012767 000340 171402      T26:    MOV      #340, PS      ;DISABLE ALL INTERRUPTS
006374 012767 000010 005204      MOV      #10, ICOUNT        ;SET UP FOR 10 ITERATIONS
006402 012767 006622 005172      MOV      #5#, ESCAPE        ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB <>
      MOV      #, FREEZ1      ;SET UP TO LOOP WITH DATA      ; 3
      .ENDC
      XN=XN+1
006410 012777 004000 005122      MOV      @BIT11, @DHSCR     ;MASTER CLEAR INTERFACE
006416 004767 005004      JSR     PC, SETALL          ;SET UP ALL LINES TO TRANSMIT

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006422 012777 000005 005110      MOV      #5, @DHSCR
006430 012777 014322 005110      MOV      @TWRD5, @DMBA      ;CHARACTER TO BE TRANSMITTED
                                ;400 (OCTAL) CHARACTERS
                                ;SELECT LINE 5 FOR TESTING
                                ;ON LINE 5 IN AUTO ECHO MODE
006436 012777 177777 005104      MOV      #-1, @DHBC
                                ;TRANSMIT ONLY 1 CHARACTER ON LINE 5
006444 012777 133503 005072      MOV      #133503, @DHLPR
                                ;SET AUTO ECHO FOR LINE 5
006452 042767 000040 005162      BIC      #40, LINACT
                                ;CLEAR LINE ACTIVE BIT
006460 012777 177777 005064      MOV      #-1, @DHBAR
                                ;SET BAR BITS FOR ALL LINES
006466 005000      CLR      R0
                                ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
006470 017704 005046      1#:     MOV      @DHNRC, R4
                                ;GET A CHARACTER FROM SILO
006474 100375      BPL      1#
                                ;IF NOT VALID DATA, TRY AGAIN
006476 010403      MOV      R4, R3
                                ;EXTRACT LINE NUMBER FORM CHARACTER
006500 000303      SWAB    R3
                                ;CLEAR STATUS BITS
006502 042703 177760      BIC      #177760, R3
006506 010302      MOV      R3, R2
006510 006302      ASL     R2
006512 020327 000005      CMP      R3, #5
                                ;IF LINE NUMBER IS 5
006516 001432      BEQ     4#
                                ;CHECK FOR CORRECT ECHOED CHARACTER
006520 026204 014246      CMP      RBUF(R2), R4
                                ;IF NOT LINE 5, CHECK DATA
006524 001404      BEQ     2#
006526 016205 014246      MOV      RBUF(R2), R5
                                ;(R5)=EXPECTED NON ECHOED DATA
006532      HLT     1
                                ;NON ECHOED DATA ERROR
006532 104001      EMT     1
006534 000423      BR      4#
006536 105262 014246      2#:     INCB    RBUF(R2)
                                ;UPDATE EXPECTED RECEIVED DATA
006542 001352      BNE     1#
                                ;CONTINUE IF NOT DONE
006544 046267 014450 005070      BIC      LINBIT(R2), LINACT
                                ;CLEAR ACTIVE BIT
006552 005767 005064      3#:     TST     LINACT
                                ;IF ALL LINES ARE DONE
006556 001344      BNE     1#
                                ;EXIT
006560 012777 000005 004752      MOV      #5, @DHSCR
                                ;SELECT LINE 5
006566 042777 100000 004750      BIC      #100000, @DHLPR
                                ;CLEAR AUTO ECHO FOR LINE 5
006574 105777 004760      TSTB    @DHSLR
                                ;GET REST OF CHARACTERS
006600 001333      BNE     1#
                                ;AND CHECK
006602 000407      BR      5#
006604 005200      4#:     INC     R0
                                ;UPDATE ECHOED CHARACTER COUNT
006606 020467 005510      CMP      R4, TWRD5
                                ;CHECK ECHOED DATA
006612 001757      BEQ     3#
006614 016705 005502      MOV      TWRD5, R5
                                ;(R5)=EXPECTED ECHOED DATA
006620      HLT     2
                                ;ECHOED DATA ERROR
006620 104002      EMT     2
006622 104400      5#:     SCOPE
                                ;CHECK FOR ITERATIONS, LOOP
                                LINE=LINE+1
                                BITX=BITX+BITX
                                KX=KX+1
006624      AUTO2  \LINE, \BITX, \KX

                                ;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 6
                                ;TRANSMIT 1 CHARACTER ON LINE 6 WITH AUTO ECHO ENABLED
                                ;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
                                ;CHARACTER LENGTH IS 8 BITS
                                ;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

006624      TS     \XN, 10, 5#
006624 012767 000340 171144      T27:    MOV      #340, PS
                                ;DISABLE ALL INTERRUPTS
006632 012767 000010 004746      MOV      #10, ICOUNT
                                ;SET UP FOR 10 ITERATIONS
006640 012767 007060 004734      MOV      #5#, ESCAPE
                                ;SET UP TO ESCAPE TO NEXT TEST
                                .IF NB <>

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                                MOV     #,FREEZ1      ;SET UP TO LOOP WITH DATA      ; 3
                                .ENDC
                                XN=XN+1
006646 000030 004000 004664      MOV     #BIT11,@DHSCR      ;MASTER CLEAR INTERFACE
006654 004767 004546          JSR     PC,SETALL         ;SET UP ALL LINES TO TRANSMIT
                                ;400 (OCTAL) CHARACTERS
                                MOV     #6,@DHSCR      ;SELECT LINE 6 FOR TESTING
                                MOV     #TWRD6,@DHBA   ;CHARACTER TO BE TRANSMITTED
                                ;ON LINE 6 IN AUTO ECHO MODE
                                ;TRANSMIT ONLY 1 CHARACTER ON LINE 6
                                MOV     #-1,@DHBC      ;SET AUTO ECHO FOR LINE 6
                                MOV     #133503,@DHLPR
                                BIC     #100,LINACT   ;CLEAR LINE ACTIVE BIT
                                MOV     #-1,@DHBAR      ;SET BAR BITS FOR ALL LINES
                                CLR     R0            ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
                                10:   MOV     @DHNRC,R4   ;GET A CHARACTER FROM SILO
                                BPL     10           ;IF NOT VALID DATA, TRY AGAIN
                                MOV     R4,R3         ;EXTRACT LINE NUMBER FORM CHARACTER
                                SWAB    R3
                                BIC     #177760,R3   ;CLEAR STATUS BITS
                                MOV     R3,R2
                                ASL     R2
                                CMP     R3,#6        ;IF LINE NUMBER IS 6
                                BEQ     40           ;CHECK FOR CORRECT ECHOED CHARACTER
                                CMP     RBUF(R2),R4   ;IF NOT LINE 6, CHECK DATA
                                BEQ     20
                                MOV     RBUF(R2),R5   ;(R5)=EXPECTED NON ECHOED DATA
                                HLT     1            ;NON ECHOED DATA ERROR
                                EMT     1
                                BR      40
                                20:   INCB    RBUF(R2) ;UPDATE EXPECTED RECEIVED DATA
                                BNE     10           ;CONTINUE IF NOT DONE
                                BIC     LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
                                30:   TST     LINACT    ;IF ALL LINES ARE DONE
                                BNE     10           ;EXIT
                                MOV     #6,@DHSCR      ;SELECT LINE 6
                                BIC     #100000,@DHLPR ;CLEAR AUTO ECHO FOR LINE 6
                                TSTB   @DHSLR        ;GET REST OF CHARACTERS
                                BNE     10           ;AND CHECK
                                BR      50
                                40:   INC     R0            ;UPDATE ECHOED CHARACTER COUNT
                                CMP     R4,TWRD6     ;CHECK ECHOED DATA
                                BEQ     30
                                MOV     TWRD6,R5    ;(R5)=EXPECTED ECHOED DATA
                                HLT     2            ;ECHOED DATA ERROR
                                EMT     2
                                50:   SCOPE          ;CHECK FOR ITERATIONS, LOOP
                                LINE=LINE+1
                                BITX=BITX+BITX
                                KX=KX+1
                                AUTO2  \LINE,\BITX,\KX
007062

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;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 7
;TRANSMIT 1 CHARACTER ON LINE 7 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

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007062      TS \XN,10
007062 012767 000340 170706 T30:  MOV    #340,PS           ;DISABLE ALL INTERRUPTS
007070 012767 000010 004510      MOV    #10,ICOUNT       ;SET UP FOR 10 ITERATIONS
007076 012767 007316 004476      MOV    #5,ESCAPE        ;SET UP TO ESCAPE TO NEXT TEST
                .IF NB <>
                MOV    #,FREEZ1           ;SET UP TO LOOP WITH DATA           ; 3
                .ENDC
                XN=XN+1
007104 000031 012777 004000 004426      MOV    #BIT11,@DHSCR     ;MASTER CLEAR INTERFACE
007112 004767 004310      JSR    PC,SETALL        ;SET UP ALL LINES TO TRANSMIT
                                ;400 (OCTAL) CHARACTERS
                                ;SELECT LINE 7 FOR TESTING
007116 012777 000007 004414      MOV    #7,@DHSCR        ;CHARACTER TO BE TRANSMITTED
007124 012777 014326 004414      MOV    #TWRD7,@DHBA     ;ON LINE 7 IN AUTO ECHO MODE
                                ;TRANSMIT ONLY 1 CHARACTER ON LINE 7
                                ;SET AUTO ECHO FOR LINE 7
007132 012777 177777 004410      MOV    #-1,@DHBC        ;CLEAR LINE ACTIVE BIT
007140 012777 133503 004376      MOV    #133503,@DHLPR   ;SET BAR BITS FOR ALL LINES
007146 042767 000200 004466      BIC    #200,LINACT      ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
007154 012777 177777 004370      MOV    #-1,@DHBA       ;GET A CHARACTER FROM SILO
007162 005000      CLR    R0               ;IF NOT VALID DATA, TRY AGAIN
007164 017704 004352 1$:      MOV    @DHNRC,R4        ;EXTRACT LINE NUMBER FORM CHARACTER
007170 100375      BPL    1$              ;CLEAR STATUS BITS
007172 010403      MOV    R4,R3
007174 000303      SWAB   R3
007176 042703 177760      BIC    #177760,R3
007202 010302      MOV    R3,R2
007204 006302      ASL    R2
007206 020327 000007      CMP    R3,#7           ;IF LINE NUMBER IS 7
007212 001432      BEQ    4$              ;CHECK FOR CORRECT ECHOED CHARACTER
007214 026204 014246      CMP    RBUF(R2),R4     ;IF NOT LINE 7, CHECK DATA
007220 001404      BEQ    2$
007222 016205 014246      MOV    RBUF(R2),R5     ;(R5)=EXPECTED NON ECHOED DATA
007226      HLT    1             ;NON ECHOED DATA ERROR
007226 104001      EMT    1
007230 000423      BR     4$
007232 105262 014246 2$:      INCB   RBUF(R2)        ;UPDATE EXPECTED RECEIVED DATA
007236 001352      BNE    1$              ;CONTINUE IF NOT DONE
007240 046267 014450 004374      BIC    LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
007246 005767 004370 3$:      TST    LINACT          ;IF ALL LINES ARE DONE
007252 001344      BNE    1$              ;EXIT
007254 012777 000007 004256      MOV    #7,@DHSCR       ;SELECT LINE 7
007262 042777 100000 004254      BIC    #100000,@DHLPR   ;CLEAR AUTO ECHO FOR LINE 7
007270 105777 004264      TSTB   @DHSLR          ;GET REST OF CHARACTERS
007274 001333      BNE    1$              ;AND CHECK
007276 000407      BR     5$
007300 005200 4$:      INC    R0               ;UPDATE ECHOED CHARACTER COUNT
007302 020467 005020      CMP    R4,TWRD7        ;CHECK ECHOED DATA
007306 001757      BEQ    3$
007310 016705 005012      MOV    TWRD7,R5       ;(R5)=EXPECTED ECHOED DATA
007314      HLT    2             ;ECHOED DATA ERROR
007314 104002      EMT    2
007316 104400 5$:      SCOPE
                LINE=LINE+1
                BITX=BITX+BITX
                KX=KX+1
                AUTO2 \LINE,\BITX,\KX
                                ;CHECK FOR ITERATIONS, LOOP
007320      ;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 10

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;TRANSMIT 1 CHARACTER ON LINE 10 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

