

DH11

ECHO TEST

MD-11-DZDHJ-B

EP-DZDHJ-B-DL-A

OCT 1976

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FICHE 1 OF 1

Made In U.S.A.

This microfiche card contains a grid of frames. The frames on the left side of the card contain data, likely test results or system logs, organized in a structured format. The frames on the right side are mostly blank, indicating that the data is concentrated in the left portion of the card. The data in the frames appears to be organized in columns and rows, possibly representing different test parameters or system states over time.

.REM *

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDHJ-S-0
PRODUCT NAME: DH11 ECHO/CABLE TEST
DATE CREATED: APRIL 1973
REVISED: JANUARY 1975
MAINTAINER: DIAGNOSTIC
AUTHOR: GEORGE BAISLEY

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001

1. ABSTRACT
THE DH11 ECHO/CABLE DIAGNOSTIC IS DIVIDED INTO TWO TESTS.
THE FIRST TEST (ECHO) IS A QUICK VERIFY TEST USING
A TTY OR VT05 ETC.

THE SECOND TEST (CABLE TEST) IS A QUICK VERIFY TEST USING THE
CABLE TERMINATOR (TEST CONNECTOR).

BOTH TESTS ASSUME 8 BITS/CHARACTER, NO PARITY GENERATION
OR CHECKING, AND A DH PRIORITY LEVEL 5 (BR:5)

1.1 THE DH11 ECHO TEST VERIFIES THAT ALL CHARACTERS (0-377)
WILL ECHO ON EACH LINE (0-17 OCTAL) WITH STANDARD DH11
TERMINAL ATTACHMENTS TTY 33,35 OR VT05 ETC. USING ASCII
ASYNCHRONOUS CODE

1.2 THE DH11 CABLE TEST VERIFIES THAT ALL CHARACTERS (0-377)
ARE TRANSMITTED AND RECEIVED ON A PER LINE BASIS.
THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR !

2. REQUIREMENTS

PDP-11 FAMILY STANDARD COMPUTER WITH MINIMUM 4K MEMORY.
DH11 ASYNCHRONOUS MULTIPLEXER.

2.1 FOR THE ECHO TEST
TWO TERMINALS; ONE FOR CONSOLE, ONE FOR DH11 ECHO TEST.

2.2 FOR THE CABLE TEST
ONE CONSOLE TERMINAL, ONE TEST CONNECTOR MINIMUM

2.3 STORAGE

THE PROGRAM LOADS INTO 4KW OF MEMORY WITH ABS LOADER

3. LOADING PROCEDURE

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

4. STARTING PROCEDURE

CONTROL SWITCH SETTINGS

AFTER PROGRAM LOAD (INITIAL PROGRAM START)

ALL CONSOLE SWITCHES DOWN.

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

SW00=1

TO MODIFY DH11 LINE NUMBER AND BAUD RATE OF DH11 (WHILE RUNNING)

SW02=1 (MOMENTARILY- DO NOT LEAVE THIS SWITCH UP AFTER LINE # QUESTION)

4.2 STARTING ADDRESS

THE STARTING ADDRESS FOR ALL TESTS IS 000200

THE RESTART ADDRESS FOR ALL TESTS IS 000200

4.3 PROGRAM AND/OR OPERATOR ACTION

4.3.1 INITIAL PROGRAM START

LOAD PROGRAM INTO MEMORY

LOAD ADDRESS 000200

CLEAR CONSOLE SWITCHES

PRESS START

4.3.2 THE PROGRAM WILL TYPE "DH11 ECHO/CABLE TEST" <CR>
DZDHJ-REVISION B (ONCE ONLY)
AND WILL TYPE "WHICH TEST ECHO OR CABLE (E OR C)" AND WILL
WAIT FOR AN INPUT FROM THE CONSOLE TELETYPE KEYBOARD

TYPE IN THE TEST YOU INTEND TO RUN (E OR C) FOLLOWED BY A <CARRIAGE RETURN>

IF AN INCORRECT CHARACTER IS TYPED, THE PROGRAM WILL TYPE "?"
AND WILL THEN REPEAT THE MESSAGE

4.3.3 THE PROGRAM WILL TYPE "VECTOR ADDRESS-" AND WAIT
FOR AN INPUT FROM THE TELETYPE KEYBOARD.

TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT
VECTOR FOR THE DH11 TO BE TESTED FOLLOWED BY A
<CARRIAGE RETURN>.

4.3.3 THE PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD.

TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
OF THE DH11 TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>

IF AN INCORRECT ADDRESS IS TYPED, THE PROGRAM WILL
TYPE "?" AND WILL THEN REPEAT THE MESSAGE

4.3.4 THE PROGRAM WILL TYPE "LINE NUMBER IN OCTAL-" AND
WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD.

TYPE IN THE DH11 LINE NUMBER (IN OCTAL, FROM 0 TO 17)
TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>.

4.3.5 THE PROGRAM WILL TYPE "BAUD RATE-" AND WAIT FOR
AN INPUT FROM THE TELETYPE KEYBOARD.

TYPE IN THE APPROPRIATE DH11 TERMINAL'S LINE
SPEED FOLLOWED BY <CARRIAGE RETURN>.
(ANY LEGAL BAUD RATE IS ACCEPTABLE IN THE CABLE TEST) TRY 'EM ALL

IF AN INVALID BAUD RATE IS TYPED IN THE PROGRAM
WILL TYPE "INVALID BAUD RATE" AND REPEAT THE MESSAGE.

- 4.3.6 THE PROGRAM WILL TYPE "ECHO" OR "CABLE" RESP. TO INDICATE THAT IT IS
ABOUT TO START TESTING, AND THEN TESTING WILL BEGIN.

THE ECHO TEST WILL TYPE "TYPE A CHARACTER ON DH11 TERMINAL"
-TYPE OR TRANSMIT VIA PREPUNCHED TAPE ANY SEQUENCE OF CHARACTERS(EXCEPT +C)
A CONTROL C (+C) WHEN TYPED ON THE DH11 TERMINAL WILL CAUSE
PROGRAM TO EXIT TO THE END OF PASS ROUTINE.

THE CABLE TEST REQUIRES NO ADDITIONAL OPERATOR INTERVENTION
UNLESS TO RESELECT LINE #, BAUD RATE, ETC.

NOTE: TO CHANGE LINE NUMBER AND/OR BAUD RATE,
SIMPLY MOMENTARILY RAISE SW02 (SW02=1).

- 4.4 PROGRAM RESTART WITH ALL SWITCHES DOWN

LOAD ADDRESS 000200

PRESS START

THE PROGRAM WILL TYPE "ECHO" OR "CABLE" RESPECTIVELY
AND COMMENCE TESTING AS BEFORE.

- 4.5 PROGRAM RESTART WITH SW00=1

LOAD ADDRESS 000200

SET SW01=1

PRESS START

THE PROGRAM WILL PERFORM AS DESCRIBED IN 4.3.2 TO 4.3.6

5. OPERATING PROCEDURE

- 5.1 OPERATIONAL SWITCH SETTINGS

SW15=1, HALT ON ERROR
SW14=1, LOOP ON CURRENT TEST (CABLE TEST ONLY)
SW13=1, SUPPRESS ERROR TYPEOUT
SW11=1, INHIBIT ITERATIONS (CABLE TEST ONLY)
SW10=1, ESCAPE ON ERROR
SW02=1, RESELECT LINE NUMBER AND BAUD RATE (MOMENTARILY)
SW00=1, CHANGE PARAMETERS AT PROGRAM RESTART

- 6.0 ERRORS

6.1 ERROR HALTS

THE ERROR MESSAGE FORMAT FOR ALL ERROR TYPEOUTS IS AS FOLLOWS:

PC+2
MESSAGE

WHERE
PC+2 IS THE ADDRESS OF THE CALL TO THE ERROR HANDLER +2
MESSAGE IS AN ASCII MESSAGE DESCRIBING (BRIEFLY) THE FAILURE

6.1.1 ERROR DESCRIPTIONS

SEE LISTING FOR DETAILS OF ERRORS

NOTE: FOR SERIOUS TROUBLESHOOTING....USE THE REGULAR DH11 DIAGNOSTICS

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 OCCURRED.
THE PROGRAM MUST BE RESTARTED AT 200 TO RECOVER FROM THIS
ERROR.

