

DL11-E

ONLINE TEST

MD-11-DZDLB-B

EP-DZDLB-B-DL-A

OCT 1978

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digital

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Made in U.S.A.

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.REPT 0

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDLB-B-D

PRODUCT NAME: DL11-E ON LINE TESTS

DATE: 21-DECEMBER-1975

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: ROBERT WHITTON

REVISED BY: AL LOSCHAK JUN-75
M. McNALLY DEC-75 :SUPPORT SOFTWARE SWITCH REGISTE

THIS MAINDEC OBSOLETES MAINDEC-11-DZDLBA

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THREE STARTING ADDRESSES ARE PROVIDED. THEY ARE:

- ```

200 - NORMAL START
210 - REMAP DEVICES PRESENT AND RESTART
220 - MODIFY DEVICE ADDRESSES IF NON STANDARD
 INSTRUCTIONS TO DO THIS ARE TYPED OUT.

```

THIS DOCUMENT DESCRIBES THE ON LINE TESTS.

**THE AVAILABLE TESTS ARE:**

- PAGE SINGLE CHARACTER LINE MODE DATA TEST  
PAGE BINARY COUNT LINE MODE DATA TEST  
PAGE MESSAGE TRANSMIT ONLY W/W/O PARITY  
PAGE RECEIVE DATA TEST  
PAGE MESSAGE TRANSMIT (SPIRAL) ONLY W/W/O PARITY.

### 3.1 EQUIPMENT

- A. PDP 11 SYSTEM  
B. DL11-E(S)  
C. SUITABLE TERMINAL DEVICE (ASR 33, 37, DATA POINT, ETC)  
D. MODEM TYPE 103 OR 202 OR EQUIVALENT

THIS PROGRAM USES 8K OF MEMORY



3. OPERATING PROCEDURE:

3.1 LOADING PROCEDURE

THE ABSOLUTE LOADER IS USED TO LOAD THE PROGRAM.

3.2 DL11-E PARAMETER SELECTION

THE SELECTABLE DL11-E PARAMETERS ARE:

BIT1-0 CHARACTER LENGTH

| BIT1 | BIT0 | CHAR. LENGTH |
|------|------|--------------|
| 0    | 0    | 8            |
| 0    | 1    | 7            |
| 1    | 0    | 6            |
| 1    | 1    | 5            |

WHEN A TERMINAL IS INVOLVED DL11-E PARAMETERS SHOULD BE SET ACCORDING TO TERMINAL SPECIFICATIONS.

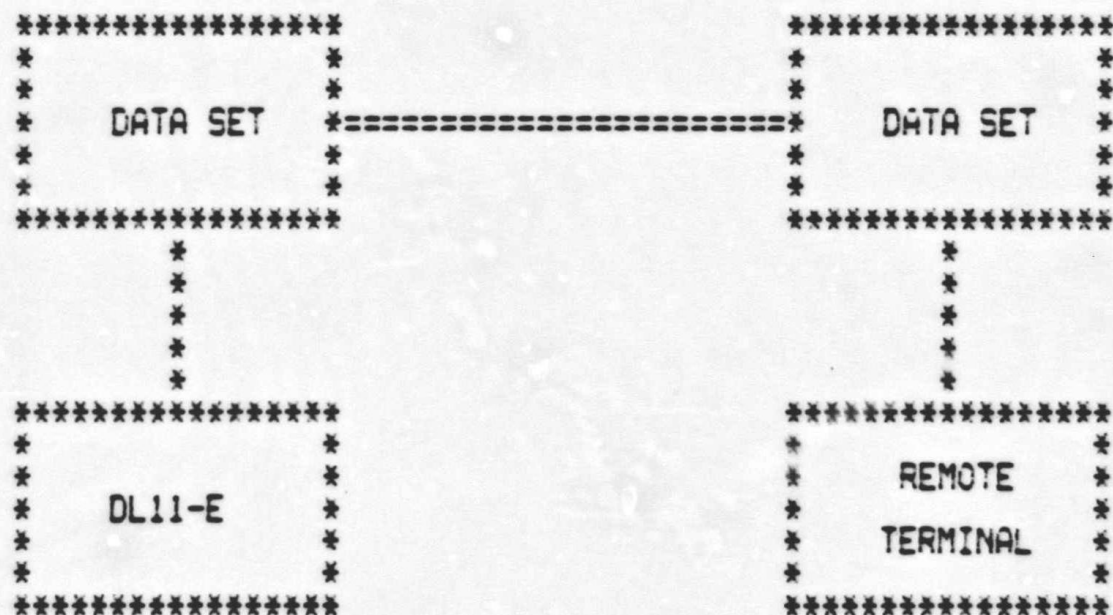
3.3 PDP-11 STANDARD OPERATING PARAMETERS

|      |   |                               |
|------|---|-------------------------------|
| SW15 | 1 | HALT ON ERROR                 |
| SW14 | 1 | SCOPE LOOP (NOT USED)         |
| SW13 | 1 | INHIBIT ERROR PRINTOUT        |
| SW12 | 1 | INHIBIT TRACE TRAP (NOT USED) |
| SW11 | 1 | INHIBIT ITERATION (NOT USED)  |



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| 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 |
| 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 |

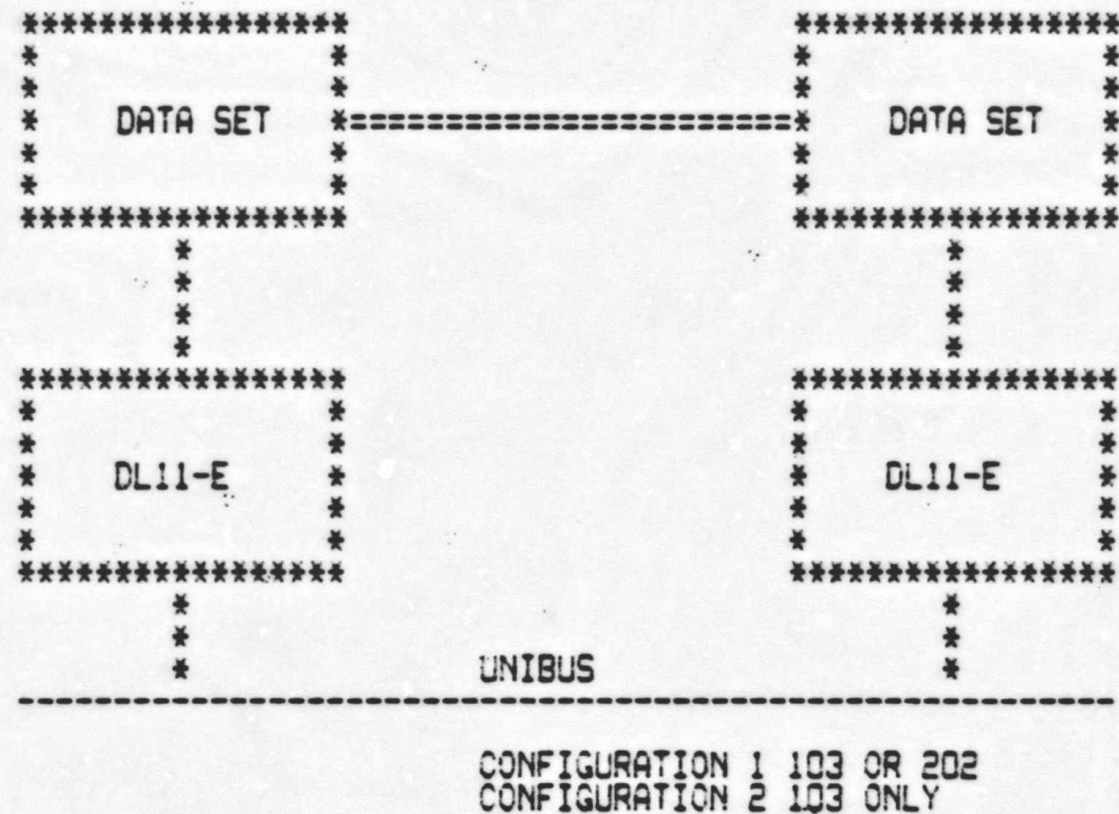
CONFIGURATION D: THIS CONFIGURATION TRANSMITS DATA FROM THE DL11-E CONNECTED TO THE LINE THAT WAS CALLED TO THE MODEM THAT CALLED (THE CALLER). THIS CONFIGURATION MAY BE USED TO TRANSMIT DATA TO A TERMINAL DEVICE. NOTE NO DATA CHECKING IS PERFORMED BY THE PROGRAM. HOWEVER, DATA MAY BE VISUALLY CHECKED AT THE TERMINAL DEVICE. TO INITIATE PROGRAM ACTION CALL THE MODEM CONNECTED TO A DL11-E FROM A MODEM CONNECTED TO THE TERMINAL DEVICE. WHEN THE PHONE RINGS AT THE PD11 THE PROGRAM WILL REQUEST THE CONFIGURATION. SET BITS0-1=00 BY TYPING IN OCTAL FOLLOWED BY A CR. WHEN THE 'HANDSHAKING' IS COMPLETED THE PROGRAM WILL REQUEST DL11-E PARAMETERS. TYPE THE PARAMETERS AS REQUESTED. THE PROGRAM WILL TYPE 'LINE CONNECTION MADE' AND BEGIN DATA TRANSMISSION.



CONFIGURATION 0

CONFIGURATION 1: THIS CONFIGURATION TRANSMITS DATA FROM THE DL11-E CONNECTED TO THE LINE THAT WAS CALLED TO THE DL11-E CONNECTED TO THE LINE THAT CALLED (THE CALLER). TO INITIATE PROGRAM ACTION CALL THE DL11-E YOU WISH TO TRANSMIT ON FROM THE LINE CONNECTED TO THE DL11-E YOU WISH TO RECEIVE THE DATA ON. WHEN THE PHONE RINGS AT THE PDP11 THE PROGRAM WILL REQUEST THE CONFIGURATION AND MODEM TYPE. TYPE BIT0=1=01 & BIT2=0 IF A 103 (OR EQUIV.) AND BIT2=1 IF A 202 (OR EQUIV.). THE PROGRAM WILL REQUEST THE LINE NUMBER THAT YOU CALLED FROM. TYPE THIS IN OCTAL FOLLOWED BY A CARRIAGE RETURN. WHEN THE CARRIER



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CONFIGURATION 2: THIS CONFIGURATION TRANSMITS DATA FROM BOTH THE CALLED TRANSMITTER AND THE TRANSMITTER CONNECTED TO THE LINE THAT WAS CALLING, I.E. IN ADDITION TO THE DATA TRANSMITTED AS IN CONFIGURATION 1 DATA IS ALSO TRANSMITTED IN THE REVERSE DIRECTION. TO INITIATE PROGRAM ACTION CALL THE DL11-E YOU WISH TO TRANSMIT ON FROM THE DL11-E YOU WISH TO RECEIVE/TRANSMIT ON. WHEN THE PHONE RINGS AT THE PDP11 THE PROGRAM WILL REQUEST THE CONFIGURATION AND MODEM TYPE. TYPE BIT0-1 =10 AND BIT2=0. NOTE: \*\*\*\*\*DO NOT USE MODEM TYPE 202 (OR EQUIV) USING CONFIG #2\*\*\*\* THE PROGRAM WILL REQUEST THE LINE YOU CALLED FROM. TYPE THE NUMBER IN OCTAL FOLLOWED BY A CR. WHEN THE CARRIER IS HEARD IN THE HEADSET PRESS THE DATA BUTTON ON THE DATA SET. NOTE YOU HAVE APPROXIMATELY 10 SECONDS IN WHICH TO DO THIS. WHEN THE 'HANDSHAKING IS COMPLETED THE PROGRAM WILL REQUEST TWO SETS OF DL11-E PARAMETERS. THE CHARACTER LENGTH OF BOTH SETS MUST BE THE SAME AND THE SPEED OF THE SECOND SET MUST BE GREATER THAN THE SPEED OF THE FIRST. WHEN THE PARAMETERS HAVE BEEN LOADED THE PROGRAM WILL TYPE 'LINE CONNECTION MADE' AND BEGIN TO WAY DATA TRANSMISSION. WHEN 100. CHARACTERS HAVE BEEN RECEIVED AND CHECKED THE BELL WILL RING AT THE TTY, AND ANOTHER BLOCK OF 100. CHARACTERS WILL BE PROCESSED. NOTE, DL11-E#X REFERS TO THE 'CALLED' DL11-E, AND DL11-E#Y REFERS TO THE 'CALLING' DL11-E.

### 3.5 LINE NUMBERS

LINE NUMBER REFERS TO THE ADDRESSES TO WHICH THE DL11-E RESPONDS.

|                |                |                |                |
|----------------|----------------|----------------|----------------|
| LINE 00 77561X | LINE 10 77571X | LINE 20 77601X | LINE 30 77611X |
| LINE 01 77562X | LINE 11 77572X | LINE 21 77602X | LINE 31 77612X |
| LINE 02 77563X | LINE 12 77573X | LINE 22 77603X | LINE 32 77613X |
| LINE 03 77564X | LINE 13 77574X | LINE 23 77604X | LINE 33 77614X |
| LINE 04 77565X | LINE 14 77575X | LINE 24 77605X | LINE 34 77615X |
| LINE 05 77566X | LINE 15 77576X | LINE 25 77606X | LINE 35 77616X |
| LINE 06 77567X | LINE 16 77577X | LINE 26 77607X | LINE 36 77617X |
| LINE 07 77570X | LINE 17 77600X | LINE 27 77610X |                |



4. USE PROCEDURE  
-----

THIS PROGRAM HAS BEEN MODIFIED TO RUN WITH OR WITHOUT  
A CONSOLE PROCESSOR.

IF A CONSOLE MACHINE IS USED; THEN THE PROGRAM  
LOOKS AT THE HARDWARE SWITCH REGISTER.

IF A CONSOLE-LESS MACHINE IS USED; THEN THE PROGRAM  
AUTOMATICALLY LOOKS AT THE CONTENTS OF LOCATION  
SOFTSR (176) AS A SWITCH REGISTER.

IT'S THE RESPONSIBILITY OF THE OPERATOR TO SET UP  
THIS LOCATION PRIOR TO STARTING THE PROGRAM.

## 4.1 PRG0 SINGLE CHARACTER LINE MODE DATA TEST

A. LOAD ADDRESS = 000200 (RESTART LOAD ADDR. = 000200)

B. START - PROGRAM WILL REQUEST PROGRAM NUMBER

C. THE PROGRAM WILL NOW REQUEST THE DATA. TYPE THE DATA IN OCTAL  
FOLLOWED BY A CARRIAGE RETURN.

D. MAKE LINE CONNECTION. SEE SECT 3.4

## 4.2 PRG1 - BINARY COUNT LINE MODE DATA TEST

A. LOAD ADDRESS = 000200

B. START - PROGRAM WILL REQUEST PROGRAM NUMBER

C. MAKE LINE CONNECTION SEE SECT 3.4

## 4.3 PRG2 - SPECIAL MESSAGE XMIT ONLY

A. LOAD ADDRESS = 000200

B. START - PROGRAM WILL REQUEST PROGRAM NUMBER

C. DEPRESS START - THE PROGRAM WILL IDENTIFY ITSELF AND  
TYPE INSTRUCTIONS TO SELECT DESIRED DL11-E PARAMETERS

(SEE SECT 3.2)

D. TYPE IN PARAMETERS. IF IT IS DESIRED TO TRANSMIT  
DATA WITH PARITY SET BIT6. ALSO SET BITS TO TRANSMIT ODD  
PARITY AND CLEAR TO TRANSMIT EVEN PARITY.

|      |     |                          |
|------|-----|--------------------------|
| BIT6 | 1/0 | ENABLE/DISABLE PARITY    |
| BITS | 1/0 | TRANSMIT ODD/EVEN PARITY |

E. WHEN 'MAKE LINE CONNECTION' IS TYPED CALL THE DL11-E  
YOU WISH TO TRANSMIT ON FROM THE TERMINAL MODEM.  
WHEN THE 'HANDSHAKING' IS COMPLETED THE MESSAGE

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'THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK  
0123456799' WILL BE TRANSMITTED. TO TERMINATE, HANG UP.



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## 4.4 PRG3 - RECEIVE TRANSMIT MESSAGE TEST

- A. LOAD ADDRESS = 000200
- B. START - PROGRAM WILL REQUEST PROGRAM NUMBER
- C. THE PROGRAM WILL IDENTIFY ITSELF AND TYPE INSTRUCTIONS TO SELECT DESIRED OPTIONS.
- D. SET IN OPTIONS AND PRESS CONTINUE.
- E. WHEN 'MAKE LINE CONNECTION' IS TYPED CALL THE DL11-E YOU WISH TO TRANSMIT ON. WHEN THE 'HANDSHAKING' IS COMPLETED THE DL11-E WILL TRANSMIT A CR LF TO THE TERMINAL DEVICE. AT THIS TIME YOU MAY BEGIN TO SEND DATA FROM THE DEVICE TO THE DL11-E WHERE IT WILL BE ECHOED BACK TO THE TERMINAL. TYPE ANY CHARACTER TO SIGNAL START OF MESSAGE. THEN TYPE MESSAGE AND THE SAME CHARACTER TO SIGNAL END OF MESSAGE. CONTROL C WILL CAUSE THE BUFFERS CONTENTS TO BE TRANSMITTED WHEN TYPED.
- F. IF NO ECHO IS DESIRED (ON A CHARACTER BASIS FOR EXAMPLE WHEN USING A TERMINAL THAT PRODUCES ITS OWN LOCAL COPY) SET BIT7 OF SWITCH REGISTER.

## 4.5 PRG4 - SPECIAL MESSAGE XMIT ONLY

- A. LOAD ADDRESS = 000200
- B. OPTIONS
  - 1. BITS 0-2 = 4
  - 2. BITS 3-6 = LINE NUMBER (SEE SECT 3.5)
- C. DEPRESS START - THE PROGRAM WILL IDENTIFY ITSELF AND TYPE INSTRUCTIONS TO SELECT DESIRED DL11-E PARAMETERS (SEE SECT 3.2)
- D. SET IN PARAMETERS IF IT IS DESIRED TO TRANSMIT DATA WITH PARITY RAISE SR6. ALSO RAISE SR5 TO TRANSMIT ODD PARITY AND LOWER TO TRANSMIT EVEN PARITY.
 

|      |     |                          |
|------|-----|--------------------------|
| BIT6 | 1/0 | ENABLE/DISABLE PARITY    |
| BITS | 1/0 | TRANSMIT ODD/EVEN PARITY |
- E. WHEN 'MAKE LINE CONNECTION' IS TYPED CALL THE DL11-E YOU WISH TO TRANSMIT ON FROM THE TERMINAL MODEM. WHEN THE 'HANDSHAKING' IS COMPLETED A SPIRAL PATTERN WILL BE TRANSMITTED. TO TERMINATE, HANG UP.



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## 5. PROGRAM DESCRIPTIONS

## 5.1 PRG0 - SINGLE CHARACTER LINE MODE DATA TEST

PRG0 TRANSMITS USER SPECIFIED DATA AND A CARRIAGE RETURN/LINE FEED EVERY 72ND CHARACTER.

## 5.2 PRG1 - BINARY COUNT PATTERN LINE MODE DATA TEST

PRG1 TRANSMITS A BINARY COUNT PATTERN. THIS PROGRAM IS THE SAME AS PRG0 EXCEPT FOR THE DATA TRANSMITTED.

## 5.3 PRG2 - SPECIAL MESSAGE TRANSMIT ONLY

PRG2 TRANSMITS THE MESSAGE  
THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK 0123456789.  
NO DATA ERROR CHECKING IS PERFORMED BY THE PROGRAM.

## 5.4 PRG3 - RECEIVE/TRANSMIT MESSAGE TEST

PRG3 - RECEIVES DATA FROM A TERMINAL AND READS THE RECEIVED MESSAGE BACK, AND TYPES THE MESSAGE ON THE PDP-11 TTY WHEN THE MESSAGE IS TERMINATED. CHARACTERS MAY BE ECHOED BACK (IF REQUIRED) ON A CHARACTER BASIS THEREBY CREATING LOCAL COPY AS THE MESSAGE IS TYPED.  
TRANSMISSION MAY BEGIN AT THE TERMINAL WHEN A CR/LF IS RECEIVED AT THE TERMINAL. THIS PROGRAM IS RESTRICTED TO USE BY ONLY FULL DUPLEX MODEMS.

## 5.5 PRG4 - SPECIAL MESSAGE TRANSMIT ONLY

PRG4 TRANSMITS A SPIRAL PATTERN.  
NO DATA CHECKING IS PERFORMED BY THE PROGRAM.



## 6.0

## ERRORS

THERE ARE TWO TYPES OF ERRORS WHICH ARE DETECTED BY THESE TESTS  
LINE FAILURE AND DATA ERRORS.

LINE FAILURES ARE DETECTED AND REPORTED BY ALL TESTS, AND  
DATA ERRORS ARE DETECTED ONLY IN PRG 0 & 1 WHEN USING CONFIG-  
URATIONS 1 OR 2. DATA ERRORS IN THE OTHER TESTS MAY BE DETECT-  
ED BY VISUAL INSPECTION OF THE DATA AT THE TERMINAL.

LINE FAILURES ARE REPORTED BY TYPING THE PC, THE RECEIVER CON-  
TROL STATUS REGISTER ADDRESS, AND ITS CONTENTS. SEE THE PRO-  
GRAM LISTING FOR A DETAILED DESCRIPTION OF THE ERROR.

THE MOST FREQUENTLY ENCOUNTERED ERROR WILL PROBABLY BE THE  
LOSS OF CARRIER. THIS ERROR WILL BE REPORTED IF AFTER A LINE  
CONNECTION IS MADE THE CARRIER IS LOST, EITHER BY 'HANGING UP'  
OR A 'GLITCH' ON THE LINE CAUSING THE CARRIER TO MOMENTARILY  
DROP. IN EITHER INSTANCE THE PROGRAM DISCONNECTS THE DL11-E  
FROM THE MODEM (BY CLEARING DATA TERMINAL READY) AND THE  
LINE WILL HAVE TO BE RECONNECTED TO RESUME TESTING.

IF IT IS PHYSICALLY IMPOSSIBLE TO GET TO THE DATA BUTTON  
WITHIN THE TIME ALLOTTED (APPROX. 10 SECONDS) TO MAKE THE  
LINE CONNECTION, THIS TIME MAY BE INCREASED BY PUTTING A  
LARGER NUMBER INTO THE DELAY. PATCH THE LARGER NUMBER  
INTO THE ADDRESS FOLLOWING THE DELAY EMT (BETWEEN RINTBG AND  
RINTBH). FOR EXAMPLE PATCHING IN 72460 WILL ALLOW APPROXIMATELY  
30 SECONDS IN WHICH TO RESPOND.

DATA ERRORS ARE REPORTED BY TYPING THE PC, THE RECEIVER CONTROL  
REGISTER ADDRESS OF THE LINE THAT FAILED, WHAT THE DATA SHOULD  
HAVE BEEN, WHAT THE DATA WAS, AND THE CHARACTER NUMBER.

PC=XXXXXX 174010 DATA S/B 301 WAS 321 CHAR NO 23

THIS TYPEOUT INDICATES A DATA ERROR ON LINE 1  
IF CONFIGURATION 2 IS SELECTED TWO ERROR TYPEOUTS MAY OCCUR  
FOR A SINGLE ERROR DEPENDING ON WHERE THE ERROR OCCURED. CON-  
FIGURATION 2 COMPARES THE DATA RECEIVED AT THE CALLED DL11-E  
WITH THE DATA TRANSMITTED BY THE CALLED DL11-E, AND ALSO THE DATA  
RECEIVED AT THE CALLER, DL11-E (CALLER) WITH THE DATA TRANSMITTED  
BY THE CALLED DL11-E.  
IF FOR EXAMPLE A DATA ERROR OCCURRED AT THE RECEIVER OF THE CALLING  
DL11-E CAUSING IT TO TRANSMIT INCORRECT DATA TO THE CALLED DL11-E TWO  
TYPEOUTS WILL OCCUR AS SHOWN BELOW:

PC=XXXXXX 174010 DATA S/B 301 WAS 321 CHAR NO 23  
PC=XXXXXX 174000 DATA S/B 301 WAS 321 CHAR NO 23

THESE TYPEOUTS SHOW THAT THE RECEIVER ON LINE 0 WAS THE CAUSE  
OF THE ERROR AND THE RECEIVER ON LINE 1 RECEIVED THE CORRECT  
INCORRECT DATA.