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007320 TS \XN,10,5#
007320 012767 000340 170450 T31: MOV #340,PS ;DISABLE ALL INTERRUPTS
007326 012767 000010 004252 MOV #10,ICOUNT ;SET UP FOR 10 ITERATIONS
007334 012767 007554 004240 MOV #54,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB <>
      MOV #,FREEZ1 ;SET UP TO LOOP WITH DATA ; 3
      .ENDC
      XN=XN+1
007342 000032 012777 004000 004170 MOV #BIT11,@DHSCR ;MASTER CLEAR INTERFACE
007350 004767 004052 JSR PC,SETALL ;SET UP ALL LINES TO TRANSMIT
      ;400 (OCTAL) CHARACTERS
007354 012777 000010 004156 MOV #10,@DHSCR ;SELECT LINE 10 FOR TESTING
007362 012777 014330 004156 MOV #TWRD10,@DHBA ;CHARACTER TO BE TRANSMITTED
      ;ON LINE 10 IN AUTO ECHO MODE
007370 012777 177777 004152 MOV #-1,@DHBC ;TRANSMIT ONLY 1 CHARACTER ON LINE 10
007376 012777 133503 004140 MOV #133503,@HLPB ;SET AUTO ECHO FOR LINE 10
007404 042767 000400 004230 BIC #400,LINACT ;CLEAR LINE ACTIVE BIT
007412 012777 177777 004132 MOV #-1,@DHBA ;SET BAR BITS FOR ALL LINES
007420 005000 CLR R0 ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
007422 017704 004114 1#: MOV @DHNR,R4 ;GET A CHARACTER FROM SILO
007426 100375 BPL 1# ;IF NOT VALID DATA, TRY AGAIN
007430 010403 MOV R4,R3 ;EXTRACT LINE NUMBER FROM CHARACTER
007432 000303 SWAB R3
007434 042703 177760 BIC #177760,R3 ;CLEAR STATUS BITS
007440 010302 MOV R3,R2
007442 006302 ASL R2
007444 020327 000010 CMP R3,#10 ;IF LINE NUMBER IS 10
007450 001432 BEQ 4# ;CHECK FOR CORRECT ECHOED CHARACTER
007452 026204 014246 CMP RBUF(R2),R4 ;IF NOT LINE 10, CHECK DATA
007456 001404 BEQ 2#
007460 016205 014246 MOV RBUF(R2),R5 ;(R5)=EXPECTED NON ECHOED DATA
007464 HLT 1 ;NON ECHOED DATA ERROR
007464 104001 EMT 1
007466 000423 BR 4#
007470 105262 014246 2#: INCB RBUF(R2) ;UPDATE EXPECTED RECEIVED DATA
007474 001352 BNE 1# ;CONTINUE IF NOT DONE
007476 046267 014450 004136 BIC LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
007504 005767 004132 3#: TST LINACT ;IF ALL LINES ARE DONE
007510 001344 BNE 1# ;EXIT
007512 012777 000010 004020 MOV #10,@DHSCR ;SELECT LINE 10
007520 042777 100000 004016 BIC #100000,@HLPB ;CLEAR AUTO ECHO FOR LINE 10
007526 105777 004026 TSTB @DHSLR ;GET REST OF CHARACTERS
007532 001333 BNE 1# ;AND CHECK
007534 000407 BR 5#
007536 005200 4#: INC R0 ;UPDATE ECHOED CHARACTER COUNT
007540 020467 004564 CMP R4,TWRD10 ;CHECK ECHOED DATA
007544 001757 BEQ 3#
007546 016705 004556 MOV TWRD10,R5 ;(R5)=EXPECTED ECHOED DATA
007552 HLT 2 ;ECHOED DATA ERROR
007552 104002 EMT 2
007554 104400 5#: SCOPE ;CHECK FOR ITERATIONS, LOOP
      LINE=LINE+1
000011

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001000      BITX=BITX+BITX
000011      KX=KX+1
007556      AUTO2  \LINE,\BITX,\KX

;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 11
;TRANSMIT 1 CHARACTER ON LINE 11 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

007556      TS \XN,10,5#
007556      012767 000340 170212 T32:  MOV  #340,PS ;DISABLE ALL INTERRUPTS
007564      012767 000010 004014      MOV  #10,ICOUNT ;SET UP FOR 10 ITERATIONS
007572      012767 010012 004002      MOV  #5,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST

;IF NB <>
      MOV  #,FREEZ1 ;SET UP TO LOOP WITH DATA ; 3

.ENDC
XN=XN+1

007600      000033      004000 003732      MOV  #BIT11,@DHSCR ;MASTER CLEAR INTERFACE
007606      004767 003614      JSR  PC.SETALL ;SET UP ALL LINES TO TRANSMIT
;400 (OCTAL) CHARACTERS
;SELECT LINE 11 FOR TESTING

007612      012777 000011 003720      MOV  #11,@DHSCR
007620      012777 014332 003720      MOV  #TWRD11,@DHBA ;CHARACTER TO BE TRANSMITTED
;ON LINE 11 IN AUTO ECHO MODE
;TRANSMIT ONLY 1 CHARACTER ON LINE 11
;SET AUTO ECHO FOR LINE 11

007626      012777 177777 003714      MOV  #-1,@DHBC
007634      012777 133503 003702      MOV  #133503,@DHLPR
007642      042767 001000 003772      BIC  #1000,LINACT ;CLEAR LINE ACTIVE BIT
007650      012777 177777 003674      MOV  #-1,@DHBA ;SET BAR BITS FOR ALL LINES
007656      005000      CLR  R0 ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
007660      017704 003656      1#:  MOV  @DHNR,R4 ;GET A CHARACTER FROM SILO
007664      100375      BPL  1# ;IF NOT VALID DATA, TRY AGAIN
007666      010403      MOV  R4,R3 ;EXTRACT LINE NUMBER FORM CHARACTER
007670      000303      SWAB R3
007672      042703 177760      BIC  #177760,R3 ;CLEAR STATUS BITS
007676      010302      MOV  R3,R2
007700      006302      ASL  R2
007702      020327 000011      CMP  R3,#11 ;IF LINE NUMBER IS 11
007706      001432      BEQ  4# ;CHECK FOR CORRECT ECHOED CHARACTER
007710      026204 014246      CMP  R2,FBUF(R2),R4 ;IF NOT LINE 11, CHECK DATA
007714      001404      BEQ  2#
007716      016205 014246      MOV  RBUF(R2),R5 ;(R5)=EXPECTED NON ECHOED DATA
007722      HLT  1 ;NON ECHOED DATA ERROR
007722      104001      EMT  1
007724      000423      BR  4#
007726      105262 014246      2#:  INCB RBUF(R2) ;UPDATE EXPECTED RECEIVED DATA
007732      001352      BNE  1# ;CONTINUE IF NOT DONE
007734      046267 014450 003700      BIC  LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
007742      005767 003674      3#:  TST  LINACT ;IF ALL LINES ARE DONE
007746      001344      BNE  1# ;EXIT
007750      012777 000011 003562      MOV  #11,@DHSCR ;SELECT LINE 11
007756      042777 100000 003560      BIC  #100000,@DHLPR ;CLEAR AUTO ECHO FOR LINE 11
007764      105777 003570      TSTB @DHSLR ;GET REST OF CHARACTERS
007770      001333      BNE  1# ;AND CHECK
007772      000407      BR  5#
007774      005200      4#:  INC  R0 ;UPDATE ECHOED CHARACTER COUNT
007776      020467 004330      CMP  R4,TWRD11 ;CHECK ECHOED DATA
010002      001757      BEQ  3#

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010004 016705 004322      MOV      TWRD11,R5      ;(R5)=EXPECTED ECHOED DATA
010010      HLT      2      ;ECHOED DATA ERROR
010010 104002      EMT      2
010012 104400      5#: SCOPE      ;CHECK FOR ITERATIONS, LOOP
      000012      LINE=LINE+1
      002000      BITX=BITX+BITX
      000012      KX=KX+1
010014      AUTO2   \LINE,\BITX,\KX

      ;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 12
      ;TRANSMIT 1 CHARACTER ON LINE 12 WITH AUTO ECHO ENABLED
      ;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
      ;CHARACTER LENGTH IS 8 BITS
      ;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

010014      TS \XN,10,5#
010014 012767 000340 167754 T33:  MOV      #340,PS      ;DISABLE ALL INTERRUPTS
010022 012757 000010 003556      MOV      #10,ICOUNT     ;SET UP FOR 10 ITERATIONS
010030 012767 010250 003544      MOV      #5#,ESCAPE    ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB <>
      MOV      #,FREEZ1    ;SET UP TO LOOP WITH DATA      ; 3
      .ENDC
      XN=XN+1
010036 012777 004000 003474      MOV      #BIT11,@DHSCR  ;MASTER CLEAR INTERFACE
010044 004767 003356      JSR      PC,SETALL     ;SET UP ALL LINES TO TRANSMIT
      ;400 (OCTAL) CHARACTERS
010050 012777 000012 003462      MOV      #12,@DHSCR    ;SELECT LINE 12 FOR TESTING
010056 012777 014334 003462      MOV      #TWRD12,@DHBA ;CHARACTER TO BE TRANSMITTED
      ;ON LINE 12 IN AUTO ECHO MODE
010064 012777 177777 003456      MOV      #-1,@DHBC     ;TRANSMIT ONLY 1 CHARACTER ON LINE 12
010072 012777 133503 003444      MOV      #133503,@DHLPR ;SET AUTO ECHO FOR LINE 12
010100 042767 002000 003534      BIC      #2000,LINACT   ;CLEAR LINE ACTIVE BIT
010106 012777 177777 003436      MOV      #-1,@DHBAR    ;SET BAR BITS FOR ALL LINES
010114 005000      CLR      R0            ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
010116 017704 003420      1#:  MOV      @DHNR,R4    ;GET A CHARACTER FROM SILO
010122 100375      BPL      1#           ;IF NOT VALID DATA, TRY AGAIN
010124 010403      MOV      R4,R3        ;EXTRACT LINE NUMBER FORM CHARACTER
010126 000303      SWAB     R3
010130 042703 177760      BIC      #177760,R3    ;CLEAR STATUS BITS
010134 010302      MOV      R3,R2
010136 006302      ASL     R2
010140 020327 000012      CMP      R3,#12        ;IF LINE NUMBER IS 12
010144 001432      BEQ     4#           ;CHECK FOR CORRECT ECHOED CHARACTER
010146 026204 014246      CMP      RBUF(R2),R4   ;IF NOT LINE 12, CHECK DATA
010152 001404      BEQ     2#
010154 016205 014246      MOV      RBUF(R2),R5   ;(R5)=EXPECTED NON ECHOED DATA
010160      HLT     1          ;NON ECHOED DATA ERROR
010160 104001      EMT     1
010162 000423      BR     4#
010164 105262 014246      2#:  INCB     RBUF(R2)   ;UPDATE EXPECTED RECEIVED DATA
010170 001352      BNE     1#           ;CONTINUE IF NOT DONE
010172 046267 014450 003442      BIC     LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
010200 005767 003436      3#:  TST     LINACT       ;IF ALL LINES ARE DONE
010204 001344      BNE     1#           ;EXIT
010206 012777 000012 003324      MOV      #12,@DHSCR    ;SELECT LINE 12
010214 042777 100000 003322      BIC     #100000,@DHLPR ;CLEAR AUTO ECHO FOR LINE 12
010222 105777 003332      TSTB    @DHSLR        ;GET REST OF CHARACTERS

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010226 001333          BNE      1#          ;AND CHECK
010230 000407          BR       5#
010232 005200          4# :   INC      R0          ;UPDATE ECHOED CHARACTER COUNT
010234 020467 004074   CMP      R4,TWRD12   ;CHECK ECHOED DATA
010240 001757          BEQ      3#
010242 016705 004066   MOV      TWRD12,R5   ;(R5)=EXPECTED ECHOED DATA
010246          HLT      2          ;ECHOED DATA ERROR
010246 104002          EMT      2
010250 104400          5# :   SCOPE          ;CHECK FOR ITERATIONS, LOOP
      000013
      004000
      000013
010252          AUTC2  \LINE,\BITX,\KX

      ;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 13
      ;TRANSMIT 1 CHARACTER ON LINE 13 WITH AUTO ECHO ENABLED
      ;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
      ;CHARACTER LENGTH IS 8 BITS
      ;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

010252          TS \XN,10,5#
010252 012767 000340 167516 T34:   MOV      #340,PS     ;DISABLE ALL INTERRUPTS
010260 012767 000010 003320   MOV      #10,ICOUNT ;SET UP FOR 10 ITERATIONS
010266 012767 010506 003306   MOV      #5#,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST

      .IF NB <>
      MOV      #.FREEZ1 ;SET UP TO LOOP WITH DATA          : 3
      .ENDC
      XN=XN+1

010274 012777 004000 003236   MOV      #BIT11,@DHSCR ;MASTER CLEAR INTERFACE
010302 004767 003120          JSR      PC,SETALL   ;SET UP ALL LINES TO TRANSMIT
      ;400 (OCTAL) CHARACTERS
010306 012777 000013 003224   MOV      #13,@DHSCR  ;SELECT LINE 13 FOR TESTING
010314 012777 014336 003224   MOV      #TWRD13,@DHBA ;CHARACTER TO BE TRANSMITTED
      ;ON LINE 13 IN AUTO ECHO MODE
010322 012777 177777 003220   MOV      #-1,@DHSC   ;TRANSMIT ONLY 1 CHARACTER ON LINE 13
010330 012777 133503 003206   MOV      #133503,@DHLPR ;SET AUTO ECHO FOR LINE 13
010336 042767 004000 003276   BIC      #4000,LINACT ;CLEAR LINE ACTIVE BIT
010344 012777 177777 003200   MOV      #-1,@DHBAR  ;SET BAR BITS FOR ALL LINES
010352 005000          CLR      R0          ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
010354 017704 003162          1# :   MOV      @DHARC,R4   ;GET A CHARACTER FROM SILO
010360 100375          BPL      1#          ;IF NOT VALID DATA, TRY AGAIN
010362 010403          MOV      R4,R3      ;EXTRACT LINE NUMBER FORM CHARACTER
010364 000303          SWAB    R3
010366 042703 177760          BIC      #177760,R3  ;CLEAR STATUS BITS
010372 010302          MOV      R3,R2
010374 006302          ASL     R2
010376 020327 000013          CMP      R3,#13     ;IF LINE NUMBER IS 13
010402 001432          BEQ     4#          ;CHECK FOR CORRECT ECHOED CHARACTER
010404 026204 014246          CMP     RBUF(R2),R4 ;IF NOT LINE 13, CHECK DATA
010410 001404          BEQ     2#
010412 016205 014246          MOV     RBUF(R2),R5 ;(R5)=EXPECTED NON ECHOED DATA
010416          HLT     1          ;NON ECHOED DATA ERROR
010416 104001          EMT     1
010420 000423          BR      4#
010422 105262 014246          2# :   INCB    RBUF(R2)   ;UPDATE EXPECTED RECEIVED DATA
010426 001352          BNE     1#          ;CONTINUE IF NOT DONE
010430 046267 014450 003204   BIC     LINBIT(R2),LINACT ;CLEAR ACTIVE BIT