7. RESTRICTIONS

NONE

8. MISCELLANEOUS

- THE ECHO TEST DOES NOT ENABLE AUTO-ECHO
- BAUD RATE 134.5 HAS BEEN ROUNDED OFF TO 135

9. PROGRAM DESCRIPTION

BOTH TESTS CHECK OUT THE DH11 IN AN "ONLINE" FUNCTION;
ONE LINE AT A TIME AT THE FOLLOWING ASYNCHRONOUS BAUD
RATES: 50,75,110,134.5,150,200,300,600,1200,1800,2400,4800,9600.

10. LISTING

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:DH11 ECHO/CABLE TEST
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:STARTING PROCEDURE
:LOAD PROGRAM
:LOAD ADDRESS 000200
:PRESS START
:PROGRAM WILL TYPE DH11 ECHO/CABLE TEST
:PROGRAM WILL TYPE WHICH TEST- ECHO OR CABLE
:TYPE IN E OR C RESPECTIVELY
: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 "LINE NUMBER-"
:TYPE IN THE LINE NUMBER TO BE TESTED (IN OCTAL)
:FOLLOWED BY <CARRIAGE RETURN>
:PROGRAM WILL TYPE "BAUD RATE-"
:TYPE IN THE BAUD RATE OF THE DH11 TERMINAL
:FOLLOWED BY <CARRIAGE RETURN>
:THE FOLLOWING BAUD RATES ARE ACCEPTED IN DECIMAL

- 50
- 75
- 110
- 135 (ROUNDED OFF 134.5)
- 150
- 200
- 300
- 600
- 1200
- 1800
- 2400
- 4800
- 9600

:ALL OTHERS ARE REJECTED

:PROGRAM WILL TYPE "ECHO" OR "CABLE TEST" TO INDICATE THAT TESTING HAS STARTED
:AT THE END OF A PASS, PROGRAM WILL TYPE " DZDHJB "
:AND THEN RESUME TESTING

:SWITCH REGISTER OPTIONS

!00000
040000
020000
010000
004000
002000
001000
000400
000100
000040
000020

SW15=100000
SW14=40000
SW13=20000
SW12=10000
SW11=4000
SW10=2000
SW09=1000
SW08=400
SW06=100
SW05=40
SW04=20

: =1, HALT ON ERROR
: =1, LOOP ON CURRENT TEST
: =1, INHIBIT ERROR TYPEOUT

: =1, INHIBIT ITERATIONS
: =1, ESCAPE TO NEXT TEST ON ERROR
: =1, LOOP WITH CURRENT DATA

Vertical column of characters on the left margin, likely a scan artifact or a specific test sequence indicator.

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000024 000024 . =24
000024 004774
000026 000340
000030 002566
000032 000340
000034 002770
000036 000340
000200 000200 . =200
000200 000137 001100

PFAIL :POWER FAIL HANDLER
340 :SERVICE AT LEVEL 7
ERRORS :ERROR HANDLER
340 :SERVICE AT LEVEL 7
TRPSRV :GENERAL HANDLER DISPATCH SERVICE
340 :SERVICE AT LEVEL 7
JMP START :GO TO START OF PROGRAM

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

104400
104401
104402
104403
104404
104405
104406
104407
104410
104411
104412
104413
001100 . =1100

SCOPE=TRAP+0 :SCOPE LOOP AND ITERATION HANDLER
TYPE=TRAP+1 :TELETYPE OUTPUT ROUTINE
OCTASC=TRAP+2 :OCTAL TO ASCII CONVERSION
INSTR=TRAP+3 :INPUT ASCII STRING
INSTER=TRAP+4 :STRING INPUT ERROR
PARAM=TRAP+5 :CONVERT STRING TO OCTAL, CHECK LIMITS
SAVOSP=TRAP+6 :SAVE R0-R5, PC
RESOS=TRAP+7 :RESTORE R0-R5
SCOPE1=TRAP+10 :CHECK FOR FREEZE ON CURRENT DATA
PARAMD=TRAP+11 :CONVERT DECIMAL STRING TO OCTAL
PAWCH=TRAP+12 :SET FLAG ECHO OR CABLE
SAVOS=TRAP+13 :SAVE R0 - R5

:PROGRAM INITIALIZATION
:LOCK OUT INTERRUPTS
:SET UP PROCESSOR STACK
:SET UP POWER FAIL VECTOR
:CLEAR PROGRAM FLAGS AND COUNTS
:TYPE TITLE MESSAGE

001100
001100 012737 000340 177776
001106 012706 001100
001112 012737 004774 000024
001120 012737 001100 004700
001126 005037 004736
001132 005037 004674
001136 005037 004676
001142 005037 004672
001146 005037 004742
001152 005237 004732
001156 001003
001160 104401 005136
001164 000404
001166 032737 000001 177570
001174 001471
001176 012701 000300

STACK:
START: MOV #340,PS :LOCK OUT INTERRUPTS
MOV #STACK,SP :SET UP PROCESSOR STACK
MOV #PFAIL,#24 :SET UP POWER FAIL TRAP
MOV #START,RETURN :SET UP IN CASE OF POWER FAIL
CLR STFLG :CLEAR TEST START FLAG
CLR PASCNT :CLEAR PASS COUNT
CLR ERRCNT :CLEAR ERROR COUNT
CLR ERRFLG :CLEAR ERROR FLAG
CLR LAST :CLEAR LAST ERROR PC
INC INIFLG :SET UP FOR ONCE ONLY TYPE OUT
BNE VEC1 :DITTO
TYPE ,MTITLE :TYPE TITLE
BR VEC2
VEC1: BIT #SW00,SWR :IF SW00=1, GET NEW VECTOR
BEG BEGIN :AND CSR
VEC2: MOV #300,R1

439	001202	012702	000302		MOV	#302,R2		
440	001206	012703	000004		MOV	#4,R3		
441	001212	010211		1\$:	MOV	R2,(R1)	:RESTORE TRAPCATCHER	
442	001214	005012			CLR	(R2)	:IN FLOATING VECTOR AREA	
443	001216	060301			ADD	R3,R1		
444	001220	060302			ADD	R3,R2		
445	001222	020127	001000		CMP	R1,#1000		
446	001226	001371			BNE	1\$		
447	001230	104403			INSTR		:INPUT WHICH TEST YOU ARE RUNNING	
448	001232	005545			MWHICH		:ECHO OR CABLE	
449	001234	104412			PAWCH		:SET FLAG	
450	001236	004734			WCHFLG		:THIS FLAG	
451	001240	104403			INSTR		:INPUT ADDRESS OF DEVICE VECTOR	
452	001242	005214			MVECTOR		:MESSAGE "VECTOR ADDRESS--"	
453	001244	104405			PARAM		:CONVERT STRING TO OCTAL	
454	001246	000300			300		:LOW LIMIT	
455	001250	000770			770		:HIGH LIMIT	
456	001252	004660			DHRVEC		:LOCATIONS TO BE FILLED	
457	001254	003		.BYTE	3		:LSB MASK	
458	001255	004		.BYTE	4		:NUMBER OF LOCATIONS	
459	001256	104403			INSTR		:INPUT ADDRESS OF DEVICE CSR	
460	001260	005237			MREGAD		:MESSAGE "CONTROL REGISTER ADDRESS--"	
461	001262	104405			PARAM		:CONVERT STRING TO OCTAL	
462	001264	000300			0		:LOW LIMIT	
463	001266	177776			177776		:HIGH LIMIT	
464	001270	004636			DHSCR		:LOCATIONS TO BE FILLED	
465	001272	007		.BYTE	7		:LSB MASK	
466	001273	010		.BYTE	10		:NUMBER OF LOCATIONS	
467	001274	012777	004000	003334	MOV	#BIT11,DHSCR	:MASTER CLEAR INTERFACE	
468	001302	005037	004736		CLR	STFLG	:CLEAR PROGRAM START FLAG	
469	001306	104403			INSTR		:INPUT LINE NUMBER	
470	001310	005433			MLINE		:MESSAGE "LINE NUMBER--"	
471	001312	104405			PARAM		:CONVERT STRING TO OCTAL	
472	001314	000000			0		:LOW LIMIT	
473	001316	000017			17		:HIGH LIMIT	
474	001320	004756			LINENU		:LOCATION TO BE FILLED	
475	001322	000		.BYTE	0		:LSB MASK	
476	001323	001		.BYTE	1		:NUMBER OF LOCATIONS	
477	001324	104403		BAUD:	INSTR		:INPUT BAUD RATE	
478	001326	005465			MSPEED		:MESSAGE "BAUD RATE--"	
479	001330	104411			PARAM		:CONVERT DECIMAL STRING TO OCTAL	
480	001332	000062			50		:LOW LIMIT	
481	001334	022600			9600		:HIGH LIMIT	
482	001336	004752			LINESP		:LOCATION TO BE FILLED	
483	001340	000		.BYTE	0		:LSB MASK	
484	001341	001		.BYTE	1		:NUMBER OF LOCATIONS	
485	001342	004537	004052		JSR	RS,SET		
486	001346	013737	004654	004656	MOV	DHSSR,DHSLR	:SET UP ADDRESS OF SILO	
487	001354	005237	004656		INC	DHSLR	:STATUS REGISTER HIGH BYTE	
488								
489								
490	001360	012737	000340	177776	BEGIN:	MOV	#340,PS	:LOCK OUT INTERRUPTS
491	001366	012706	001100		MOV	#STACK,SP	:SET UP PROCESSOR STACK	
492	001372	005037	004740		CLR	LOCKUP	:CLEAR TIMEOUT	
493	001376	005737	004734		TST	WCHFLG	:ECHO OR CABLE TEST ?	
494	001402	001413			BEG	2\$:ECHO	