.ENDR

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441 .TITLE DZDLBB
442 .ENABLE ABS,AMA
443 ;THIS TEST CHECKS THE DL11-E USING MODEMS
444 ;REFER ALSO TO TEST DZDLA (DL11-E OFF LINE TESTS)
445 ;STARTING PROCEEDURE
446 LOAD ADDRESS 200
447
448 STACK POINTER IS AT 1200
449 PRESS START
450
451 ;AVAILABLE PROGRAMS
452 PRG0- SINGLE CHARACTER LINE MODE DATA TEST.
453 PRG1- SPECIAL BINARY COUNT LINE MODE DATA TEST.
454 PRG2- SPECIAL MESSAGE XMIT ONLY W/W/O PARITY
455 PRG3- RECEIVE DATA TEST
456 PRG4- SPIRAL PATTERN MESSAGE XMIT ONLY W/W/O PARITY
457 PRG5- DATA ECHO TEST (USES FACILITY AT MAYNARD)
458
459 ;STANDARD SR SWITCH OPTIONS (SWITCH SET TO A 1)
460 ;SR15- HALT ON ERROR.
461 ;SR14- SCOPE (NOT USED)
462 ;SR13- INHIBIT PRINTOUT
463 ;SR12- INHIBIT TRACE (NOT USED)
464 ;SR11- INHIBIT ITERATION (NOT USED)
465
466 .=0
467 000000 000000 ERTF ;UNASSIGNED TRAP
468 000002 000000 0
469 000004 004520 MACHER: ERTF ;SP OVERFLOW, BUS ERROR TRAP
470 000006 000040 40
471 000010 004520 ERTF ;RESERVED INSTRUCTION TRAP
472 000012 000100 100
473 000014 004520 ERTF ;TRACE TRAP
474 000016 000140 140
475 000020 004626 MAPVEC ;TRAP TO MAP VECTOR
476 000022 000340 PRTY7
477 000024 002646 PFAIL ;POWER FAIL TRAP
478 000026 000340 PRTY7
479 000030 002222 EMTINT ;EMT TRAP
480 000032 000340 PRTY7
481 000034 004520 ERTF
482 000036 000340 340
483 000040 000042 .+2
484 000042 000000 HALT
485 .REPT 119.
486 .+2
487 4
488 .ENDR
489
489 ;EQUATE STATEMENTS
490 PSW=177776
491 STKPTR=1200
492 OPEN=0
493 MANUAL=BIT15
494 BIT15=100000
495 BIT14=40000
496 BIT13=20000

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NO1.

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BIT12=10000  
BIT11=4000  
BIT10=2000  
BIT9=1000  
BIT8=400  
BIT7=200  
BIT6=100  
BIT5=40  
BIT4=20  
BIT3=10  
BIT2=4  
BIT1=2  
BIT0=1  
POPS=5726  
POPS2=022626  
PRTY7=340  
PRTY6=300  
PRTY5=240  
PRTY4=200  
PRTY3=140  
PRTY2=100  
PRTY1=40  
PRTY0=0  
TYPE=EMT+0  
TYPES=EMT+1  
STALL=EMT+2  
ERROR=EMT+3  
DATCHK=EMT+4  
CHALT=EMT+5  
STRXV=EMT+6  
STTXV=EMT+7  
EHALT=EMT+10  
SAVREG=EMT+11  
RSTREG=EMT+12  
ERROR1=EMT+13  
ERRTX=EMT+14  
ERRRX=EMT+15  
DELAY=EMT+16  
N=0  
A=0

;POP THE STACK. SAME AS TST (6)+  
;POP STACK TWICE. SAME AS CMP (6)+,(6)+  
;PRIORITY LEVEL DEFINITIONS

.MACR CNVOA SRC,DST,COUNT  
JSR %5,OACNV ;GO TO OCTAL TO ASCII CONVERT.  
SRC ;SOURCE ADDR.  
DST ;DESTINATION ADDR.  
COUNT ;#OF DIGITS TO CONVERT.  
.ENDM

RISR'N': .MACR ISR N  
MOV #'N',%0  
JMP RISR ;GO TO COMMON INTERRUPT SERVICE ROUTINE  
.ENDM

TISR'N': .MACR ISRT N  
MOV #'N',%0 ;PUT LINE # IN RO



```

JMP TISR :GO TO COMMON INTERRUPT SERVICE

.ENDM

.MACR RRCV N,A :ADDRESS OF RECEIVER LINE * 'A'
175610+N
.ENDM

.MACR RBUF N,A :ADDRESS OF RECEIVER BUFFER LINE * 'A'
175612+N
.ENDM

.MACR TXMT N,A :ADDRESS OF TRANSMITTER CSR LINE * 'A'
175614+N
.ENDM

.MACR TBUF N,A :ADDRESS OF TRANSMIT BUFFER LINE * 'A'
175616+N
.ENDM

```

```

000174 000174
000176 177570
000176 000000
000200 000200
000200 012737 001422 000300
000206 000407
000210 012737 001416 000300
000216 000403
000220 012737 002024 000300
000226
000226 012706 001200
000232 013746 000006
000236 013746 000004
000242 012737 000256 000004
000250 005777 177720
000254 000404
000256 012737 000176 000174 13:
000264 022626
000266 012637 000004
000272 012637 000006
000276 000137
000300 000000
000300 001200
001200 000000
001202 000000
001204 000000
001206 000000
001210 000000
001212 000200
001214 000000
001216 000200
001220 177560
001222 177562

SRPTR: 177570
SOFTSR: 000000
:200
MOV #START,STAD :SET UP FOR NORMAL START
BR STCONT :CONTINUE
MOV #REMAP,STAD :SET FOR A REMAP START
BR STCONT
MOV #MODEV,STAD :SET TO MODIFY ON START
STCONT: MOV #STKPTR,%5 :SET BOTTOM OF STACK
 MOV 6,-(SP) :SAVE CURRENT VECTOR
 MOV 4,-(SP)
 MOV #13,4
 TEST $SRPTR
 BR 2$
 MOV #SOFTSR,SRPTR
 CMP (6)+,(6)+
 MOV (6)+,4
 MOV (6)+,6
 JMP 3(PC)+
 STAD: 0
 :1200
RXCSR: 0
RXBUF: 0
TXCSR: 0
TXBUF: 0
RXVTR: OPEN
RXLVL: PRY4
TXVTR: OPEN
TXLVL: PRY4
TKS: 177560
TKB: 177562

:SET UP TIME OUT VECTOR
:TRY TO REFERENCE THE
:HARDWARE SWITCH REGISTER
:BRANCH IF NO TIME OUT TRAP OCCURS
:CHANGE THE SWITCH REGISTER POINTER
:TO POINT TO A SOFTWARE SWITCH REGISTER
:RESTORE THE STACK
:RESTORE TIME OUT VECTOR

:JUMP TO SELECTED START

:RECEIVER CSR UNDER TEST
:RECEIVER BUFFER UNDER TEST
:TRANSMITTER CSR UNDER TEST
:TRANSMITTER BUFFER UNDER TEST
:RECEIVER VECTOR
:RECEIVER PRIORITY LEVEL
:TRANSMITTER VECTOR
:TRANSMITTER PRIORITY LEVEL
:LSR CSR
:LSR BUFFER

```



```

609 001224 177564
610 001226 177566
611 001230 000060
612 001232 000200
613 001234 000064
614 001236 000200
615 001240 000000
616 001242 000000
617 001244 006424
618 001246 006540
619 001250 006642
620 001252 006740
621 001254 007474
622 001256 007706
623 001260 002354
624 001262 002354
625 001264 003122
626 001266 003244
627 001270 000000
628 001272 002512
629 001274 002412
630 001276 002366
631 001300 003042
632 001302 003072
633 001304 002400
634 001306 002254
635 001310 002314
636 001312 002534
637 001314 002710
638 001316 002732
639 001320 003466
640 001322 000000
641 001324 000000
642 001326 000000
643 001330 000000
644 001332 000000
645 001334 000000
646
647 001336 000000
648 001340 000000
649 001342 000000
650 001344 000000
651 001346 000000
652 001350 000000
653 001352 000000
654 001354 000000
655 001356 000000
656 001360 000000
657 001362 000000
658 001364 000000
659 001366 000000
660 001370 000000
661 001372 000000
662 001374 000000
663 001376 000000
664 001400 000000

```

```

TPS: 177564
TPB: 177566
TKVTR: 60
TKLVL: PRTY4
TPVTR: 64
TPLVL: PRTY4
PRGNUM: OPEN
PRGID: OPEN
PRGTAB: PRG0

```

```

PRG1
PRG2
PRG3
PRG4
PRG5
INCPRG
INCPRG

```

```

EMTTAB: TYP
TYP
TYP
OPEN
ERR
DTCHK
CHLT
STRVRV
STXMTV
EHLT
SAVRG
RSTRG
ERR1
TXERR
RXERR
DLY

```

```

PARBIT: OPEN
COUNT: OPEN
SAVE: OPEN
LINE: OPEN
CONFIG: OPEN
NUMBER: OPEN

```

```

OLDPS: 0
TOPC: 00
FROMPC: 00
FTITLE: 00
FNONE: 00
FMAP: 00
TEMP1: 00
LINENO: 0
RECDAT: OPEN
XMTDAT: OPEN
CARMSK: OPEN
CTRD: OPEN
TXCSRT: OPEN
RXCSRT: OPEN
TEMP: OPEN
SRT: OPEN
INBUFP: OPEN
BUFFP: OPEN

```

```

:LSP CSR
:LSP BUFFER
:LSP INTERRUPT VECTOR
:LSP PRIORITY LEVEL
:LSP INTERRUPT VECTOR
:LSP PRIORITY LEVEL
:CONTAINS CURRENT PROGRAM#
:CONTAINS PROGRAM INDICATORS
:PRG0 START ADDRESS
:PRG1 START ADDRESS
:PRG2 START ADDRESS
:PRG3 START ADDRESS
:PRG4 START ADDRESS
:PRG5 START ADDRESS

```

```

:POINTER TO TYPEOUT ROUTINE
:POINTER TO CHAINED MESSAGES ROUTINE
:POINTER TO RANDOM STALL ROUTINE
:POINTER TO ERROR ROUTINE
:POINTER TO DATA CHECK ROUTINE
:COMMON HALT
:POINTER TO ROUTINE TO SET RCVR VECTOR AND PRIORITY
:POINTER TO ROUTINE TO SET XMIT VECTOR AND PRIORITY
:POINTER TO ERROR HALT ROUTINE
:POINTER TO SAVE REGISTERS ROUTINE
:POINTER TO RESTORE REGISTERS ROUTINE
:POINTER TO ERROR ROUTINE
:POINTER TO XMIT ERROR ROUTINE
:POINTER TO RCVR ERROR ROUTINE
:POINTER TO DELAY ROUTINE

```



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|     |        |        |        |              |                                           |
|-----|--------|--------|--------|--------------|-------------------------------------------|
| 665 | 001402 | 000000 |        | CALLER: OPEN |                                           |
| 666 | 001404 | 000000 |        | CALLED: OPEN |                                           |
| 667 | 001406 | 000000 |        | OTBUFP: OPEN | : CONTAINS ADDRESS FROM WHERE NEXT TRAN-  |
| 668 |        |        |        |              | : SMITTED CHAR. (IN OUTBUF) IS TO COME    |
| 669 | 001410 | 000000 |        | TBUFP: OPEN  |                                           |
| 670 | 001412 | 000000 |        | MODEM: OPEN  | : CONTAINS MODEM TYPE 0=103, 4=202        |
| 671 | 001414 | 000000 |        | OPEN         | : CONTAINS ADDRESS FROM WHERE NEXT TRANS- |
| 672 |        |        |        |              | : MITTED CHAR. (CALLER'S LINE) IS TO COME |
| 673 |        |        |        |              |                                           |
| 674 | 001416 | 005037 | 001344 | REMAP: CLR   | FTITLE                                    |
| 675 | 001422 | 012706 | 001200 | START: MOV   | #STKPTR,%6                                |
| 676 | 001426 | 000005 |        | RESET        | : SET BOTTOM OF SP STACK:                 |
| 677 | 001430 | 005037 | 177776 | CLR          | PSW                                       |
| 678 | 001434 | 012737 | 004520 | MOV          | #ERTP,MACHER                              |
| 679 | 001442 | 012737 | 000040 | MOV          | #40,MACHER+2                              |
| 680 | 001450 | 005737 | 001344 | TST          | FTITLE                                    |
| 681 | 001454 | 001145 |        | BNE          | START1                                    |
| 682 | 001456 | 104000 |        | TYPE         | : TITLE PRINTED                           |
| 683 | 001460 | 012012 |        | MTITLE       | : YES, SKIP THIS                          |
| 684 | 001462 | 005237 | 001344 | INC          | FTITLE                                    |
| 685 | 001466 | 005037 | 001346 | CLR          | FNONE                                     |
| 686 | 001472 | 012737 | 177777 | MOV          | #-1,LINENO                                |
| 687 | 001500 | 012737 | 001550 | MOV          | #MAPNE,MACHER                             |
| 688 | 001506 | 012737 | 000340 | MOV          | #PTY7,MACHER+2                            |
| 689 | 001514 | 012704 | 010432 | MOV          | #RCSR,%4                                  |
| 690 | 001520 | 005237 | 001354 | MAPA: INC    | LINENO                                    |
| 691 | 001524 | 020427 | 010530 | CMP          | %4,#RBUF                                  |
| 692 | 001530 | 001477 |        | BEQ          | MAPEND                                    |
| 693 | 001532 | 005037 | 177776 | CLR          | PSW                                       |
| 694 | 001536 | 005774 | 000000 | TST          | 3(4)                                      |
| 695 | 001542 | 000240 |        | NOP          | : TEST DEVICE                             |
| 696 | 001544 | 000240 |        | NOP          |                                           |
| 697 | 001546 | 000404 |        | BR           | MAPOK                                     |
| 698 | 001550 | 062704 | 000002 | MAPNE: ADD   | #2,%4                                     |
| 699 | 001554 | 022626 |        | POPSP2       |                                           |
| 700 | 001556 | 000760 |        | BR           | MAPA                                      |
| 701 | 001560 | 011437 | 001352 | MAPOK: MOV   | (4),TEMP1                                 |
| 702 | 001564 | 004537 | 003530 | JSR          | %5,0ACNV                                  |
| 703 | 001570 | 001352 |        | TEMP1        | : SAVE DEVICE FOR TYPING                  |
| 704 | 001572 | 012154 |        | MDADR        |                                           |
| 705 | 001574 | 000006 |        | 6            |                                           |
| 706 | 001576 | 004537 | 003530 | JSR          | %5,0ACNV                                  |
| 707 | 001602 | 001354 |        | LINENO       |                                           |
| 708 | 001604 | 012146 |        | MLINE        |                                           |
| 709 | 001606 | 000002 |        | 2            |                                           |
| 710 | 001610 | 011401 |        | MOV          | (4),%1                                    |
| 711 | 001612 | 004737 | 004704 | JSR          | %7,FORMAD                                 |
| 712 | 001616 | 052737 | 000001 | BIS          | #BIT0,FMAP                                |
| 713 | 001624 | 042777 | 000100 | BIC          | #BIT6,3TXCSR                              |
| 714 | 001632 | 052777 | 000100 | BIS          | #BIT6,3TXCSR                              |
| 715 | 001640 | 000240 |        | NOP          |                                           |
| 716 | 001642 | 012737 | 000340 | MOV          | #PTY7,PSW                                 |
| 717 | 001650 | 005737 | 001210 | TST          | RXVTR                                     |
| 718 | 001654 | 001406 |        | BEQ          | MAPOKA                                    |
| 719 | 001656 | 013701 | 001354 | MOV          | LINENO,%1                                 |
| 720 | 001662 | 006301 |        | ASL          | %1                                        |



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|     |        |        |        |        |         |        |                                 |                           |
|-----|--------|--------|--------|--------|---------|--------|---------------------------------|---------------------------|
| 721 | 001664 | 013761 | 001210 | 010334 |         | MOV    | RXVTR, VECTAB(1) ; STORE VECTOR |                           |
| 722 | 001672 | 042777 | 000100 | 177304 | MAPOKA: | BIC    | #BIT6, JTXCSR                   |                           |
| 723 | 001700 | 004537 | 003530 |        |         | JSR    | %5, OACNV                       |                           |
| 724 | 001704 | 001210 |        |        |         | RXVTR  |                                 |                           |
| 725 | 001706 | 012166 |        |        |         | MTRAP  |                                 |                           |
| 726 | 001710 | 000004 |        |        |         | 4      |                                 |                           |
| 727 | 001712 | 104000 |        |        |         | TYPE   |                                 |                           |
| 728 | 001714 | 012146 |        |        |         | MLINE  |                                 |                           |
| 729 | 001716 | 005237 | 001346 |        |         | INC    | FNONE                           |                           |
| 730 | 001722 | 062704 | 000002 |        |         | ADD    | #2, %4                          |                           |
| 731 | 001726 | 000674 |        |        |         | BR     | MAPA                            |                           |
| 732 | 001730 | 012737 | 004520 | 000004 | MAPEND: | MOV    | #ERTP, MACHER                   |                           |
| 733 | 001736 | 012737 | 000040 | 000006 |         | MOV    | #40, MACHER+2                   |                           |
| 734 | 001744 | 005737 | 001346 |        |         | TST    | FNONE                           |                           |
| 735 | 001750 | 001007 |        |        |         | BNE    | START1                          |                           |
| 736 | 001752 | 104000 |        |        | MAPERR: | TYPE   |                                 |                           |
| 737 | 001754 | 012176 |        |        |         | MNONE  |                                 |                           |
| 738 | 001756 | 005037 | 001344 |        |         | CLR    | FTITLE                          |                           |
| 739 | 001762 | 000000 |        |        |         | HALT   |                                 |                           |
| 740 | 001764 | 000137 | 001422 |        |         | JMP    | START                           |                           |
| 741 | 001770 | 005037 | 177776 |        | START1: | CLR    | PSW                             |                           |
| 742 | 001774 | 104000 |        |        |         | TYPE   |                                 |                           |
| 743 | 001776 | 012213 |        |        |         | MSWSEL |                                 |                           |
| 744 | 002000 | 004737 | 003314 |        |         | JSR    | PC, RDOCT                       | ; GET INPUT               |
| 745 | 002004 | 012600 |        |        |         | MOV    | (SP)+, %0                       | ; (SR) TO RD              |
| 746 | 002006 | 042700 | 177770 |        |         | BIC    | #177770, %0                     | ; LIMIT (SR) TO BITS 2-0  |
| 747 | 002012 | 010037 | 001240 |        |         | MOV    | %0, PRGNUM                      | ; SAVE PROGRAM #          |
| 748 | 002016 | 006300 |        |        |         | ASL    | %0                              | ; ROX2                    |
| 749 | 002020 | 000170 | 001244 |        |         | JMP    | @PRGTAB(0)                      | ; GO TO SELECTED PROGRAM. |
| 750 |        |        |        |        |         |        |                                 |                           |
| 751 | 002024 | 012706 | 001200 |        | MODEV:  | MOV    | #STKPTR, %6                     |                           |
| 752 | 002030 | 000005 |        |        |         | RESET  |                                 |                           |
| 753 | 002032 | 005037 | 177776 |        |         | CLR    | PSW                             |                           |
| 754 | 002036 | 104000 |        |        | MODEV1: | TYPE   |                                 |                           |
| 755 | 002040 | 014435 |        |        |         | MMOD1  |                                 |                           |
| 756 | 002042 | 004737 | 003314 |        |         | JSR    | PC, RDOCT                       | ; GET INPUT               |
| 757 | 002046 | 011600 |        |        |         | MOV    | (SP), %0                        |                           |
| 758 | 002050 | 042700 | 177740 |        |         | BIC    | #177740, %0                     |                           |
| 759 | 002054 | 006300 |        |        |         | ASL    | %0                              |                           |
| 760 | 002056 | 022627 | 000036 |        |         | CMP    | (SP)+, #36                      |                           |
| 761 | 002062 | 101403 |        |        |         | BLOS   | MODEV2                          | ; BRANCH IF > 36          |
| 762 | 002064 | 104000 |        |        |         | TYPE   |                                 |                           |
| 763 | 002066 | 014363 |        |        |         | MMODX  |                                 |                           |
| 764 | 002070 | 000762 |        |        |         | BR     | MODEV1                          |                           |
| 765 | 002072 | 104000 |        |        | MODEV2: | TYPE   |                                 |                           |
| 766 | 002074 | 014553 |        |        |         | MMOD2  |                                 |                           |
| 767 | 002076 | 004737 | 003314 |        |         | JSR    | PC, RDOCT                       | ; GET INPUT               |
| 768 | 002102 | 032716 | 000001 |        |         | BIT    | #BIT0, (SP)                     |                           |
| 769 | 002106 | 001403 |        |        |         | BEQ    | MODEV3                          |                           |
| 770 | 002110 | 104000 |        |        |         | TYPE   |                                 |                           |
| 771 | 002112 | 014405 |        |        |         | MMOD0  |                                 |                           |
| 772 | 002114 | 000706 |        |        |         | BR     | MODEV2                          |                           |
| 773 | 002116 | 012601 |        |        | MODEV3: | MOV    | (SP)+, %1                       | ; SAVE DEV ADR            |
| 774 | 002120 | 010003 |        |        |         | MOV    | %0, %3                          |                           |
| 775 | 002122 | 062703 | 010432 |        |         | ADD    | #RCSR, %3                       |                           |
| 776 | 002126 | 010113 |        |        |         | MOV    | %1, (3)                         |                           |