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010436 005767 003200      3$:  TST  LINACT      ;IF ALL LINES ARE DONE
010442 001344              BNE  1$          ;EXIT
010444 012777 000013 003066  MOV  #13, @DHSCR ;SELECT LINE 13
010452 042777 100000 003064  BIC  #100000, @DHLPR ;CLEAR AUTO ECHO FOR LINE 13
010460 105777 003074      TSTB @DHSLR     ;GET REST OF CHARACTERS
010464 001333              BNE  1$          ;AND CHECK
010466 000407              BR   5$          ;
010470 005200              4$:  INC  R0          ;UPDATE ECHOED CHARACTER COUNT
010472 020467 003640      CMP  R4, TWRD13  ;CHECK ECHOED DATA
010476 001757              BEQ  3$          ;
010500 016705 003632      MOV  TWRD13, R5   ;(R5)=EXPECTED ECHOED DATA
010504              HLT  2          ;ECHOED DATA ERROR
010506 104002              EMT  2          ;
104400      5$:  SCOPE          ;CHECK FOR ITERATIONS, LOOP
000014      LINE=LINE+1
010000      BITX=BITX+BITX
000014      KX=KX+1
010510      AUTO2  \LINE, \BITX, \KX

;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 14
;TRANSMIT 1 CHARACTER ON LINE 14 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

010510      TS  \XN, 10, 5$
010510 012767 000340 167260  T35:  MOV  #340, PS      ;DISABLE ALL INTERRUPTS
010516 012767 000010 003062  MOV  #10, ICOUNT    ;SET UP FOR 10 ITERATIONS
010524 012767 010744 003050  MOV  #5$, ESCAPE    ;SET UP TO ESCAPE TO NEXT TEST
;IF NB <>
MOV  #, FREEZ1      ;SET UP TO LOOP WITH DATA ; 3
.ENDC
XN=XN+1
010532 012777 004000 003000  MOV  #BIT11, @DHSCR ;MASTER CLEAR INTERFACE
010540 004767 002662      JSR  PC, SETALL    ;SET UP ALL LINES TO TRANSMIT
;400 (OCTAL) CHARACTERS
;SELECT LINE 14 FOR TESTING
010544 012777 000014 002766  MOV  #14, @DHSCR   ;CHARACTER TO BE TRANSMITTED
010552 012777 014340 002766  MOV  #TWRD14, @DHBA ;ON LINE 14 IN AUTO ECHO MODE
;TRANSMIT ONLY 1 CHARACTER ON LINE 14
;SET AUTO ECHO FOR LINE 14
010560 012777 177777 002762  MOV  #-1, @DHBC    ;CLEAR LINE ACTIVE BIT
010566 012777 133503 002750  MOV  #133503, @DHLPR ;SET BAR BITS FOR ALL LINES
010574 042767 010000 003040  BIC  #10000, LINACT ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
010602 012777 177777 002742  MOV  #-1, @DHBAR   ;GET A CHARACTER FROM SILO
010610 005000              CLR  R0          ;IF NOT VALID DATA, TRY AGAIN
010612 017704 002724      1$:  MOV  @DHNRC, R4    ;EXTRACT LINE NUMBER FORM CHARACTER
010616 100375              BPL  1$          ;
010620 010403              MOV  R4, R3      ;
010622 000303              SWAB R3          ;
010624 042703 177760      BIC  #177760, R3   ;CLEAR STATUS BITS
010630 010302              MOV  R3, R2      ;
010632 006302              ASL  R2          ;
010634 020327 000014      CMP  R3, #14     ;IF LINE NUMBER IS 14
010640 001432              BEQ  4$          ;CHECK FOR CORRECT ECHOED CHARACTER
010642 026204 014246      CMP  RBUF(R2), R4 ;IF NOT LINE 14, CHECK DATA
010646 001404              BEQ  2$          ;
010650 016205 014246      MOV  RBUF(R2), R5 ;(R5)=EXPECTED NON ECHOED DATA
010654              HLT  1          ;NON ECHOED DATA ERROR

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010654 104001          EMT      1
010656 000423          BR      4#
010660 105262 014246  2# : INCB   RBUF(R2)      ;UPDATE EXPECTED RECEIVED DATA
010664 001352          BNE     1#      ;CONTINUE IF NOT DONE
010666 046267 014450 002746 BIC     LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
010674 005767 002742  3# : TST    LINACT      ;IF ALL LINES ARE DONE
010700 001344          BNE     1#      ;EXIT
010702 012777 000014 002630 MOV     #14, @DHSCR      ;SELECT LINE 14
010710 042777 100000 002626 BIC     #100000, @DHLPR  ;CLEAR AUTO ECHO FOR LINE 14
010716 105777 002636          TSTB   @DHSLR          ;GET REST OF CHARACTERS
010722 001333          BNE     1#      ;AND CHECK
010724 000407          BR      5#
010726 005200          INC     R0      ;UPDATE ECHOED CHARACTER COUNT
010730 020467 003404  4# : CMP    R4, TWRD14     ;CHECK ECHOED DATA
010734 001757          BEQ     3#
010736 016705 003376          MOV     TWRD14, R5      ;(R5)=EXPECTED ECHOED DATA
010742          HLT     2      ;ECHOED DATA ERROR
010742 104002          EMT      2
010744 104400          5# : SCOPE          ;CHECK FOR ITERATIONS LOOP
      000015          LINE=LINE+1
      020000          BITX=BITX+BITX
      000015          KX=KX+1
010746          AUTO2  \LINE, \BITX, \KX

      ;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 15
      ;TRANSMIT 1 CHARACTER ON LINE 15 WITH AUTO ECHO ENABLED
      ;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
      ;CHARACTER LENGTH IS 8 BITS
      ;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

010746          TS \XN, 10, 5#
010746 012767 000340 167022 T36:  MOV     #340, PS      ;DISABLE ALL INTERRUPTS
010754 012767 000010 002624          MOV     #10, ICOUNT   ;SET UP FOR 10 ITERATIONS
010762 012767 011202 002612          MOV     #5#, ESCAPE    ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB <>
      MOV     #, FREEZ1      ;SET UP TO LOOP WITH DATA ; 3
      .ENDC
      XN=XN+1
010770 000037          MOV     #BIT11, @DHSCR   ;MASTER CLEAR INTERFACE
010776 004767 002424          JSR    PC, SETALL      ;SET UP ALL LINES TO TRANSMIT
      ;400 (OCTAL) CHARACTERS
011002 012777 000015 002530          MOV     #15, @DHSCR    ;SELECT LINE 15 FOR TESTING
011010 012777 014342 002530          MOV     #TWRD15, @DHBA ;CHARACTER TO BE TRANSMITTED
      ;ON LINE 15 IN AUTO ECHO MODE
011016 012777 177777 002524          MOV     #-1, @DHBC    ;TRANSMIT ONLY 1 CHARACTER ON LINE 15
011024 012777 133503 002512          MOV     #133503, @DHLPR ;SET AUTO ECHO FOR LINE 15
011032 042767 020000 002602          BIC     #20000, LINACT ;CLEAR LINE ACTIVE BIT
011040 012777 177777 002504          MOV     #-1, @DHBAR   ;SET BAR BITS FOR ALL LINES
011046 005000          CLR    R0      ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
011050 017704 002466  1# : MOV     @DHNRC, R4     ;GET A CHARACTER FROM SILO
011054 100375          BPL    1#      ;IF NOT VALID DATA, TRY AGAIN
011056 010403          MOV     R4, R3      ;EXTRACT LINE NUMBER FORM CHARACTER
011060 000303          SWAB  R3
011062 042703 177760          BIC     #177760, R3    ;CLEAR STATUS BITS
011066 010302          MOV     R3, R2
011070 006302          ASL   R2
011072 020327 000015          CMP    R3, #15      ;IF LINE NUMBER IS 15

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011076 001432          BEQ      4#          ;CHECK FOR CORRECT ECHOED CHARACTER
011100 026204 014246   CMP      RBUF(R2),R4 ;IF NOT LINE 15, CHECK DATA
011104 001404          BEQ      2#
011106 016205 014246   MOV      RBUF(R2),R5 ;(R5)-EXPECTED NON ECHOED DATA
011112          HLT      1          ;NON ECHOED DATA ERROR
011112 104001          EMT      1
011114 000423          BR       4#
011116 105262 014246   2#:     INCB     RBUF(R2) ;UPDATE EXPECTED RECEIVED DATA
011122 001352          BNE      1#          ;CONTINUE IF NOT DONE
011124 046267 014450 002510 JIC     LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
011132 005767 002504   3#:     TST     LINACT ;IF ALL LINES ARE DONE
011136 001344          BNE      1#          ;EXIT
011140 012777 000015 002372 MOV     #15, @DHSCR ;SELECT LINE 15
011146 042777 100000 002370 BIC     #100000, @DHLPR ;CLEAR AUTO ECHO FOR LINE 15
011154 105777 002400   TSTB    @DHSLR ;GET REST OF CHARACTERS
011160 001333          BNE      1#          ;AND CHECK
011162 000407          BR       5#
011164 005200          4#:     INC     R0 ;UPDATE ECHOED CHARACTER COUNT
011166 020467 003150   CMP     R4, TWRD15 ;CHECK ECHOED DATA
011172 001757          BEQ     3#
011174 016705 003142   MOV     TWRD15, R5 ;(R5)-EXPECTED ECHOED DATA
011200          HLT     2          ;ECHOED DATA ERROR
011200 104002          EMT     2
011202 104400          5#:     SCOPE ;CHECK FOR ITERATIONS, LOOP
        000016     LINE=LINE+1
        040000     BITX=BITX+BITX
        000016     KX=KX+1
011204          AUTO2  \LINE, \BITX, \KX

;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 16
;TRANSMIT 1 CHARACTER ON LINE 16 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

011204          TS     \YN, 10, 5#
011204 012767 000340 166564 T37:   MOV     #340, PS ;DISABLE ALL INTERRUPTS
011212 012767 000010 002366   MOV     #10, ICOUNT ;SET UP FOR 10 ITERATIONS
011220 012767 011440 002354   MOV     #5#, ESCAPE ;SET UP TO ESCAPE TO NEXT TEST

        .IF NB <>
        MOV     #, FREEZ1 ;SET UP TO LOOP WITH DATA ; 3
        .ENDC
        XN=XN+1

011226 000040          MOV     #BIT11, @DHSCR ;MASTER CLEAR INTERFACE
011234 004767 002166   JSR     PC, SETALL ;SET UP ALL LINES TO TRANSMIT
;400 (OCTAL) CHARACTERS
;SELECT LINE 16 FOR TESTING
011240 012777 000016 002272   MOV     #16, @DHSCR ;CHARACTER TO BE TRANSMITTED
011246 012777 014344 002272   MOV     @TWRD16, @DHBA ;ON LINE 16 IN AUTO ECHO MODE
;TRANSMIT ONLY 1 CHARACTER ON LINE 16
;SET AUTO ECHO FOR LINE 16
011254 012777 177777 002266   MOV     #-1, @DHBC ;CLEAR LINE ACTIVE BIT
011262 012777 133503 002254   MOV     #133503, @DHLPR ;SET BAR BITS FOR ALL LINES
011270 042767 040000 002344   BIC     #40000, LINACT ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
011276 012777 177777 002246   MOV     #-1, @DHBAR ;GET A CHARACTER FROM SILO
011304 005000          CLR     R0 ;IF NOT VALID DATA, TRY AGAIN
011306 017704 002230   1#:     MOV     @DHNRC, R4 ;EXTRACT LINE NUMBER FORM CHARACTER
011312 100375          BPL     1#
011314 010403          MOV     R4, R3

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011316 000303          SWAB      R3
011320 042703 177760  BIC      #177760,R3          ;CLEAR STATUS BITS
011324 010302          MOV      R3,R2
011326 006302          ASL      R2
011330 020327 000016  CMP      R3,#16          ;IF LINE NUMBER IS 16
011334 001432          BEQ      4#              ;CHECK FOR CORRECT ECHOED CHARACTER
011336 026204 014246  CMP      RBUF(R2),R4     ;IF NOT LINE 16, CHECK DATA
011342 001404          BEQ      2#
011344 016205 014246  MOV      RBUF(R2),R5     ;(R5)=EXPECTED NON ECHOED DATA
011350          HLT      1          ;NON ECHOED DATA ERROR
011350 104001          EMT      1
011352 000423          BR       4#
011354 105262 014246  2# : INCB     RBUF(R2)      ;UPDATE EXPECTED RECEIVED DATA
011360 001352          BNE     1#              ;CONTINUE IF NOT DONE
011362 046267 014450 002252 BIC      LINBIT(R2),LINACT ;CLEAR ACTIVE BIT
011370 005767 002246  3# : TST      LINACT      ;IF ALL LINES ARE DONE
011374 001344          BNE     1#              ;EXIT
011376 012777 000016 002134 MOV      #16,#DHSCR      ;SELECT LINE 16
011404 042777 100000 002132 BIC      #100000,#DHSLR  ;CLEAR AUTO ECHO FOR LINE 16
011412 105777 002142  TSTB     #DHSLR         ;GET REST OF CHARACTERS
011416 001333          BNE     1#              ;AND CHECK
011420 000407          BR       5#
011422 005200          4# : INC      R0          ;UPDATE ECHOED CHARACTER COUNT
011424 020467 002714  CMP      R4,TWRD16      ;CHECK ECHOED DATA
011430 001757          BEQ      3#
011432 016705 002706  MOV      TWRD16,R5      ;(R5)=EXPECTED ECHOED DATA
011436          HLT      2          ;ECHOED DATA ERROR
011436 104002          EMT      2
011440 104400          5# : SCOPE      ;CHECK FOR ITERATIONS, LOOP
      000017
      100000
      000017
011442          LINE=LINE+1
      BITX=BITX+BITX
      KX=KX+1
      AUTO2  \LINE,\BITX,\KX