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495 001404 012737 001770 004700      MOV      #TEST2,RETURN      ;CABLE TEST
496 001412 005737 004736              TST      STFLG              ;ARE YOU LOOPING ?
497 001416 001017              BNE      1$                 ;YES
498 001420 005137 004736              COM      STFLG              ;NO
499 001424 104401 005642              TYPE     ,MCABLE           ;TYPE CABLE TEST
500 001430 000412              BR       1$
501 001432 012737 001462 004700 2$:    MOV      #TEST1,RETURN      ;SET UP ECHO TEST
502 001440 005737 004736              TST      STFLG              ;ARE YOU LOOPING ?
503 001444 001004              BNE      1$                 ;YES
504 001446 005137 004736              COM      STFLG              ;NO
505 001452 104401 005614              TYPE     ,MTERM            ;TYPE ECHO TEST
506 001456 000177 003216              JMP      @RETURN            ;START TESTING
507                                     ;THIS TEST WILL ACCEPT 1 CHARACTER AT A TIME
508                                     ; (IN INTERRUPT MODE) AND TRANSMIT THAT SAME CHARACTER,
509                                     ; ONE LINE AT A TIME, ANY LINE 0 THRU 17 (OCTAL)
510
511 001462 012737 000340 177776 TEST1:  MOV      #340,PS            ;DISABLE ALL INTERRUPTS
512 001470 012737 001274 004702      MOV      #LINE,ESCAPE
513 001476 012737 002374 004670      MOV      #EOP,NEXT
514 001504 052777 004000 003124      BIS      #BIT11,@DHSCR     ;MASTER CLEAR INTERFACE
515 001512 013777 004760 003116      MOV      NUMLIN,@DHSCR     ;SELECT LINE # & SET INTERRUPT ENABLE
516 001520 013777 004754 003114      MOV      SPEED,@DHLPR     ;SET LINE SPEED AND
517                                     ; CHARACTER LENGTH (TRANS. & REC.)
518 001526 012777 000000 003120      MOV      #0,@DHSSR        ;SET SILO ALARM LEVEL=0
519 001534 012777 004772 003102      MOV      #TBUF,@DHBA      ;ADDRESS OF TRANSMITTER
520                                     ; DATA BUFFER
521 001542 052777 100000 003066      BIS      #100000,@DHSCR   ;SET TRANSMIT "DONE"
522 001550 012777 001612 003102      MOV      #INTSVC,@DHVEC   ;SET UP INTERRUPT SERVICE
523 001556 013777 004764 003076      MOV      Prio,@DHLVL      ;AND LEVEL
524 001564 013737 004766 177776      MOV      LESS1,PS         ;ALLOW INTERRUPTS
525 001572 104401 005504              TYPE     ,MCHAR           ;TYPE "ANY CHARACTER"
526 001576 032737 000004 177570 DELAY:  BIT      #SW02,SWR        ;IF SW02=1 GET NEW LINE NUMBER
527 001604 001774              BEQ      DELAY             ;RETURN HERE AFTER "INTERRUPT"
528 001606 000137 001274              JMP      LINE
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532 001612 105777 003020 INTSVC: ;THE FOLLOWING IS THE RECEIVER INTERRUPT SVC ROUTINE
533 001616 100401              TSTB     @DHSCR            ;TEST REC. FLAG
534 001620 104000              BMI      .+4
535 001622 005777 003012              HLT      0                ;ERROR - INTERRUPT NOT CAUSED BY FLAG
536 001626 100401              TST      @DHNRC           ;TEST FOR VALID CHARACTER
537 001630 104001              BMI      .+4
538 001632 017737 003002 004770      HLT      1                ;NON- VALID CHARACTER
539 001640 113737 004770 004772      MOV      @DHNRC,@#RECDAT  ;MOVE CHARACTER TO OUTPUT AREA
540 001646 113737 004770 005710      MOV      RECDAT,TBUF     ;MOVE CHARACTER TO CHECK FOR +C
541 001654 042737 177600 005710      MOV      RECDAT,INBUF    ;STRIP JUNK PLUS PARITY
542 001662 042737 170377 004770      BIC      #+C<177>,INBUF   ;SAVE ONLY LINE NUMBER
543 001670 000337 004770              SWAB     RECDAT
544 001674 023737 004756 004770      CMP      LINENU,RECDAT   ;DOES THE LINE # COMPARE?
545 001702 001401              BEQ      .+4
546 001704 104002              HLT      2                ;WRONG LINE NUMBER
547 001706 012777 177777 002732      MOV      #-1,@DHBC       ;! (OCTAL) BYTES WILL BE XMITTED
548 001714 032777 100000 002714      BIT      #100000,@DHSCR  ;TEST "FLAG" FOR DONE
549 001722 001001              BNE      .+4
550 001724 104003              HLT      3                ;TRANSMITTER DONE SHOULD BE SET

```