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|     |        |        |        |                                 |               |                      |
|-----|--------|--------|--------|---------------------------------|---------------|----------------------|
| 777 | 002130 | 062701 | 000002 | ADD                             | %2,%1         | ;UPDATE DEV ADR      |
| 778 | 002134 | 010003 |        | MOV                             | %0,%3         |                      |
| 779 | 002136 | 062703 | 010530 | ADD                             | #RBUF,%3      |                      |
| 790 | 002142 | 010113 |        | MOV                             | %1,(3)        |                      |
| 781 | 002144 | 062701 | 000002 | ADD                             | %2,%1         | ;UPDATE DEV ADR      |
| 782 | 002150 | 010003 |        | MOV                             | %0,%3         |                      |
| 783 | 002152 | 062703 | 010626 | ADD                             | #TCSR,%3      |                      |
| 784 | 002156 | 010113 |        | MOV                             | %1,(3)        |                      |
| 785 | 002160 | 062701 | 000002 | ADD                             | %2,%1         | ;UPDATE DEV ADR      |
| 786 | 002164 | 010003 |        | MOV                             | %0,%3         |                      |
| 787 | 002166 | 062703 | 010724 | ADD                             | #TBUF,%3      |                      |
| 788 | 002172 | 010113 |        | MOV                             | %1,(3)        |                      |
| 789 | 002174 | 104000 |        | TYPE                            |               |                      |
| 790 | 002176 | 014621 |        | MMOD3                           |               |                      |
| 791 | 002200 | 004737 | 003314 | JSR                             | PC,RDOCT      | ;GET INPUT           |
| 792 | 002204 | 022627 | 177777 | CMP                             | (SP)+,#177777 |                      |
| 793 | 002210 | 001712 |        | BEQ                             | MODEV1        |                      |
| 794 | 002212 | 005037 | 001344 | CLR                             | FTITLE        |                      |
| 795 | 002216 | 000137 | 001422 | JMP                             | START         |                      |
| 796 |        |        |        |                                 |               |                      |
| 797 |        |        |        |                                 |               |                      |
| 798 | 002222 | 011646 |        |                                 |               |                      |
| 799 | 002224 | 162716 | 000002 | EMTINT: MOV                     | %6,-(6)       | ;GET SAVED PC.       |
| 800 | 002230 | 017616 | 000000 | SUB                             | %2,%6         | ;DECREMENT PC BY 2.  |
| 801 | 002234 | 006116 |        | MOV                             | %6,%6         |                      |
| 802 | 002236 | 042716 | 177001 | EMTA: ROL                       | %6            | ;EMT ARG X 2.        |
| 803 | 002242 | 062716 | 001264 | BIC                             | #177001,%6    | ;REMOVE 7 MSB.       |
| 804 | 002246 | 017616 | 000000 | ADD                             | #EMTTAB,%6    | ;FORM EMT RTN ADDR.  |
| 805 | 002252 | 000136 |        | MOV                             | %6,%6         |                      |
| 806 |        |        |        | JMP                             | %6+           | ;GO TO EMT ROUTINE.  |
| 807 |        |        |        |                                 |               |                      |
| 808 | 002254 | 012637 | 002310 |                                 |               |                      |
| 809 | 002260 | 012637 | 002312 | SAVE REGS 0 TO 4 SUBROUTINE.    |               |                      |
| 810 | 002264 | 010446 |        | SAVRG: MOV                      | (6)+,SVRPC    | ;SAVE PC AND PSW.    |
| 811 | 002266 | 010346 |        | MOV                             | (6)+,SVRPSW   |                      |
| 812 | 002270 | 010246 |        | MOV                             | %4,-(6)       | ;SAVE REGS 0 - 4     |
| 813 | 002272 | 010146 |        | MOV                             | %3,-(6)       | ;IN STACK.           |
| 814 | 002274 | 010046 |        | MOV                             | %2,-(6)       |                      |
| 815 | 002276 | 013746 | 002312 | MOV                             | %1,-(6)       |                      |
| 816 | 002302 | 013746 | 002310 | MOV                             | %0,-(6)       |                      |
| 817 | 002306 | 000002 |        | MOV                             | SVRPSW,-(6)   | ;RESTORE PC AND PSW. |
| 818 | 002310 | 000000 |        | MOV                             | SVRPC,-(6)    |                      |
| 819 | 002312 | 000000 |        | RTI                             |               | ;EXIT.               |
| 820 |        |        |        | SVRPC: OPEN                     |               |                      |
| 821 |        |        |        | SVRPSW: OPEN                    |               |                      |
| 822 | 002314 | 012637 | 002350 |                                 |               |                      |
| 823 | 002320 | 012637 | 002352 | RESTORE REGS 0 TO 4 SUBROUTINE. |               |                      |
| 824 | 002324 | 012600 |        | RSTRG: MOV                      | (6)+,RSTPC    | ;SAVE PC AND PSW.    |
| 825 | 002326 | 012601 |        | MOV                             | (6)+,RSTPSW   |                      |
| 826 | 002330 | 012602 |        | MOV                             | (6)+,%0       | ;RESTORE REGS 0 - 4  |
| 827 | 002332 | 012603 |        | MOV                             | (6)+,%1       | ;FROM STACK.         |
| 828 | 002334 | 012604 |        | MOV                             | (6)+,%2       |                      |
| 829 | 002336 | 013746 | 002352 | MOV                             | (6)+,%3       |                      |
| 830 | 002342 | 013746 | 002350 | MOV                             | (6)+,%4       |                      |
| 831 | 002346 | 000002 |        | MOV                             | RSTPSW,-(6)   | ;RESTORE PC AND PSW. |
| 832 | 002350 | 000000 |        | MOV                             | RSTPC,-(6)    |                      |
|     |        |        |        | RTI                             |               | ;EXIT                |
|     |        |        |        | RSTPC: OPEN                     |               |                      |



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|     |        |        |        |        |                                  |                |                                    |
|-----|--------|--------|--------|--------|----------------------------------|----------------|------------------------------------|
| 833 | 002352 | 000000 |        |        | RSTPSW: OPEN                     |                |                                    |
| 834 | 002354 | 104000 |        |        | INCPRG: TYPE                     |                | ;TYPE INCORRECT PROGRAM SELECTED.  |
| 835 | 002356 | 013352 |        |        | AINPRG                           |                |                                    |
| 836 | 002360 | 000000 |        |        | HALT                             |                |                                    |
| 837 | 002362 | 000137 | 001422 |        | JMP                              | START          |                                    |
| 838 |        |        |        |        | ROUTINE                          |                |                                    |
| 839 | 002366 | 011600 |        |        | CHLT: MOV                        | 3%6,%0         | ;DEVELOP ADDRESS OF CALLER.        |
| 840 | 002370 | 162700 | 000002 |        | SUB                              | #2,%0          |                                    |
| 841 | 002374 | 000000 |        |        | HALT                             |                | ;HALT. ADDRESS OF CALL INSTRUCTION |
| 842 | 002376 | 000002 |        |        | RTI                              |                | ;IN DATA LIGHTS.                   |
| 843 |        |        |        |        |                                  |                |                                    |
| 844 |        |        |        |        | :CONDITIONAL ERROR HALT ROUTINE. |                |                                    |
| 845 | 002400 | 005777 | 175570 |        | EHLT: TST                        | 3SRPTR         | ;CHECK FOR HALT ON ERROR.          |
| 846 | 002404 | 100001 |        |        | BPL                              | EHLTA          | ;BRANCH IF NO HALT DESIRED.        |
| 847 | 002406 | 000000 |        |        | HALT                             |                | ;HALT.                             |
| 848 | 002410 | 000002 |        |        | EHLTA: RTI                       |                | ;IN DATA LIGHTS.                   |
| 849 |        |        |        |        |                                  |                |                                    |
| 850 |        |        |        |        | :DATA CHECK ROUTINE.             |                |                                    |
| 851 | 002412 | 043737 | 001362 | 001360 | DTCHK: BIC                       | CARMSK,XMTDAT  | ;CLEAR UNTRANSMITTED BITS          |
| 852 | 002420 | 123737 | 001356 | 001360 | CMPB                             | RECDAT,XMTDAT  | ;COMPARE TRANSMITTED AND RECEIVED  |
| 853 | 002426 | 001430 |        |        | BEQ                              | DTCHKA         | ;CHARS. BRANCH IF SAME.            |
| 854 | 002430 |        |        |        | CNVOA                            | RECDAT,CWAS,3  |                                    |
| 855 | 002442 |        |        |        | CNVOA                            | XMTDAT,CSB,3   |                                    |
| 856 | 002454 |        |        |        | CNVOA                            | RXCSP,CSRADD,6 |                                    |
| 857 | 002466 | 104013 |        |        | ERROR1                           |                |                                    |
| 858 | 002470 | 012357 |        |        | CSRADD                           |                |                                    |
| 859 | 002472 | 004537 | 004216 |        | JSR                              | 5,BDCNV        | ;CONVERT                           |
| 860 | 002476 | 001364 |        |        | CTRD                             |                | ;CHAR #                            |
| 861 | 002500 | 013343 |        |        | CRNUM                            |                | ;TO DECIMAL                        |
| 862 | 002502 | 000004 |        |        | 4                                |                | ;4 BITS                            |
| 863 | 002504 | 104013 |        |        | ERROR1                           |                |                                    |
| 864 | 002506 | 013300 |        |        | CERDAT                           |                |                                    |
| 865 | 002510 | 000002 |        |        | DTCHKA: RTI                      |                | ;EXIT.                             |
| 866 |        |        |        |        |                                  |                |                                    |
| 867 | 002512 | 012737 | 177777 | 002624 | ERR: MOV                         | #-1,ERRB       | ;SET UP ONE MESSAGE CALL.          |
| 868 | 002520 | 012737 | 000240 | 002626 | MOV                              | #240,ERRB+2    |                                    |
| 869 | 002526 | 005037 | 002644 |        | CLR                              | ERRE           |                                    |
| 870 | 002532 | 000413 |        |        | BR                               | ERRA           |                                    |
| 871 | 002534 | 011637 | 002624 |        | ERR1: MOV                        | 3%6,ERRB       | ;DEVELOP ADDT'L MESSAGE ADDR.      |
| 872 | 002540 | 017737 | 000060 | 002624 | MOV                              | 3ERRB,ERRB     | ;STORE AT ERRE.                    |
| 873 | 002546 | 012737 | 177777 | 002626 | MOV                              | #-1,ERRB+2     |                                    |
| 874 | 002554 | 012737 | 000002 | 002644 | MOV                              | #2,ERRE        |                                    |
| 875 | 002562 | 032777 | 020000 | 175404 | ERRA: BIT                        | #BIT13,3SRPTR  | ;INHIBIT ERROR PRINT?              |
| 876 | 002570 | 001020 |        |        | BNE                              | ERRC           | ;BRANCH TO INHIBIT PRINT.          |
| 877 | 002572 | 011637 | 002642 |        | MOV                              | 3%6,ERRD       | ;DEVELOP CALLING ADDR.             |
| 878 | 002576 | 162737 | 000002 | 002642 | SUB                              | #2,ERRD        |                                    |
| 879 | 002604 |        |        |        | CNVOA                            | ERRD,APC,6     | ;CONVERT CALL ADDR TO ASCII.       |
| 880 | 002616 | 104011 |        |        | SAVREG                           |                |                                    |
| 881 | 002620 | 104001 |        |        | TYPES                            |                | ;TYPE:                             |
| 882 | 002622 | 012427 |        |        | EMD                              |                | ;ERROR HEADER.                     |
| 883 | 002624 | 000000 |        |        | ERRB: OPEN                       |                | ;ADDT'L ERROR MESSAGE IF ANY.      |
| 884 | 002626 | 177777 |        |        | -1                               |                |                                    |
| 885 | 002630 | 104012 |        |        | RSTREG                           |                |                                    |
| 886 | 002632 | 104010 |        |        | ERRC: EHALT                      |                | ;GO ERR HALT IF DESIRED.           |
| 887 | 002634 | 063716 | 002644 |        | ADD                              | ERRE,3%6       |                                    |
| 888 | 002640 | 000002 |        |        | RTI                              |                | ;EXIT.                             |



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899 002642 000000 ERRD: OPEN
900 002644 000000 ERRE: OPEN
901
902 ;POWER FAIL SERVICE
893 002646 012737 002656 000024 PFAIL: MOV #PWRUP,2#24
894 002654 000000 HALT
895 002656 012737 002646 000024 PWRUP: MOV #PFAIL,2#24
896 002664 000005 RESET
897 002666 012706 001200 MOV #STKPTR,%6
898 002672 104000 TYPE
899 002674 014325 MPWRF
900 002676 013700 001240 RESTRT: MOV PRGNUM,%0
901 002702 006300 ASL %0
902 002704 000170 001244 JMP @PRGTAB(0)
903
904 002710 TXERR: CNVOA TXCSR,ATXWAS,6 ;CONVERT CONTENTS OF TXCSR TO ASCII.
905 002722 012737 012445 003026 MOV #ATXCSR,CRXTXB
906 002730 000410 BR
907 002732 RXERR: CNVOA RXCSR,ARXWAS,6 ;CONVERT CONTENTS OF RXCSR TO ASCII.
908 002744 012737 012466 003026 MOV #ARXCSR,CRXTXB
909 002752 011637 003024 CRXTX: MOV 2%6,CRXTXA ;DEVELOP ADDR OF ADDTT'L ERROR MESSAGE.
910 002756 017737 000042 003024 MOV @CRXTXA,CRXTXA
911 002764 032777 020000 175202 BIT #BIT13,@SRPTR ;INHIBIT PRINT?
912 002772 001017 BNE CRXTXC ;BRANCH TO INHIBIT PRINT.
913 002774 011637 002642 MOV 2%6,ERRD ;DEVELOP CALLING ADDR.
914 003000 162737 000002 002642 SUB #2,ERRD
915 003006 CNVOA ERRD,APC,6 ;CONVERT CALLING ADDR TO ASCII.
916 003020 104001 TYPES ;TYPE ERROR MESSAGE.
917 003022 012427 EMO ;ERR HEADER
918 003024 000000 CRXTXA: OPEN ;ADDT'L ERR MESSAGE
919 003026 000000 CRXTXB: OPEN ;TXCSR OR RXCSR CONTENTS.
920 003030 177777 -1
921 003032 104010 CRXTXC: EHALT ;GO HALT IF DESIRED.
922 003034 062716 000002 ADD #2,2%6
923 003040 000002 RTI ;EXIT.
924
925 ;ROUTINE TO SET RECEIVER INTERRUPT VECTOR AND PRIORITY
926 003042 017637 000000 003062 STRVRV: MOV 2(6),STPRA+2 ;MOVE VECTOR ADDR TO STPRA+2
927 003050 062716 000002 ADD #2,2%6 ;SET UP EXIT
928 003054 013701 001210 MOV RXVTR,%1
929 003060 012721 000000 STPRA: MOV #OPEN,(1)+ ;SET VECTOR ADDRESS
930 003064 013721 001212 MOV RXLVL,(1)+ ;SET PRIORITY
931 003070 000002 RTI ;EXIT
932
933 ;ROUTINE TO SET TRANSMITTER INTERRUPT VECTOR AND PRIORITY.
934 003072 017637 000000 003112 STXMTV: MOV 2(6),STPPA+2 ;MOVE VECTOR ADDR TO STPPA+2
935 003100 062716 000002 ADD #2,2%6 ;SET UP EXIT
936 003104 013701 001214 MOV TXVTR,%1
937 003110 012721 000000 STPPA: MOV #OPEN,(1)+ ;SET VECTOR ADDRESS.
938 003114 013721 001216 MOV TXLVL,(1)+ ;SET PRIORITY
939 003120 000002 RTI ;EXIT.
940
941 ;SUBROUTINE TO OUTPUT ASCII MESSAGE ON TELETYPE PRINTER.
942 003122 010037 003312 TYP: MOV %0,SAVRD ;SAVE RO
943 003126 011600 MOV 2%6,%0 ;GET ADDRESS THAT CONTAINS MESSAGE ADDRESS.
944 003130 062716 000002 ADD #2,2%6 ;SET UP EXIT.

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|      |        |        |        |        |                                                                      |                  |                                            |
|------|--------|--------|--------|--------|----------------------------------------------------------------------|------------------|--------------------------------------------|
| 945  | 003134 | 011000 |        |        | MOV                                                                  | %0,%0            | ;ADDRESS OF MESSAGE TO RO.                 |
| 946  | 003136 | 112037 | 003242 |        | MOVE                                                                 | (0)+,TYPDAT      | ;GET CHARACTER                             |
| 947  | 003142 | 122737 | 000100 | 003242 | CMPB                                                                 | #100,TYPDAT      | ;CHECK FOR"2"CHARACTER                     |
| 948  | 003150 | 001003 |        |        | BNE                                                                  | TYPC             | ;BRANCH IF NOT"2"                          |
| 949  | 003152 | 013700 | 003312 |        | MOV                                                                  | SAVR0,%0         | ;RESTORE RO                                |
| 950  | 003156 | 000002 |        |        | RTI                                                                  |                  | ;TERMINATOR CHAR. DONE. EXIT.              |
| 951  | 003160 | 122737 | 000045 | 003242 | TYPC:                                                                | CMPB #45,TYPDAT  | ;CHECK FOR"%"                              |
| 952  | 003166 | 001412 |        |        | BEQ                                                                  | TYPF             | ;BRANCH IF"%"                              |
| 953  | 003170 | 004737 | 003176 |        | JSR                                                                  | %7,TYPD          | ;TYPE CHAR IN TYPDAT                       |
| 954  | 003174 | 000760 |        |        | BR                                                                   | TYPD             |                                            |
| 955  | 003176 | 113777 | 003242 | 176022 | TYPD:                                                                | MOV8 TYPDAT,%TPB | ;OUTPUT CHARACTER TO PRINTER               |
| 956  | 003204 | 105777 | 176014 |        | TSTB                                                                 | %TPS             | ;WAIT FOR DONE FLAG.                       |
| 957  | 003210 | 100375 |        |        | BPL                                                                  | -4               |                                            |
| 958  | 003212 | 000207 |        |        | RTS                                                                  | %7               | ;EXIT                                      |
| 959  | 003214 | 112737 | 000015 | 003242 | TYPF:                                                                | MOV8 #15,TYPDAT  | ;MOVE CARRIAGE RETURN CODE TO TYPDAT       |
| 960  | 003222 | 004737 | 003176 |        | JSR                                                                  | %7,TYPD          | ;GO TYPE CHAR.                             |
| 961  | 003226 | 112737 | 000012 | 003242 | MOV8                                                                 | #12,TYPDAT       | ;MOVE LF CODE TO TYPDAT.                   |
| 962  | 003234 | 004737 | 003176 |        | JSR                                                                  | %7,TYPD          | ;GO TYPE CHAR.                             |
| 963  | 003240 | 000736 |        |        | BR                                                                   | TYPD             |                                            |
| 964  | 003242 | 000000 |        |        | TYPDAT:                                                              | OPEN             |                                            |
| 965  |        |        |        |        | ;SUBROUTINE TO OUTPUT A SERIES OF ASCII MESSAGES ON TELETYPE PRINTER |                  |                                            |
| 966  | 003244 | 010037 | 003312 |        | TYP8:                                                                | MOV %0,SAVR0     |                                            |
| 967  | 003250 | 011600 |        |        | TYP8AA:                                                              | MOV %0,%0        | ;GET ADDRESS THAT CONTAINS MESSAGE ADDRESS |
| 968  | 003252 | 062716 | 000002 |        | ADD                                                                  | #2,%0            | ;UPDATE TO NEXT MESSAGE ADDRESS            |
| 969  | 003256 | 011037 | 003306 |        | MOV                                                                  | %0,TYP8B         | ;ADDRESS OF MESSAGE TO TYP8B               |
| 970  | 003262 | 022737 | 177777 | 003306 | CMP                                                                  | #-1,TYP8B        | ;CHECK FOR TERMINATOR                      |
| 971  | 003270 | 001003 |        |        | BNE                                                                  | TYP8A            | ;BRANCH IF NOT TERMINATOR.                 |
| 972  | 003272 | 013700 | 003312 |        | MOV                                                                  | SAVR0,%0         | ;RESTORE RO                                |
| 973  | 003276 | 000002 |        |        | RTI                                                                  |                  | ;TERMINATOR, EXIT                          |
| 974  | 003300 | 013700 | 003312 |        | TYP8A:                                                               | MOV SAVR0,%0     |                                            |
| 975  | 003304 | 104000 |        |        | TYP8B:                                                               | OPEN             | ;CALL ON TYP SUB TO TYPE MESSAGE           |
| 976  | 003306 | 000000 |        |        | BR                                                                   | TYP8AA           | ;ADDRESS OF MESSAGE GOES HERE              |
| 977  | 003310 | 000757 |        |        | SAVR0:                                                               | OPEN             | ;GO PROCESS NEXT MESSAGE                   |
| 978  | 003312 | 000000 |        |        |                                                                      |                  |                                            |
| 979  |        |        |        |        | ;SUBROUTINE TO READ OCTAL DATA FROM THE TELETYPE PRINTER             |                  |                                            |
| 980  |        |        |        |        | RDOCT:                                                               | MOV (SP),-(SP)   | ;MAKE ROOM FOR DATA WORD                   |
| 981  | 003314 | 011646 |        |        | MOV                                                                  | %0,-(SP)         | ;SAVE RO                                   |
| 982  | 003316 | 010046 |        |        | MOV                                                                  | %1,-(SP)         | ;SAVE R1                                   |
| 983  | 003320 | 010146 |        |        | INDAT:                                                               | CLR %1           | ;CLEAR DATA WORD                           |
| 984  | 003322 | 005001 |        |        | CLR                                                                  | COUNT            | ;SET NO. OF DIGITS = 0                     |
| 985  | 003324 | 005037 | 001324 |        | RDDAT:                                                               | TSTB %TKS        | ;TEST TTY READ STATUS                      |
| 986  | 003330 | 105777 | 175664 |        | BPL                                                                  | RDDAT            | ;WAIT                                      |
| 987  | 003334 | 100375 |        |        | MOV8                                                                 | %TKB,-(SP)       | ;PUSH DIGIT ON STACK                       |
| 988  | 003336 | 117746 | 175660 |        | BIC                                                                  | #BIT7,(SP)       |                                            |
| 989  | 003342 | 042716 | 000200 |        | ECDAT:                                                               | TSTB %TPS        | ;TEST TTY PRINT STATUS                     |
| 990  | 003346 | 105777 | 175652 |        | BPL                                                                  | ECDAT            | ;WAIT                                      |
| 991  | 003352 | 100375 |        |        | MOV8                                                                 | (SP),%TPB        | ;ECHO CHARACTER                            |
| 992  | 003354 | 111677 | 175646 |        | CMPB                                                                 | #15,(SP)         | ;IS IT A TERMINATOR?                       |
| 993  | 003360 | 122716 | 000015 |        | BEQ                                                                  | RETRN            | ;BR IF YES                                 |
| 994  | 003364 | 001432 |        |        | CMPB                                                                 | #177,(SP)        | ;IS IT A RUBOUT?                           |
| 995  | 003366 | 122716 | 000177 |        | BEQ                                                                  | RREAD            | ;BR IF YES                                 |
| 996  | 003372 | 001423 |        |        | CMPB                                                                 | #60,(SP)         | ;IS IT AN OCTAL DIGIT?                     |
| 997  | 003374 | 122716 | 000060 |        | BGT                                                                  | RREAD            | ;BR IF NO                                  |
| 998  | 003400 | 003020 |        |        | CMPB                                                                 | #67,(SP)         | ;TEST AGAIN                                |
| 999  | 003402 | 122716 | 000067 |        | BLT                                                                  | RREAD            | ;BR IF NO                                  |
| 1000 | 003406 | 002415 |        |        |                                                                      |                  |                                            |



| Address | Hex    | Hex    | Hex    | Hex    | Instruction                                                     | Comment                                |
|---------|--------|--------|--------|--------|-----------------------------------------------------------------|----------------------------------------|
| 1001    | 003410 | 005237 | 001324 |        | INC COUNT                                                       | ; INC NO. OF DIGITS                    |
| 1002    | 003414 | 022737 | 000067 | 001324 | CMP #67, COUNT                                                  | ; MORE THAN SIX DIGITS?                |
| 1003    | 003422 | 003407 |        |        | BLE RREAD                                                       | ; BR IF YES                            |
| 1004    | 003424 | 006301 |        |        | ASL %1                                                          | ; CLEAR LOWEST THREE BITS              |
| 1005    | 003426 | 006301 |        |        | ASL %1                                                          | ; OF DATA WORD                         |
| 1006    | 003430 | 006301 |        |        | ASL %1                                                          |                                        |
| 1007    | 003432 | 162716 | 000060 |        | SUB #60, (SP)                                                   | ; CONVERT TO BINARY                    |
| 1008    | 003436 | 062601 |        |        | ADD (SP)+, %1                                                   | ; ADD DIGIT TO DATA WORD               |
| 1009    | 003440 | 000733 |        |        | BR RDDAT                                                        | ; GET NEXT DIGIT                       |
| 1010    | 003442 | 104000 |        |        | RREAD: TYPE                                                     | ; TELL USER ABOUT ILLEGAL CHARACTER    |
| 1011    | 003444 | 013232 |        |        | DTERR                                                           |                                        |
| 1012    | 003446 | 005726 |        |        | TST (SP)+                                                       | ; GET RID OF ILLEGAL CHARACTER         |
| 1013    | 003450 | 000724 |        |        | BR INDAT                                                        | ; START SUBROUTINE AGAIN               |
| 1014    | 003452 | 010166 | 000010 |        | RETRN: MOV %1, 10(SP)                                           | ; STORE DATA WORD ON STACK             |
| 1015    | 003456 | 005726 |        |        | TST (SP)+                                                       | ; INC STACK POINTER                    |
| 1016    | 003460 | 012601 |        |        | MOV (SP)+, %1                                                   | ; RESTORE R1                           |
| 1017    | 003462 | 012600 |        |        | MOV (SP)+, %0                                                   | ; RESTORE R0                           |
| 1018    | 003464 | 000207 |        |        | RTS PC                                                          | ; RETURN                               |
| 1019    |        |        |        |        |                                                                 |                                        |
| 1020    |        |        |        |        | ; SUBROUTINE TO DELAY A SPECIFIED NUMBER OF MILLISECONDS        |                                        |
| 1021    | 003466 | 011637 | 003526 |        | DLY: MOV %6, DLCNT                                              | ; GET DELAY COUNT ADDRESS.             |
| 1022    | 003472 | 062716 | 000002 |        | ADD #2, %6                                                      | ; SET UP EXIT ADDRESS                  |
| 1023    | 003476 | 017746 | 000024 |        | MOV %DLCNT, -(6)                                                | ; DELAY COUNT TO STACK                 |
| 1024    | 003502 | 001407 |        |        | BEQ DLYC                                                        |                                        |
| 1025    | 003504 | 012746 | 000226 |        | DLYA: MOV #226, -(6)                                            | ; 1 MSEC COUNT TO STACK                |
| 1026    | 003510 | 005316 |        |        | DLYB: DEC %6                                                    | ; DECREMENT 1 MSEC COUNT               |
| 1027    | 003512 | 001376 |        |        | BNE DLYB                                                        | ; BRANCH IF NOT 0.                     |
| 1028    | 003514 | 005726 |        |        | POPSP                                                           | ; ZERO. UNCOVER MSECS. COUNT.          |
| 1029    | 003516 | 005316 |        |        | DEC %6                                                          | ; DECREMENT IT                         |
| 1030    | 003520 | 001371 |        |        | BNE DLYA                                                        | ; BR IF NOT DONE DELAYING              |
| 1031    | 003522 | 005726 |        |        | DLYC: POPSP                                                     | ; DONE                                 |
| 1032    | 003524 | 000002 |        |        | RTI                                                             | ; EXIT.                                |
| 1033    | 003526 | 000000 |        |        | DLCNT: OPEN                                                     | ; CONTAINS MILLISECONDS COUNT ADDRESS. |
| 1034    |        |        |        |        |                                                                 |                                        |
| 1035    |        |        |        |        | ; OCTAL TO ASCII CONVERT ROUTINE                                |                                        |
| 1036    | 003530 | 104011 |        |        | OACNV: SAVREG                                                   | ; SAVE REGS.                           |
| 1037    | 003532 | 013500 |        |        | MOV %5, %0                                                      | ; GET OCTAL VALUE.                     |
| 1038    | 003534 | 012501 |        |        | MOV (5)+, %1                                                    | ; GET DESTINATION ADDR.                |
| 1039    | 003536 | 012502 |        |        | MOV (5)+, %2                                                    | ; GET CONVERT COUNT.                   |
| 1040    | 003540 | 060201 |        |        | ADD %2, %1                                                      | ; DEVELOP ADDR TO STORE 1ST CHAR.      |
| 1041    | 003542 | 010003 |        |        | OACNVA: MOV %0, %3                                              |                                        |
| 1042    | 003544 | 042703 | 177770 |        | BIC #177770, %3                                                 | ; ISOLATE LEAST SIGNIFICANT DIGIT.     |
| 1043    | 003550 | 062703 | 000060 |        | ADD #60, %3                                                     | ; CONVERT DIGIT TO ASCII.              |
| 1044    | 003554 | 110341 |        |        | MOVB %3, -(1)                                                   | ; STORE ASCII CHARACTER.               |
| 1045    | 003556 | 042700 | 000007 |        | BIC #7, %0                                                      |                                        |
| 1046    | 003562 | 006000 |        |        | ROR %0                                                          |                                        |
| 1047    | 003564 | 006000 |        |        | ROR %0                                                          |                                        |
| 1048    | 003566 | 006000 |        |        | ROR %0                                                          |                                        |
| 1049    | 003570 | 005302 |        |        | DEC %2                                                          | ; DONE ALL DIGITS?                     |
| 1050    | 003572 | 001363 |        |        | BNE OACNVA                                                      | ; BRANCH IF NOT DONE.                  |
| 1051    | 003574 | 104012 |        |        | RSTREG                                                          | ; RESTORE REGS.                        |
| 1052    | 003576 | 000205 |        |        | RTS %5                                                          | ; DONE. EXIT.                          |
| 1053    |        |        |        |        | ; SUBROUTINE TO GENERATE PARITY ON DATA FOR 5,6,7,8 LEVEL CODE. |                                        |
| 1054    |        |        |        |        | ; PARITY BIT IS THE MSB OF THE CHARACTER PARITY CAN BE EITHER   |                                        |
| 1055    |        |        |        |        | ; EVEN OR ODD                                                   |                                        |
| 1056    |        |        |        |        | ; GENERATES ODD/EVEN PARITY.                                    |                                        |