;TRANSMIT A BINARY COUNT PATTERN ON ALL LINES EXCEPT LINE 17
;TRANSMIT 1 CHARACTER ON LINE 17 WITH AUTO ECHO ENABLED
;TRANSMISSION SPEED FOR ALL LINES IS 9600 BAUD
;CHARACTER LENGTH IS 8 BITS
;VERIFY THAT CORRECT DATA IS RECEIVED ON ALL LINES

011442          TS  \XN-10,5#
011442 012767 000340 166326 T40: MOV      #340,PS      ;DISABLE ALL INTERRUPTS
011450 012767 000010 002130 MOV      #10,ICOUNT     ;SET UP FOR 10 ITERATIONS
011456 012767 011676 002116 MOV      #5#,ESCAPE     ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB <>
      MOV      #,FREEZ1   ;SET UP TO LOOP WITH DATA          ; 3
      .ENDC
      XN=XN+1
011464 012777 004000 002046 MOV      #BIT11,#DHSCR  ;MASTER CLEAR INTERFACE
011472 004767 001730  JSR      PC,SETALL     ;SET UP ALL LINES TO TRANSMIT
      ;400 (OCTAL) CHARACTERS
011476 012777 000017 002034 MOV      #17,#DHSCR     ;SELECT LINE 17 FOR TESTING
011504 012777 014346 002034 MOV      #TWRD17,#DHBA ;CHARACTER TO BE TRANSMITTED
      ;ON LINE 17 IN AUTO ECHO MODE
011512 012777 177777 002030 MOV      #-1,#DHBC     ;TRANSMIT ONLY 1 CHARACTER ON LINE 17
011520 012777 133503 002016 MOV      #133503,#DHSLR ;SET AUTO ECHO FOR LINE 17
011526 042767 100000 002106 BIC      #100000,LINACT ;CLEAR LINE ACTIVE BIT

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011534 012777 177777 002010      MOV    #1, @DHBAR      ;SET BAR BITS FOR ALL LINES
011542 005000                    CLR    R0              ;KEEP COUNT OF NUMBER OF RECEIVED CHARACTERS
011544 017704 001772      1$:  MOV    @DHNR, R4      ;GET A CHARACTER FROM SILO
011550 100375                    BPL    1$              ;IF NOT VALID DATA, TRY AGAIN
011552 010403                    MOV    R4, R3          ;EXTRACT LINE NUMBER FORM CHARACTER
011554 000303                    SWAB   R3              ;
011556 042703 177760      BIC    #177760, R3     ;CLEAR STATUS BITS
011562 010302                    MOV    R3, R2
011564 006302                    ASL    R2
011566 020327 000017      CMP    R3, #17        ;IF LINE NUMBER IS 17
011572 001432                    BEQ    4$              ;CHECK FOR CORRECT ECHOED CHARACTER
011574 026204 014246      CMP    RBUF(R2), R4   ;IF NOT LINE 17, CHECK DATA
011600 001404                    BEQ    2$              ;
011602 016205 014246      MOV    RBUF(R2), R5   ;(R5)=EXPECTED NON ECHOED DATA
011606                    HLT    1                ;NON ECHOED DATA ERROR
011606 104001                    EMT    1
011610 000423                    BR     4$              ;
011612 105262 014246      2$:  INCB   RBUF(R2)      ;UPDATE EXPECTED RECEIVED DATA
011616 001352                    BNE    1$              ;CONTINUE IF NOT DONE
011620 046267 014450 002014  BIC    LINBIT(R2), LINACT ;CLEAR ACTIVE BIT
011626 005767 002010      3$:  TST    LINACT        ;IF ALL LINES ARE DONE
011632 001344                    BNE    1$              ;EXIT
011634 012777 000017 001676  MVI    #17, @DHSCR    ;SELECT LINE 17
011642 042777 100000 001674  'T.    #00000, @DHLPR  ;CLEAR AUTO ECHO FOR LINE 17
011650 105777 001704      ISTB   @DHSLR        ;GET REST OF CHARACTERS
011654 001333                    BNE    1$              ;AND CHECK
011656 000407                    BR     5$              ;
011660 005200                    INC    R0              ;UPDATE ECHOED CHARACTER COUNT
011662 020467 002460      4$:  CMP    R4, TWRD17    ;CHECK ECHOED DATA
011666 001757                    BEQ    3$              ;
011670 016705 002452      MOV    TWRD17, R5    ;(R5)=EXPECTED ECHOED DATA
011674                    HLT    2                ;ECHOED DATA ERROR
011674 104002                    EMT    2
011676 104400      5$:  SCOPE          ;CHECK FOR ITERATIONS, LOOP
      000020      LINE=LINE+1
      000000      BITX=BITX+BITX
      000020      KX=KX+1

```

```

1
2
3
4
5 011700 TS \XN,100,5#
011700 012767 000340 166070 T41: MOV #340,PS ;DISABLE ALL INTERRUPTS
011706 012767 000100 001672 MOV #100,ICOUNT ;SET UP FOR 100 ITERATIONS
011714 012767 012130 001660 MOV #5#,ESCAPE ;SET UP TO ESCAPE TO NEXT TEST
      .IF NB <>
      MOV #,FREEZ1 ;SET UP TO LOOP WITH DATA ; 3
      .ENDC
      XN=XN+1
6 011722 000042 012777 004000 001610 MOV #BIT11,@DHSCR ;MASTER CLEAR INTERFACE
7 011730 012700 000020 012700 MOV #20,R0 ;SET UP PARAMETERS FOR 16 LINES
8 011734 012701 014310 012701 MOV #TWRDO,R1 ;CHARACTER TO BE TRANSMITTED
9 011740 012702 014350 012702 MOV #RCNTO,R2 ;RECEIVED CHARACTER COUNT
10 011744 012703 014410 012703 MOV #RDCTO,R3 ;EXPECTED NUMBER OF CHARACTERS
11 011750 010177 0015 2 1#: MOV R1,@DHBA ;LOAD BUS ADDRESS
12 011754 012777 177777 001566 MOV # -1,@DHBC ;LOAD BYTE COUNT
13 011762 012777 131403 001554 MOV #131403,@DHLPR ;SET AUTO ECHO
14 011770 005022 CLR (R2)+ ;CLEAR RECEIVED CHARACTER COUNT
15 011772 012723 000100 MOV #100,(R3)+ ;NUMBER OF CHARACTERS TO BE RECEIVED
16 011776 062701 000002 ADD #2,R1 ;ADVANCE POINTER
17 012002 005300 DEC R0 ;CONTINUE IF NOT DONE
18 012004 001361 BNE 1#
19 012006 012767 177777 001630 MOV # -1,AEACT ;INDICATE AUTO ECHO ACTIVE
20
21 012014 012777 177777 001530 2#: MOV # -1,@DHBAR ;FOR ALL LINES
22 012022 105777 001512 TSTB @DHSCR ;SET BAR BITS FOR ALL LINES
23 012026 100375 BPL 2# ;WAIT FOR A CHARACTER
24 012030 017704 001506 MOV @DHNRC,R4 ;GET CHARACTER
25 012034 010403 MOV R4,R3
26 012036 000303 SWAB R3
27 012040 042703 177760 BIC #177760,R3 ;EXTRACT LINE NUMBER
28 012044 010302 MOV R3,R2
29 012046 006302 ASL R2
30 012050 005262 014350 INC RCNTO(R2) ;UPDATE RECEIVED COUNT FOR LINE
31 012054 020462 014310 CMP R4,TWRDC(R2) ;CHECK EXPECTED AND RECEIVED DATA
32 012060 001404 BEQ 3#
33 012062 016205 014310 MOV TWRDO(R2),R5 ;(R5)=EXPECTED ECHOED DATA
34 012066 HLT 2 ;AUTO ECHO ERROR
012066 104002 EMT 2
35 012070 000417 BR 5#
36 012072 005362 014410 3#: DEC RDCTO(R2) ;UPDATE RECEIVED EXPECTED COUNT
37 012076 003351 BGT 2# ;CONTINUE IF NOT 0
38 012100 100413 BMI 5# ;EXIT IOF NEGATIVE
39 012102 010377 001432 MOV R3,@DHSCR ;SELECT LINE THAT FTNISHED
40 012106 042777 100000 001430 BIC #100000,@DHLPR ;CLEAR AUTO ECHO
41 012114 046267 014450 001522 BIC LINBIT(R2),AEACT ;CLEAR AUTO ECHO ACTIVE
42 012122 005767 001516 TST AEACTION ;ALL LINES DONE
43 012126 001335 BNE 2# ;IF NOT, CONTINUE
44 012130 104400 5#: SCOPE ;CHECK FOR ITERATIONS, LOOP

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1
2 012132      .EOP      †/BEGIN/

                ;END OF PASS
                ;TYPE NAME OF TEST
                ;UPDATE PASS COUNT
                ;CHECK FOR EXIT TO ACT-11
                ;RESTART TEST

012132 104401      EOP:      TYPE
012134 015064      MEPASS      ;TYPE NAME OF TEST
012136 005067 001474  CLR      LAST      ;CLEAR LAST ERROR PC
012142 005067 001424  CLR      ERRFLG   ;CLEAR ERROR FLAG
012146 005267 001422  INC      PASCNT   ;UPDATE PASS COUNT
012152 005767 166624  TST      LIGHTS   ; ARE WE USING LIGHTS?      : 4
012156 001005      BNE      2†      ; BRANCH IF WE ARE          : 6
012160 104401      TYPE
012162 015077      PASTXT
012164 104402      OCTASC
012166 012224      PASARG   ; TYPE PASCOUNT MESSAGE    : 5
012170 000403      BR      3†      ; PRINT PASCOUNT           : 4
012172          2†:
012172 016767 001376 166602  MOV      PASCNT,LIGHTS ; CONTINUE                  : 4
012200          3†:
012200 013701 000042  MOV      @#42,R1     ;DISPLAY PASS COUNT        : 4
012204 001405      BEQ      RESTRT   ;CHECK FOR ACT-11 OR DDP
012206 000005      RESET
012210 004711      LOGICAL: JSR      PC,(R1) ;IF NOT, CONTINUE TESTING
012212 000240      NOP
012214 000240      NOP
012216 000240      NOP
012220 000167 167062  RESTRT: JMP      BEGIN
012224 000001      PASARG: .WORD 1      ; PARAMETERS TO PRINT PASCOUNT : 5
012226 006 002      .BYTE 6,2
012230 013574      .WORD PASCNT ; 5
3 012232      .SCOPE
                ;CHECK FOR LOOP ON CURRENT TEST      : 3
                ;CHECK FOR ITERATION SUPPRESSION

012232 032777 002000 166540  SCOPER: BIT      @SW10,@SWR      : 4
012240 001030      BNE      4†
012242 032777 040000 166530 1†:  BIT      @SW14,@SWR      : 4
012250 001021      BNE      3†
012252 032777 004000 166520  BIT      @SW11,@SWR      : 4
012260 001006      BNE      2†
012262 005267 001322  INC      LPCNT
012266 026767 001316 001312  CMP      LPCNT,ICOUNT
012274 001007      BNE      3†
012276 005067 001306  2†:  CLR      LPCNT
012302 005067 001264  CLR      ERRFLG
012306 011667 001266  MOV      (SP),RETRN
012312 000002      RTI
012314 016716 001260  3†:  MOV      RETRN,(SP)
012320 000002      RTI
012322 005767 001244  4†:  TST      ERRFLG
012326 001745      BEQ      1†

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012330 000762 BR 24
4 012332 .SCOP1

;CHECK FOR FREEZE ON CURRENT DATA

012332 032777 001000 166440 SCOP1R: BIT @SW09,BSMR
012340 001402 BEQ 14 ; 4
012342 016716 001236 MOV FREEZ1,(SP)
012346 000002 14: RTI

1 012350

.ERROR

;ERROR HANDLER

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012350 032777 020000 166422 ERRORS: BIT    #SW13, #SWR           ; 4
012356 001055          BNE    HALTS
012360 021667 001252    CMP    (SP), LAST
012364 001404          BEQ    1#
012366 011667 001244    MOV    (SP), LAST
012372 005067 001174    CLR    ERRFLG
012376 104406          1# :   SAV05P
012400 011605          MOV    (SP), R5
012402 162705 000002    SUB    #2, R5
012406 011504          MOV    (R5), R4
012410 006304          ASL    R4
012412 006304          ASL    R4
012414 042704 177001    BIC    #177001, R4
012420 062704 015216    ADD    #ERRTAB, R4
012424 012467 000040    MOV    (R4), ERRMSG
012430 011467 000052    MOV    (R4), DATABP
012434 005767 001132    TST    ERRFLG
012440 001403          BEQ    TYPMSG
012442 005767 000040    TST    DATABP
012446 001011          BNE    TYPDAT
012450 104401          TYPMSG: TYPE           : 3
012452 014774          MCRLF           : 5
012454 104402          OCTASC         : 5
012456 012554          ERTABO
012460 012767 000001 001104    MOV    #1, ERRFLG
012466 104401          TYPE
012470 000000          ERRMSG: 0
012472 005767 000010    TYPDAT: TST    DATABP
012476 001404          BEQ    RESREG
012500 104401          TYPE           : 5
012502 014774          MCRLF           : 5
012504 104402          OCTASC
012506 000000          DATABP: 0
012510 104407          RESREG: RES05
012512 005777 166262    HALTS: TST    #SWR           : 4
012516 100005          BPL    EXITER
012520 010046          PUSHRO
012522 016600 000002    MOV    2(SP), R0
012526 000000          HALT
012530 012600          POPRO
012532 005267 001040    EXITER: INC    ERRCNT
012536 032777 002000 166234    BIT    #SW10, #SWR           : 4
012544 001402          BEQ    1#
012546 016716 001030    MOV    ESCAPE, (SP)
012552 000002          1# :   RTI
012554 000001          ERTABO: 1
012556 006      002      .BYTE    6, 2
012560 013630          SAVPC