```

551 001726 123727 005710 000003 CMPB INBUF,#3 ;IS IT A 10 ?
552 001734 001006 BNE 1$ ;NO
553 001736 052777 004000 002672 BIS #BIT11,JDHSCR ;STOP DEVICE
554 001744 012716 002374 MOV #EOP,(SP) ;CRUNCH STACK
555 001750 000002 RTI
556 001752 012777 004772 002664 1$: MOV #TBUF,JDHBA ;ADDRESS OF TRANSMITTER
557 001760 013777 004762 002662 MOV NUMBAR,JDHBAR ;START XMITTER
558 001766 000002 RTI
559
560
561 ;THIS TEST TRANSMITS A BINARY COUNT PATTERN
562 ;VIA INTERRUPT MODE TO THE RECEIVER
563 ;... THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR
564 TEST2: MOV #340,PS ;DISABLE INTERRUPTS
565 MOV #LINE,ESCAPE
566 MOV #EOP,NEXT
567 BIS #BIT11,JDHSCR ;MASTER CLEAR INTERFACE
568 MOV NUMLIN,JDHSCR ;SELECT LINE # & REC. INTERRUPT ENABLE
569 BIS #BIT13,JDHSCR ;SET TRANSMITTER INTERRUPT ENABLE
570 ;& NON EXISTANT MEMORY INTR ENABLE
571 MOV SPEED,JDHLPR ;SET LINE SPEED
572 MOV #0,JDHSSR ;SET SILO ALARM LEVEL =0
573 MOV #TABLE,JDHBA ;ADDRESS OF TRANSMITTER DATA BUFFER
574 MOV #-256,JDHBC ;SET UP BYTE COUNT
575 MOV #INTREC,JDHVEC ;SET UP INTR SERVICE
576 MOV PRIO,JDHRLVL ;SET UP LEVEL
577 MOV #INTRAN,JDHTVEC ;SET UP INTR SERVICE
578 MOV PRIO,JDHTLVL ;SET UP LEVEL
579 MOV #TABLE,R1 ;SET UP DATA POINTER
580 MOV LESS1,PS ;ALLOW INTERRUPTS
581 MOV NUMBAR,JDHBAR ;SET UP BAR BIT
582
583 ;YOU RETURN HERE AFTER EVERY RECEIVER INTERRUPT
584 SPIN: BIT #SW02,SWR ;IF SW02=1 GET NEW LINE NUMBER
585 BEQ 1$ ;SW02=0
586 JMP LINE ;SW02=1
587 1$: INC LOCKUP ;INC TIMEOUT FLAG
588 BNE SPIN ;IF NOT 0 RETURN SPINNING
589 HLT 6 ;RECEIVER FAILED TO INTERRUPT CHECK CABLE/TERMINATOR
590
591 QUIT: SCOPE
592 INTREC: CLR LOCKUP ;CLEAR TIMEOUT FLAG
593 TSTB JDHSCR ;TEST REC DONE
594 BMI .+4 ;YES
595 HLT 0 ;FALSE INTERRUPT
596 MOV JDHNR,RECDAT ;SAVE WORD
597 TST RECDAT ;TEST FOR VALID CHARACTER
598 BMI .+4 ;NON VALID CHARACTER
599 HLT 1 ;DATA OVERRUN ?
600 BIT #BIT14,RECDAT ;NO
601 BEQ .+4 ;YES
602 HLT 7 ;FRAMING ERROR ?
603 BIT #BIT13,RECDAT ;NO
604 BEQ .+4 ;YES
605 HLT 10 ;PARITY ERROR ?
606 BIT #BIT12,RECDAT ;NO
607 BEQ .+4 ;NO

```


607	002250	104011				HLT	11		; YES
608	002252	122137	004770			CMPB	(R1)+,RECDAT		; GOOD CHARACTER ?
609	002256	001401				BEQ	.+4		; YES
610	002260	104005				HLT	5		; NO
611	002262	042737	170377	004770		BIC	#170377,RECDAT		; SAVE ONLY LINE NUMBER
612	002270	000337	004770			SWAB	RECDAT		
613	002274	023737	004756	004770		CMP	LINENU,RECDAT		; DOES THE LINE # COMPARE ?
614	002302	001401				BEQ	.+4		; YES
615	002304	104002				HLT	2		; WRONG LINE #
616	002306	126127	177777	000377		CMPB	-1(R1),#377		; LAST CHARACTER ?
617	002314	001003				BNE	1\$; NO
618	002316	012716	002160			MOV	#QUITS,(SP)		; CRUNCH STACK
619	002322	000402				BR	2\$		
620	002324	012716	002134		1\$:	MOV	#SPIN,(SP)		; CRUNCH STACK
621	002330	000002			2\$:	RTI			
622									
623	002332	032777	100000	002276	INTRAN:	BIT	#BIT15,JDHSCR		; TEST TRANSMIT FLAG
624	002340	001001				BNE	.+4		
625	002342	104003				HLT	3		; FALSE INTERRUPT
626	002344	032777	002000	002264		BIT	#BIT10,JDHSCR		; NON EXISTANT MEMORY ?
627	002352	001404				BEQ	1\$		
628	002354	104004				HLT	4		; NON EXISTANT MEMORY SHOULD NOT BE UP
629	002356	042777	000400	002252		BIC	#BIT08,JDHSCR		; CLEAR NON EXISTANT MEMORY BIT
630	002364	042777	100000	002244	1\$:	BIC	#BIT15,JDHSCR		; CLEAR DONE BIT FOR NEXT ROUND
631	002372	000002				RTI	;RETURN		


```

632
633
634
635
636
637
638
639 002374 104401 EOP: TYPE ;TYPE NAME OF TEST
640 002376 005372 MEPASS
641 002400 005037 004742 CLR LAST ;CLEAR LAST ERROR PC
642 002404 005037 004672 CLR ERRFLG ;CLEAR ERROR FLAG
643 002410 005237 004674 INC PASCNT ;UPDATE PASS COUNT
644 002414 013737 004674 177570 MOV PASCNT,LIGHTS ;DISPLAY PASS COUNT
645 002422 013701 000042 MOV @#42,R1 ;CHECK FOR ACT-11 OR DDP
646 002426 001406 BEQ RESTRT ;IF NOT, CONTINUE TESTING
647 002430 000005 RESET
648 002432 004711 LOGICAL: JSR PC,(R1)
649 002434 000240 NOP
650 002436 000240 NOP
651 002440 000240 NOP
652 002442 000240 NOP
653 002444 000137 001360 RESTRT: JMP BEGIN
654
655 ;CHECK FOR LOOP ON CURRENT TEST
656 ;CHECK FOR ITERATION SUPPRESSION
657
658 002450 032737 002000 177570 SCOPER: BIT #SW10,SWR
659 002456 001030 BNE 4$
660 002460 032737 040000 177570 1$: BIT #SW14,SWR
661 002466 001021 BNE 3$
662 002470 032737 004000 177570 BIT #SW11,SWR
663 002476 001006 BNE 2$
664 002500 005237 004710 INC LPCNT
665 002504 023737 004710 004706 CMP LPCNT,ICOUNT
666 002512 001007 BNE 3$
667 002514 005037 004710 2$: CLR LPCNT
668 002520 005037 004672 CLR ERRFLG
669 002524 013737 004670 004700 MOV NEXT,RETURN
670 002532 013716 004700 3$: MOV RETURN,(SP) ;LOOPING
671 002536 000002 RTI
672 002540 005737 004672 4$: TST ERRFLG
673 002544 001745 BEQ 1$
674 002546 000762 BR 2$
675
676 ;CHECK FOR FREEZE ON CURRENT DATA
677
678 002550 032737 001000 177570 SCOP1R: BIT #SW09,SWR
679 002556 001402 BEQ 1$
680 002560 013716 004704 MOV FREEZ1,(SP)
681 002564 000002 1$: RTI
682
683 ;ERROR HANDLER
684
685 002566 032737 020000 177570 ERRORS: BIT #SW13,SWR
686 002574 001051 BNE HALTS
687 002576 021637 004742 CMP (SP),LAST

```


BOC

```

000000 000000 001404
000000 000000 011637 004742
000000 000000 005037 004672
000000 000000 104406
000000 000000 011605
000000 000000 162705 000002
000000 000000 011604
000000 000000 006304
000000 000000 006304
000000 000000 042704 177001
000000 000000 062704 005746
000000 000000 012437 002702
000000 000000 011437 002714
000000 000000 005737 004672
000000 000000 001403
000000 000000 005737 002714
000000 000000 001007
000000 000000 104402
000000 000000 002762
000000 000000 012737 000001 004672
000000 000000 104401
000000 000000 000000
000000 000000 005737 002714
000000 000000 001402
000000 000000 104402
000000 000000 000000
000000 000000 104407
000000 000000 005737 177570
000000 000000 100005
000000 000000 010046
000000 000000 016600 000002
000000 000000 000000
000000 000000 012600
000000 000000 005237 004676
000000 000000 032737 002000 177570
000000 000000 001402
000000 000000 013716 004702
000000 000000 000002
000000 000000 000001
000000 000000 006 002
000000 000000 004730

```