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1057
1058 003600 032737 000200 001362 GENPAR: BIT #BIT7,CARMSK ;TEST LSB CHAR LENGTH
1059 003606 001411 BEQ EIGHT ;CHAR IS 8
1060 003610 032737 000100 001362 BIT #BIT6,CARMSK ;TEST MSB CHAR LENGTH
1061 003616 001427 BEQ SEVEN ;CHAR LENGTH IS 7
1062 003620 032737 000040 001362 BIT #BIT5,CARMSK
1063 003626 001412 BEQ SIX
1064 003630 000433 BR FIVE
1065 003632 012737 000200 001322 EIGHT: MOV #BIT7,PARBIT ;PLACE PARITY BIT IN PROPER POSITION
1066 003640 012737 000007 001324 MOV #7,COUNT ;SET UP ROTATE COUNTER=7
1067 003646 042701 177600 BIC #177600,%1 ;MASK OFF UNUSED BITS
1068 003652 000433 BR DOIT ;GO AND GENERATE PARITY FOR 8
1069 003654 012737 000040 001322 SIX: MOV #BIT5,PARBIT ;PLACE PARITY BIT IN PROPER POSITION
1070 003662 012737 000005 001324 MOV #5,COUNT ;SET UP ROTATE COUNTER=5
1071 003670 042701 177740 BIC #177740,%1 ;MASK OFF UNUSED BITS
1072 003674 000422 BR DOIT ;GO AND GENERATE PARITY FOR
1073 003676 012737 000100 001322 SEVEN: MOV #BIT6,PARBIT ;PLACE PARITY BIT IN PROPER POSITION
1074 003704 012737 000006 001324 MOV #6,COUNT ;SET UP ROTATE COUNTER=6
1075 003712 042701 177700 BIC #177700,%1 ;MASK OFF UNUSED BITS
1076 003716 000411 BR DOIT ;GO AND GENERATE PARITY FOR 7
1077 003720 012737 000020 001322 FIVE: MOV #BIT4,PARBIT ;PLACE PARITY BIT IN PROPER POSITION
1078 003726 012737 000004 001324 MOV #4,COUNT ;SET UP ROTATE COUNTER=4
1079 003734 042701 177760 BIC #177760,%1 ;MASK OFF UNUSED BITS
1080 003740 000400 BR DOIT ;GO AND GENERATE PARITY FOR
1081 003742 010137 001326 DOIT: MOV %1,SAVE ;SAVE DATA
1082 003746 006001 AGAIN: ROR %1 ;ROTATE DATA
1083 003750 103415 BCS ADD1 ;IF CARRY SET ADD IN PARBIT
1084 003752 005337 001324 RTN: DEC COUNT ;DECREMENT COUNTER
1085 003756 001373 BNE AGAIN ;NOT DONE DO IT AGAIN
1086 003760 032737 000040 001374 BIT #BIT5,SRT ;DONE EVEN OR ODD PARITY?
1087 003766 001403 BEQ DONE ;IF EVEN FINISHED
1088 003770 063737 001322 001326 ADD PARBIT,SAVE ;IF ODD ADD IN ANOTHER 1
1089 003776 013701 001326 DONE: MOV SAVE,%1 ;PLACE DATA + PARITY BACK IN R1
1090 004002 000207 RTS 7 ;AND EXIT
1091 004004 063737 001322 001326 ADD1: ADD PARBIT,SAVE ;ADD PARBIT TO DATA
1092 004012 000757 BR RTN ;RETURN TO COUNTER
1093
1094 ;SUBROUTINE TO SELECT LINE AND LOAD VECTOR ASSIGNMENT
1095 004014 104000 LINSEL: TYPE
1096 004016 014256 LDLINE
1097 004020 004737 003314 JSR PC,RDOCT ;GET INPUT
1098 004024 012601 MOV (SP)+,%1 ;LOAD R1
1099 004026 042701 177407 BIC #177407,%1 ;MASK OFF ALL BUT LINE BITS
1100 004032 006201 ASR %1
1101 004034 006201 ASR %1
1102 004036 010137 001372 MOV %1,TEMP ;SAVE LINE #
1103 004042 012703 001200 MOV #RXCSR,%3 ;LOAD ADDRESS OF REGISTERS
1104 004046 012704 000004 MOV #4,%4 ;SET UP COUNTER
1105 004052 016102 010432 MOV RCSR(1),%2
1106 004056 010223 LINSR: MOV %2,(3)+
1107 004060 062702 000002 ADD #2,%2
1108 004064 005304 DEC %4
1109 004066 001373 BNE LINSR
1110 004070 016101 010334 MOV VECTAB(1),%1 ;GET LINE VECTOR ADDRESS
1111 004074 010123 MOV %1,(3)+ ;LOAD INTO PROG. RXVTR
1112 004076 022121 CMP (1)+,(1)+ ;ADD +4 TO RXVTR TO = TXVTR

```



|      |        |        |               |             |               |                                 |
|------|--------|--------|---------------|-------------|---------------|---------------------------------|
| 1113 | 004100 | 005723 |               | TST         | (3)+          | ;POINT TO PROG TXVTR            |
| 1114 | 004102 | 010113 |               | MOV         | %1,(3)        | ;LOAD INTO PROG TXVTR           |
| 1115 | 004104 | 022737 | 000005 001240 | CMP         | #5,PRGNUM     | ;RUNNING PROGRAM # 5            |
| 1116 | 004112 | 001001 |               | BNE         | +4            |                                 |
| 1117 | 004114 | 000205 |               | RTS         | 5             | ;RETURN TO PROG 5               |
| 1118 | 004116 | 006237 | 001372        | ASR         | TEMP          | ;POSITION                       |
| 1119 | 004122 |        |               | CNVOA       | TEMP,TLINEX,2 |                                 |
| 1120 | 004134 | 104000 |               | TYPE        |               | ;TYPE LINE # THAT               |
| 1121 | 004136 | 013665 |               | ALINEX      |               | ;WAS CALLED                     |
| 1122 | 004140 | 000205 |               | RTS         | 5             |                                 |
| 1123 |        |        |               |             |               |                                 |
| 1124 |        |        |               |             |               |                                 |
| 1125 | 004142 | 105037 | 001334        |             |               |                                 |
| 1126 | 004146 | 012500 |               | INFIL: CLRB | NUMBER        | ;INITIALIZE BINARY COUNT        |
| 1127 | 004150 | 012537 | 001364        | FILL: MOV   | (5)+,%0       | ;GET ADDRESS                    |
| 1128 | 004154 | 113720 | 001334        |             | (5)+,CTRD     | ;GET COUNT                      |
| 1129 | 004160 | 105237 | 001334        | FILLA: MOV  | NUMBER,(0)+   | ;LOAD ADDRESS WITH BINARY COUNT |
| 1130 | 004164 | 005337 | 001364        | INCB        | NUMBER        | ;INC. BINARY COUNT              |
| 1131 | 004170 | 001871 |               | DEC         | CTRD          | ;DEC. COUNT                     |
| 1132 | 004172 | 000205 |               | BNE         | FILLA         |                                 |
| 1133 |        |        |               | RTS         | 5             | ;EXIT                           |
| 1134 |        |        |               |             |               |                                 |
| 1135 | 004174 | 104011 |               |             |               |                                 |
| 1136 | 004176 | 012501 |               |             |               |                                 |
| 1137 | 004200 | 012502 |               |             |               |                                 |
| 1138 | 004202 | 012503 |               |             |               |                                 |
| 1139 | 004204 | 112122 |               |             |               |                                 |
| 1140 | 004206 | 005303 |               |             |               |                                 |
| 1141 | 004210 | 001375 |               |             |               |                                 |
| 1142 | 004212 | 104012 |               |             |               |                                 |
| 1143 | 004214 | 000205 |               |             |               |                                 |
| 1144 |        |        |               |             |               |                                 |
| 1145 |        |        |               |             |               |                                 |
| 1146 | 004216 | 104011 |               |             |               |                                 |
| 1147 | 004220 | 012700 | 004374        |             |               |                                 |
| 1148 | 004224 | 013501 |               |             |               |                                 |
| 1149 | 004226 | 012537 | 004304        |             |               |                                 |
| 1150 | 004232 | 012537 | 004306        |             |               |                                 |
| 1151 | 004236 | 012702 | 004362        |             |               |                                 |
| 1152 | 004242 | 012737 | 000005 004354 |             |               |                                 |
| 1153 | 004250 | 012237 | 004360        |             |               |                                 |
| 1154 | 004254 | 004737 | 004314        |             |               |                                 |
| 1155 | 004260 | 005337 | 004354        |             |               |                                 |
| 1156 | 004264 | 001371 |               |             |               |                                 |
| 1157 | 004266 | 163700 | 004306        |             |               |                                 |
| 1158 | 004272 | 010037 | 004302        |             |               |                                 |
| 1159 | 004276 | 004537 | 004174        |             |               |                                 |
| 1160 | 004302 | 000000 |               |             |               |                                 |
| 1161 | 004304 | 000000 |               |             |               |                                 |
| 1162 | 004306 | 000000 |               |             |               |                                 |
| 1163 | 004310 | 104012 |               |             |               |                                 |
| 1164 | 004312 | 000205 |               |             |               |                                 |
| 1165 | 004314 | 005037 | 004356        |             |               |                                 |
| 1166 | 004320 | 163701 | 004360        |             |               |                                 |
| 1167 | 004324 | 103403 |               |             |               |                                 |
| 1168 | 004326 | 005237 | 004356        |             |               |                                 |



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1169 004332 000772
1170 004334 063701 004360
1171 004340 062737 000060 004356
1172 004346 113720 004356
1173 004352 000207
1174 004354 000000
1175 004356 000000
1176 004360 000000
1177 004362 023420
1178 004364 001750
1179 004366 000144
1180 004370 000012
1181 004372 000001
1182 004374 040 040 040
1183 004377 040 040 040
1184
1185 004402 104000
1186 004404 013055
1187 004406 004737 003314
1188 004412 012637 001374
1189 004416
1190 004430 104000
1191 004432 013355
1192 004434 012737 177400 001362
1193 004442 032737 000002 001374
1194 004450 001413
1195 004452 012737 177700 001362
1196 004460 032737 000001 001374
1197 004466 001403
1198 004470 012737 177740 001362
1199 004476 000207
1200 004500 032737 000001 001374
1201 004506 001773
1202 004510 012737 177600 001362
1203 004516 000767
1204
1205
1206 004520 013737 177776 001336
1207 004526 012737 000340 177776
1208 004534 006237 001336
1209 004540 006237 001336
1210 004544 006237 001336
1211 004550 042737 177740 001336
1212 004556 013737 001336 001340
1213 004564 011637 001342
1214 004570 004537 003530
1215 004574 001340
1216 004576 012314
1217 004600 000006
1218 004602 004537 003530
1219 004606 001342
1220 004610 012346
1221 004612 000006
1222 004614 104000
1223 004616 012247
1224 004620 000000

SUBTNB: BR SUBTNA
ADD TENPWR,%1 ;RESTORE SUBTRACTED VALUE.
ADD #60,DIGIT ;CONVERT (DIGIT) TO ASCII
MOVB DIGIT,(0)+ ;MOVE ASCII CHAR TO DECVAL FIELD.
RTS %7 ;EXIT.

CNVCTR: OPEN
DIGIT: OPEN
TENPWR: OPEN
ADTENP: 10000.
1000.
100.
10.
1.

DECVAL: .BYTE 040,040,040,040,040,040

;SUBROUTINE TO SET CHARACTER LENGTH PARAMETER
SETPAR: TYPE ;TYPE: SELECT PARAMETERS.
SELPAR
JSR PC,RDOCT ;GET INPUT
MOV (SP)+,SRT
CNVOA SRT,APARM,3
TYPE
PARMTS

TBIT1: MOV #177400,CARMSK ;SET CHARACTER MASK TO 8 BITS.
BIT #BIT1,SRT ;SEE IF SR BIT 1 IS SET.
BEQ STPARA ;BRANCH IF NOT SET.
MOV #177700,CARMSK ;CHANGE CHAR MASK TO 6 BITS.
BIT #BIT0,SRT ;SEE IF SR BIT0 IS SET.
BEQ PAREX ;BRANCH IF NOT SET.
MOV #177740,CARMSK ;CHANGE CHAR MASK TO 5 BITS.
RTS %7 ;EXIT.
STPARA: BIT #BIT0,SRT ;SEE IF SR BIT0 IS SET.
BEQ STPARA-2 ;BRANCH IF NOT SET.
MOV #177600,CARMSK ;CHANGE CHAR MASK TO 7 BITS.
BR PAREX

;ERROR TRAP HANDLER - TYPE TO AND FROM WHERE ERROR TRAP OCCURS
ERTP: MOV PSW,OLDPS ;SAVE OLDPS
MOV #PRTY7,PSW
ASR OLDPS
ASR OLDPS
ASR OLDPS
BIC #177740,OLDPS
MOV OLDPS,TOPC
MOV @%6,FROMPC
ERTPA: JSR %5,0ACNV
TOPC
MTO
6
JSR %5,0ACNV
FROMPC
MFROM
6
TYPE
MTERR
HALT

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1225 004622 000137 001422 JMP START
1226
1227 ;MAPVEC - MAP VECTOR VECTOR OR REPORT ERROR DEPENDING ON FMAP FLAG
1228 MAPVEC: MOV 3%6, TOPC
1229 POPSP2
1230 MOV 3%6, FROMPC
1231 SUB #4, TOPC
1232 TST FMAP
1233 BEQ ERTPA ;NOT MAPPING, REPORT ERROR
1234 MOV TOPC, TXVTR ;STORE VECTOR
1235 SUB #4, TOPC
1236 MOV TOPC, RXVTR
1237 CLR FMAP
1238 RTI
1239
1240 ;FORMAD - FORM DEVICE AT ADDRESS
1241 FORMAD: MOV %1, RXCSR
1242 ADD #2, %1
1243 MOV %1, RXBUF
1244 ADD #2, %1
1245 MOV %1, TXCSR
1246 ADD #2, %1
1247 MOV %1, TXBUF
1248 RTS %7
1249
1250 ;SUBROUTINE TO MAKE LINE CONNECTION.
1251 LINCON: MOV 3RXCSR, RXCSRT
1252 BIT #BIT13, RXCSRT ;YES, IS CLEAR TO SEND UP
1253 BNE LINEUP ;YES CONNECTION IS MADE.
1254 LINCA: BIC #146, 3RXCSR ;CLEAR IE BIT AND DTR, RQ TO SND
1255 TST 3RXBUF ;CLEAR DONE FLAG
1256 TYPE ;TYPE
1257 MAKCON ;'MAKE LINE CONNECTION'
1258 LINCB: MOV 3RXCSR, RXCSRT
1259 BIT #BIT14, RXCSRT ;DID YOU RING
1260 BEQ LINCB ;GO WAIT FOR RING
1261 BIS #6, 3RXCSR ;SET DTR, RQ TO SND
1262 DELAY ;WAIT 10 SECONDS FOR
1263 10000. ;CLEAR TO SEND
1264 MOV 3RXCSR, RXCSRT
1265 TST 3RXBUF ;CLEAR DONE
1266 BIT #BIT13, RXCSRT ;IS CLEAR TO SEND UP?
1267 BNE LINCFF ;YES. GO TO LINCFF
1268 ERRRX ;NO. PRINT ERROR MESSAGE
1269 LINCHM ;'CLEAR TO SEND NOT SET'
1270 BR ;START OVER AGAIN
1271 LINCFF: MOV 3RXCSR, RXCSRT ;CLEAR ALL FLAGS
1272 TST 3RXBUF ;AND DONE
1273 TYPE ;TYPE MESSAGE
1274 LINMAD ;CONNECTION IS MADE'
1275 LINEUP: RTS 5 ;EXIT LINE CONNECTION ROUTINE WITH
1276 ;SUBROUTINE TO OVERLAY (CR LF) IN DATA PATTERN (EVERY 72.ND CHAR)
1277 OVRLAY: MOV #OUTBUF, %1 ;GET OUTBUF ADDRESS
1278 MOV #14, %2 ;GET COUNTER
1279 OVRLYA: MOV #105215, (1) ;INSERT CR&LF
1280 ADD #72., %1 ;ADD OFFSET

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10001 005116 005303 DEC %2 :DONE?
10002 005120 001372 BNE OVRLYA
10003 005122 000207 RTS 7 :EXIT

:RECEIVER INTERRUPTS COMMON HANDLER
10004 005124 000240 RISR: NOP
10005 005126 010037 001330 MOV %0,LINE
10006 005128 006300 ASL %0
10007 005130 16037 010432 001300 MOV RCSR(0),RXCSP :GET ADDRESS OF INTERRUPTING DL11-E'S RCSR
10008 005132 017727 174032 001370 MOV BRXCSP,RXCSP :GET CSR CONTENTS
10009 005134 100570 BMI DCERR :CHECK INT
10010 005136 105737 001370 TSTB RXCSP :TEST DONE
10011 005138 001002 BNE RISRA
10012 005140 104003 ERROR :FALSE INTERRUPT
10013 005142 000002 RTI :EXIT
10014 005144 020037 001404 RISRA: CMP %0,CALLED :DID CALLED LINE INTERRUPT?
10015 005146 001020 BNE RISRB :BRANCH IF CALLER INTERRUPTED
10016 005148 005737 001412 TST MODEM :CHECK MODEM TYPE
10017 005150 001403 BEQ RISRAA :BRANCH IF 103
10018 005152 005770 010530 TST BRBUF(0) :READ CALLED LINES DATA
10019 005154 000002 RTI
10020 005156 007077 010530 174162 RISRAA: MOVB BRBUF(0),JINBUF :STORE CHARACTER IN INPUT BUFFER
10021 005158 005237 001376 INC INBUF :INCREMENT POINTER
10022 005160 022737 017024 001376 CMP #INBUF+100.,INBUF :HAVE 100. CHARACTERS BEEN RECEIVED?
10023 005162 001430 BEQ RISRC :GO CHECK DATA IF YES
10024 005164 000002 RTI :EXIT IF NO
10025 005166 117077 010530 174140 RISRB: MOVB BRBUF(0),JBUFF :STORE CHARACTER IN INTERMEDIATE DATA BUFFER
10026 005168 005237 001400 INC JBUFF :INCREMENT POINTER
10027 005170 022737 015066 001400 CMP #JBUFF+10.,JBUFF :HAVE 10 CHARACTERS BEEN RECEIVED
10028 005172 002401 BLT .+4
10029 005174 000002 RTI :EXIT
10030 005176 022737 000002 001332 CMP #2,CONFIG :RUNNING CONFIGURATION 2?
10031 005178 001405 BEQ RISRB
10032 005180 022737 015220 001400 CMP #JBUFF+100.,JBUFF :HAVE 100. CHARACTERS BEEN RECEIVED?
10033 005182 001405 BEQ RISRC :GO CHECK DATA IF YES, OTHERWISE
10034 005184 000002 RTI :EXIT
10035 005186 052770 000100 010626 RISRBB: BIS #BIT6,BTCSR(0) :START CALLERS TRANSMITTER
10036 005188 000002 RTI :EXIT
10037 005190 :CHECK DATA CONFIGURATION #1
10038 005192 RISRC: NOP
10039 005194 012737 000001 001364 MOV #1,CTRD :INITIALIZE CHARACTER COUNT
10040 005196 012702 015054 MOV #BUFF,%2 :POINT R2 TO CALLERS RECEIVED DATA BUFFER
10041 005198 012703 014710 MOV #OUTBUF,%3 :R3 = FIRST ADDRESS OF OUTPUT DATA BUFFER
10042 005200 010237 001400 MOV %2,BUFFP :RESTORE CALLERS RCVD DATA BUFFER PTR
10043 005202 022737 000001 001332 CMP #1,CONFIG :CHECK CONFIGURATION
10044 005204 001015 BNE RISRC
10045 005206 112337 001360 RISRC: MOVB (3)+,XMTDAT :GET TRANSMITTED CHARACTER
10046 005208 112237 001356 MOVB (2)+,RECDAT :GET RECEIVED CHARACTER
10047 005210 104004 DATCHK :CHECK DATA
10048 005212 005237 001364 INC CTRD :INCREMENT CHARACTER COUNT
10049 005214 022737 000101 001364 CMP #101,CTRD :HAS ALL DATA BEEN CHECKED
10050 005216 001365 BNE RISRC
10051 005218 000137 005476 JMP FINISH
10052 005220 :CHECK DATA CONFIGURATION #2
10053 005222 RISRD: NOP
10054 005224 000240
10055 005226
10056 005228
10057 005230
10058 005232
10059 005234
10060 005236
10061 005238
10062 005240
10063 005242
10064 005244
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10067 005250
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10071 005258
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|------|--------|--------|--------|--------|-----------------|-----------------|----------------------------------------|
| 1337 | 005400 | 012704 | 016660 |        | MOV             | %INBUF,%4       | :POINT R4 TO CALLED LINES RECEIVER     |
| 1338 | 005404 | 010437 | 001376 |        | MOV             | %4,INBUFP       | :DATA BUFFER & INIT. POINTER           |
| 1339 | 005410 | 012737 | 015054 | 001410 | MOV             | %BUFF,TBUFP     |                                        |
| 1340 | 005416 | 013701 | 001404 |        | MOV             | CALLED,%1       |                                        |
| 1341 | 005422 | 016137 | 010432 | 001200 | MOV             | RCSR(1),RXCSR   |                                        |
| 1342 | 005430 | 112337 | 001360 |        | MOVB            | (3)+,XMTDAT     |                                        |
| 1343 | 005434 | 112237 | 001356 |        | MOVB            | (2)+,RECDAT     | :COMPARE TRANSMITTED DATA WITH DATA    |
| 1344 | 005440 | 104004 |        |        | DATCHK          |                 | :RECEIVED BY CALLED LINE               |
| 1345 | 005442 | 013701 | 001402 |        | MOV             | CALLER,%1       |                                        |
| 1346 | 005446 | 016137 | 010432 | 001200 | MOV             | RCSR(1),RXCSR   |                                        |
| 1347 | 005454 | 112437 | 001356 |        | MOVB            | (4)+,RECDAT     | :COMPARE TRANSMITTED DATA WITH DATA    |
| 1348 | 005450 | 104004 |        |        | DATCHK          |                 | :RECEIVED BY CALLER                    |
| 1349 | 005452 | 005237 | 001364 |        | INC             | CTRD            |                                        |
| 1350 | 005466 | 022737 | 000101 | 001364 | CMP             | %101,CTRD       |                                        |
| 1351 | 005474 | 001350 |        |        | BNE             | RISRDA          |                                        |
| 1352 | 005476 | 000240 |        |        | FINISH: NOP     |                 |                                        |
| 1353 | 005500 | 013701 | 001404 |        | MOV             | CALLED,%1       |                                        |
| 1354 | 005504 | 004537 | 004146 |        | JSR             | S.FILL          |                                        |
| 1355 | 005510 | 014710 |        |        | OUTBUF          |                 |                                        |
| 1356 | 005512 | 000144 |        |        | 100.            |                 |                                        |
| 1357 | 005514 | 104000 |        |        | TYPE            |                 |                                        |
| 1358 | 005516 | 013350 |        |        | ENDPAS          |                 |                                        |
| 1359 | 005520 | 052771 | 000100 | 010626 | BIS             | %BIT6,%TCSR(1)  |                                        |
| 1360 | 005526 | 000240 |        |        | NOP             |                 |                                        |
| 1361 | 005530 | 000002 |        |        | RTI             |                 |                                        |
| 1362 |        |        |        |        | SERVICE ROUTINE |                 |                                        |
| 1363 | 005532 | 032770 | 100000 | 010530 | OCERR: BIT      | %BIT15,%RBUF(0) | :TEST ERROR                            |
| 1364 | 005540 | 001402 |        |        | BEQ             | RISRF           |                                        |
| 1365 | 005542 | 104015 |        |        | ERRRX           |                 |                                        |
| 1366 | 005544 | 012357 |        |        | CSRADD          |                 |                                        |
| 1367 | 005546 | 012737 | 014710 | 001406 | RISRF: MOV      | %OUTBUF,OTBUFP  | :SET OUTPUT BUFFER POINTER             |
| 1368 | 005554 | 012737 | 016660 | 001376 | MOV             | %INBUF,INBUFP   | :SET INPUT BUFFER POINTER              |
| 1369 | 005562 | 012737 | 015054 | 001400 | MOV             | %BUFF,BUFP      | :SET INTERMEDIATE BUFFER POINTER       |
| 1370 | 005570 | 012737 | 015054 | 001410 | MOV             | %BUFF,TBUFP     | :SET POINTER FOR CONFIG #2 TRANSMITTER |
| 1371 | 005576 | 032737 | 040000 | 001370 | BIT             | %BIT14,RXCSR    | :CHECK RING INDICATOR                  |
| 1372 | 005604 | 001005 |        |        | BNE             | RISREX          | :BRANCH IF RING                        |
| 1373 | 005606 | 004737 | 006234 |        | JSR             | 7,DISCON        | :ERROR SET - NO RING                   |