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012562          .TRPSRV
                ;TRAP DISPATCH SERVICE
                ;ARGUMENT OF TRAP IS EXTRACTED
                ;AND USED AS OFFSET TO OBTAIN POINTER
                ;TO SELECTED SUBROUTINE
                ; 3

012562 011646          TRPSRV: MOV    (SP),-(SP)          ;GET PC OF RETURN
012564 162716 000002          SUB    #2,(SP)           ;=PC OF TRAP
012570 017616 000000          MOV    @((SP),(SP)         ;GET TRP
012574 006316          TRPOK: ASL    (SP)             ;MULTIPLY TRAP ARG BY 2
012576 042716 177001          BIC    #177001,(SP)        ;CLEAR UNWANTED BITS
012602 062716 015136          ADD    @TRPTAB,(SP)       ;POINTER TO SUBROUTINE ADDRESS
012606 017616 000000          MOV    @((SP),(SP)         ;SUBROUTINE ADDRESS
012612 000136          JMP    @((SP)+          ;GO TO SUBROUTINE
2 012614          .SAVREG

                ;SAVE PC OF TEST THAT FAILED AND R0-R5

012614 016667 000004 001006 SV05P: MOV    4(SP),SAVPC

                ;SAVE R0-R5

012622 010567 000776          SV05:  MOV    R5,SAVR5
012626 010467 000770          MOV    R4,SAVR4
012632 010367 000762          MOV    R3,SAVR3
012636 010267 000754          MOV    R2,SAVR2
012642 010167 000746          MOV    R1,SAVR1
012646 010067 000740          MOV    R0,SAVR0
012652 000002          RTI
3 012654          .RESREG

                ;RESTORE R0-R5

012654 016700 000732          RS05:  MOV    SAVR0,R0
012660 016701 000730          MOV    SAVR1,R1
012664 016702 000726          MOV    SAVR2,R2
012670 016703 000724          MOV    SAVR3,R3
012674 016704 000722          MOV    SAVR4,R4
012700 016705 000720          MOV    SAVR5,R5
012704 000002          RTI

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1 012706

.TYPER

;TELETYPE OUTPUT ROUTINE

012706 017605 000000
 012712 062716 000002
 012716 105777 000612
 012722 100375
 012724 105715
 012726 001001
 012730 000002
 012732 112577 000600
 012736 000767
 2 012740

TYPER: MOV @ (SP), R5
 ADD #2, (SP)
 1: TSTB @TPCSR
 BPL 1#
 TSTB (R5)
 BNE 2#
 RTI
 2: MOVB (R5), @TPDBR
 BR 1#
 .INSTRG

; 3

;ASCII STRING INPUT ROUTINE

012740 017667 000000 000006
 012746 062716 000002
 012752 104401
 012754 000000
 012756 012764 015160
 012762 012703 000007
 012766 105777 000536
 012772 100375
 012774 117714 000532
 013000 142714 000200
 013004 122427 000015
 013010 001413
 013012 117777 000514 000516
 013020 105777 000510
 013024 100375
 013026 005303
 013030 001356
 013032 104401
 013034 014770
 013036 000745
 013040 000002

INSTRG: MOV @ (SP), MSG
 ADD #2, (SP)
 INSTR1: TYPE
 MSG: 0
 MOV @INBUF, R4
 MOV #7, R3
 1: TSTB @TKCSR
 BPL 1#
 MOVB @TKDBR, (R4)
 BICB #200, (R4)
 CMPB (R4), #15
 BEQ INSTR2
 MOVB @TKLDBR, @TPDBR
 2: TSTB @TPCSR
 BPL 2#
 DEC R3
 BNE 1#
 INSTR2: TYPE
 MOVB
 BR INSTR1
 INSTR2: RTI

1 013042

.PARAMS

;CONVERT ASCII STRING TO OCTAL

; 3

013042 011605
 013044 012567 000146
 013050 012567 000144
 013054 012567 000142
 013060 112567 000140
 013064 112567 000135
 013070 010516
 013072 005005
 013074 012704 015160
 013100 122714 000015
 013104 001420
 013106 121427 000060
 013112 002415
 013114 121427 000067
 013120 003012
 013122 142714 000060
 013126 152405
 013130 122714 000015
 013134 001406
 013136 006305
 013140 006305
 013142 006305
 013144 000760
 013146 104404
 013150 000750

PARAMS: MOV (SP),R5
 MOV (R5)+,LOLIM
 MOV (R5)+,HILIM
 MOV (R5)+,DEVADR
 MOV (R5)+,LOBITS
 MOV (R5)+,ADRCNT
 MOV R5,(SP)
 PARAM1: CLR R5
 MOV #INBUF,R4
 CMPB #15,(R4)
 BEQ PARERR
 1\$: CMPB (R4),#60
 BLT PARERR
 CMPB (R4),#67
 BGT PARERR
 BICB #60,(R4)
 BISB (R4)+,R5
 CMPB #15,(R4)
 BEQ LIMITS
 ASL R5
 ASL R5
 ASL R5
 BR 1\$
 PARERR: INSTER
 BR PARAM1

;TEST TO SEE IF NUMBER IS WITHIN LIMITS

013152 020567 000042
 013156 101373
 013160 020567 000032
 013164 103770
 013166 136705 000032
 013172 001365

LIMITS: CMP R5,HILIM
 BHI PARERR
 CMP R5,LOLIM
 BLO PARERR
 BITB LOBITS,R5
 BNE PARERR

; 3

;STORE NUMBER AT SPECIFIED ADDRESS

013174 016704 000022
 013200 010524
 013202 062705 000002
 013206 105367 000013
 013212 001372
 013214 000002
 013216 000000
 013220 000000
 013222 000000
 013224 000000
 013225

1\$: MOV DEVADR,R4
 MOV R5,(R4)+
 ADD #2,R5
 DECB ADRCNT
 BNE 1\$
 RTI
 LOLIM: 0
 HILIM: 0
 DEVADR: 0
 LOBITS: 0
 ADRCNT=LOBITS+1

013226

.OCTASC

;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER

013226 017601 000000
 013232 062716 000002
 013236 012167 000130
 013242 112167 000126
 013246 112167 000123
 013252 013167 000120
 013256 016704 000114
 013262 116705 000106
 013266 012700 015172
 013272 010403
 013274 042703 177770
 013300 062703 000260
 013304 110320
 013306 006204
 013310 006204
 013312 006204
 013314 005305
 013316 001365
 013320 012703 015204
 013324 114023
 013326 105367 000042
 013332 001374
 013334 105767 000035
 013340 001405
 013342 112723 000240
 013346 105367 000023
 013352 001373
 013354 105013
 013356 104401
 013360 015204
 013362 005367 000004
 013366 001325
 013370 000002
 013372 000000
 013374 000000
 013375 013375
 013376 000000

OCTASN: MOV @ (SP), R1
 ADD @2, (SP)
 MOV (R1)+, WRDCNT
 1#: MOV (R1)+, CHRCNT
 MOV (R1)+, SPACNT
 MOV @ (R1)+, BINWRD
 2#: MOV BINWRD, R4
 MOV CHRCNT, R5
 MOV @TEMP, R0
 3#: MOV R4, R3
 BIC @177770, R3
 ADD @260, R3
 MOV R3, (R0)+
 ASR R4
 ASR R4
 ASR R4
 DEC R5
 BNE 3#
 MOV @MDATA, R3
 4#: MOV -(R0), (R3)+
 DECB CHRCNT
 BNE 4#
 TSTB SPACNT
 BEQ 6#
 5#: MOV @240, (R3)+
 DECB SPACNT
 BNE 5#
 6#: CLRB (R3)
 TYPE
 MDATA
 DEC WRDCNT
 BNE 1#
 RTI
 WRDCNT: 0
 CHRCNT: 0
 SPACNT=CHRCNT+1
 BINWRD: 0

: 5

: 3

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013400                                CCLRALL
;CLEAR ALL BYTE COUNT AND BUS ADDRESS REGISTERS

013400 012700 000020          CLRALL: MOV    #20,R0          ;SET UP TO CLEAR 16
013404 005077 000136          1+:  CLR    @DH3A          ;CLEAR BUS ADDRESS
013410 005077 000134          CLR    @DHBC          ;CLEAR BYTE COUNT
013414 005277 000120          INC    @DHSCR         ;ADVANCE LINE NUMBER
013420 005300          DEC    R0          ;CONTINUE IF NOT DONE
013422 001370          BNE    1+
013424 000207          RTS    PC          ;RETURN TO CALLING ROUTINE
2 013426          SSETALL

;SET BYTE COUNT FOR ALL LINES TO 400
;SET BUS ADDRESS FOR ALL LINES TO TBUF
;CLEAR EXPECTED CHARACTER BUFFERS
;SET LINE ACTIVE BITS FOR ALL LINES

013426 012700 000020          SETALL: MOV    #20,R0          ;SET UP TO LOAD 16
;BYTE COUNT AND BUS ADDRESS
;MEMORY LOCATIONS
013432 005001          CLR    R1          ;SET UP TO GENERATE EXPECTED
;RECEIVED CHARACTER BUFFER
013434 012702 000200          MOV    #200,R2        ;WILL BE HIGH BYTE
;OF EXPECTED RECEIVED CHARACTER
;OFFSET FOR HIGH BYTE
013440 012703 000001          MOV    #1,R3          ;LOAD BUS ADDRESS
013444 012777 013646 000074  1+:  MOV    @TBUF,@DH3A    ;LOAD BYTE COUNT
013452 012777 177400 000070  MOV    #-400,@DHBC   ;SET LINE SPEED TO 4800 BAUD
013460 012777 031403 000056  MOV    #31403,@DHLPR
013466 105061 014246          CLRB  RBUF(R1)      ;RECEIVED CHARACTER
;LOAD HIGH BYTE
013472 110263 014246          MOVB  R2,RBUF(R3)   ;ADVANCE LINE NUMBER TO NEXT LINE
013476 005277 000036          INC    @DHSCR         ;UPDATE POINTERS
013502 005202          INC    R2
013504 062701 000002          ADD    #2,R1
013510 062703 000002          ADD    #2,R3
013514 005300          DEC    R0          ;CONTINUE IF NOT DONE
013516 001352          BNE    1+
013520 012767 177777 000114  MOV    #-1,LINACT   ;SET ACTIVE FLAGS FOR ALL LINES
013526 000207          RTS    PC          ;RETURN TO CALLING ROUTINE