```

IS:
MOV (SP), LAST
CLR ERRFLG
SAVOSP
MOV (SP), R5
SUB #2, R5
MOV (R5), R4
ASL R4
ASL R4
BIC #177001, R4
ADD #ERRTAB, R4
MOV (R4)+, ERRMSG
MOV (R4), DATABP
TST ERRFLG
BEQ TYPMSG
TST TABP
BNE TYPDAT
TYPMSG: OCTASC
ERTABD
MOV #1, ERRFLG
TYPE
ERRMSG: 0
TYPDAT: TST DATABP
RESREG
OCTASC
DATABP: 0
RESREG: RESOS
HALTS: TST SWR
SPL EXITER
PUSHRO
MOV 2(SP), R0
HALT
POPPO
EXITER: INC ERRCNT
BIT #SW10, SWR
BEQ IS
MOV ESCAPE, (SP)
IS:
ERTABD: 1
.BYTE 6, 2
SAVPC
:TRAP DISPATCH SERVICE
:ARGUMENT OF TRAP IS EXTRACTED
:AND USED AS OFFSET TO OBTAIN POINTER
:TO SELECTED SUBROUTINE
TRPSRV: MOV (SP), -(SP) :GET PC OF RETURN
SUB #2, (SP) :=PC OF TRAP
MOV 3(SP), (SP) :GET TRP
TRPOK: ASL (SP) :MULTIPLY TRAP ARG BY 2
BIC #177001, (SP) :CLEAR UNWANTED BITS
ADD #TRPTAB, (SP) :POINTER TO SUBROUTINE ADDRESS
MOV 3(SP), (SP) :SUBROUTINE ADDRESS
JMP 3(SP)+ :GO TO SUBROUTINE
:SAVE PC OF TEST THAT FAILED AND R0-R5

```


CO2

```

765 003022 016637 000004 004730 SV05P: MOV 4(SP), SAVPC
766 ;SAVE R0-R5
767
768 003030 010537 004724 SV05: MOV R5, SAVR5
769 003034 010437 004722 MOV R4, SAVR4
770 003040 010337 004720 MOV R3, SAVR3
771 003044 010237 004716 MOV R2, SAVR2
772 003050 010137 004714 MOV R1, SAVR1
773 003054 010037 004712 MOV R0, SAVR0
774 003060 000002 RTI
775 ;RESTORE R0-R5
776
777 003062 013700 004712 RS05: MOV SAVR0, R0
778 003066 013701 004714 MOV SAVR1, R1
779 003072 013702 004716 MOV SAVR2, R2
780 003076 013703 004720 MOV SAVR3, R3
781 003102 013704 004722 MOV SAVR4, R4
782 003106 013705 004724 MOV SAVR5, R5
783 RTI
784 ;TELETYPE OUTPUT ROUTINE
785
786 003114 017605 000000 TYPER: MOV 2(SP), R5
787 003120 062716 000002 ADD #2, (SP)
788 770 003124 105777 001502 1S: TSTB 2TPCSR
789 BPL 1S
790 TSTB (R5)
791 BNE 2S
792 RTI
793 774 003136 000002 2S: MOVB (R5)+, 2TPDBR
794 BR 1S
795
796 ;ASCII STRING INPUT ROUTINE
797
798 003146 017637 000000 003162 INSTRG: MOV 2(SP), MSG
799 003154 062716 000002 ADD #2, (SP)
800 003160 104401 INSTR1: TYPE
801 003162 000000 MSG: 0
802 003164 012704 005710 MOV #INBUF, R4
803 003170 012703 000007 MOV #7, R3
804 786 003174 105777 001426 1S: TSTB 2TKCSR
805 BPL 1S
806 MOVB 2TKDBR, (R4)
807 BICB #200, (R4)
808 CMPB (R4)+, #15
809 BEQ INSTR2
810 792 003220 117777 001404 001406 2S: MOVB 2TKDBR, 2TPDBR
811 TSTB 2TPCSR
812 BPL 2S
813 DEC R3
814 BNE 1S
815 INSTR2: TYPE
816 798 003242 005274 MQM
817 799 003244 000745 BR INSTR1
    
```



```

00000000 000442 012537 003622
00000001 000446 012537 003624
00000002 000450 112537 003626
00000003 000454 112537 003627
00000004 000458 010516
00000005 000462 005005
00000006 000466 012704 005710
00000007 000470 122714 000015
00000008 000474 001424
00000009 000478 121427 000060
00000010 000482 002421
00000011 000486 121427 000071
00000012 000490 003016
00000013 000494 142714 000060
00000014 000498 005002
00000015 000502 152402
00000016 000506 060205
00000017 000510 122714 000015
00000018 000514 001410
00000019 000518 006305
00000020 000522 010502
00000021 000526 006305
00000022 000530 006305
00000023 000534 060205
00000024 000538 000754
00000025 000542 104404
00000026 000546 000744
00000027 003554 020537 003622
00000028 003560 101373
00000029 003562 020537 003620
00000030 003566 103770
00000031 003570 133705 003626
00000032 003574 001365
00000033 003576 013704 003624
00000034 003602 010524
00000035 003604 052705 000002
00000036 003610 105337 003627
00000037 003614 001372
00000038 003616 000002
00000039 003620 000000
00000040 003622 000000
00000041 003624 000000
00000042 003626 000
00000043 003627 000

```

```

MOV (R5)+,7$
MOV (R5)+,8$
MOVB (R5)+,9$
MOVB (R5)+,10$
MOV R5,(SP)
2$: CLR R5
MOV #INBUF,R4
CMPB #15,(R4)
BEQ 3$
1$: CMPB (R4),#'0
BLT 3$
CMPB (R4),#'9
SGT 3$
BICB #'0,(R4)
CLR R2
BISB (R4)+,R2
ADD R2,R5
CMPB #15,(R4)
BEQ 4$
ASL R5 :X2
MOV R5,R2 :SAVE X2
ASL R5 :X4
ASL R5 :X8
ADD R2,R5 :TIMES 10
BR 1$
3$: INSTER
BR 2$

```

:TEST TO SEE IF NUMBER IS WITHIN LIMITS