| 1374 | 005612 | 104015 |        |        | ERRRX           |                 |                                        |
| 1375 | 005614 | 012357 |        |        | CSRADD          |                 |                                        |
| 1376 | 005616 | 000002 |        |        | RTI             |                 |                                        |
| 1377 | 005620 |        |        |        | RISREX: CNVOA   | LINE,TLINE,2    |                                        |
| 1378 | 005632 | 104000 |        |        | TYPE            |                 |                                        |
| 1379 | 005634 | 013715 |        |        | ALINE           |                 |                                        |
| 1380 | 005636 | 010037 | 001404 |        | MOV             | %0,CALLED       |                                        |
| 1381 | 005642 | 004737 | 003314 |        | JSR             | PC,RDOCT        | :GET INPUT                             |
| 1382 | 005646 | 011637 | 001412 |        | MOV             | (SP),MODEM      | :GET MODEM TYPE                        |
| 1383 | 005652 | 042737 | 177773 | 001412 | BIC             | %177773,MODEM   | :0=103,4=202                           |
| 1384 | 005660 | 012637 | 001332 |        | MOV             | (SP)+,CONFIG    |                                        |
| 1385 | 005664 | 042737 | 177774 | 001332 | BIC             | %177774,CONFIG  |                                        |
| 1386 | 005672 | 001042 |        |        | BNE             | RISRFC          | :GO TO SERVICE FOR CONFIG 1 OR 2       |
| 1387 | 005674 | 004737 | 006250 |        | JSR             | 7,CONN          | :CONNECT LINE IF CONFIGURATION 0       |
| 1388 | 005700 | 104000 |        |        | TYPE            |                 | :TYPE MESSAGE TO PRESS DATA            |
| 1389 | 005702 | 014215 |        |        | BUTTON          |                 | :BUTTON ON DATA PHONE                  |
| 1390 | 005704 | 104016 |        |        | DELAY           |                 | :WAIT FOR CARRIER                      |
| 1391 | 005706 | 023420 |        |        | 10000.          |                 | :10 SECONDS                            |
| 1392 | 005710 | 005770 | 010530 |        | TST             | %RBUF(0)        | :READ BUFFER TO CLEAR DONE             |



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1393 005714 032770 020000 010432 BIT #BIT13,DRCSR(0) ;TEST FOR CLEAR TO SEND
1394 005722 001004 BNE RISRFB
1395 005724 104003 ERROR ;ERROR! DID NOT RECEIVE CLEAR TO SEND
1396 ;WITHIN TIME ALLOTTED (10 SEC.)
1397 005726 004737 006234 JSR 7,DISCON ;DISCONNECT LINE
1398 005732 000002 RTI ;AND EXIT
1399 005734 016037 010626 001204 RISRFB: MOV TCSR(0),TXCSR ;GET CALLED LINES TXCSR ADDRESS
1400 005742 004737 004402 JSR 7,SETPAR ;LOAD USER PARAMETERS
1401 005746 104000 TYPE ;TYPE 'LINE CONNECTION
1402 005750 013427 LINMAD ;MADE'
1403 005752 CNVOA CONFIG,TCONFIG,2
1404 005754 104000 TYPE
1405 005756 013456 ACONFIG
1406 005770 052770 000100 010626 BIS #BIT5,DTCSR(0)
1407 005776 000002 RTI ;AND EXIT
1408 ;
1409 ;HERE IF CONFIGURATION 1 OR 2
1410 RISRFB: TYPE ;ASK USER WHICH LINE HE IS
1411 006000 104000 WRU ;DIALING ON
1412 006002 014065 JSR PC,RDOCT ;GET INPUT
1413 006004 004737 003314 MOV (SP)+,%1 ;GET LINE #
1414 006010 012601 BIC #177740,%1 ;MASK UNUSED BITS
1415 006012 042701 177740 MOV %1,LINE
1416 006016 010137 001330 CNVOA LINE,URA,2
1417 006022 TYPE ;REPORT LINE # ON TTY
1418 006034 104000 UR
1419 006036 014162 ASL %1
1420 006040 006301 MOV %1,CALLER ;SAVE CALLERS LINE #
1421 006042 010137 001402 JSR 7,CONN ;CONNECT CALLED LINE
1422 006046 004737 006250 BIS #BIT1,DRCSR(1) ;SET DTR ON CALLERS LINE
1423 006052 052771 000002 010432 TYPE MESSAGE TO PRESS DATA
1424 006062 014215 BUTTON ;ON DATA PHONE
1425 006064 104016 DELAY ;WAIT 10 SECONDS FOR CLEAR TO SEND
1426 006066 023420 10000. ;SET AT CALLED LINE
1427 006070 027071 010530 010530 CMP DRBUF(0),DRBUF(1) ;READ BUFFERS
1428 006076 032770 020000 010432 BIT #BIT13,DRCSR(0) ;TEST FOR CLEAR TO SEND AT CALLED LINE
1429 006104 001007 BNE RISRFF
1430 006106 104003 ERROR ;ERROR! CLEAR TO SEND NOT SET AT CALLED LINE
1431 006110 004737 006234 RISRFB: JSR 7,DISCON ;DISCONNECT
1432 006114 042771 000006 010432 BIC #6,DRCSR(1) ;LINE
1433 006122 000002 RTI ;AND EXIT
1434 006124 022737 000002 001332 RISRFF: CMP #2,CONFIG
1435 006132 001414 BEQ RISRFG
1436 006134 022771 010000 010432 CMP #BIT12,DRCSR(1) ;CHECK CARRIER AT CALLERS LINE
1437 006142 001003 BNE RISRFE
1438 006144 104003 ERROR ;ERROR! NO CARRIER AT CALLERS LINE
1439 006146 000137 006110 JMP RISRFB ;GO DISCONNECT LINES
1440 006152 016137 010432 001200 RISRFE: MOV RCSR(1),RXCSR
1441 006160 000137 005734 JMP RISRFB ;GO GET PARAMETERS AND ENABLE
1442 ;CALLED TRANSMITTER AND EXIT
1443 ;
1444 ;HERE IF CONFIGURATION 2
1445 006164 032771 020000 010432 RISRFG: BIT #BIT13,DRCSR(1) ;TEST CALLERS CLEAR TO SEND
1446 006172 001003 BNE RISRFB
1447 006174 104003 ERROR ;ERROR! NO CTS AT CALLERS LINE
1448 006176 000137 006110 JMP RISRFB ;GO DISCONNECT LINE AND EXIT

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1449 006202 016037 010432 001200 RISRFH: MOV RCSR(0),RXCSR
1450 006210 016137 010626 001204 MOV TCSR(1),TXCSR
1451 006216 004737 004402 JSR 7,SETPAR ;GO GET PARAMETERS FOR CALLERS
1452 ;TRANSMITTER AND CALLED RECEIVE
1453 006222 016137 010432 001200 MOV RCSR(1),RXCSR
1454 006230 000137 005734 JMP RISRFB
1455 ;
1456 ;SUBROUTINE TO DISCONNECT LINE R0 HAS LINE #
1457 006234 042770 000006 010432 DISCON: BIC #6,RCSR(0)
1458 006242 005770 010432 TST RCSR(0)
1459 006246 000207 RTS 7
1460 ;
1461 ;SUBROUTINE TO CONNECT LINE R0 HAS LINE #
1462 006250 052770 000006 010432 CONN: BIS #6,RCSR(0) ;SET DTR, R0 TO SND
1463 006256 000207 RTS 7
1464 ;TRANSMITTER INTERRUPT COMMON HANDLER
1465 TISR: NOP
1466 006262 006300 ASL %0 ;R0 HAS LINE #
1467 006264 105770 010626 TSTB @TCSR(0) ;CHECK FOR DONE
1468 006270 100402 BMI TISRA ;BRANCH IF DONE
1469 006272 104003 ERROR ;ERROR! FALSE INTERRUPT
1470 006274 000002 TISRAA: RTI ;EXIT
1471 006276 005737 001332 TISRA: TST CONFIG ;THIS CONFIGURATION 0?
1472 006302 001420 BEQ TISRC ;BRANCH IF YES
1473 006304 020037 001402 CMP %0,CALLER ;DID CALLER INTERRUPT
1474 006310 001015 BNE TISRC
1475 006312 117770 173072 010724 MOVB @TBUFP,@TBUF(0) ;TRANSMIT
1476 006320 005237 001410 INC TBUFP ;STEP POINTER
1477 006324 022737 015220 001410 CMP #BUFP+100.,TBUFP
1478 006332 001003 BNE .+10
1479 006334 042770 000100 010626 BIC #BIT6,@TCSR(0)
1480 006342 000002 RTI
1481 006344 117770 173036 010724 TISRC: MOVB @OTBUFP,@TBUF(0) ;TRANSMIT THE NEXT CHARACTER
1482 006352 005237 001406 INC OTBUFP ;STEP POINTER TO NEXT CHAR.
1483 006356 005737 001332 TST CONFIG ;WAS CONFIGURATION 0 SELECTED
1484 006362 001010 BNE TISRB ;BRANCH IF CONFIG #1 OR #2
1485 006364 022737 016660 001406 CMP #OUTBUF+1000.,OTBUFP ;HAVE 1000. CHARS. BEEN SENT
1486 006372 001340 BNE TISRAA ;EXIT IF NOT
1487 006374 012737 014710 001406 TISRBS: MOV #OUTBUF,OTBUFP ;RESET POINTER
1488 006402 000002 RTI ;AND EXIT
1489 ;
1490 006404 022737 015054 001406 TISRB: CMP #OUTBUF+100.,OTBUFP ;HAVE 100. CHARS. BEEN SENT?
1491 006412 001330 BNE TISRAA ;EXIT IF NOT
1492 006414 042770 000100 010626 BIC #BIT6,@TCSR(0) ;DISABLE TRANSMITTER INTERRUPT
1493 006422 000764 BR TISRBS ;RESET POINTER AND EXIT
1494 ;
1495 ;*****
1496 ;PRGO - SINGLE CHARACTER LINE MODE TEST.
1497 ;*****
1498 PRGO: NOP ;BEGIN PRGO
1499 006426 104000 TYPE ;TYPE
1500 006430 012507 POTIT ;PROGRAM TITLE
1501 006432 104000 TYPE
1502 006434 013143 SELCAR
1503 006436 004737 003314 JSR PC,RDOCT ;GET INPUT
1504 006442 112601 MOVB (SP)+,%1 ;GET USER SPECIFIED DATA

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|      |        |        |        |                                                            |                |                                   |
|------|--------|--------|--------|------------------------------------------------------------|----------------|-----------------------------------|
| 1505 | 006444 | 010137 | 014710 | MOV                                                        | %1,OUTBUF      | ;AND                              |
| 1506 | 006450 | 004537 | 004174 | JSR                                                        | 5,9MOVE        | ;LOAD                             |
| 1507 | 006454 | 014710 |        | OUTBUF                                                     |                | ;INTO                             |
| 1508 | 006456 | 014711 |        | OUTBUF+1                                                   |                | ;OUTPUT                           |
| 1509 | 006460 | 001747 |        | 999.                                                       |                | ;BUFFER                           |
| 1510 | 006462 | 004737 | 005076 | JSR                                                        | 7,OVRLAY       | ;OVER LAY CR,LF'S IN DATA         |
| 1511 | 006466 | 004737 | 010274 | JSR                                                        | 7,LDPRI        | ;LOAD PRIORITY LEVEL IN VECTOR+2  |
| 1512 | 006472 | 004737 | 010226 | JSR                                                        | 7,LDTVEC       | ;LOAD TRANSMITTER VECTORS         |
| 1513 | 006476 | 004737 | 010162 | JSR                                                        | 7,LDVECS       | ;LOAD RECEIVER VECTORS            |
| 1514 | 006502 | 012737 | 000340 | MOV                                                        | #PTY7,PSW      | ;SET PROCESSOR PRIORITY=7         |
| 1515 | 006510 | 012702 | 000140 | MOV                                                        | #140,%2        | ;SET IE                           |
| 1516 | 006514 | 012701 | 010432 | MOV                                                        | #RCSR,%1       | ;BIT IN                           |
| 1517 | 006520 | 004537 | 010116 | JSR                                                        | 5,MOVIT        | ;ALL RECEIVERS                    |
| 1518 | 006524 | 104000 |        | TYPE                                                       |                | ;TYPE                             |
| 1519 | 006526 | 013251 |        | MAKCON                                                     |                | ;MAKE LINE CONNECTION             |
| 1520 | 006530 | 005037 | 177776 | CLR                                                        | PSW            | ;SET PROCESSOR PRIORITY=0         |
| 1521 | 006534 | 000001 |        | PRG0A: WAIT                                                |                | ;WAIT                             |
| 1522 | 006536 | 000776 |        | BR                                                         | PRG0A          | ;HERE                             |
| 1523 |        |        |        | *****                                                      |                |                                   |
| 1524 |        |        |        | ;PRG1 - SPECIAL BINARY COUNT PATTERN LINE MODE TEST.       |                |                                   |
| 1525 |        |        |        | *****                                                      |                |                                   |
| 1526 | 006540 | 104000 |        | PRG1: TYPE                                                 |                | ;TYPE PROGRAM TITLE.              |
| 1527 | 006542 | 012553 |        | PITIT                                                      |                |                                   |
| 1528 | 006544 | 012737 | 105215 | MOV                                                        | #105215,OUTBUF | ;LOAD CRLF                        |
| 1529 | 006552 | 004537 | 004142 | JSR                                                        | 5,INFIL        | ;LOAD OUTPUT                      |
| 1530 | 006556 | 014712 |        | OUTBUF+2                                                   |                | ;WITH BINARY                      |
| 1531 | 006560 | 001750 |        | 1000.                                                      |                | ;COUNT PATTERN                    |
| 1532 | 006562 | 012737 | 000100 | MOV                                                        | #100,NUMBER    |                                   |
| 1533 | 006570 | 004737 | 010274 | JSR                                                        | 7,LDPRI        | ;LOAD PRIORITY LEVEL IN VECTOR +2 |
| 1534 | 006574 | 004737 | 010226 | JSR                                                        | 7,LDTVEC       | ;LOAD TRANSMITTER VECTORS         |
| 1535 | 006600 | 004737 | 010162 | JSR                                                        | 7,LDVECS       | ;LOAD RECEIVER VECTORS            |
| 1536 | 006604 | 012737 | 000340 | MOV                                                        | #PTY7,PSW      | ;SET PROCESSOR PRIORITY=7         |
| 1537 | 006612 | 012702 | 000140 | MOV                                                        | #140,%2        | ;GET IE BIT                       |
| 1538 | 006616 | 012701 | 010432 | MOV                                                        | #RCSR,%1       | ;GET FIRST CSR ADDRESS            |
| 1539 | 006622 | 004537 | 010116 | JSR                                                        | 5,MOVIT        | ;AND MOVE IT                      |
| 1540 | 006626 | 104000 |        | TYPE                                                       |                | ;TYPE                             |
| 1541 | 006630 | 013251 |        | MAKCON                                                     |                | ;MAKE LINE CONNECTION             |
| 1542 | 006632 | 005037 | 177776 | CLR                                                        | PSW            | ;SET PROCESSOR PRIORITY=0         |
| 1543 | 006636 | 000001 |        | PRG1C: WAIT                                                |                | ;WAIT                             |
| 1544 | 006640 | 000776 |        | BR                                                         | PRG1C          | ;HERE                             |
| 1545 |        |        |        | *****                                                      |                |                                   |
| 1546 |        |        |        | ;PRG2-SPECIAL MESSAGE TRANSMIT ONLY THIS PROGRAM TRANSMITS |                |                                   |
| 1547 |        |        |        | *****                                                      |                |                                   |
| 1548 |        |        |        | ;THE MESSAGE 'A QUICK BROWN FOX JUMPED OVER THE LAZY DOGS  |                |                                   |
| 1549 |        |        |        | ;BACK 1234567890.'                                         |                |                                   |
| 1550 |        |        |        |                                                            |                |                                   |
| 1551 | 006642 | 104000 |        | PRG2: TYPE                                                 |                | ;TYPE PROGRAM                     |
| 1552 | 006644 | 012622 |        | P2TIT                                                      |                | ;TITLE                            |
| 1553 | 006646 | 004537 | 004014 | JSR                                                        | 5,LINSEL       |                                   |
| 1554 | 006652 | 004737 | 004402 | JSR                                                        | 7,SETPAR       | ;GO SET PARAMETERS                |
| 1555 | 006656 | 052777 | 000004 | BIS                                                        | #BIT2,3RCSR    | ;SET REQUEST TO SEND              |
| 1556 | 006664 | 004537 | 004742 | PRG2A: JSR                                                 | 5,LINCON       | ;GO MAKE LINE CONNECTION          |
| 1557 | 006670 | 012702 | 013504 | PRG2B: MOV                                                 | #PRG2M,%2      | ;GET ADDRESS OF MESSAGE           |
| 1558 | 006674 | 112201 |        | PRG2C: MOV                                                 | (2)+,%1        | ;GET FIRST CHARACTER              |
| 1559 | 006676 | 020127 | 000045 | CMP                                                        | %1,%1          | ;TERMINATOR CHARACTER             |
| 1560 | 006702 | 001772 |        | BEQ                                                        | PRG2B          | ;RESEND MESSAGE                   |



|      |        |        |        |        |                                    |               |                             |
|------|--------|--------|--------|--------|------------------------------------|---------------|-----------------------------|
| 1561 | 006704 | 032737 | 000100 | 001374 | BIT                                | #BIT6,SRT     | ;PARITY ENABLED             |
| 1562 | 006712 | 001402 |        |        | BEQ                                | .+6           |                             |
| 1563 | 006714 | 004737 | 003600 |        | JSR                                | 7,GENPAR      | ;GENERATE PARITY            |
| 1564 | 006720 | 004537 | 004742 |        | JSR                                | 5,LINCON      | ;CHECK LINE CONNECTION      |
| 1565 | 006724 | 010177 | 172256 |        | MOV                                | %1,STXBUF     | ;LOAD BUFFER                |
| 1566 | 006730 | 105777 | 172250 |        | TSTB                               | STXCSR        | ;AND WAIT FOR CHARACTER     |
| 1567 | 006734 | 100375 |        |        | BPL                                | .-4           | ;TO BE TRANSMITTED          |
| 1568 | 006736 | 000756 |        |        | BR                                 | PRG2C         | ;GET NEXT CHARACTER.        |
| 1569 |        |        |        |        | *****                              |               |                             |
| 1570 |        |        |        |        | PRG3-PROGRAM TO RECEIVE A MESSAGE. |               |                             |
| 1571 |        |        |        |        | *****                              |               |                             |
| 1572 | 006740 | 104000 |        |        | PRG3: TYPE                         |               | ;TYPE PROGRAM               |
| 1573 | 006742 | 012672 |        |        | P3TIT                              |               | ;TITLE                      |
| 1574 | 006744 | 004537 | 004014 |        | JSR                                | 5,LINSEL      |                             |
| 1575 | 006750 | 004737 | 004402 |        | JSR                                | 7,SETPAR      | ;GET PARAMETERS             |
| 1576 | 006754 | 012706 | 001176 |        | PRG3A: MOV                         | #STKPTR-2,%6  | ;REPOSITION STACK POINTER   |
| 1577 | 006760 | 052777 | 000004 | 172212 | BIS                                | #BIT2,STXCSR  | ;SET REQUEST TO SEND        |
| 1578 | 006766 | 004537 | 004742 |        | JSR                                | 5,LINCON      | ;MAKE LINE CONNECTION       |
| 1579 | 006772 | 104006 |        |        | STRXV                              |               | ;SET RECEIVER INTERRUPT     |
| 1580 | 006774 | 007056 |        |        | RINT3                              |               | ;TO THIS ADDRESS            |
| 1581 | 006776 | 104007 |        |        | STTXV                              |               | ;SET TRANSMITTER INTERRUPT  |
| 1582 | 007000 | 007270 |        |        | TINT3                              |               | ;TO THIS ADDRESS            |
| 1583 | 007002 | 005037 | 007470 |        | CLR                                | WORDS         |                             |
| 1584 | 007006 | 013700 | 001234 |        | MOV                                | TPVTR,%0      |                             |
| 1585 | 007012 | 012720 | 007422 |        | MOV                                | #TPINT,(0)+   | ;LOAD TELEPRINTER VECTOR    |
| 1586 | 007016 | 013710 | 001236 |        | MOV                                | TPLVL,(0)     | ;AND PRIORITY               |
| 1587 | 007022 | 012701 | 014710 |        | MOV                                | #OUTBUF,%1    | ;GET BUF ADD                |
| 1588 | 007026 | 052737 | 100000 | 007466 | BIS                                | #BIT15,TFLAG  | ;SET BIT 15                 |
| 1589 | 007034 | 004737 | 007654 |        | JSR                                | 7,TCRLF       | ;SEND CRLF                  |
| 1590 | 007040 | 052777 | 000140 | 172132 | BIS                                | #140,STXCSR   | ;ENABLE RECEIVER INTERRUPTS |
| 1591 | 007046 | 005037 | 177776 |        | CLR                                | PSW           |                             |
| 1592 | 007052 | 000001 |        |        | WAIT                               |               | ;DO                         |
| 1593 | 007054 | 000776 |        |        | BR                                 | .-2           | ;NOTHING                    |
| 1594 | 007056 | 017737 | 172116 | 001370 | RINT3: MOV                         | STXCSR,RXCST  | ;GET RXCSR DATA             |
| 1595 | 007064 | 100461 |        |        | BMI                                | ERR3A         | ;BRANCH IF ERROR            |
| 1596 | 007066 | 105737 | 001370 |        | TSTB                               | RXCST         | ;TEST                       |
| 1597 | 007072 | 100064 |        |        | BPL                                | ERR3B         |                             |