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1 013530      .POINT  †/DHSCR,DHNRC,DHLPR,DHBA,DHBC,DHBAR,DHBCR,DHSSR,DHSLR,DHRVEC,DHRLVL,DHTVEC,DHTLVL/
                ;INDIRECT POINTERS
                ; 3
      013530  177560      TKCSR:  177560
      013532  177562      TKDBR:  177562
      013534  177564      TPCSR:  177564
      013536  177566      TPDBR:  177566
      .IRP      A          <DHSCR,DHNRC,DHLPR,DHBA,DHBC,DHBAR,DHBCR,DHSSR,DHSLR,DHRVEC,DHRLVL,DHTVEC,DH
TLVL >
      A:        0
      .ENDM
      013540  000000      DHSCR:  0
      013542  000000      DHNRC:  0
      013544  000000      DHLPR:  0
      013546  000000      DHBA:   0
      013550  000000      DHBC:   0
      013552  000000      DHBAR:  0
      013554  000000      DHBCR:  0
      013556  000000      DHSSR:  0
      013560  000000      DHSLR:  0
      013562  000000      DHRVEC: 0
      013564  000000      DHRLVL: 0
      013566  000000      DHTVEC: 0
      013570  000000      DHTLVL: 0
2 013572      .VARIA  †/ENDFLG,LINACT,AEACT/
                ;PROGRAM VARIABLES
      013572  000000      ERRFLG: 0          ;ERROR FLAG
      013574  000000      PASCNT: 0          ;PASS COUNT
      013576  000000      ERRCNT: 0          ;ERROR COUNT
      013600  000000      RETRN:  0          ;SCOPE RETURN ADDRESS FOR TEST LOOPING
      013602  000000      ESCAPE: 0          ;ADDRESS FOR ERROR ESCAPE
      013604  000000      FREEZ1: 0          ;DATA LOOPING RETURN ADDRESS
      013606  000000      ICOUNT: 0          ;ITERATION COUNT FOR TEST IN PROGRESS
      013610  000000      LPCNT:  0          ;NUMBER OF ITERATIONS THIS TEST
      013612  000000      SAVR0:  0          ;R0 SAVE AREA
      013614  000000      SAVR1:  0          ;R1 SAVE AREA
      013616  000000      SAVR2:  0          ;R2 SAVE AREA
      013620  000000      SAVR3:  0          ;R3 SAVE ARE
      013622  000000      SAVR4:  0          ;R4 SAVE AREA
      013624  000000      SAVR5:  0          ;R5 SAVE AREA
      013626  000000      SAVSP:  0          ;STACK POINTER SAVE AREA
      013630  000000      SAVPC:  0          ;CALLING ROUTINE SAVE AREA
      013632  000000      INIFLG: 0          ;PROGRAM INITIALIZATION FLAG
      013634  000000      STFLG:  0          ;PROGRAM START FLAG
      013636  000000      LAST:   0          ;LAST ERROR PC
      .IRP      A          <ENDFLG,LINACT,AEACT>
      A:        0
      .ENDM
      013640  000000      ENDFLG: 0
      013642  000000      LINACT: 0
      013644  000000      AEACT:  0

```

: 3

	000001	TDAT=1	
4	013646	000	TBUF: .BYTE 0
5		000377	.REPT 377
6			.BYTE TDAT
7			.NLIST
8			TDAT=TDAT+1
9			.LIST
10			.ENOR
	013647	001	.BYTE TDAT
		000002	TDAT=TDAT+1
	013650	002	.BYTE TDAT
		000003	TDAT=TDAT+1
	013651	003	.BYTE TDAT
		000004	TDAT=TDAT+1
	013652	004	.BYTE TDAT
		000005	TDAT=TDAT+1
	013653	005	.BYTE TDAT
		000006	TDAT=TDAT+1
	013654	006	.BYTE TDAT
		000007	TDAT=TDAT+1
	013655	007	.BYTE TDAT
		000010	TDAT=TDAT+1
	013656	010	.BYTE TDAT
		000011	TDAT=TDAT+1
	013657	011	.BYTE TDAT
		000012	TDAT=TDAT+1
	013660	012	.BYTE TDAT
		000013	TDAT=TDAT+1
	013661	013	.BYTE TDAT
		000014	TDAT=TDAT+1
	013662	014	.BYTE TDAT
		000015	TDAT=TDAT+1
	013663	015	.BYTE TDAT
		000016	TDAT=TDAT+1
	013664	016	.BYTE TDAT
		000017	TDAT=TDAT+1
	013665	017	.BYTE TDAT
		000020	TDAT=TDAT+1
	013666	020	.BYTE TDAT
		000021	TDAT=TDAT+1
	013667	021	.BYTE TDAT
		000022	TDAT=TDAT+1
	013670	022	.BYTE TDAT
		000023	TDAT=TDAT+1
	013671	023	.BYTE TDAT
		000024	TDAT=TDAT+1
	013672	024	.BYTE TDAT
		000025	TDAT=TDAT+1
	013673	025	.BYTE TDAT
		000026	TDAT=TDAT+1
	013674	026	.BYTE TDAT
		000027	TDAT=TDAT+1
	013675	027	.BYTE TDAT
		000030	TDAT=TDAT+1
	013676	030	.BYTE TDAT
		000031	TDAT=TDAT+1
	013677	031	.BYTE TDAT

	000032	TDAT=TDAT+1
013700	032	.BYTE TDAT
	000033	TDAT=TDAT+1
013701	033	.BYTE TDAT
	000034	TDAT=TDAT+1
013702	034	.BYTE TDAT
	000035	TDAT=TDAT+1
013703	035	.BYTE TDAT
	000036	TDAT=TDAT+1
013704	036	.BYTE TDAT
	000037	TDAT=TDAT+1
013705	037	.BYTE TDAT
	000040	TDAT=TDAT+1
013706	040	.BYTE TDAT
	000041	TDAT=TDAT+1
013707	041	.BYTE TDAT
	000042	TDAT=TDAT+1
013710	042	.BYTE TDAT
	000043	TDAT=TDAT+1
013711	043	.BYTE TDAT
	000044	TDAT=TDAT+1
013712	044	.BYTE TDAT
	000045	TDAT=TDAT+1
013713	045	.BYTE TDAT
	000046	TDAT=TDAT+1
013714	046	.BYTE TDAT
	000047	TDAT=TDAT+1
013715	047	.BYTE TDAT
	000050	TDAT=TDAT+1
013716	050	.BYTE TDAT
	000051	TDAT=TDAT+1
013717	051	.BYTE TDAT
	000052	TDAT=TDAT+1
013720	052	.BYTE TDAT
	000053	TDAT=TDAT+1
013721	053	.BYTE TDAT
	000054	TDAT=TDAT+1
013722	054	.BYTE TDAT
	000055	TDAT=TDAT+1
013723	055	.BYTE TDAT
	000056	TDAT=TDAT+1
013724	056	.BYTE TDAT
	000057	TDAT=TDAT+1
013725	057	.BYTE TDAT
	000060	TDAT=TDAT+1
013726	060	.BYTE TDAT
	000061	TDAT=TDAT+1
013727	061	.BYTE TDAT
	000062	TDAT=TDAT+1
013730	062	.BYTE TDAT
	000063	TDAT=TDAT+1
013731	063	.BYTE TDAT
	000064	TDAT=TDAT+1
013732	064	.BYTE TDAT
	000065	TDAT=TDAT+1
013733	065	.BYTE TDAT
	000066	TDAT=TDAT+1

013734	066	.BYTE TDAT
	000067	TDAT=TDAT+1
013735	067	.BYTE TDAT
	000070	TDAT=TDAT+1
013736	070	.BYTE TDAT
	000071	TDAT=TDAT+1
013737	071	.BYTE TDAT
	000072	TDAT=TDAT+1
013740	072	.BYTE TDAT
	000073	TDAT=TDAT+1
013741	073	.BYTE TDAT
	000074	TDAT=TDAT+1
013742	074	.BYTE TDAT
	000075	TDAT=TDAT+1
013743	075	.BYTE TDAT
	000076	TDAT=TDAT+1
013744	076	.BYTE TDAT
	000077	TDAT=TDAT+1
013745	077	.BYTE TDAT
	000100	TDAT=TDAT+1
013746	100	.BYTE TDAT
	000101	TDAT=TDAT+1
013747	101	.BYTE TDAT
	000102	TDAT=TDAT+1
013750	102	.BYTE TDAT
	000103	TDAT=TDAT+1
013751	103	.BYTE TDAT
	000104	TDAT=TDAT+1
013752	104	.BYTE TDAT
	000105	TDAT=TDAT+1
013753	105	.BYTE TDAT
	000106	TDAT=TDAT+1
013754	106	.BYTE TDAT
	000107	TDAT=TDAT+1
013755	107	.BYTE TDAT
	000110	TDAT=TDAT+1
013756	110	.BYTE TDAT
	000111	TDAT=TDAT+1
013757	111	.BYTE TDAT
	000112	TDAT=TDAT+1
013760	112	.BYTE TDAT
	000113	TDAT=TDAT+1
013761	113	.BYTE TDAT
	000114	TDAT=TDAT+1
013762	114	.BYTE TDAT
	000115	TDAT=TDAT+1
013763	115	.BYTE TDAT
	000116	TDAT=TDAT+1
013764	116	.BYTE TDAT
	000117	TDAT=TDAT+1
013765	117	.BYTE TDAT
	000120	TDAT=TDAT+1
013766	120	.BYTE TDAT
	000121	TDAT=TDAT+1
013767	121	.BYTE TDAT
	000122	TDAT=TDAT+1
013770	122	.BYTE TDAT

013771	000123	TDAT=TDAT+1
	123	.BYTE TDAT
013772	000124	TDAT=TDAT+1
	124	.BYTE TDAT
013773	000125	TDAT=TDAT+1
	125	.BYTE TDAT
013774	000126	TDAT=TDAT+1
	126	.BYTE TDAT
013775	000127	TDAT=TDAT+1
	127	.BYTE TDAT
013776	000130	TDAT=TDAT+1
	130	.BYTE TDAT
013777	000131	TDAT=TDAT+1
	131	.BYTE TDAT
014000	000132	TDAT=TDAT+1
	132	.BYTE TDAT
014001	000133	TDAT=TDAT+1
	133	.BYTE TDAT
014002	000134	TDAT=TDAT+1
	134	.BYTE TDAT
014003	000135	TDAT=TDAT+1
	135	.BYTE TDAT
014004	000136	TDAT=TDAT+1
	136	.BYTE TDAT
014005	000137	TDAT=TDAT+1
	137	.BYTE TDAT
014006	000140	TDAT=TDAT+1
	140	.BYTE TDAT
014007	000141	TDAT=TDAT+1
	141	.BYTE TDAT
014010	000142	TDAT=TDAT+1
	142	.BYTE TDAT
014011	000143	TDAT=TDAT+1
	143	.BYTE TDAT
014012	000144	TDAT=TDAT+1
	144	.BYTE TDAT
014013	000145	TDAT=TDAT+1
	145	.BYTE TDAT
014014	000146	TDAT=TDAT+1
	146	.BYTE TDAT
014015	000147	TDAT=TDAT+1
	147	.BYTE TDAT
014016	000150	TDAT=TDAT+1
	150	.BYTE TDAT
014017	000151	TDAT=TDAT+1
	151	.BYTE TDAT
014020	000152	TDAT=TDAT+1
	152	.BYTE TDAT
014021	000153	TDAT=TDAT+1
	153	.BYTE TDAT
014022	000154	TDAT=TDAT+1
	154	.BYTE TDAT
014023	000155	TDAT=TDAT+1
	155	.BYTE TDAT
014024	000156	TDAT=TDAT+1
	156	.BYTE TDAT
	000157	TDAT=TDAT+1

014025	157	.BYTE TDAT
	000160	TDAT=TDAT+1
014026	160	.BYTE TDAT
	000161	TDAT=TDAT+1
014027	161	.BYTE TDAT
	000162	TDAT=TDAT+1
014030	162	.BYTE TDAT
	000163	TDAT=TDAT+1
014031	163	.BYTE TDAT
	000164	TDAT=TDAT+1
014032	164	.BYTE TDAT
	000165	TDAT=TDAT+1
014033	165	.BYTE TDAT
	000166	TDAT=TDAT+1
014034	166	.BYTE TDAT
	000167	TDAT=TDAT+1
014035	167	.BYTE TDAT
	000170	TDAT=TDAT+1
014036	170	.BYTE TDAT
	000171	TDAT=TDAT+1
014037	171	.BYTE TDAT
	000172	TDAT=TDAT+1
014040	172	.BYTE TDAT
	000173	TDAT=TDAT+1
014041	173	.BYTE TDAT
	000174	TDAT=TDAT+1
014042	174	.BYTE TDAT
	000175	TDAT=TDAT+1
014043	175	.BYTE TDAT
	000176	TDAT=TDAT+1
014044	176	.BYTE TDAT
	000177	TDAT=TDAT+1
014045	177	.BYTE TDAT
	000200	TDAT=TDAT+1
014046	200	.BYTE TDAT
	000201	TDAT=TDAT+1
014047	201	.BYTE TDAT
	000202	TDAT=TDAT+1
014050	202	.BYTE TDAT
	000203	TDAT=TDAT+1
014051	203	.BYTE TDAT
	000204	TDAT=TDAT+1
014052	204	.BYTE TDAT
	000205	TDAT=TDAT+1
014053	205	.BYTE TDAT
	000206	TDAT=TDAT+1
014054	206	.BYTE TDAT
	000207	TDAT=TDAT+1
014055	207	.BYTE TDAT
	000210	TDAT=TDAT+1
014056	210	.BYTE TDAT
	000211	TDAT=TDAT+1
014057	211	.BYTE TDAT
	000212	TDAT=TDAT+1
014060	212	.BYTE TDAT
	000213	TDAT=TDAT+1
014061	213	.BYTE TDAT

	000214	TDAT=TDAT+1
014062	214	.BYTE TDAT
	000215	TDAT=TDAT+1
014063	215	.BYTE TDAT
	000216	TDAT=TDAT+1
014064	216	.BYTE TDAT
	000217	TDAT=TDAT+1
014065	217	.BYTE TDAT
	000220	TDAT=TDAT+1
014066	220	.BYTE TDAT
	000221	TDAT=TDAT+1
014067	221	.BYTE TDAT
	000222	TDAT=TDAT+1
014070	222	.BYTE TDAT
	000223	TDAT=TDAT+1
014071	223	.BYTE TDAT
	000224	TDAT=TDAT+1
014072	224	.BYTE TDAT
	000225	TDAT=TDAT+1
014073	225	.BYTE TDAT
	000226	TDAT=TDAT+1
014074	226	.BYTE TDAT
	000227	TDAT=TDAT+1
014075	227	.BYTE TDAT
	000230	TDAT=TDAT+1
014076	230	.BYTE TDAT
	000231	TDAT=TDAT+1
014077	231	.BYTE TDAT
	000232	TDAT=TDAT+1
014100	232	.BYTE TDAT
	000233	TDAT=TDAT+1
014101	233	.BYTE TDAT