```

4$: CMP R5,7$
BHI 3$
CMP R5,6$
BLO 3$
BITB R5,R5
BNE 3$

```

:STORE NUMBER AT SPECIFIED ADDRESS

```

5$: MOV R5,R4
MOV R5,(R4)+
ADD #2,R5
DECB 10$
BNE 5$
RTI

```

```

6$: 0
7$: 0
8$: 0
9$: .BYTE 0
10$: .BYTE 0

```

```

:COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
:BUFFER TO THE CHARACTERS "E" AND "C"
:IF THE CHARACTER IS "E" CLEAR THE FLAG
:IF THE CHARACTER IS "C" SET THE FLAG

```


000000
000001
000002
000003
000004
000005
000006
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000008
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000098
000099
000100

003630 017605 000000
003634 122737 000105 005710
003642 001002
003644 105015
003646 000406
003650 122737 000103 005710
003656 001005
003660 112715 177777
003664 062716 000002
003670 000002
003672 104404
003674 000755

.PAWCH:MOV 0(SP),R5
CMPB #'E,INBUF ;IS IT "E" ?
BNE 1\$
CLRB (R5) ;000
BR 2\$
1\$: CMPB #'C,INBUF ;IS IT "C" ?
BNE 3\$
MOV B #-1,(R5) ;377
2\$: ADD #2,(SP)
3\$: RTI
INSTER ;RETRY
BR .PAWCH

;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER

003676 104401
003700 005301
003702 104413
003704 017601 000000
003710 062716 000002
003714 012137 004530
003720 112137 004532
003724 112137 004533
003730 013137 004534
003734 013704 004534
003740 113705 004532
003744 012700 005722
003750 010403
003752 042703 177770
003756 062703 000260
003762 110320
003764 006204
003766 006204
003770 006204
003772 005305
003774 001365
003776 012703 005734
004002 114023
004004 105337 004532
004010 001374
004012 105737 004533
004016 001405
004020 112723 000240
004024 105337 004533
004030 00 373
004032 105013
004034 104401
004036 005724
004040 005337 004530
004044 001325
004046 104407
004050 000002

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

;THIS ROUTINE CONVERTS LINE SPEED (LINESP) AND
;LINE NUMBER (LINENU) FOR DHLPR, DHBAR AND DHSOR

:REGISTER USAGE.

004052	013737	004756	004760	SET:	MOV	LINENU, 0#NUMLIN	:SAVE LINENU
004060	052737	000100	004760		BIS	#BIT06, 0#NUMLIN	:SET REC INTERRUPT ENABLE
004066	023727	004756	000000	BAR0:	CMP	LINENU, #0	:IS IT LINE 0?
004074	001004				BNE	BAR1	:NO
004076	012737	000001	004762		MOV	#1, 0#NUMBAR	:STORE BAR BIT 0
004104	000572				BR	SET1	
004106	023727	004756	000001	BAR1:	CMP	LINENU, #1	:IS IT LINE 1?
004114	001004				BNE	BAR2	:NO
004116	012737	000002	004762		MOV	#2, 0#NUMBAR	:STORE BAR BIT 1
004124	000562				BR	SET1	
004126	023727	004756	000002	BAR2:	CMP	LINENU, #2	:IS IT LINE 2?
004134	001004				BNE	BAR3	:NO
004136	012737	000004	004762		MOV	#4, 0#NUMBAR	:STORE BAR BIT 2
004144	000552				BR	SET1	
004146	023727	004756	000003	BAR3:	CMP	LINENU, #3	:IS IT LINE 3?
004154	001004				BNE	BAR4	:NO
004156	012737	000010	004762		MOV	#10, 0#NUMBAR	:STORE BAR BIT 3
004164	000542				BR	SET1	
004166	023727	004756	000004	BAR4:	CMP	LINENU, #4	:IS IT LINE 4?
004174	001004				BNE	BAR5	:NO
004176	012737	000020	004762		MOV	#20, 0#NUMBAR	:STORE BAR BIT 4
004204	000532				BR	SET1	
004206	023727	004756	000005	BAR5:	CMP	LINENU, #5	:IS IT LINE 5?
004214	001004				BNE	BAR6	:NO
004216	012737	000040	004762		MOV	#40, 0#NUMBAR	:STORE BAR BIT 5
004224	000522				BR	SET1	
004226	023727	004756	000006	BAR6:	CMP	LINENU, #6	:IS IT LINE 6?
004234	001004				BNE	BAR7	:NO
004236	012737	000100	004762		MOV	#100, 0#NUMBAR	:STORE BAR BIT 6
004244	000512				BR	SET1	
004246	023727	004756	000007	BAR7:	CMP	LINENU, #7	:IS IT LINE 7?
004254	001004				BNE	BAR8	:NO
004256	012737	000200	004762		MOV	#200, 0#NUMBAR	:STORE BAR BIT 7
004264	000502				BR	SET1	
004266	023727	004756	000010	BAR8:	CMP	LINENU, #10	:IS IT LINE 10?
004274	001004				BNE	BAR9	:NO
004276	012737	000400	004762		MOV	#400, 0#NUMBAR	:STORE BAR BIT 8
004304	000472				BR	SET1	
004306	023727	004756	000011	BAR9:	CMP	LINENU, #11	:IS IT LINE 11?
004314	001004				BNE	BAR10	:NO
004316	012737	001000	004762		MOV	#1000, 0#NUMBAR	:STORE BAR BIT 9
004324	000462				BR	SET1	
004326	023727	004756	000012	BAR10:	CMP	LINENU, #12	:IS IT LINE 12?
004334	001004				BNE	BAR11	:NO
004336	012737	002000	004762		MOV	#2000, 0#NUMBAR	:STORE BAR BIT 10
004344	000452				BR	SET1	
004346	023727	004756	000013	BAR11:	CMP	LINENU, #13	:IS IT LINE 13?
004354	001004				BNE	BAR12	:NO
004356	012737	004000	004762		MOV	#4000, 0#NUMBAR	:STORE BAR BIT 11
004364	000442				BR	SET1	
004366	023727	004756	000014	BAR12:	CMP	LINENU, #14	:IS IT LINE 14?
004374	001004				BNE	BAR13	:NO
004376	012737	010000	004762		MOV	#10000, 0#NUMBAR	:STORE BAR BIT 12
004404	000432				BR	SET1	


```

1024 004406 023727 004756 000015 BAR13: CMP LINENU,#15 ;IS IT LINE 15?
1025 004414 001004 BNE BAR14 ;NO
1026 004416 012737 020000 004762 MOV #20000,2#NUMBAR ;STORE BAR BIT 13
1027 004424 000422 BR SET1
1028 004426 023727 004756 000016 BAR14: CMP LINENU,#16 ;IS IT LINE 16?
1029 004434 001004 BNE BAR15 ;NO
1030 004436 012737 040000 004762 MOV #40000,2#NUMBAR ;STORE BAR BIT 14
1031 004444 000412 BR SET1
1032 004446 023727 004756 000017 BAR15: CMP LINENU,#17 ;IS IT LINE 17?
1033 004454 001004 BNE BARNUN ;NO
1034 004456 012737 100000 004762 MOV #100000,2#NUMBAR ;STORE BAR BIT 15
1035 004464 000402 BR SET1
1036 004466 005037 004762 BARNUN: CLR 2#NUMBAR ;CLEAR BAR BITS
1037 004472 012701 004536 SET1: MOV #TABLE2,R1
1038 004476 022137 004752 1$: CMP (R1)+,LINESP
1039 004502 001407 BEQ 2$
1040 004504 005721 TST (R1)+ ;IS IT THE END OF TABLE?
1041 004506 001373 BNE 1$ ;NO
1042 004510 104401 005404 TYPE ,MINVAL ;INVALID BAUD RATE,BEGIN AGAIN
1043 004514 012705 001324 MOV #BAUD,RS ;JUMP TO BAUD THRU RS
1044 004520 000402 BR 3$
1045 004522 011137 004754 2$: MOV (R1),SPEED ;SET UP BAUD RATE
1046 004526 000205 3$: RTS RS

```

```

WRDCNT: 0
CHRCNT: 0
SPACNT=CHRCNT+1
BINWRD: 0

```

TABLE2: ;THE FOLLOWING IS A TABLE OF LEGAL BAUD RATES (8 BITS/CHAR)

.WORD 50.	:50 BAUD
.WORD 2107	:TWO STOP BITS
.WORD 75.	:75 BAUD
.WORD 4207	:TWO STOP BITS
.WORD 110.	:110 BAUD
.WORD 6307	:TWO STOP BITS
.WORD 135.	:134.5 BAUD
.WORD 10407	:TWO STOP BITS
.WORD 150.	:150 BAUD
.WORD 12503	:ONE STOP BIT
.WORD 200.	:200 BAUD
.WORD 14603	:ONE STOP BIT
.WORD 300.	:300 BAUD
.WORD 16703	:ONE STOP BIT
.WORD 600.	:600 BAUD
.WORD 21003	:ONE STOP BIT
.WORD 1200.	:1200 BAUD
.WORD 23103	:ONE STOP BIT
.WORD 1800.	:1800 BAUD
.WORD 25203	:ONE STOP BIT
.WORD 2400.	:2400 BAUD
.WORD 27303	:ONE STOP BIT
.WORD 4800.	:4800 BAUD
.WORD 31403	:ONE STOP BIT
.WORD 9600.	:9600 BAUD