| 1598 | 007074 | 005237 | 007470 |        | INC                                | WORDS         |                             |
| 1599 | 007100 | 017737 | 172076 | 007472 | MOV                                | STXBUF,RXBUFF | ;GET DATA                   |
| 1600 | 007106 | 113711 | 007472 |        | MOVB                               | RXBUFF,(1)    |                             |
| 1601 | 007112 | 005737 | 007472 |        | TST                                | RXBUFF        |                             |
| 1602 | 007116 | 100455 |        |        | BMI                                | ERR3C         |                             |
| 1603 | 007120 | 105777 | 171050 |        | TSTB                               | STXCSR        | ;ECHO OPTION SELECTED       |
| 1604 | 007124 | 100405 |        |        | BMI                                | RINT3A        |                             |
| 1605 | 007126 | 105777 | 172052 |        | TSTB                               | STXCSR        |                             |
| 1606 | 007132 | 100375 |        |        | BPL                                | .-4           |                             |
| 1607 | 007134 | 111177 | 172046 |        | MOVB                               | (1),STXBUF    | ;ECHO CHARACTER             |
| 1608 | 007140 | 023727 | 007470 | 001604 | RINT3A: CMP                        | WORDS,#900.   | ;END OF BUFFER ALLOWED      |
| 1609 | 007146 | 001411 |        |        | BEQ                                | RINT3B        | ;YES EXIT                   |
| 1610 | 007150 | 005737 | 007466 |        | TST                                | TFLAG         | ;IS THIS THE FIRST          |
| 1611 | 007154 | 100441 |        |        | BMI                                | RINT3E        | ;CHARACTER BRANCH IF YES.   |
| 1612 | 007156 | 121103 |        |        | CMPB                               | (1),%3        | ;LAST CHARACTER RECEIVED    |
| 1613 | 007160 | 001404 |        |        | BEQ                                | RINT3B        |                             |
| 1614 | 007162 | 122127 | 000203 |        | CMPB                               | (1)+,#203     | ;CONTROL C                  |
| 1615 | 007166 | 001401 |        |        | BEQ                                | RINT3B        |                             |
| 1616 | 007170 | 000002 |        |        | RTI                                |               | ;EXIT                       |



|      |        |        |        |        |         |       |               |                             |
|------|--------|--------|--------|--------|---------|-------|---------------|-----------------------------|
| 1617 | 007172 | 005037 | 007470 |        | RINT3B: | CLR   | WORDS         |                             |
| 1618 | 007176 | 042777 | 000140 | 171774 |         | BIC   | #140, DRXCSR  | ;DISABLE RECEIVER           |
| 1619 | 007204 | 012701 | 014711 |        |         | MOV   | #OUTBUF+1,%1  | ;INITIALIZE BUFFER POINTER  |
| 1620 | 007210 | 010102 |        |        |         | MOV   | %1,%2         |                             |
| 1621 | 007212 | 052777 | 000100 | 171764 |         | BIS   | #BIT6, DTXCSR | ;ENABLE TRANSMITTER         |
| 1622 | 007220 | 052777 | 000100 | 171776 |         | BIS   | #BIT6, DTPS   | ;ENABLE TELEPRINTER         |
| 1623 | 007226 | 000002 |        |        |         | RTI   |               | ;EXIT                       |
| 1624 | 007230 | 104015 |        |        | ERR3A:  | ERRRX |               | ;TYPE ERROR MESSAGE         |
| 1625 | 007232 | 013605 |        |        |         | LFAIL |               |                             |
| 1626 | 007234 | 042777 | 000140 | 171736 |         | BIC   | #140, DRXCSR  | ;DISABLE RECEIVER           |
| 1627 | 007242 | 000644 |        |        |         | BR    | PRG3A         |                             |
| 1628 | 007244 | 104015 |        |        | ERR3B:  | ERRRX |               | ;TYPE                       |
| 1629 | 007246 | 012366 |        |        |         | RINTM |               | ;ERROR MESSAGE              |
| 1630 | 007250 | 000002 |        |        |         | RTI   |               | ;EXIT                       |
| 1631 | 007252 | 104015 |        |        | ERR3C:  | ERRRX |               |                             |
| 1632 | 007254 | 013623 |        |        |         | ROVER |               |                             |
| 1633 | 007256 | 000002 |        |        |         | RTI   |               |                             |
| 1634 |        |        |        |        |         |       |               |                             |
| 1635 | 007260 | 005037 | 007466 |        | RINT3E: | CLR   | TFLAG         |                             |
| 1636 | 007264 | 112103 |        |        |         | MOVB  | (1)+,%3       |                             |
| 1637 | 007266 | 000002 |        |        |         | RTI   |               |                             |
| 1638 |        |        |        |        |         |       |               |                             |
| 1639 | 007270 | 017737 | 171710 | 001366 | TINT3:  | MOV   | DTXCSR, TXCSR | ;GET TXCSR DATA             |
| 1640 | 007276 | 105737 | 001366 |        |         | TSTB  | TXCSR         | ;TEST                       |
| 1641 | 007302 | 100016 |        |        |         | BPL   | TINT3B        |                             |
| 1642 | 007304 | 112177 | 171676 |        |         | MOVB  | (1)+, DTXBUF  | ;TRANSMIT CHARACTER         |
| 1643 | 007310 | 005237 | 007470 |        |         | INC   | WORDS         |                             |
| 1644 | 007314 | 121103 |        |        |         | CMPB  | (1), %3       | ;ALL CHARACTERS TRANSMITTED |
| 1645 | 007316 | 001431 |        |        |         | BEQ   | TINT3C        |                             |
| 1646 | 007320 | 023727 | 007470 | 001604 |         | CMP   | WORDS, #900.  |                             |
| 1647 | 007326 | 001425 |        |        |         | BEQ   | TINT3C        |                             |
| 1648 | 007330 | 121127 | 000203 |        |         | CMPB  | (1), #203     | ;= CONTROL C                |
| 1649 | 007334 | 001132 |        |        |         | BEQ   | TINT3C        |                             |
| 1650 | 007336 | 000002 |        |        |         | RTI   |               | ;RETURN TO MAIN PROGRAM     |
| 1651 | 007340 | 017737 | 171660 | 001372 | TINT3B: | MOV   | DTPS, TEMP    | ;SAVE TELEPRINTER STATUS    |
| 1652 | 007346 | 005077 | 171652 |        |         | CLR   | DTPS          | ;DISABLE INTERRUPT          |
| 1653 | 007352 | 105777 | 171646 |        |         | TSTB  | DTPS          | ;WAIT FOR                   |
| 1654 | 007356 | 100375 |        |        |         | BPL   | -4            | ;TELEPRINTER TO FINISH      |
| 1655 | 007360 | 104014 |        |        |         | ERRTX |               | ;TYPE                       |
| 1656 | 007362 | 012407 |        |        |         | TINTM |               | ;ERROR MESSAGE              |
| 1657 | 007364 | 105777 | 171634 |        |         | TSTB  | DTPS          | ;WAIT FOR TELEPRINTER       |
| 1658 | 007370 | 100375 |        |        |         | BPL   | -4            | ;TO FINISH                  |
| 1659 | 007372 | 013777 | 001372 | 171624 |         | MOV   | TEMP, DTPS    | ;RESTORE TELEPRINTER STATUS |
| 1660 | 007400 | 000002 |        |        |         | RTI   |               | ;EXIT                       |
| 1661 |        |        |        |        |         |       |               |                             |
| 1662 | 007402 | 042777 | 000100 | 171574 | TINT3C: | BIC   | #BIT6, DTXCSR | ;DISABLE INTERRUPT          |
| 1663 | 007410 | 032777 | 000100 | 171606 |         | BIT   | #BIT6, DTPS   | ;IS TTY ACTIVE              |
| 1664 | 007416 | 001421 |        |        |         | BEQ   | PRG3EX        |                             |
| 1665 | 007420 | 000002 |        |        |         | RTI   |               |                             |
| 1666 |        |        |        |        |         |       |               |                             |
| 1667 |        |        |        |        |         |       |               |                             |
| 1668 | 007422 | 112277 | 171600 |        | TPINT:  | MOVB  | (2)+, DTPB    | ;TYPE CHARACTER             |
| 1669 | 007426 | 121203 |        |        |         | CMPB  | (2), %3       | ;WAS THIS THE LAST CHAR.    |
| 1670 | 007430 | 001404 |        |        |         | BEQ   | TPINTA        |                             |
| 1671 | 007432 | 121227 | 000203 |        |         | CMPB  | (2), #203     | ;= CONTROL C                |
| 1672 | 007436 | 001401 |        |        |         | BEQ   | TPINTA        |                             |



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|      |        |        |        |        |                                                            |               |                          |
|------|--------|--------|--------|--------|------------------------------------------------------------|---------------|--------------------------|
| 1673 | 007440 | 000002 |        |        | RTI                                                        |               |                          |
| 1674 | 007442 | 042777 | 000100 | 171554 | TPINTA: BIC                                                | #BIT6, JTPS   | ;DISABLE INTERRUPT       |
| 1675 | 007450 | 032777 | 000100 | 171526 | BIT                                                        | #BIT6, JTXCSR | ;IS TRANSMITTER ACTIVE   |
| 1676 | 007456 | 001401 |        |        | BEQ                                                        | .+4           |                          |
| 1677 | 007460 | 000002 |        |        | RTI                                                        |               | ;EXIT                    |
| 1678 | 007462 | 000137 | 006754 |        | PRG3EX: JMP                                                | PRG3A         |                          |
| 1679 | 007466 | 000000 |        |        | TFLAG: 0                                                   |               |                          |
| 1680 | 007470 | 000000 |        |        | WORDS: 0                                                   |               |                          |
| 1681 | 007472 | 000000 |        |        | RXBUFF: 0                                                  |               |                          |
| 1682 |        |        |        |        | *****                                                      |               |                          |
| 1683 |        |        |        |        | ;PRG4-SPECIAL MESSAGE TRANSMIT ONLY THIS PROGRAM TRANSMITS |               |                          |
| 1684 |        |        |        |        | *****                                                      |               |                          |
| 1685 |        |        |        |        | ;MESSAGE SPIRAL PATTERN                                    |               |                          |
| 1686 |        |        |        |        |                                                            |               |                          |
| 1687 | 007474 | 104000 |        |        | PRG4: TYPE                                                 |               | ;TYPE PROGRAM            |
| 1688 | 007476 | 012730 |        |        | P4TIT                                                      |               | ;TITLE                   |
| 1689 | 007500 | 004537 | 004014 |        | JSR                                                        | 5, LINSEL     |                          |
| 1690 | 007504 | 004737 | 004402 |        | JSR                                                        | 7, SETPAR     | ;GO SET PARAMETERS       |
| 1691 | 007510 | 052777 | 000004 | 171462 | BIS                                                        | #BIT2, JRXCSR | ;SET REQUEST TO SEND     |
| 1692 | 007516 | 012737 | 000110 | 007652 | MOV                                                        | #72, COLMN    | ;INIT PAGE WIDTH         |
| 1693 | 007524 | 012703 | 000040 |        | MOV                                                        | #40, %3       | ;SET LINE START CHAR     |
| 1694 | 007530 | 004537 | 004742 |        | PRG4A: JSR                                                 | 5, LINCON     | ;GO MAKE LINE CONNECTION |
| 1695 | 007534 | 004737 | 007654 |        | JSR                                                        | 7, TCRLF      |                          |
| 1696 | 007540 | 010302 |        |        | PRG4B: MOV                                                 | %3, %2        | ;GET FIRST CHARACTER     |
| 1697 | 007542 | 110201 |        |        | PRG4C: MOVB                                                | %2, %1        | ;GET CHARACTER           |
| 1698 | 007544 | 120127 | 000136 |        | CMPB                                                       | %1, #136      | ;TERMINATOR CHARACTER    |
| 1699 | 007550 | 001003 |        |        | BNE                                                        | PRG4D         | ;RESEND MESSAGE          |
| 1700 | 007552 | 012702 | 000040 |        | MOV                                                        | #40, %2       |                          |
| 1701 | 007556 | 000771 |        |        | BR                                                         | PRG4C         |                          |
| 1702 | 007560 | 032737 | 000100 | 001374 | PRG4D: BIT                                                 | #BIT6, SRT    | ;PARITY ENABLED          |
| 1703 | 007566 | 001402 |        |        | BEQ                                                        | .+6           |                          |
| 1704 | 007570 | 004737 | 003600 |        | JSR                                                        | 7, GENPAR     | ;GENERATE PARITY         |
| 1705 | 007574 | 004537 | 004742 |        | JSR                                                        | 5, LINCON     | ;CHECK LINE CONNECTION   |
| 1706 | 007600 | 010177 | 171402 |        | MOV                                                        | %1, JTXBUF    | ;LOAD BUFFER             |
| 1707 | 007604 | 105777 | 171374 |        | TSTB                                                       | JTXCSR        | ;AND WAIT FOR CHARACTER  |
| 1708 | 007610 | 100375 |        |        | BPL                                                        | .-4           | ;TO BE TRANSMITTED       |
| 1709 | 007612 | 005202 |        |        | INC                                                        | %2            | ;SET FOR NEXT CHAR       |
| 1710 | 007614 | 005337 | 007652 |        | DEC                                                        | COLMN         | ;ALL COLUMNS PRINTED?    |
| 1711 | 007620 | 001350 |        |        | BNE                                                        | PRG4C         | ;NO, GET NEXT CHAR       |
| 1712 | 007622 | 012737 | 000110 | 007652 | MOV                                                        | #72, COLMN    | ;RESET COLUMN COUNTER    |
| 1713 | 007630 | 004737 | 007654 |        | JSR                                                        | 7, TCRLF      |                          |
| 1714 | 007634 | 005203 |        |        | INC                                                        | %3            | ;UPDATE LINE START CHAR  |
| 1715 | 007636 | 120327 | 000136 |        | CMPB                                                       | %3, #136      | ;LAST IN SET             |
| 1716 | 007642 | 001336 |        |        | BNE                                                        | PRG4B         | ;NO                      |
| 1717 | 007644 | 012703 | 000040 |        | MOV                                                        | #40, %3       | ;YES, RESET              |
| 1718 | 007650 | 000733 |        |        | BR                                                         | PRG4B         | ;GET NEXT CHARACTER.     |
| 1719 | 007652 | 000000 |        |        | COLMN: 0                                                   |               |                          |
| 1720 |        |        |        |        | ;SEND CR LF                                                |               |                          |
| 1721 |        |        |        |        |                                                            |               |                          |
| 1722 |        |        |        |        |                                                            |               |                          |
| 1723 | 007654 | 112777 | 000015 | 171324 | TCRLF: MOVB                                                | #15, JTXBUF   | ;SEND CR, LF             |
| 1724 | 007662 | 105777 | 171316 |        | TSTB                                                       | JTXCSR        |                          |
| 1725 | 007666 | 100375 |        |        | BPL                                                        | .-4           |                          |
| 1726 | 007670 | 112777 | 000012 | 171310 | MOVB                                                       | #12, JTXBUF   |                          |
| 1727 | 007676 | 105777 | 171302 |        | TSTB                                                       | JTXCSR        |                          |
| 1728 | 007702 | 100375 |        |        | BPL                                                        | .-4           |                          |



|      |        |        |        |        |                                                                 |        |               |
|------|--------|--------|--------|--------|-----------------------------------------------------------------|--------|---------------|
| 1729 | 007704 | 000207 |        |        | RIS                                                             | %7     |               |
| 1730 |        |        |        |        | *****                                                           |        |               |
| 1731 |        |        |        |        | PROGRAM 5                                                       |        |               |
| 1732 |        |        |        |        | *****                                                           |        |               |
| 1733 | 007706 | 104000 |        |        | PRGS:                                                           | TYPE   |               |
| 1734 | 007710 | 012777 |        |        |                                                                 | PSTIT  |               |
| 1735 | 007712 | 004537 | 004014 |        |                                                                 | JSR    | 5,LINSEL      |
| 1736 | 007716 | 000005 |        |        |                                                                 | RESET  |               |
| 1737 | 007720 | 004737 | 004402 |        |                                                                 | JSR    | 7,SETPAR      |
| 1738 | 007724 | 052777 | 000006 | 171246 | PRGSA:                                                          | BIS    | #6,ARXCSR     |
| 1739 | 007732 | 104000 |        |        |                                                                 | TYPE   |               |
| 1740 | 007734 | 013251 |        |        |                                                                 | MAKCON |               |
| 1741 | 007736 | 000000 |        |        |                                                                 | HALT   |               |
| 1742 | 007740 | 005777 | 171236 |        |                                                                 | TST    | ARXBUF        |
| 1743 | 007744 | 032777 | 020000 | 171226 |                                                                 | BIT    | #BIT13,ARXCSR |
| 1744 | 007752 | 001003 |        |        |                                                                 | BNE    | PRGSB         |
| 1745 | 007754 | 104000 |        |        | PRGSAA:                                                         | TYPE   |               |
| 1746 | 007756 | 013377 |        |        |                                                                 | LINCHM |               |
| 1747 | 007760 | 000764 |        |        |                                                                 | BR     | PRGSA         |
| 1748 | 007762 | 104000 |        |        | PRGSB:                                                          | TYPE   |               |
| 1749 | 007764 | 013427 |        |        |                                                                 | LINMAD |               |
| 1750 | 007766 | 005037 | 010114 |        |                                                                 | CLR    | ERRCNT        |
| 1751 | 007772 | 012702 | 013504 |        | PRGSBB:                                                         | MOV    | #PRG2M,%2     |
| 1752 | 007776 | 112201 |        |        | PRGSC:                                                          | MOVB   | (2)+,%1       |
| 1753 | 010000 | 020127 | 000045 |        |                                                                 | CMP    | %1,%1         |
| 1754 | 010004 | 001440 |        |        |                                                                 | BEQ    | PRGSE         |
| 1755 | 010006 | 032737 | 000100 | 001374 |                                                                 | BIT    | #BIT6,SRT     |