	000234	TDAT=TDAT+1
014102	234	.BYTE TDAT
	000235	TDAT=TDAT+1
014103	235	.BYTE TDAT
	000236	TDAT=TDAT+1
014104	236	.BYTE TDAT
	000237	TDAT=TDAT+1
014105	237	.BYTE TDAT
	000240	TDAT=TDAT+1
014106	240	.BYTE TDAT
	000241	TDAT=TDAT+1
014107	241	.BYTE TDAT
	000242	TDAT=TDAT+1
014110	242	.BYTE TDAT
	000243	TDAT=TDAT+1
014111	243	.BYTE TDAT
	000244	TDAT=TDAT+1
014112	244	.BYTE TDAT
	000245	TDAT=TDAT+1
014113	245	.BYTE TDAT
	000246	TDAT=TDAT+1
014114	246	.BYTE TDAT
	000247	TDAT=TDAT+1
014115	247	.BYTE TDAT
	000250	TDAT=TDAT+1

014116	250	.BYTE TDAT
	000251	TDAT=TDAT+1
014117	251	.BYTE TDAT
	000252	TDAT=TDAT+1
014120	252	.BYTE TDAT
	000253	TDAT=TDAT+1
014121	253	.BYTE TDAT
	000254	TDAT=TDAT+1
014122	254	.BYTE TDAT
	000255	TDAT=TDAT+1
014123	255	.BYTE TDAT
	000256	TDAT=TDAT+1
014124	256	.BYTE TDAT
	000257	TDAT=TDAT+1
014125	257	.BYTE TDAT
	000260	TDAT=TDAT+1
014126	260	.BYTE TDAT
	000261	TDAT=TDAT+1
014127	261	.BYTE TDAT
	000262	TDAT=TDAT+1
014130	262	.BYTE TDAT
	000263	TDAT=TDAT+1
014131	263	.BYTE TDAT
	000264	TDAT=TDAT+1
014132	264	.BYTE TDAT
	000265	TDAT=TDAT+1
014133	265	.BYTE TDAT
	000266	TDAT=TDAT+1
014134	266	.BYTE TDAT
	000267	TDAT=TDAT+1
014135	267	.BYTE TDAT
	000270	TDAT=TDAT+1
014136	270	.BYTE TDAT
	000271	TDAT=TDAT+1
014137	271	.BYTE TDAT
	000272	TDAT=TDAT+1
014140	272	.BYTE TDAT
	000273	TDAT=TDAT+1
014141	273	.BYTE TDAT
	000274	TDAT=TDAT+1
014142	274	.BYTE TDAT
	000275	TDAT=TDAT+1
014143	275	.BYTE TDAT
	000276	TDAT=TDAT+1
014144	276	.BYTE TDAT
	000277	TDAT=TDAT+1
014145	277	.BYTE TDAT
	000300	TDAT=TDAT+1
014146	300	.BYTE TDAT
	000301	TDAT=TDAT+1
014147	301	.BYTE TDAT
	000302	TDAT=TDAT+1
014150	302	.BYTE TDAT
	000303	TDAT=TDAT+1
014151	303	.BYTE TDAT
	000304	TDAT=TDAT+1
014152	304	.BYTE TDAT

014153	000305	TDAT=TDAT+1
	305	.BYTE TDAT
014154	000306	TDAT=TDAT+1
	306	.BYTE TDAT
014155	000307	TDAT=TDAT+1
	307	.BYTE TDAT
014156	000310	TDAT=TDAT+1
	310	.BYTE TDAT
014157	000311	TDAT=TDAT+1
	311	.BYTE TDAT
014160	000312	TDAT=TDAT+1
	312	.BYTE TDAT
014161	000313	TDAT=TDAT+1
	313	.BYTE TDAT
014162	000314	TDAT=TDAT+1
	314	.BYTE TDAT
014163	000315	TDAT=TDAT+1
	315	.BYTE TDAT
014164	000316	TDAT=TDAT+1
	316	.BYTE TDAT
014165	000317	TDAT=TDAT+1
	317	.BYTE TDAT
014166	000320	TDAT=TDAT+1
	320	.BYTE TDAT
014167	000321	TDAT=TDAT+1
	321	.BYTE TDAT
014170	000322	TDAT=TDAT+1
	322	.BYTE TDAT
014171	000323	TDAT=TDAT+1
	323	.BYTE TDAT
014172	000324	TDAT=TDAT+1
	324	.BYTE TDAT
014173	000325	TDAT=TDAT+1
	325	.BYTE TDAT
014174	000326	TDAT=TDAT+1
	326	.BYTE TDAT
014175	000327	TDAT=TDAT+1
	327	.BYTE TDAT
014176	000330	TDAT=TDAT+1
	330	.BYTE TDAT
014177	000331	TDAT=TDAT+1
	331	.BYTE TDAT
014200	000332	TDAT=TDAT+1
	332	.BYTE TDAT
014201	000333	TDAT=TDAT+1
	333	.BYTE TDAT
014202	000334	TDAT=TDAT+1
	334	.BYTE TDAT
014203	000335	TDAT=TDAT+1
	335	.BYTE TDAT
014204	000336	TDAT=TDAT+1
	336	.BYTE TDAT
014205	000337	TDAT=TDAT+1
	337	.BYTE TDAT
014206	000340	TDAT=TDAT+1
	340	.BYTE TDAT
	000341	TDAT=TDAT+1

014207	341	.BYTE TDAT
	000342	TDAT=TDAT+1
014210	342	.BYTE TDAT
	000343	TDAT=TDAT+1
014211	343	.BYTE TDAT
	000344	TDAT=TDAT+1
014212	344	.BYTE TDAT
	000345	TDAT=TDAT+1
014213	345	.BYTE TDAT
	000346	TDAT=TDAT+1
014214	346	.BYTE TDAT
	000347	TDAT=TDAT+1
014215	347	.BYTE TDAT
	000350	TDAT=TDAT+1
014216	350	.BYTE TDAT
	000351	TDAT=TDAT+1
014217	351	.BYTE TDAT
	000352	TDAT=TDAT+1
014220	352	.BYTE TDAT
	000353	TDAT=TDAT+1
014221	353	.BYTE TDAT
	000354	TDAT=TDAT+1
014222	354	.BYTE TDAT
	000355	TDAT=TDAT+1
014223	355	.BYTE TDAT
	000356	TDAT=TDAT+1
014224	356	.BYTE TDAT
	000357	TDAT=TDAT+1
014225	357	.BYTE TDAT
	000360	TDAT=TDAT+1
014226	360	.BYTE TDAT
	000361	TDAT=TDAT+1
014227	361	.BYTE TDAT
	000362	TDAT=TDAT+1
014230	362	.BYTE TDAT
	000363	TDAT=TDAT+1
014231	363	.BYTE TDAT
	000364	TDAT=TDAT+1
014232	364	.BYTE TDAT
	000365	TDAT=TDAT+1
014233	365	.BYTE TDAT
	000366	TDAT=TDAT+1
014234	366	.BYTE TDAT
	000367	TDAT=TDAT+1
014235	367	.BYTE TDAT
	000370	TDAT=TDAT+1
014236	370	.BYTE TDAT
	000371	TDAT=TDAT+1
014237	371	.BYTE TDAT
	000372	TDAT=TDAT+1
014240	372	.BYTE TDAT
	000373	TDAT=TDAT+1
014241	373	.BYTE TDAT
	000374	TDAT=TDAT+1
014242	374	.BYTE TDAT
	000375	TDAT=TDAT+1
014243	375	.BYTE TDAT

014244 000376
376
014245 000377
377
000400
11
12 014246 000000
13 014310

TDAT=TDAT+1
.BYTE TDAT
TDAT=TDAT+1
.BYTE TDAT
TDAT=TDAT+1
.EVEN
RBUF: 0
...+40

1		.MACRO WORDS WDNAM,K,DATA
2		'WDNAME'K': DATA
3		.ENDM WORDS
5	000020	K=KX
6	000000	DATA=DATA
7	000000	KX=0
9	000020	.REPT 20
10		.NLIST
11		DATA=KX*400+100377
12		.LIST
13		WORDS +/TWRD/,\KX,\DATA
14		.NLIST
15		KX=KX+1
16		.LIST
17		.ENDR
	100377	DATA=KX*400+100377
014310		WORDS +/TWRD/,\KX,\DATA
014310	100377	TWRD0: 100377
	000001	KX=KX+1
	100777	DATA=KX*400+100377
014312		WORDS +/TWRD/,\KX,\DATA
014312	100777	TWRD1: 100777
	000002	KX=KX+1
	101377	DATA=KX*400+100377
014314		WORDS +/TWRD/,\KX,\DATA
014314	101377	TWRD2: 101377
	000003	KX=KX+1
	101777	DATA=KX*400+100377
014316		WORDS +/TWRD/,\KX,\DATA
014316	101777	TWRD3: 101777
	000004	KX=KX+1
	102377	DATA=KX*400+100377
014320		WORDS +/TWRD/,\KX,\DATA
014320	102377	TWRD4: 102377
	000005	KX=KX+1
	102777	DATA=KX*400+100377
014322		WORDS +/TWRD/,\KX,\DATA
014322	102777	TWRD5: 102777
	000006	KX=KX+1
	103377	DATA=KX*400+100377
014324		WORDS +/TWRD/,\KX,\DATA
014324	103377	TWRD6: 103377
	000007	KX=KX+1
	103777	DATA=KX*400+100377
014326		WORDS +/TWRD/,\KX,\DATA
014326	103777	TWRD7: 103777
	000010	KX=KX+1
	104377	DATA=KX*400+100377
014330		WORDS +/TWRD/,\KX,\DATA
014330	104377	TWRD10: 104377
	000011	KX=KX+1
	104777	DATA=KX*400+100377
014332		WORDS +/TWRD/,\KX,\DATA
014332	104777	TWRD11: 104777
	000012	KX=KX+1
	105377	DATA=KX*400+100377
014334		WORDS +/TWRD/,\KX,\DATA

014334	105377	TWRD12: 105377
	000013	KX=KX+1
	105777	DATAX=KX*400+100377
014336		WORDS +/TWRD/, \KX, \DATAX
014336	105777	TWRD13: 105777
	000014	KX=KX+1
	106377	DATAX=KX*400+100377
014340		WORDS +/TWRD/, \KX, \DATAX
014340	106377	TWRD14: 106377
	000015	KX=KX+1
	106777	DATAX=KX*400+100377
014342		WORDS +/TWRD/, \KX, \DATAX
014342	106777	TWRD15: 106777
	000016	KX=KX+1
	107377	DATAX=KX*400+100377
014344		WORDS +/TWRD/, \KX, \DATAX
014344	107377	TWRD16: 107377
	000017	KX=KX+1
	107777	DATAX=KX*400+100377
014346		WORDS +/TWRD/, \KX, \DATAX
014346	107777	TWRD17: 107777
	000020	KX=KX+1
19	107777	DATA=DATAX
20	000020	K=KX
21	000000	DATAX=0
22	000000	KX=0
24	000020	.REPT 20
25		WORDS +/RCNT/, \KX, \DATAX
26		.NLIST
27		KX=KX+1
28		.LIST
29		.ENDR
014350		WORDS +/RCNT/, \KX, \DATAX
014350	000000	RCNT0: 0
	000001	KX=KX+1
014352		WORDS +/RCNT/, \KX, \DATAX
014352	000000	RCNT1: 0
	000002	KX=KX+1
014354		WORDS +/RCNT/, \KX, \DATAX
014354	000000	RCNT2: 0
	000003	KX=KX+1
014356		WORDS +/RCNT/, \KX, \DATAX
014356	000000	RCNT3: 0
	000004	KX=KX+1
014360		WORDS +/RCNT/, \KX, \DATAX
014360	000000	RCNT4: 0
	000005	KX=KX+1
014362		WORDS +/RCNT/, \KX, \DATAX
014362	000000	RCNT5: 0
	000006	KX=KX+1
014364		WORDS +/RCNT/, \KX, \DATAX
014364	000000	RCNT6: 0
	000007	KX=KX+1
014366		WORDS +/RCNT/, \KX, \DATAX
014366	000000	RCNT7: 0
	000010	KX=KX+1
014370		WORDS +/RCNT/, \KX, \DATAX

014370	000000	RCNT10: 0
	000011	KX=KX+1
014372		WORDS +/RCNT/, \KX, \DATA
014372	000000	RCNT11: 0
	000012	KX=KX+1
014374		WORDS +/RCNT/, \KX, \DATA
014374	000000	RCNT12: 0
	000013	KX=KX+1
014376		WORDS +/RCNT/, \KX, \DATA
014376	000000	RCNT13: 0
	000014	KX=KX+1
014400		WORDS +/RCNT/, \KX, \DATA
014400	000000	RCNT14: 0
	000015	KX=KX+1
014402		WORDS +/RCNT/, \KX, \DATA
014402	000000	RCNT15: 0
	000016	KX=KX+1
014404		WORDS +/RCNT/, \KX, \DATA
014404	000000	RCNT16: 0
	000017	KX=KX+1
014406		WORDS +/RCNT/, \KX, \DATA
014406	000000	RCNT17: 0
	000020	KX=KX+1
31	000000	DATA=DATA
32	000020	K=KX
33	0000C0	DATA=0
34	000000	KX=0
36	000020	.REPT 20
37		WORDS +/RDCT/, \KX, \DATA
38		.NLIST
39		KX=KX+1
40		.LIST
41		.ENDR
014410		WORDS +/RDCT/, \KX, \DATA
014410	000000	RDCT0: 0
	000001	KX=KX+1
014412		WORDS +/RDCT/, \KX, \DATA
014412	000000	RDCT1: 0
	000002	KX=KX-1
014414		WORDS +/RDCT/, \KX, \DATA
014414	000000	RDCT2: 0
	000003	KX=KX+1
014416		WORDS +/RDCT/, \KX, \DATA
014416	000000	RDCT3: 0
	000004	KX=KX+1
014420		WORDS +/RDCT/, \KX, \DATA
014420	000000	RDCT4: 0
	000005	KX=KX+1
014422		WORDS +/RDCT/, \KX, \DATA
014422	000000	RDCT5: 0
	000006	KX=KX+1
014424		WORDS +/RDCT/, \KX, \DATA
014424	000000	RDCT6: 0
	000007	KX=KX+1
014426		WORDS +/RDCT/, \KX, \DATA
014426	000000	RDCT7: 0
	000010	KX=KX+1

014430		WORDS	↑/RDCT/, \KX, \DATA
014430	000000	RDCT10:	0
	000011	KX=KX+1	
014432		WORDS	↑/RDCT/, \KX, \DATA
014432	000000	RDCT11:	0
	000012	KX=KX+1	
014434		WORDS	↑/RDCT/, \KX, \DATA
014434	000000	RDCT12:	0
	000013	KX=KX+1	
014436		WORDS	↑/RDCT/, \KX, \DATA
014436	000000	RDCT13:	0
	000014	KX=KX+1	
014440		WORDS	↑/RDCT/, \KX, \DATA
014440	000000	RDCT14:	0
	000015	KX=KX+1	
014442		WORDS	↑/RDCT/, \KX, \DATA
014442	000000	RDCT15:	0
	000016	KX=KX+1	
014444		WORDS	↑/RDCT/, \KX, \DATA
014444	000000	RDCT16:	0
	000017	KX=KX+1	
014446		WORDS	↑/RDCT/, \KX, \DATA
014446	000000	RDCT17:	0
	000020	KX=KX+1	
42	014450	LINBIT:	1
43	014452		2
44	014454		4
45	014456		10
46	014460		20
47	014462		40
48	014464		100
49	014466		200
50	014470		400
51	014472		1000
52	014474		2000
53	014476		4000
54	014500		10000
55	014502		20000
56	014504		40000
57	014506		100000

1 014510

.PFAIL

;ENTER HERE ON POWER FAILURE