```

1055 004536 000062
1056 004540 002107
1057 004542 000113
1058 004544 004207
1059 004546 000156
1060 004550 006307
1061 004552 000207
1062 004554 010407
1063 004556 000226
1064 004560 012503
1065 004562 000310
1066 004564 014503
1067 004566 000454
1068 004570 016703
1069 004572 001130
1070 004574 021003
1071 004576 002260
1072 004600 023103
1073 004602 003410
1074 004604 025203
1075 004606 004540
1076 004610 027303
1077 004612 011300
1078 004614 031403
1079 004616 022600

```


1080 004620 033503
1081 004622 177777 000000

.WORD 33503 :ONE STOP BIT
.WORD -1,0 :TABLE TERMINATOR

:INDIRECT POINTERS

1082
1083
1084
1085
1086 004626 177560
1087 004630 177562
1088 004632 177564
1089 004634 177566
1090 004636 000000
1091 004640 000000
1092 004642 000000
1093 004644 000000
1094 004646 000000
1095 004650 000000
1096 004652 000000
1097 004654 000000
1098 004656 000000
1099 004660 000000
1100 004662 000000
1101 004664 000000
1102 004666 000000

TKCSR: 177560
TKDBR: 177562
TPCSR: 177564
TPDBR: 177566
DHSCR: 0
DHNRC: 0
DHLPR: 0
DHBA: 0
DHBC: 0
DHBAR: 0
DHBCR: 0
DHSSR: 0
DHSLR: 0
DHRVEC: 0
DHRLVL: 0
DHTVEC: 0
DHTLVL: 0

:PROGRAM VARIABLES

1103
1104
1105 004670 000000
1106 004672 000000
1107 004674 000000
1108 004676 000000
1109 004700 001100
1110 004702 000000
1111 004704 000000
1112 004706 000012
1113 004710 000000
1114 004712 000000
1115 004714 000000
1116 004716 000000
1117 004720 000000
1118 004722 000000
1119 004724 000000
1120 004726 000000
1121 004730 000000
1122 004732 177777
1123 004734 000000
1124 004736 000000
1125 004740 000000
1126 004742 000000
1127 004744 000000
1128 004746 000000
1129 004750 000000
1130 004752 000156
1131 004754 006307
1132
1133 004756 000000
1134 004760 000100
1135

NEXT: 0 :NEXT TEST #
ERRFLG: 0 :ERROR FLAG
PASCNT: 0 :PASS COUNT
ERRCNT: 0 :ERROR COUNT
RETURN: START :RETURN ADDRESS
ESCAPE: 0 :ADDRESS FOR ERROR ESCAPE
FREEZ1: 0 :DATA LOOPING RETURN ADDRESS
ICOUNT: 10. :ITERATION COUNT FOR TEST IN PROGRESS
LPCNT: 0 :NUMBER OF ITERATIONS THIS TEST
SAVR0: 0 :R0 SAVE AREA
SAVR1: 0 :R1 SAVE AREA
SAVR2: 0 :R2 SAVE AREA
SAVR3: 0 :R3 SAVE ARE
SAVR4: 0 :R4 SAVE AREA
SAVR5: 0 :R5 SAVE AREA
SAVSP: 0 :STACK POINTER SAVE AREA
SAVPC: 0 :CALLING ROUTINE SAVE AREA
INIFLG: .WORD -1 :PROGRAM INITIALIZATION FLAG
WCHFLG: 0 :ECHO OR CABLE FLAG
STFLG: 0 :PROGRAM START FLAG
LOCKUP: 0 :TIMEOUT FLAG
LAST: 0 :LAST ERROR PC
TDATA: 0
RDATA: 0
BYTCNT: 0
LINE SP: 110.
SPEED: 6307

:DEFAULT BAUD RATE
:DEFAULT 110 BAUD, 9 BITS/CHAR,
:FDX, 2 STOP BITS
:DEFAULT VALUE, LINE 0
:DEFAULT VALUE, REC. INTERRUPT ENABLED


```

1136 004762 000001
1137 004764 000240
1138 004766 000200
1139 004770 000000
1140 004772 000000
1141
1142
1143
1144 004774 010046
1145 004776 010146
1146 005000 010246
1147 005002 010346
1148 005004 010446
1149 005006 010546
1150 005010 013746 000024
1151 005014 010637 004726
1152 005020 012737 005032 000024
1153 005026 000000
1154 005030 000777
1155
1156
1157
1158 005032 013706 004726
1159 005036 012605
1160 005040 012604
1161 005042 012603
1162 005044 012602
1163 005046 012601
1164 005050 012600
1165 005052 012737 004774 000024
1166 005060 012737 000340 177776
1167 005066 012706 001100
1168 005072 005037 005722
1169 005076 005237 005722
1170 005102 001375
1171 005104 104402
1172 005106 005130
1173 005110 104401
1174 005112 005304
1175 005114 005037 004672
1176 005120 005037 004742
1177 005124 000177 177550
1178 005130 000001
1179 005132 006 002
1180 005134 000207
1181 005136 005015 042812 030510
      005170 005104 044104 020112
      005214 005015 042526 052103
      005237 015 041412 047117
      005274 020040 020077 000
      005301 015 000012
      005304 020040 047520 042527
      005372 005015 055104 044104
      005404 005015 047111 040526
      005433 015 046012 047111
      005465 015 041012 052501

```

```

NUMBER: 1 ;DEFAULT VALUE, BAR BIT 0
PRIO: 240 ;DEFAULT DEVICE PRIORITY 5
LESS1: 200 ;DEFAULT PRIORITY4, TO ALLOW INTERRUPTS
RECDAT: 0
TBUF: 0 ;ENTER HERE ON POWER FAILURE

PFAIL: MOV R0, -(SP) ;SAVE R0-R5 ON PROCESSOR STACK
      MOV R1, -(SP)
      MOV R2, -(SP)
      MOV R3, -(SP)
      MOV R4, -(SP)
      MOV R5, -(SP)
      MOV 24, -(SP)
      MOV SF, SAVSP ;SAVE STACK POINTER
      MOV #RESTART, 24 ;SET UP FOR POWER UP TRAP
      HALT ;HALT ON POWER DOWN NORMAL
      BR .

;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED

RESTAR: MOV SAVSP, SP ;RESTORE STACK POINTER
        MOV (SP)+, R5 ;RESTORE R0-R5
        MOV (SP)+, R4
        MOV (SP)+, R3
        MOV (SP)+, R2
        MOV (SP)+, R1
        MOV (SP)+, R0
        MOV #PFAIL, 24 ;SET UP FOR POWER FAILURE
        MOV #340, PS
        MOV #STACK, SP
        CLR TEMP
        INC TEMP
        BNE .-4
        OCTASC
        PFTAB
        TYPE
        MPFAIL
        CLR ERRFLG
        CLR LAST
        JMP @RETURN