| 1756 | 010014 | 001402 |        |        |                                                                 | BEQ    | +6            |
| 1757 | 010016 | 004737 | 003600 |        |                                                                 | JSR    | 7,GENPAR      |
| 1758 | 010022 | 032777 | 020000 | 171150 |                                                                 | BIT    | #BIT13,ARXCSR |
| 1759 | 010030 | 001751 |        |        |                                                                 | BEQ    | PRGSAA        |
| 1760 | 010032 | 010177 | 171150 |        |                                                                 | MOV    | %1,ATXBUF     |
| 1761 | 010036 | 005777 | 171140 |        |                                                                 | TST    | ARXBUF        |
| 1762 | 010042 | 100001 |        |        |                                                                 | BPL    | +4            |
| 1763 | 010044 | 104003 |        |        |                                                                 | ERROR  |               |
| 1764 | 010046 | 105777 | 171126 |        |                                                                 | TSTB   | ARXCSR        |
| 1765 | 010052 | 100375 |        |        |                                                                 | BPL    | -4            |
| 1766 | 010054 | 117703 | 171122 |        |                                                                 | MOVB   | ARXBUF,%3     |
| 1767 | 010060 | 043701 | 001362 |        |                                                                 | BIC    | CARMSK,%1     |
| 1768 | 010064 | 120103 |        |        |                                                                 | CMPB   | %1,%3         |
| 1769 | 010066 | 001403 |        |        |                                                                 | BEQ    | PRGSD         |
| 1770 | 010070 | 104003 |        |        |                                                                 | ERROR  |               |
| 1771 | 010072 | 005237 | 010114 |        |                                                                 | INC    | ERRCNT        |
| 1772 | 010076 | 105777 | 171102 |        | PRGSD:                                                          | TSTB   | ATXCSR        |
| 1773 | 010102 | 100375 |        |        |                                                                 | BPL    | -4            |
| 1774 | 010104 | 000734 |        |        |                                                                 | BR     | PRGSC         |
| 1775 | 010106 | 104000 |        |        | PRGSE:                                                          | TYPE   |               |
| 1776 | 010110 | 013350 |        |        |                                                                 | ENDPAS |               |
| 1777 | 010112 | 000727 |        |        |                                                                 | BR     | PRGSBB        |
| 1778 | 010114 | 000000 |        |        | ERRCNT:                                                         | OPEN   |               |
| 1779 |        |        |        |        | ;THIS ROUTINE MOVES THE CONTENTS OF R2 TO THE ADDRESS SPECIFIED |        |               |
| 1780 |        |        |        |        | ;BY R1                                                          |        |               |
| 1781 | 010116 | 012737 | 000006 | 000004 | MOVIT:                                                          | MOV    | #6,4          |
| 1782 | 010124 | 012737 | 000002 | 000006 |                                                                 | MOV    | #2,6          |
| 1783 | 010132 | 012700 | 000037 |        |                                                                 | MOV    | #31,%0        |
| 1784 | 010136 | 010231 |        |        | MOVITA:                                                         | MOV    | %2,%(1)+      |

;SET DTR RQ TO SND  
 ;TYPE MESSAGE TO MAKE  
 ;LINE CONNECTION  
 ;WAIT FOR USER TO MAKE LINE CONNECTION  
 ;READ BUFFER  
 ;TEST FOR CLEAR TO SEND  
 ;TYPE ERROR MESSAGE  
 ;AND TRY AGAIN  
 ;GET BASE ADDRESS OF DATA TO BE TRANSMITTED  
 ;GET A CHARACTER  
 ;WAS IT THE TERMINATOR?  
 ;WAS PARITY OPTION SELECTED?  
 ;BRANCH IF NO PARITY DESIRED  
 ;GENERATE PARITY ON CHAR. IN R1  
 ;CHECK CLEAR TO SEND  
 ;TYPE ERROR MSG. IF NOT SET  
 ;TRANSMIT THE CHARACTER  
 ;ANY ERROR FLAGS?  
 ;BRANCH IF NO ERROR FLAGS  
 ;ERROR! SOME ERROR FLAG IS SET  
 ;WAIT FOR THE RECEIVER TO RECEIVE  
 ;THE TRANSMITTED CHARACTER  
 ;SAVE IT IN R3  
 ;CLEAR NON- TRANSMITTED BITS  
 ;WAS RECEIVED & TRANSMITTED DATA THE SAME  
 ;ERROR! DATA ERROR  
 ;WAIT FOR TRANSMITTER TO FINISH  
 ;SET UP FOR RETURN  
 ;GET COUNTER  
 ;MOVE THE DATA



K03

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1785 010140 005300 DEC %0 ;ALL DATA MOVED?
1786 010142 001375 BNE MOVITA ;NO. RETURN
1787 010144 012737 004520 000004 MOV #ERTP,MACHER
1788 010152 012737 000040 000006 MOV #40,MACHER+2
1789 010160 000205 RTS 5 ;RETURN
1790
1791 ;SUBROUTINE TO LOAD ALL VECTORS
1792 010162 012701 011022 LDVECS: MOV #RISRO,%1
1793 010166 012702 010334 MOV #VECTAB,%2
1794 010172 012703 000010 MOV #10,%3
1795 010176 012704 000037 MOV #31,%4
1796 010202 032712 000001 LDVECB: BIT #BIT0,(2) ;DOES THIS VECTOR EXIST
1797 010206 001002 BNE LDVEC1 ;NO, SKIP LOADING
1798 010210 010172 000000 LDVEC1: MOV %1,%2(2) ;LOAD VECTOR
1799 010214 060301 ADD %3,%1
1800 010216 005722 TST (2)+
1801 010220 005304 DEC %4
1802 010222 001367 BNE LDVECB
1803 010224 000207 RTS
1804
1805 010226 012701 011412 LDTVEC: MOV #TISRO,%1
1806 010232 012702 010334 MOV #VECTAB,%2
1807 010236 012703 000010 MOV #10,%3
1808 010242 012704 000037 MOV #31,%4
1809 010246 032712 000001 LDTVED: BIT #BIT0,(2) ;DOES THIS VECTOR EXIST
1810 010252 001003 BNE LDVEC2 ;NO, SKIP LOADING
1811 010254 011200 MOV (2),%0
1812 010256 010160 000004 LDVEC2: MOV %1,%4(0)
1813 010262 060301 ADD %3,%1
1814 010264 005722 TST (2)+
1815 010266 005304 DEC %4
1816 010270 001366 BNE LDTVED
1817 010272 000207 RTS 7
1818
1819 ;ROUTINE TO LOAD PRIORITY LEVEL 7 IN VECTOR +2
1820 010274 012701 010334 LDPRI: MOV #VECTAB,%1 ;GET BASE VECTOR
1821 010300 012702 000340 MOV #340,%2 ;GET LEVEL 7
1822 010304 012703 000037 MOV #31,%3 ;LOAD COUNTER
1823 010310 032711 000001 LDPRIA: BIT #BIT0,(1) ;DOES THIS VECTOR EXIST
1824 010314 001003 BNE LDPRIX ;NO SKIP LOADING
1825 010316 011104 MOV (1),%4 ;LOAD VECTOR +2
1826 010320 010264 000002 LDPRIX: MOV %2,%4(4)
1827 010324 005721 TST (1)+ ;POINT TO NEXT VECTOR
1828 010326 005303 DEC %3 ;DECREMENT COUNTER
1829 010330 001367 BNE LDPRIA
1830 010332 000207 RTS 7
1831
1832 ;VECTOR ASSIGNMENT TABLE
1833 010334 000301 VECTAB: 301 ;LINE 0 VECTOR
1834 010336 000311 311 ;LINE 1 VECTOR
1835 010340 000321 321 ;LINE 2 VECTOR
1836 010342 000331 331 ;LINE 3 VECTOR
1837 010344 000341 341 ;LINE 4 VECTOR
1838 010346 000351 351 ;LINE 5 VECTOR
1839 010350 000361 361 ;LINE 6 VECTOR
1840 010352 000371 371 ;LINE 7 VECTOR
1841 010354 000401 401 ;LINE 10 VECTOR

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|      |        |        |     |         |        |
|------|--------|--------|-----|---------|--------|
| 1841 | 010356 | 000411 | 411 | LINE 11 | VECTOR |
| 1842 | 010360 | 000421 | 421 | LINE 12 | VECTOR |
| 1843 | 010362 | 000431 | 431 | LINE 13 | VECTOR |
| 1844 | 010364 | 000441 | 441 | LINE 14 | VECTOR |
| 1845 | 010366 | 000451 | 451 | LINE 15 | VECTOR |
| 1846 | 010370 | 000461 | 461 | LINE 16 | VECTOR |
| 1847 | 010372 | 000471 | 471 | LINE 17 | VECTOR |
| 1848 | 010374 | 000501 | 501 | LINE 20 | VECTOR |
| 1849 | 010376 | 000511 | 511 | LINE 21 | VECTOR |
| 1850 | 010400 | 000521 | 521 | LINE 22 | VECTOR |
| 1851 | 010402 | 000531 | 531 | LINE 23 | VECTOR |
| 1852 | 010404 | 000541 | 541 | LINE 24 | VECTOR |
| 1853 | 010406 | 000551 | 551 | LINE 25 | VECTOR |
| 1854 | 010410 | 000561 | 561 | LINE 26 | VECTOR |
| 1855 | 010412 | 000571 | 571 | LINE 27 | VECTOR |
| 1856 | 010414 | 000601 | 601 | LINE 30 | VECTOR |
| 1857 | 010416 | 000611 | 611 | LINE 31 | VECTOR |
| 1858 | 010420 | 000621 | 621 | LINE 32 | VECTOR |
| 1859 | 010422 | 000631 | 631 | LINE 33 | VECTOR |
| 1860 | 010424 | 000641 | 641 | LINE 34 | VECTOR |
| 1861 | 010426 | 000651 | 651 | LINE 35 | VECTOR |
| 1862 | 010430 | 000661 | 661 | LINE 36 | VECTOR |
| 1863 |        |        |     |         |        |
| 1864 |        | 000000 |     |         |        |
| 1865 |        | 000000 |     |         |        |
| 1866 | 010432 |        |     |         |        |
| 1867 |        |        |     |         |        |
| 1868 |        |        |     |         |        |
| 1869 |        |        |     |         |        |
| 1870 |        |        |     |         |        |
| 1871 |        | 000000 |     |         |        |
| 1872 |        | 000000 |     |         |        |
| 1873 | 010530 |        |     |         |        |
| 1874 |        |        |     |         |        |
| 1875 |        |        |     |         |        |
| 1876 |        |        |     |         |        |
| 1877 |        |        |     |         |        |
| 1878 |        | 000000 |     |         |        |
| 1879 |        | 000000 |     |         |        |
| 1880 | 010626 |        |     |         |        |
| 1881 |        |        |     |         |        |
| 1882 |        |        |     |         |        |
| 1883 |        |        |     |         |        |
| 1884 |        |        |     |         |        |
| 1885 |        | 000000 |     |         |        |
| 1886 |        | 000000 |     |         |        |
| 1887 | 010724 |        |     |         |        |
| 1888 |        |        |     |         |        |
| 1889 |        |        |     |         |        |
| 1890 |        |        |     |         |        |
| 1891 |        |        |     |         |        |
| 1892 |        | 000000 |     |         |        |
| 1893 |        |        |     |         |        |
| 1894 |        |        |     |         |        |
| 1895 |        |        |     |         |        |
| 1896 |        |        |     |         |        |

|       |        |       |                            |  |  |
|-------|--------|-------|----------------------------|--|--|
|       |        |       | ;DL11-E REGISTER ADDRESSES |  |  |
|       |        | N=0   |                            |  |  |
|       |        | A=0   |                            |  |  |
| RCSR: | .REPT  | 31.   |                            |  |  |
|       | RRCV   | \N,\A |                            |  |  |
|       | N=N+10 |       |                            |  |  |
|       | A=A+1  |       |                            |  |  |
|       | .ENDR  |       |                            |  |  |
|       | N=0    |       |                            |  |  |
|       | A=0    |       |                            |  |  |
| RBUF: | .REPT  | 31.   |                            |  |  |
|       | RBUFF  | \N,\A |                            |  |  |
|       | N=N+10 |       |                            |  |  |
|       | A=A+1  |       |                            |  |  |
|       | .ENDR  |       |                            |  |  |
|       | N=0    |       |                            |  |  |
|       | A=0    |       |                            |  |  |
| TCSR: | .REPT  | 31.   |                            |  |  |
|       | TXMT   | \N,\A |                            |  |  |
|       | N=N+10 |       |                            |  |  |
|       | A=A+1  |       |                            |  |  |
|       | .ENDR  |       |                            |  |  |
|       | N=0    |       |                            |  |  |
|       | A=0    |       |                            |  |  |
| TBUF: | .REPT  | 31.   |                            |  |  |
|       | TBUFF  | \N,\A |                            |  |  |
|       | N=N+10 |       |                            |  |  |
|       | A=A+1  |       |                            |  |  |
|       | .ENDR  |       |                            |  |  |
|       | N=0    |       |                            |  |  |
|       | .REPT  | 31.   |                            |  |  |
|       | ISR    | \N    |                            |  |  |
|       | N=N+1  |       |                            |  |  |
|       | .ENDR  |       |                            |  |  |



| Year | Address | Value  | Label  | Comment |
|------|---------|--------|--------|---------|
| 1897 | 000000  |        |        |         |
| 1898 |         |        |        |         |
| 1899 |         |        |        |         |
| 1900 |         |        |        |         |
| 1901 |         |        |        |         |
| 1902 |         |        |        |         |
| 1903 | 012012  | 042045 | 030514 | 026461  |
| 1904 | 012020  | 020105 | 047117 | 046040  |
| 1905 | 012026  | 047111 | 020105 | 042524  |
| 1906 | 012034  | 052123 | 026440 | 046440  |
| 1907 | 012042  | 044501 | 042116 | 041505  |
| 1908 | 012050  | 030455 | 026461 | 055104  |
| 1909 | 012056  | 046104 | 026502 | 022502  |
| 1910 | 012064  | 046445 | 050101 | 047440  |
| 1911 | 012072  | 020106 | 042504 | 044526  |
| 1912 | 012100  | 042503 | 020123 | 051120  |
| 1913 | 012106  | 051505 | 047105 | 022524  |
| 1914 | 012114  | 046045 | 047111 | 020105  |
| 1915 | 012122  | 042040 | 040455 | 051104  |
| 1916 | 012130  | 020040 | 020040 | 052040  |
| 1917 | 012136  | 040522 | 020120 | 052101  |
| 1918 | 012144  | 040045 |        |         |
| 1919 | 012146  | 020040 | 020040 | 020040  |
| 1920 | 012154  | 020040 | 020040 | 020040  |
| 1921 | 012162  | 020040 | 020040 |         |
| 1922 | 012166  | 020040 | 020040 | 020040  |
| 1923 | 012174  | 040045 |        |         |
| 1924 | 012176  | 047045 | 047117 | 020105  |
| 1925 | 012204  | 047506 | 047125 | 022504  |
| 1926 | 012212  | 100    |        |         |
| 1927 | 012213  | 045    | 054524 | 042520  |
| 1928 | 012220  | 044440 | 020116 | 051120  |
| 1929 | 012226  | 043517 | 040522 | 020115  |
| 1930 | 012234  | 052516 | 041115 | 051105  |
| 1931 | 012242  | 020040 | 020040 | 100     |
| 1932 | 012247  | 045    | 051105 | 047522  |
| 1933 | 012254  | 020122 | 020055 | 047125  |
| 1934 | 012262  | 054105 | 042520 | 052103  |
| 1935 | 012270  | 042105 | 052040 | 040522  |
| 1936 | 012276  | 120    |        |         |
| 1937 | 012277  | 045    | 051124 | 050101  |
| 1938 | 012304  | 042520 | 020104 | 047524  |
| 1939 | 012312  | 020040 |        |         |
| 1940 | 012314  | 020040 | 020040 | 020040  |
| 1941 | 012322  | 020040 |        |         |
| 1942 | 012324  | 052045 | 040522 | 050120  |
| 1943 | 012332  | 042105 | 043040 | 047522  |
| 1944 | 012340  | 020115 | 041520 | 020040  |
| 1945 | 012346  | 020040 | 020040 | 020040  |
| 1946 | 012354  | 020040 | 100    |         |
| 1947 | 012357  | 040    | 020040 | 020040  |
| 1948 | 012364  | 040040 |        |         |
| 1949 | 012366  | 043045 | 046101 | 042523  |
| 1950 | 012374  | 044440 | 052116 | 020056  |
| 1951 | 012402  | 041522 | 051126 | 100     |
| 1952 | 012407  | 045    | 040506 | 051514  |



|      |        |        |        |        |                                                                |
|------|--------|--------|--------|--------|----------------------------------------------------------------|
| 1953 | 012414 | 020105 | 047111 | 020124 |                                                                |
| 1954 | 012422 | 046530 | 052111 | 100    |                                                                |
| 1955 | 012427 | 045    | 041520 | 020075 | EMO: .ASCII '%PC= '                                            |
| 1956 | 012434 | 020040 | 020040 | 020040 | APC: .ASCII 'a'                                                |
| 1957 | 012442 | 020040 | 100    |        |                                                                |
| 1958 | 012445 | 040    | 052040 | 041530 | ATXCSR: .ASCII 'TXCSR = '                                      |
| 1959 | 012452 | 051123 | 036440 | 040    |                                                                |
| 1960 | 012457 | 040    | 020040 | 020040 | ATXWAS: .ASCII 'a'                                             |
| 1961 | 012464 | 040040 |        |        |                                                                |
| 1962 | 012466 | 020040 | 054122 | 051503 | ARXCSR: .ASCII 'RXCSR = '                                      |
| 1963 | 012474 | 020122 | 020075 |        |                                                                |
| 1964 | 012500 | 020040 | 020040 | 020040 | ARXWAS: .ASCII 'a'                                             |
| 1965 | 012506 | 100    |        |        |                                                                |
| 1966 | 012507 | 045    | 050045 | 043522 | POTIT: .ASCII '%PRG0 - SINGLE CHAR LINE MODE TESTa'            |
| 1967 | 012514 | 020060 | 020055 | 044523 |                                                                |
| 1968 | 012522 | 043516 | 042514 | 041440 |                                                                |
| 1969 | 012530 | 040510 | 020122 | 044514 |                                                                |
| 1970 | 012536 | 042516 | 046440 | 042117 |                                                                |
| 1971 | 012544 | 020105 | 042524 | 052123 |                                                                |
| 1972 | 012552 | 100    |        |        |                                                                |
| 1973 | 012553 | 045    | 050045 | 043522 | P1TIT: .ASCII '%PRG1 - SPEC BIN COUNT LINE MODE TESTa'         |
| 1974 | 012560 | 020061 | 020055 | 050123 |                                                                |
| 1975 | 012566 | 041505 | 041040 | 047111 |                                                                |
| 1976 | 012574 | 041440 | 052517 | 052116 |                                                                |
| 1977 | 012602 | 046040 | 047111 | 020105 |                                                                |
| 1978 | 012610 | 047515 | 042504 | 052040 |                                                                |
| 1979 | 012616 | 051505 | 040124 |        |                                                                |
| 1980 | 012622 | 022445 | 051120 | 031107 | P2TIT: .ASCII '%PRG2 - SPECIAL MESSAGE LINE MODE TESTa'        |
| 1981 | 012630 | 026440 | 051440 | 042520 |                                                                |
| 1982 | 012636 | 044503 | 046101 | 046440 |                                                                |
| 1983 | 012644 | 051505 | 040523 | 042507 |                                                                |
| 1984 | 012652 | 046040 | 047111 | 020105 |                                                                |
| 1985 | 012660 | 047515 | 042504 | 052040 |                                                                |
| 1986 | 012666 | 051505 | 040124 |        |                                                                |
| 1987 | 012672 | 022445 | 051120 | 031507 | P3TIT: .ASCII '%PRG3 - RECEIVE MESSAGE TESTa'                  |
| 1988 | 012700 | 026440 | 051040 | 041505 |                                                                |
| 1989 | 012706 | 044505 | 042526 | 046440 |                                                                |
| 1990 | 012714 | 051505 | 040523 | 042507 |                                                                |
| 1991 | 012722 | 052040 | 051505 | 040124 |                                                                |
| 1992 | 012730 | 022445 | 051120 | 032107 | P4TIT: .ASCII '%PRG4 - SPECIAL MESSAGE TEST (SPIRAL)a'         |
| 1993 | 012736 | 026440 | 051440 | 042520 |                                                                |
| 1994 | 012744 | 044503 | 046101 | 046440 |                                                                |
| 1995 | 012752 | 051505 | 040523 | 042507 |                                                                |
| 1996 | 012760 | 052040 | 051505 | 020124 |                                                                |
| 1997 | 012766 | 051450 | 044520 | 040522 |                                                                |
| 1998 | 012774 | 024514 | 100    |        |                                                                |
| 1999 | 012777 | 045    | 051120 | 032507 | P5TIT: .ASCII '%PRG5 - DATA ECHO TEST USING MAYNARD FACILITYa' |
| 2000 | 013004 | 026440 | 042040 | 052101 |                                                                |
| 2001 | 013012 | 020101 | 041505 | 047510 |                                                                |
| 2002 | 013020 | 052040 | 051505 | 020124 |                                                                |
| 2003 | 013026 | 051525 | 047111 | 020107 |                                                                |
| 2004 | 013034 | 040515 | 047131 | 051101 |                                                                |
| 2005 | 013042 | 020104 | 040506 | 044503 |                                                                |
| 2006 | 013050 | 044514 | 054524 | 100    |                                                                |
| 2007 | 013055 | 045    | 054524 | 042520 | SELPAR: .ASCII '%TYPE IN PARAMETERS AS FOLLOWS:'               |
| 2008 | 013062 | 044440 | 020116 | 040520 |                                                                |