```

014510 010046          PFAIL:  MOV    R0,-(SP)          ;SAVE R0-R5 ON PROCESSOR STACK
014512 010146          MOV    R1,-(SP)
014514 010246          MOV    R2,-(SP)
014516 010346          MOV    R3,-(SP)
014520 010446          MOV    R4,-(SP)
014522 010546          MOV    R5,-(SP)
014524 016746 163274   MOV    24,-(SP)
014530 010667 177072   MOV    SP,SAVSP          ;SAVE STACK POINTER
014534 012767 014546 163262  MOV    #RESTART,24      ;SET UP FOR POWER UP TRAP
014542 000000          HALT                                ;HALT ON POWER DOWN NORMAL
014544 000777          BR

```

;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED

```

014546 016706 177054   RESTAR: MOV    SAVSP,SP          ;RESTORE STACK POINTER
014552 012605          MOV    (SP)+,R5          ;RESTORE R0-R5
014554 012604          MOV    (SP)+,R4
014556 012603          MOV    (SP)+,R3
014560 012602          MOV    (SP)+,R2
014562 012601          MOV    (SP)+,R1
014564 012600          MOV    (SP)+,R0
014566 012767 014510 163230  MOV    #PFAIL,24      ;SET UP FOR POWER FAILURE
014574 012767 000340 163174  MOV    #340,PS
014602 012706 015644          MOV    #STACK,SP
014606 005067 000360          CLR    TEMP
014612 005267 000354          INC    TEMP
014616 001375          BNE    .-4
014620 104401          TYPE
014622 014774          MCRLF                                ; 5
014624 104402          OCTASC                                ; 5
014626 014650          PFTAB
014630 104401          TYPE
014632 014777          MPFAIL
014634 005067 176732          CLR    ERRFLG
014640 005067 176772          CLR    LAST
014644 000177 176730          JMP    #RETRN
014650 000001          PFTAB: 1
014652 000006 000002          6,2
014656 013600          RETRN

```


014660				.MSG	↑/DH11 AUTO ECHO TEST/./↑/CZDMM-CO/
014660	015	012	012	MTITLE:	.ASCIZ <15><12><12>/DH11 AUTO ECHO TEST /<15><12>
014663	104	110	061		
014666	061	040	101		
014671	125	124	117		
014674	040	105	103		
014677	110	117	040		
014702	124	105	123		
014705	124	040	015		
014710	012	000			
014712	015	012	126	MVECTOR:	.ASCIZ <15><12>/VECTOR ADDRESS-/
014715	105	103	124		
014720	117	122	040		
014723	101	104	104		
014726	122	105	123		
014731	123	055	000		
014734	015	012	103	MREGAD:	.ASCIZ <15><12>/CONTROL REGISTER ADDRESS-/
014737	117	116	124		
014742	122	117	114		
014745	040	122	105		
014750	107	111	123		
014753	124	105	122		
014756	040	101	104		
014761	104	122	105		
014764	123	123	055		
014767	000				
014770	040	040	077	MQM:	.ASCIZ / ?/
014773	000				
014774	015	012	000	MCRLF:	.ASCIZ <15><12>
014777	040	040	120	MPFAIL:	.ASCIZ / POWER FAILURE, PROGRAM RESTART AT TEST IN PROGRESS/
015002	117	127	105		
015005	122	040	106		
015010	101	111	114		
015013	125	122	105		
015016	054	040	120		
015021	122	117	107		
015024	122	101	115		
015027	040	122	105		
015032	123	124	101		
015035	122	124	040		
015040	101	124	040		
015043	124	105	123		
015046	124	040	111		
015051	116	040	120		
015054	122	117	107		
015057	122	105	123		
015062	123	000			
015064	015	012	103	MEPASS:	.ASCIZ <15><12>/CZDMM-CO/
015067	132	104	110		
015072	110	055	103		
015075	060	000			
015077	015	012	120	PASTXT:	.ASCIZ <15><12>/PASS COUNT = /
015102	101	123	123		
015105	040	103	117		
015110	125	116	124		
015113	040	075	040		

```

015116      000
015117      015      012      122 MR:      .ASCIZ  <15><12>/R/
015122      000
015123      015      012      124 MTSTPC: .ASCIZ  <15><12>/TEST PC-/
015126      105      123      124
015131      040      120      103
015134      055      000

      .EVEN
      .EVEN
      .TRPTAB

3 015136

      ;TABLE OF POINTERS FOR TRAP DECODING

015136      012232      TRPTAB: SCOPER
015140      012706      TYPER
015142      013226      OCTASN
015144      012740      INSTRG
015146      013032      INSTRE
015150      013042      PARAMS
015152      012614      SVOSP
015154      012654      RSOS
015156      012332      SCOP1R
4 015160      .BUFFER

      ;BUFFERS FOR INPUT-OUTPUT

015160      000000      INBUF:  0
      015172      .+.10
015172      000000      TEMP:   0
      015204      .+.10

015204      000000      MDATA:  0
      015216      .+.10
5 015216      .ERRTAB

      ;TABLE OF POINTERS TO ERROR MESSAGES AND DATA

015216      ERRTAB:
6 015216      015232      EM1
7 015220      015414      DT1
8 015222      015267      EM2
9 015224      015426      DT2
10 015226      015343      EM3
11 015230      015426      DT2
12 015232      101      125      124 EM1:  .ASCIZ  /AUTO ECHO ERROR/<15><12>/EXP      REC/
      015235      117      040      105
      015240      103      110      117
      015243      040      105      122
      015246      122      117      122
      015251      015      012      105
      015254      130      120      040
      015257      040      040      040
      015262      040      122      105
      015265      103      000
13 015267      116      117      116 EM2:  .ASCIZ  /NON ECHOED DATA ERROR/<15><12>/EXP      REC      LINE/
      015272      040      105      103
      015275      110      117      105

```

	015300	104	040	104			
	015303	101	124	101			
	015306	040	105	122			
	015311	122	117	122			
	015314	015	012	105			
	015317	130	120	040			
	015322	040	040	040			
	015325	040	122	105			
	015330	103	040	040			
	015333	040	040	040			
	015336	114	111	116			
14	015341	105	000				
	015343	105	103	110	EM3:	.ASCIZ	/ECHOED DATA ERROR/<15><12>/EXP
	015346	117	105	104		REC	LINE/
	015351	040	104	101			
	015354	124	101	040			
	015357	105	122	122			
	015362	117	122	015			
	015365	012	105	130			
	015370	120	040	040			
	015373	040	040	040			
	015376	122	105	103			
	015401	040	040	040			
	015404	040	040	114			
	015407	111	116	105			
	015412	000					
15					.EVEN		
16	015414	000002			DT1:	2	
17	015416	006	002		.BYTE	6.2	
18	015420	013624				SAVR5	
19	015422	006	000		.BYTE	6.0	
20	015424	013622				SAVR4	
21	015426	000003			DT2:	3	
22	015430	006	002		.BYTE	6.2	
23	015432	013624				SAVR5	
24	015434	006	002		.BYTE	6.2	
25	015436	013622				SAVR4	
26	015440	002	002		.BYTE	2.2	
27	015442	013620				SAVR3	
28	015444				.ENDCOD		
	015444	000000			ENDCOD:	0	
29		000001			.END		

ADRCNT - 013225	ERRTAB 015216	POPRO = 012600	SAVR4 013622	TWRD2 014314
AEACT 013644	ERTAB0 012554	POP1SP= 005726	SAVR5 013624	TWRD3 014316
BEGIN 001306	ESCAPE 013602	POP2SP= 022626	SAVSP 013626	TWRD4 014320
BINWRD 013376	EXITER 012532	PS = 177776	SAV05P= 104406	TWRD5 014322
BITX = 000000	FREEZ1 013604	PUSHRO= 010046	SCOPE = 104400	TWRD6 014324
BIT00 = 000001	HALTS 012512	PUSH1S= 005746	SCOPE1= 104410	TWRD7 014326
BIT01 = 000002	HILIM 013220	PUSH2S= 024646	SCOPE1R 012332	TYPDAT 012472
BIT02 = 000004	ICOUNT 013606	RBUF 014246	SETALL 013426	TYPE = 104401
BIT03 = 000010	INBUF 015160	RCNT0 014350	SPACNT= 013375	TYPER 012706
BIT04 = 000020	INIFLG 013632	RCNT1 014352	STACK = 015644	TYPMSG 012450
BIT05 = 000040	INSTER= 104404	RCNT10 014370	START 001004	T1 001400
BIT06 = 000100	INSTR = 104403	RCNT11 014372	STFLG 013634	T10 003002
BIT07 = 000200	INSTRE 013032	RCNT12 014374	SV05 012622	T11 003160
BIT08 = 000400	INSTRG 012740	RCNT13 014376	SV05P 012614	T12 003336
BIT09 = 001000	INSTR1 012752	RCNT14 014400	SWR 001000	T13 003514
BIT10 = 002000	INSTR2 013040	RCNT15 014402	SW00 = 000001	T14 003672
BIT11 = 004000	K = 000020	RCNT16 014404	SW01 = 000002	T15 004050
BIT12 = 010000	KX = 000020	RCNT17 014406	SW02 = 000004	T16 004226
BIT13 = 020000	LAST 013636	RCNT2 014354	SW03 = 000010	T17 004404
BIT14 = 040000	LIGHTS 001002	RCNT3 014356	SW04 = 000020	T2 001556
BIT15 = 100000	LIMITS 013152	RCNT4 014360	SW05 = 000040	T20 004562
CHRCNT 013374	LINACT 013642	RCNT5 014362	SW06 = 000100	T21 004740
CLRALL 013400	LINBIT 014450	RCNT6 014364	SW08 = 000400	T22 005176
DATA = 000000	LINE = 000020	RCNT7 014366	SW09 = 001000	T23 005434
DATABP 012506	LOBITS 013224	RDCT0 014410	SW10 = 002000	T24 005672
DATAx = 000000	LOGICA 012210	RDCT1 014412	SW11 = 004000	T25 006130
DEVADR 013222	LOLIM 013216	RDCT10 014430	SW12 = 010000	T26 006366
DHBA 013546	LPCNT 013610	RDCT11 014432	SW13 = 020000	T27 006624
DHBAr 013552	MCRLF 014774	RDCT12 014434	SW14 = 040000	T3 001734
DHBC 013550	MDATA 015204	RDCT13 014436	SW15 = 100000	T30 007062
DHBCr 013554	MEPASS 015064	RDCT14 014440	TBUF 013646	T31 007320
DHLPR 013544	MPFAIL 014777	RDCT15 014442	TDAT = 000400	T32 007556
DHNRc 013542	MQM 014770	RDCT16 014444	TEMP 015172	T33 010014
DHRLVL 013564	MR 015117	RDCT17 014446	TKCSR 013530	T34 010252
DHRVEC 013562	MREGAD 014734	RDCT2 014414	TKDBR 013532	T35 010510
DHSCR 013540	MSG 012754	RDCT3 014416	TPCSR 013534	T36 010746
DHSLR 013560	MTITLE 014660	RDCT4 014420	TPDBR 013536	T37 011204
DHSSR 013556	MTSTPC 015123	RDCT5 014422	TRPK 012574	T4 002112
DHTLVL 013570	MVECTO 014712	RDCT6 014424	TRPSRV 012562	T40 011442
DHTVEC 013566	N = 000001	RDCT7 014426	TRPTAB 015136	T41 011700
DT1 015414	OCTASC= 104402	RESREG 012510	TWRD0 014310	T5 002270
DT2 015426	OCTASN 013226	RESTAR 014546	TWRD1 014312	T6 002446
EM1 015232	PARAM = 104405	RESTRT 012220	TWRD10 014330	T7 002624
EM2 015267	PARAMS 013042	RES05 = 104407	TWRD11 014332	VEC1 001164
EM3 015343	PARAM1 013072	RETRN 013600	TWRD12 014334	VEC2 001174
ENDCOD 015444	PARERR 013146	RS05 012654	TWRD13 014336	WRDCNT 013372
ENDFLG 013640	PASARG 012224	SAVPC 013630	TWRD14 014340	X = 000000
EOP 012132	PASCNT 013574	SAVR0 013612	TWRD15 014342	XBIT = 000000
EPRCNT 013576	PASTXT 015077	SAVR1 013614	TWRD16 014344	XLINE = 000020
ERRFLG 013572	PFAIL 014510	SAVR2 013616	TWRD17 014346	XN = 000042
ERRMSG 012470	PFTAB 014650	SAVR3 013620		Y = 000011
ERRCRS 012350				

ABS. 015446 000
000000 001
ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 19200 WORDS (75 PAGES)

SYMBOL TABLE

DYNAMIC MEMORY AVAILABLE FOR 71 PAGES
CZDMMC.BIN,CZDMMC.SEG-CZDMMC.DOC,DHMACA.MAC,CZDMMC.P11