PFTAB: 1
       .BYTE 6, 2
       RETURN

MTITLE: .ASCII <15><12><12>?DH11 ECHO/CABLE TEST ?<15><12>
        .ASCIZ /DZDHJ REVISION B /
MVECTO: .ASCIZ <15><12>/VECTOR ADDRESS- /
MREGAD: .ASCIZ <15><12>/CONTROL REGISTER ADDRESS- /
MQM: .ASCIZ / ? /
MCRLF: .ASCIZ <15><12>
MPFAIL: .ASCIZ / POWER FAILURE, PROGRAM RESTART AT TEST IN PROGRESS /
MEPASS: .ASCIZ <15><12>/DZDHJB /
MINVAL: .ASCIZ <15><12>/INVALID BAUD RATE - /
MLINE: .ASCIZ <15><12>/LINE NUMBER IN OCTAL - /
MSPEED: .ASCIZ <15><12>/BAUD RATE - /

```


005504	005015	054524	042520	MCHAR:	.ASCIZ	<15><12>/TYPE A CHAR. ON DH11 TERMINAL /
005545	015	053412	044510	MWHICH:	.ASCIZ	<15><12>/WHICH TEST ? ECHO OR CABLE (E OR C) /
005614	005015	042524	046522	MTERM:	.ASCIZ	<15><12>/TERMINAL ECHO TEST /
005642	005015	040503	046102	MCABLE:	.ASCIZ	<15><12>/CABLE TEST /
					.EVEN	

;TABLE OF POINTERS FOR TRAP DECODING

1192				TRPTAB:	SCOPER
1193					TYPER
1194	005660	002450			OCTASN
1195	005662	003114			INSTRG
1196	005664	003676			INSTRE
1197	005666	003146			PARAMS
1198	005670	003240			SVQSP
1199	005672	003250			RSQ5
1190	005674	003022			SCOP1R
1191	005676	003062			.PARAMD
1192	005700	002550			.PAWCH
1193	005702	003434			SVQ5
1194	005704	003630			
1195	005706	003030			

;BUFFERS FOR INPUT-OUTPUT

1196				INBUF:	0
1197				.=.+10	
1198				TEMP:	0
1199	005710	000000		.=.+10	
1200		005722		MDATA:	0
1201	005722	000000		.=.+10	
1202		005734			
1203	005734	000000			
1204		005746			

;TABLE OF POINTERS TO ERROR MESSAGES AND DATA

1205				ERRTAB:	EM1
1206					0
1207					EM2
1208	005746				0
1209	005746	006016			EM3
1210	005750	000000			0
1211	005752	006065			EM4
1212	005754	000000			0
1213	005756	006122			EM5
1214	005760	000000			0
1215	005762	006155			EM6
1216	005764	000000			0
1217	005766	006225			EM7
1218	005770	000000			0
1219	005772	006262			EM8
1220	005774	000000			0
1221	005776	006313			EM9
1222	006000	000000			0
1223	006002	006411			EM10
1224	006004	000000			0
1225	006006	006437			
1226	006010	000000			
1227	006012	006466			
1228	006014	000000			
1229	006016	005015	051105	047522	EM1: .ASCIZ <15><12>/ERROR- INTERRUPT NOT CAUSED BY FLAG /
	006065	015	042412	051122	EM2: .ASCIZ <15><12>/ERROR-NON VALID CHARACTER /
	006122	005015	051105	047522	EM3: .ASCIZ <15><12>/ERROR-WRONG LINE NUMBER /

006155	015	042412	051122	EM4:	.ASCIZ	<15><12>/ERROR-TRANSMITTER DONE SHOULD BE SET /
006225	015	042412	051122	EM5:	.ASCIZ	<15><12>/ERROR-NON-EXISTANT MEMORY /
006262	005015	051105	047522	EM6:	.ASCIZ	<15><12>/ERROR-WRONG CHARACTER /
006313	015	042412	051122	EM7:	.ASCIZ	<15><12>/ERROR- NOT RECEIVING CHARACTERS -CHECK CABLE OR TERMINATOR /
006411	015	042412	051122	EM8:	.ASCIZ	<15><12>/ERROR-DATA OVERRUN /
006437	015	042412	051122	EM9:	.ASCIZ	<15><12>/ERROR-FRAMING ERROR /
006466	005015	040520	044522	EM10:	.ASCIZ	<15><12>/PARITY ERROR /

.EVEN
TABLE:

1230	006506	000	.BYTE	0
1231	006507	001	.BYTE	1
1232	006510	002	.BYTE	2
1233	006511	003	.BYTE	3
1234	006512	004	.BYTE	4
1235	006513	005	.BYTE	5
1236	006514	006	.BYTE	6
1237	006515	007	.BYTE	7
1238	006516	010	.BYTE	10
1239	006517	011	.BYTE	11
1240	006520	012	.BYTE	12
1241	006521	013	.BYTE	13
1242	006522	014	.BYTE	14
1243	006523	015	.BYTE	15
1244	006524	016	.BYTE	16
1245	006525	017	.BYTE	17
1246	006526	020	.BYTE	20
1247	006527	021	.BYTE	21
1248	006530	022	.BYTE	22
1249	006531	023	.BYTE	23
1250	006532	024	.BYTE	24
1251	006533	025	.BYTE	25
1252	006534	026	.BYTE	26
1253	006535	027	.BYTE	27
1254	006536	030	.BYTE	30
1255	006537	031	.BYTE	31
1256	006540	032	.BYTE	32
1257	006541	033	.BYTE	33
1258	006542	034	.BYTE	34
1259	006543	035	.BYTE	35
1260	006544	036	.BYTE	36
1261	006545	037	.BYTE	37
1262	006546	040	.BYTE	40
1263	006547	041	.BYTE	41
1264	006550	042	.BYTE	42
1265	006551	043	.BYTE	43
1266	006552	044	.BYTE	44
1267	006553	045	.BYTE	45
1268	006554	046	.BYTE	46
1269	006555	047	.BYTE	47
1270	006556	050	.BYTE	50
1271	006557	051	.BYTE	51
1272	006560	052	.BYTE	52
1273	006561	053	.BYTE	53
1274	006562	054	.BYTE	54
1275	006563	055	.BYTE	55
1276	006564	056	.BYTE	56

1277	006565	057	.BYTE	57
1278	006566	060	.BYTE	60
1279	006567	061	.BYTE	61
1280	006570	062	.BYTE	62
1281	006571	063	.BYTE	63
1282	006572	064	.BYTE	64
1283	006573	065	.BYTE	65
1284	006574	066	.BYTE	66
1285	006575	067	.BYTE	67
1286	006576	070	.BYTE	70
1287	006577	071	.BYTE	71
1288	006600	072	.BYTE	72
1289	006601	073	.BYTE	73
1290	006602	074	.BYTE	74
1291	006603	075	.BYTE	75
1292	006604	076	.BYTE	76
1293	006605	077	.BYTE	77
1294	006606	100	.BYTE	100
1295	006607	101	.BYTE	101
1296	006610	102	.BYTE	102
1297	006611	103	.BYTE	103
1298	006612	104	.BYTE	104
1299	006613	105	.BYTE	105
1300	006614	106	.BYTE	106
1301	006615	107	.BYTE	107
1302	006616	110	.BYTE	110
1303	006617	111	.BYTE	111
1304	006620	112	.BYTE	112
1305	006621	113	.BYTE	113
1306	006622	114	.BYTE	114
1307	006623	115	.BYTE	115
1308	006624	116	.BYTE	116
1309	006625	117	.BYTE	117
1310	006626	120	.BYTE	120
1311	006627	121	.BYTE	121
1312	006630	122	.BYTE	122
1313	006631	123	.BYTE	123
1314	006632	124	.BYTE	124
1315	006633	125	.BYTE	125
1316	006634	126	.BYTE	126
1317	006635	127	.BYTE	127
1318	006636	130	.BYTE	130
1319	006637	131	.BYTE	131
1320	006640	132	.BYTE	132
1321	006641	133	.BYTE	133
1322	006642	134	.BYTE	134
1323	006643	135	.BYTE	135
1324	006644	136	.BYTE	136
1325	006645	137	.BYTE	137
1326	006646	140	.BYTE	140
1327	006647	141	.BYTE	141
1328	006650	142	.BYTE	142
1329	006651	143	.BYTE	143
1330	006652	144	.BYTE	144
1331	006653	145	.BYTE	145
1332	006654	146	.BYTE	146

1333	006655	147
1334	006656	150
1335	006657	151
1336	006660	152
1337	006661	153
1338	006662	154
1339	006663	155
1340	006664	156
1341	006665	157
1342	006666	160
1343	006667	161
1344	006670	162
1345	006671	163
1346	006672	164
1347	006673	165
1348	006674	166
1349	006675	167
1350	006676	170
1351	006677	171
1352	006700	172
1353	006701	173
1354	006702	174
1355	006703	175
1356	006704	176
1357	006705	177
1358	006706	200
1359	006707	201
1360	006710	202
1361	006711	203
1362	006712	204
1363	006713	205
1364	006714	206
1365	006715	207
1366	006716	210
1367	006717	211
1368	006720	212
1369	006721	213
1370	006722	214
1371	006723	215
1372	006724	216
1373	006725	217
1374	006726	220
1375	006727	221
1376	006730	222
1377	006731	223
1378	006732	224
1379	006733	225
1380	006734	226
1381	006735	227
1382	006736	230
1383	006737	231
1384	006740	232
1385	006741	233
1386	006742	234
1387	006743	235
1388	006744	236

.BYTE	147
.BYTE	150
.BYTE	151
.BYTE	152
.BYTE	153
.BYTE	154
.BYTE	155
.BYTE	156
.BYTE	157
.BYTE	160
.BYTE	161
.BYTE	162
.BYTE	163
.BYTE	164
.BYTE	165
.BYTE	166
.BYTE	167
.BYTE	170
.BYTE	171
.BYTE	172
.BYTE	173
.BYTE	174
.BYTE	175
.BYTE	176
.BYTE	177
.BYTE	200
.BYTE	201
.BYTE	202
.BYTE	203
.BYTE	204
.BYTE	205
.BYTE	206
.BYTE	207
.BYTE	210
.BYTE	211
.BYTE	212
.BYTE	213
.BYTE	214
.BYTE	215
.BYTE	216
.BYTE	217
.BYTE	220
.BYTE	221
.BYTE	222
.BYTE	223
.BYTE	224
.BYTE	225
.BYTE	226
.BYTE	227
.BYTE	230
.BYTE	231
.BYTE	232
.BYTE	233
.BYTE	234
.BYTE	235
.BYTE	236

HL1 359# 534 537 546 550 589 594 598 601 604 607 610 615 625 628

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ASO11	1181																		
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CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478
	1479	1480	1481	1482	1483	1484	1485	1486							
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.REM	1														
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.TITLE	272														
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	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1122		

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

*.DZDHJB.SEG/SOL/CRF/PAGNUM=DZDHJB
RUN-TIME: 7 11 3 SECONDS
RUN-TIME RATIO: 67/22=2.9
CORE USED: 9K (15 PAGES)