```

000000 013070 040522 042515 042524
000000 013076 051523 040440 020123
000000 013104 047506 046114 053517
000000 013112 035123
000000 013114 041045 052111 026461
000000 013122 020060 020075 044103
000000 013130 051101 046040 047105
000000 013136 052107 022510 100
000000 013143 045 054524 042520
000000 013150 052040 051505 020124
000000 013156 044103 051101 041440
000000 013174 042117 020105 047111
000000 013200 041040 052111 026467
000000 013206 044502 030124 047440
000000 013214 020106 047101 047440
000000 013222 052103 046101 041040
000000 013230 052131 020105 020040
000000 013238 040040
000000 013246 044445 046114 043505
000000 013254 046101 042040 052101
000000 013262 022501 100
000000 013270 045 040515 042513
000000 013278 046040 047111 020105
000000 013286 047503 047116 041505
000000 013294 044524 047117 040056
000000 013302 042040 052101 020101
000000 013310 027523 035102 040
000000 013318 040 020040 020040
000000 013326 040527 035123 040
000000 013334 040 020040 020040
000000 013342 044103 051101 047040
000000 013350 027117 040
000000 013358 040 020040 040040
000000 013366 007
000000 013374 100
000000 013382 037445 100
000000 013390 045 040520 040522
000000 013398 042515 042524 051522
000000 013406 036440 040
000000 013414 040 020040 100
000000 013422 040 046103 040505
000000 013430 020122 047524 051440
000000 013438 047105 020104 047516
000000 013446 020124 042523 027124
000000 013454 100
000000 013462 045 044514 042516
000000 013470 041440 047117 042516
000000 013478 052103 047511 020116
000000 013486 040515 042504 040056
000000 013494 041445 047117 044506
000000 013502 052507 040522 045324
000000 013510 047117 021440 040
000000 013518 040 020040 100
000000 013526 013504
000000 013534 015 012
000000 013542 044124 020105 052521

```

.ASCII '%BIT1-0 = CHAR LENGTH%'

SELCAR: .ASCII '%TYPE TEST CHAR CODE IN BIT7-BIT0 OF AN OCTAL BYTE 3'

DTERR: .ASCII '%ILLEGAL DATA%'

MAKCON: .ASCII '%MAKE LINE CONNECTION.3'

CERDAT: .ASCII ' DATA S/B: '

CSB: .ASCII ' WAS: '

CWAS: .ASCII ' CHAR NO. '

CRNUM: .ASCII ' 3'

ENDPAS: .BYTE 007

AINPRG: .ASCII '3'

PARMTS: .ASCII '%PARAMETERS = '

APARM: .ASCII ' 3'

LINCHM: .ASCII ' CLEAR TO SEND NOT SET.3'

LINMAD: .ASCII '%LINE CONNECTION MADE.3'

ACONFIG: .ASCII '%CONFIGURATION 3'

TCONFIG: .ASCII ' 3'

PRG2M: .EVEN

.BYTE 015,012

.ASCII 'THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK'



|      |        |        |        |        |                                                                          |
|------|--------|--------|--------|--------|--------------------------------------------------------------------------|
| 2065 | 013514 | 041511 | 020113 | 051102 |                                                                          |
| 2066 | 013522 | 053517 | 020116 | 047506 |                                                                          |
| 2067 | 013530 | 020130 | 052512 | 050115 |                                                                          |
| 2068 | 013536 | 042105 | 047440 | 042526 |                                                                          |
| 2069 | 013544 | 020122 | 044124 | 020105 |                                                                          |
| 2070 | 013552 | 040514 | 054532 | 042040 |                                                                          |
| 2071 | 013560 | 043517 | 020123 | 040502 |                                                                          |
| 2072 | 013566 | 045503 |        |        |                                                                          |
| 2073 | 013570 | 030040 | 031061 | 032063 | .ASCII ' 0123456789.%'                                                   |
| 2074 | 013576 | 033065 | 034067 | 027071 |                                                                          |
| 2075 | 013604 | 045    |        |        |                                                                          |
| 2076 | 013605 | 045    | 044514 | 042516 | LFAIL: .ASCII '%LINE FAILED%'                                            |
| 2077 | 013612 | 043040 | 044501 | 042514 |                                                                          |
| 2078 | 013620 | 022504 | 100    |        |                                                                          |
| 2079 | 013623 | 045    | 053117 | 051105 | ROVER: .ASCII '%OVERRUN, FRAME, OR PARITY ERROR%'                        |
| 2080 | 013630 | 052522 | 026116 | 043040 |                                                                          |
| 2081 | 013636 | 040522 | 042515 | 020054 |                                                                          |
| 2082 | 013644 | 051117 | 050040 | 051101 |                                                                          |
| 2083 | 013652 | 052111 | 020131 | 051105 |                                                                          |
| 2084 | 013660 | 047522 | 022522 | 100    |                                                                          |
| 2085 | 013665 | 045    | 044514 | 042516 | ALINEX: .ASCII '%LINE # '                                                |
| 2086 | 013672 | 021440 | 040    |        |                                                                          |
| 2087 | 013675 | 040    | 020040 | 040527 | TLINEX: .ASCII ' WAS SELECTED'                                           |
| 2088 | 013702 | 020123 | 042523 | 042514 |                                                                          |
| 2089 | 013710 | 052103 | 042105 | 100    |                                                                          |
| 2090 | 013715 | 045    | 044514 | 042516 | ALINE: .ASCII '%LINE # '                                                 |
| 2091 | 013722 | 021440 | 040    |        |                                                                          |
| 2092 | 013725 | 040    | 020040 | 040527 | TLINE: .ASCII ' WAS CALLED'                                              |
| 2093 | 013732 | 020123 | 040503 | 046114 |                                                                          |
| 2094 | 013740 | 042105 |        |        |                                                                          |
| 2095 | 013742 | 052045 | 050131 | 020105 | .ASCII '%TYPE IN OCTAL: CONFIGURATION IN BIT0-1 & MODEM TYPE'            |
| 2096 | 013750 | 047111 | 047440 | 052103 |                                                                          |
| 2097 | 013756 | 046101 | 020072 | 047503 |                                                                          |
| 2098 | 013764 | 043116 | 043511 | 051125 |                                                                          |
| 2099 | 013772 | 052101 | 047511 | 020116 |                                                                          |
| 2100 | 014000 | 047111 | 041040 | 052111 |                                                                          |
| 2101 | 014006 | 026460 | 020061 | 020046 |                                                                          |
| 2102 | 014014 | 047515 | 042504 | 020115 |                                                                          |
| 2103 | 014022 | 054524 | 042520 |        |                                                                          |
| 2104 | 014026 | 044445 | 020116 | 044502 | .ASCII '%IN BIT2 (0=103, 1=202) 3'                                       |
| 2105 | 014034 | 031124 | 020040 | 030050 |                                                                          |
| 2106 | 014042 | 030475 | 031460 | 020054 |                                                                          |
| 2107 | 014050 | 036461 | 030062 | 024462 |                                                                          |
| 2108 | 014056 | 020040 | 020040 | 020040 |                                                                          |
| 2109 | 014064 | 100    |        |        |                                                                          |
| 2110 | 014065 | 045    | 054524 | 042520 | WRU: .ASCII '%TYPE IN OCTAL IN BIT0-4 THE LINE # YOU ARE CALLING FROM 3' |
| 2111 | 014072 | 044440 | 020116 | 041517 |                                                                          |
| 2112 | 014100 | 040524 | 020114 | 047111 |                                                                          |
| 2113 | 014106 | 041040 | 052111 | 026460 |                                                                          |
| 2114 | 014114 | 020064 | 044124 | 020105 |                                                                          |
| 2115 | 014122 | 044514 | 042516 | 021440 |                                                                          |
| 2116 | 014130 | 054440 | 052517 | 040440 |                                                                          |
| 2117 | 014136 | 042522 | 041440 | 046101 |                                                                          |
| 2118 | 014144 | 044514 | 043516 | 043040 |                                                                          |
| 2119 | 014152 | 047522 | 020115 | 020040 |                                                                          |
| 2120 | 014160 | 040040 |        |        |                                                                          |



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|      |        |        |        |        |         |        |                                                                    |
|------|--------|--------|--------|--------|---------|--------|--------------------------------------------------------------------|
| 2121 | 014162 | 054445 | 052517 | 041440 | UR:     | .ASCII | '%YOU CALLED FROM LINE # '                                         |
| 2122 | 014170 | 046101 | 042514 | 020104 |         |        |                                                                    |
| 2123 | 014176 | 051106 | 046517 | 046040 |         |        |                                                                    |
| 2124 | 014204 | 047111 | 020105 | 020043 |         |        |                                                                    |
| 2125 | 014212 | 020040 | 100    |        | URA:    | .ASCII | '3'                                                                |
| 2126 | 014215 | 045    | 051120 | 051505 | BUTTON: | .ASCII | '%PRESS DATA BUTTON ON DATA PHONE3'                                |
| 2127 | 014232 | 020123 | 040504 | 040524 |         |        |                                                                    |
| 2128 | 014230 | 041040 | 052125 | 047524 |         |        |                                                                    |
| 2129 | 014236 | 020116 | 047117 | 042040 |         |        |                                                                    |
| 2130 | 014244 | 052101 | 020101 | 044120 |         |        |                                                                    |
| 2131 | 014252 | 047117 | 040105 |        |         |        |                                                                    |
| 2132 | 014256 | 052045 | 050131 | 020105 | LDLINE: | .ASCII | '%TYPE LINE NO. IN OCTAL IN BIT 3-7 3'                             |
| 2133 | 014264 | 044514 | 042516 | 047040 |         |        |                                                                    |
| 2134 | 014272 | 027117 | 044440 | 020116 |         |        |                                                                    |
| 2135 | 014300 | 041517 | 040524 | 020114 |         |        |                                                                    |
| 2136 | 014306 | 047111 | 041040 | 052111 |         |        |                                                                    |
| 2137 | 014314 | 031440 | 033455 | 020040 |         |        |                                                                    |
| 2138 | 014322 | 020040 | 100    |        |         |        |                                                                    |
| 2139 | 014325 | 045    | 042522 | 047503 | MPWRF:  | .ASCII | '%RECOVERED FROM POWER FAILURES3'                                  |
| 2140 | 014332 | 042526 | 042522 | 020104 |         |        |                                                                    |
| 2141 | 014340 | 051106 | 046517 | 050040 |         |        |                                                                    |
| 2142 | 014346 | 053517 | 051105 | 043040 |         |        |                                                                    |
| 2143 | 014354 | 044501 | 052514 | 042522 |         |        |                                                                    |
| 2144 | 014362 | 100    |        |        |         |        |                                                                    |
| 2145 | 014363 | 045    | 046111 | 042514 | MMDX:   | .ASCII | '%ILLEGAL LINE NO.3'                                               |
| 2146 | 014370 | 040507 | 020114 | 044514 |         |        |                                                                    |
| 2147 | 014376 | 042516 | 047040 | 027117 |         |        |                                                                    |
| 2148 | 014404 | 100    |        |        |         |        |                                                                    |
| 2149 | 014405 | 045    | 046111 | 042514 | MMOD:   | .ASCII | '%ILLEGAL DEVICE ADDRESS3'                                         |
| 2150 | 014412 | 040507 | 020114 | 042504 |         |        |                                                                    |
| 2151 | 014420 | 044526 | 042503 | 040440 |         |        |                                                                    |
| 2152 | 014426 | 042104 | 042522 | 051523 |         |        |                                                                    |
| 2153 | 014434 | 100    |        |        |         |        |                                                                    |
| 2154 | 014435 | 045    | 054524 | 042520 | MMOD1:  | .ASCII | '%TYPE IN OCTAL : BIT 0-5 THE LINE NUMBER OF DEVICE ADDRESS TO BE' |
| 2155 | 014442 | 044440 | 020116 | 041517 |         |        |                                                                    |
| 2156 | 014450 | 040524 | 020114 | 020072 |         |        |                                                                    |
| 2157 | 014456 | 044502 | 020124 | 026460 |         |        |                                                                    |
| 2158 | 014464 | 020065 | 044124 | 020105 |         |        |                                                                    |
| 2159 | 014472 | 044514 | 042516 | 047040 |         |        |                                                                    |
| 2160 | 014500 | 046525 | 042502 | 020122 |         |        |                                                                    |
| 2161 | 014506 | 043117 | 042040 | 053105 |         |        |                                                                    |
| 2162 | 014514 | 041511 | 020105 | 042101 |         |        |                                                                    |
| 2163 | 014522 | 051104 | 051505 | 020123 |         |        |                                                                    |
| 2164 | 014530 | 047524 | 041040 | 105    |         |        |                                                                    |
| 2165 | 014535 | 040    | 047515 | 044504 |         | .ASCII | ' MODIFIED 3'                                                      |
| 2166 | 014542 | 044506 | 042105 | 020040 |         |        |                                                                    |
| 2167 | 014550 | 020040 | 100    |        |         |        |                                                                    |
| 2168 | 014553 | 045    | 054524 | 042520 | MMOD2:  | .ASCII | '%TYPE IN NEW RXCSR DEVICE ADDRESS 3'                              |
| 2169 | 014560 | 044440 | 020116 | 042516 |         |        |                                                                    |
| 2170 | 014566 | 020127 | 054122 | 051503 |         |        |                                                                    |
| 2171 | 014574 | 020122 | 042504 | 044526 |         |        |                                                                    |
| 2172 | 014602 | 042503 | 040440 | 042104 |         |        |                                                                    |
| 2173 | 014610 | 042522 | 051523 | 020040 |         |        |                                                                    |
| 2174 | 014616 | 020040 | 100    |        |         |        |                                                                    |
| 2175 | 014621 | 045    | 054524 | 042520 | MMOD3:  | .ASCII | '%TYPE IN 177777 TO CHANGE ANOTHER'                                |
| 2176 | 014626 | 044440 | 020116 | 033461 |         |        |                                                                    |



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|      |        |        |        |        |
|------|--------|--------|--------|--------|
| 2177 | 014634 | 033467 | 033467 | 020040 |
| 2178 | 014642 | 047524 | 041440 | 040510 |
| 2179 | 014650 | 043516 | 020105 | 047101 |
| 2180 | 014656 | 052117 | 042510 | 122    |
| 2181 | 014663 | 040    | 042504 | 044526 |
| 2182 | 014670 | 042503 | 040440 | 042104 |
| 2183 | 014676 | 042522 | 051523 | 020040 |
| 2184 | 014704 | 020040 | 100    |        |
| 2185 |        | 014710 |        |        |
| 2186 | 014710 | 000000 |        |        |
| 2187 |        | 016660 |        |        |
| 2188 | 016660 | 000000 |        |        |
| 2189 |        | 020630 |        |        |
| 2190 |        | 015054 |        |        |
| 2191 | 020630 | 000001 |        |        |

.ASCII ' DEVICE ADDRESS 3'

OUTBUF: .EVEN  
OPEN  
.=OUTBUF+1000.  
INBUF: OPEN  
.=INBUF+1000.  
BUFF=OUTBUF+100.  
DEND: .END



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 DZDLBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

|        |   |        |       |       |       |       |       |       |       |       |       |
|--------|---|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| A      | = | 000037 | 536#  | 1865# | 1871# | 1872# | 1878# | 1879# | 1895# | 1885# | 1892# |
| ACONFI |   | 013456 | 1405  | 2058# |       |       |       |       |       |       |       |
| ADD1   |   | 004004 | 1063  | 1091# |       |       |       |       |       |       |       |
| ADTENP |   | 004362 | 1151  | 1177# |       |       |       |       |       |       |       |
| AGAIN  |   | 003746 | 1082# | 1085  |       |       |       |       |       |       |       |
| AINPRG |   | 013352 | 835   | 2044# |       |       |       |       |       |       |       |
| ALINE  |   | 013715 | 1379  | 2090# |       |       |       |       |       |       |       |
| ALINEX |   | 013665 | 1121  | 2085# |       |       |       |       |       |       |       |
| APARM  |   | 013373 | 1190  | 2048# |       |       |       |       |       |       |       |
| APC    |   | 012434 | 880   | 916   | 1956# |       |       |       |       |       |       |
| ARXCSR |   | 012466 | 908   | 1962# |       |       |       |       |       |       |       |
| ARXWAS |   | 012500 | 908   | 1964# |       |       |       |       |       |       |       |
| ATXCSR |   | 012445 | 905   | 1958# |       |       |       |       |       |       |       |
| ATXWAS |   | 012457 | 905   | 1960# |       |       |       |       |       |       |       |
| BDCNV  |   | 004216 | 859   | 1146# |       |       |       |       |       |       |       |
| BDCNVA |   | 004250 | 1153# | 1156  |       |       |       |       |       |       |       |
| BDCNVB |   | 004302 | 1158# | 1160# |       |       |       |       |       |       |       |
| BDCNVC |   | 004304 | 1149# | 1161# |       |       |       |       |       |       |       |
| BDCNVD |   | 004306 | 1150# | 1157  | 1162# |       |       |       |       |       |       |
| BIT0   | = | 000001 | 509#  | 712   | 768   | 1196  | 1200  | 1796  | 1809  | 1823  |       |
| BIT1   | = | 000002 | 508#  | 1193  | 1422  |       |       |       |       |       |       |
| BIT10  | = | 002000 | 499#  |       |       |       |       |       |       |       |       |
| BIT11  | = | 004000 | 498#  |       |       |       |       |       |       |       |       |
| BIT12  | = | 010000 | 497#  | 1436  |       |       |       |       |       |       |       |
| BIT13  | = | 020000 | 496#  | 875   | 911   | 1252  | 1266  | 1393  | 1428  | 1445  | 1743  |
| BIT14  | = | 040000 | 495#  | 1259  | 1371  |       |       |       |       |       | 1758  |
| BIT15  | = | 100000 | 493   | 494#  | 1363  | 1588  |       |       |       |       |       |
| BIT2   | = | 000004 | 507#  | 1555  | 1577  | 1691  |       |       |       |       |       |
| BIT3   | = | 000010 | 506#  |       |       |       |       |       |       |       |       |
| BIT4   | = | 000020 | 505#  | 1077  |       |       |       |       |       |       |       |
| BIT5   | = | 000040 | 504#  | 1062  | 1069  | 1086  |       |       |       |       |       |
| BIT6   | = | 000100 | 503#  | 713   | 714   | 722   | 1060  | 1073  | 1317  | 1359  | 1406  |
|        |   |        | 1622  | 1662  | 1663  | 1674  | 1675  | 1702  | 1755  | 1479  | 1492  |
| BIT7   | = | 000200 | 502#  | 989   | 1058  | 1065  |       |       |       |       | 1561  |
| BIT8   | = | 000400 | 501#  |       |       |       |       |       |       |       | 1621  |
| BIT9   | = | 001000 | 500#  |       |       |       |       |       |       |       |       |
| BMOVE  |   | 004204 | 1139# | 1141  |       |       |       |       |       |       |       |
| BMOVE  |   | 004174 | 1135# | 1159  | 1506  |       |       |       |       |       |       |
| BUFF   | = | 015054 | 1309  | 1314  | 1322  | 1339  | 1369  | 1370  | 1477  | 2190# |       |
| BUFFP  |   | 001400 | 664#  | 1307# | 1308# | 1309  | 1314  | 1324* | 1369* |       |       |
| BUTTON |   | 014215 | 1389  | 1424  | 2126# |       |       |       |       |       |       |
| CALLED |   | 001404 | 666#  | 1296  | 1340  | 1353  | 1380* |       |       |       |       |
| CALLER |   | 001402 | 665#  | 1345  | 1420* | 1473  |       |       |       |       |       |
| CARMSK |   | 001362 | 657#  | 851   | 1058  | 1060  | 1062  | 1192* | 1195* | 1199* | 1202* |
| CERDAT |   | 013300 | 864   | 2034# |       |       |       |       |       |       | 1767  |
| CHALT  | = | 104005 | 525#  |       |       |       |       |       |       |       |       |
| CHLT   |   | 002366 | 630   | 839#  |       |       |       |       |       |       |       |
| CNVCTR |   | 004354 | 1152# | 1155# | 1174# |       |       |       |       |       |       |
| COLMN  |   | 007652 | 1692# | 1710# | 1712# | 1719# |       |       |       |       |       |
| CONFIG |   | 001332 | 644#  | 1312  | 1325  | 1384* | 1385* | 1404  | 1434  | 1471  | 1483  |
| CONN   |   | 006250 | 1387  | 1421  | 1462# |       |       |       |       |       |       |
| COUNT  |   | 001324 | 641#  | 985#  | 1001* | 1002  | 1066* | 1070* | 1074* | 1078* | 1084* |
| CRNUM  |   | 013343 | 861   | 2041# |       |       |       |       |       |       |       |
| CRXTX  |   | 002752 | 906   | 909#  |       |       |       |       |       |       |       |
| CRXTXA |   | 003024 | 909#  | 910#  | 918#  |       |       |       |       |       |       |
| CRXTXB |   | 003026 | 905#  | 903#  | 919#  |       |       |       |       |       |       |



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 DZDLBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

|         |        |       |       |       |       |       |       |      |       |      |
|---------|--------|-------|-------|-------|-------|-------|-------|------|-------|------|
| CRXTXC  | 003032 | 912   | 921#  |       |       |       |       |      |       |      |
| CSB     | 013313 | 856   | 2036# |       |       |       |       |      |       |      |
| CSRADD  | 012357 | 857   | 858   | 1366  | 1375  | 1947# |       |      |       |      |
| CTRD    | 001364 | 658#  | 860   | 1127* | 1130* | 1321* | 1330* | 1331 | 1349* | 1350 |
| CWAS    | 013325 | 855   | 2038# |       |       |       |       |      |       |      |
| DATCHK= | 104004 | 524#  | 1329  | 1344  | 1348  |       |       |      |       |      |
| DCERR   | 005532 | 1291  | 1363# |       |       |       |       |      |       |      |
| DECVAL  | 004374 | 1147  | 1182# |       |       |       |       |      |       |      |
| DELAY = | 104016 | 534#  | 1262  | 1390  | 1425  |       |       |      |       |      |
| DEND    | 020630 | 2191# |       |       |       |       |       |      |       |      |
| DIGIT   | 004356 | 1165* | 1168* | 1171* | 1172  | 1175# |       |      |       |      |
| DISCON  | 006234 | 1373  | 1397  | 1431  | 1457# |       |       |      |       |      |
| DLCNT   | 003526 | 1021* | 1023  | 1033# |       |       |       |      |       |      |
| DLY     | 003466 | 639   | 1021# |       |       |       |       |      |       |      |
| DLYA    | 003504 | 1025# | 1030  |       |       |       |       |      |       |      |
| DLYB    | 003510 | 1026# | 1027  |       |       |       |       |      |       |      |
| DLYC    | 003522 | 1024  | 1031# |       |       |       |       |      |       |      |
| DOIT    | 003742 | 1068  | 1072  | 1076  | 1080  | 1081# |       |      |       |      |
| DONE    | 003776 | 1087  | 1089# |       |       |       |       |      |       |      |
| DTCHK   | 002412 | 629   | 851#  |       |       |       |       |      |       |      |
| DTCHKA  | 002510 | 853   | 865#  |       |       |       |       |      |       |      |
| DTERR   | 013232 | 1011  | 2027# |       |       |       |       |      |       |      |
| ECDAT   | 003346 | 990#  | 991   |       |       |       |       |      |       |      |
| EHALT = | 104010 | 528#  | 886   | 921   |       |       |       |      |       |      |
| EHLT    | 002400 | 633   | 845#  |       |       |       |       |      |       |      |
| EHLTA   | 002410 | 846   | 848#  |       |       |       |       |      |       |      |
| EIGHT   | 003632 | 1059  | 1065# |       |       |       |       |      |       |      |
| EMTA    | 002234 | 801#  |       |       |       |       |       |      |       |      |
| EMTINT  | 002222 | 478   | 798#  |       |       |       |       |      |       |      |
| EMTTAB  | 001264 | 625#  | 803   |       |       |       |       |      |       |      |
| EMO     | 012427 | 882   | 917   | 1955# |       |       |       |      |       |      |
| ENDPAS  | 013350 | 1358  | 1776  | 2042# |       |       |       |      |       |      |
| ERR     | 002512 | 628   | 867#  |       |       |       |       |      |       |      |
| ERRA    | 002562 | 870   | 875#  |       |       |       |       |      |       |      |
| ERRB    | 002624 | 867*  | 868*  | 871*  | 872*  | 873*  | 883#  |      |       |      |
| ERRC    | 002632 | 876   | 886#  |       |       |       |       |      |       |      |
| ERRCNT  | 010114 | 1750* | 1771* | 778#  |       |       |       |      |       |      |
| ERRD    | 002642 | 877*  | 878*  | 880   | 889#  | 913*  | 914*  | 916  |       |      |
| ERRE    | 002644 | 869*  | 874*  | 887   | 890#  |       |       |      |       |      |
| ERROR = | 104003 | 523#  | 1294  | 1395  | 1430  | 1438  | 1447  | 1469 | 1763  | 1770 |
| ERROR1= | 104013 | 531#  | 857   | 863   |       |       |       |      |       |      |
| ERRRX = | 104015 | 533#  | 1268  | 1365  | 1374  | 1624  | 1628  | 1631 |       |      |
| ERRTX = | 104014 | 532#  | 1655  |       |       |       |       |      |       |      |
| ERR1    | 002534 | 636   | 871#  |       |       |       |       |      |       |      |
| ERR3A   | 007230 | 1595  | 1624# |       |       |       |       |      |       |      |
| ERR3B   | 007244 | 1597  | 1628# |       |       |       |       |      |       |      |
| ERR3C   | 007252 | 1602  | 1631# |       |       |       |       |      |       |      |
| ERTP    | 004520 | 466   | 468   | 470   | 472   | 480   | 678   | 732  | 1206# | 1787 |
| ERTPA   | 004570 | 1214# | 1233  |       |       |       |       |      |       |      |
| FILL    | 004146 | 1126# | 1354  |       |       |       |       |      |       |      |
| FILLA   | 004154 | 1128# | 1131  |       |       |       |       |      |       |      |
| FINISH  | 005476 | 1333  | 1352# |       |       |       |       |      |       |      |
| FIVE    | 003720 | 1064  | 1077# |       |       |       |       |      |       |      |
| FMAP    | 001350 | 652#  | 712*  | 1232  | 1237* |       |       |      |       |      |
| FNCNE   | 001346 | 651#  | 685*  | 729*  | 734   |       |       |      |       |      |
| FORMAD  | 004704 | 711   | 1241# |       |       |       |       |      |       |      |



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 DZDLBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

|         |        |       |       |       |       |       |       |      |       |
|---------|--------|-------|-------|-------|-------|-------|-------|------|-------|
| FROMPC  | 001342 | 649#  | 1213* | 1219  | 1230* |       |       |      |       |
| FTITLE  | 001344 | 550#  | 674*  | 680   | 684*  | 738*  | 794*  |      |       |
| GENPAR  | 003600 | 1058# | 1563  | 1704  | 1757  |       |       |      |       |
| INBUF   | 016660 | 1304  | 1337  | 1368  | 2188# | 2189  |       |      |       |
| INBUFP  | 001376 | 663#  | 1302* | 1303* | 1304  | 1338* | 1368* |      |       |
| INCPRG  | 002354 | 623   | 624   | 834#  |       |       |       |      |       |
| INDAT   | 003322 | 984#  | 1013  |       |       |       |       |      |       |
| INFIL   | 004142 | 1125# | 1529  |       |       |       |       |      |       |
| LDLINE  | 014256 | 1096  | 2132# |       |       |       |       |      |       |
| LDPRI   | 010274 | 1511  | 1533  | 1820# |       |       |       |      |       |
| LDPRIA  | 010310 | 1823# | 1829  |       |       |       |       |      |       |
| LDPRIX  | 010324 | 1824  | 1827# |       |       |       |       |      |       |
| LDTVEC  | 010226 | 1512  | 1534  | 1805# |       |       |       |      |       |
| LDTVED  | 010246 | 1809# | 1816  |       |       |       |       |      |       |
| LDVECB  | 010202 | 1796# | 1802  |       |       |       |       |      |       |
| LDVECS  | 010152 | 1513  | 1535  | 1792# |       |       |       |      |       |
| LDVEC1  | 010214 | 1797  | 1799# |       |       |       |       |      |       |
| LDVEC2  | 010262 | 1910  | 1813# |       |       |       |       |      |       |
| LFIL    | 013605 | 1625  | 2076# |       |       |       |       |      |       |
| LINCA   | 004760 | 1254# | 1270  |       |       |       |       |      |       |
| LINCB   | 004776 | 1258# | 1260  |       |       |       |       |      |       |
| LINCF   | 005056 | 1267  | 1271# |       |       |       |       |      |       |
| LINCHM  | 013377 | 1269  | 1746  | 2049# |       |       |       |      |       |
| LINCON  | 004742 | 1251# | 1556  | 1564  | 1578  | 1694  | 1705  |      |       |
| LINE    | 001330 | 643#  | 1287* | 1378  | 1415* | 1417  |       |      |       |
| LINENO  | 001354 | 654#  | 686*  | 690*  | 707   | 719   |       |      |       |
| LINEUP  | 005074 | 1253  | 1275# |       |       |       |       |      |       |
| LINMAD  | 013427 | 1274  | 1402  | 1749  | 2054# |       |       |      |       |
| LINSA   | 004056 | 1106# | 1109  |       |       |       |       |      |       |
| LINSEL  | 004014 | 1095# | 1553  | 1574  | 1689  | 1735  |       |      |       |
| MACHER  | 000004 | 468#  | 678*  | 679*  | 687*  | 688*  | 732*  | 733* | 1787* |
| MAKCON  | 013251 | 1257  | 1519  | 1541  | 1740  | 2030# | 1789* |      |       |
| MANUAL= | 100000 | 493#  |       |       |       |       |       |      |       |
| MAPA    | 001520 | 690#  | 700   | 731   |       |       |       |      |       |
| MAPEND  | 001730 | 692   | 732#  |       |       |       |       |      |       |
| MAPERR  | 001752 | 736#  |       |       |       |       |       |      |       |
| MAPNE   | 001550 | 687   | 698#  |       |       |       |       |      |       |
| MAPCK   | 001560 | 697   | 701#  |       |       |       |       |      |       |
| MAPOKA  | 001672 | 718   | 722#  |       |       |       |       |      |       |
| MAPVEC  | 004626 | 474   | 1228# |       |       |       |       |      |       |
| MDADR   | 012154 | 704   | 1920# |       |       |       |       |      |       |
| MFROM   | 012346 | 1220  | 1945# |       |       |       |       |      |       |
| MLINE   | 012146 | 708   | 728   | 1919# |       |       |       |      |       |
| MMODD   | 014405 | 771   | 2149# |       |       |       |       |      |       |
| MMODX   | 014363 | 763   | 2145# |       |       |       |       |      |       |
| MMOD1   | 014435 | 755   | 2154# |       |       |       |       |      |       |
| MMOD2   | 014553 | 766   | 2168# |       |       |       |       |      |       |
| MMOD3   | 014621 | 790   | 2175# |       |       |       |       |      |       |
| MNONE   | 012176 | 737   | 1924# |       |       |       |       |      |       |
| MODEM   | 001412 | 670#  | 1298  | 1382* | 1383* |       |       |      |       |
| MODEV   | 002024 | 582   | 751#  |       |       |       |       |      |       |
| MODEV1  | 002036 | 754#  | 764   | 793   |       |       |       |      |       |
| MODEV2  | 002072 | 761   | 765#  | 772   |       |       |       |      |       |
| MODEV3  | 002116 | 769   | 773#  |       |       |       |       |      |       |
| MOVIT   | 010116 | 1517  | 1539  | 1781# |       |       |       |      |       |
| MOVITA  | 010136 | 1784# | 1786  |       |       |       |       |      |       |



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DZDLBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

|         |        |       |
|---------|--------|-------|
| RISR16  | 011202 | 1897* |
| RISR17  | 011212 | 1897* |
| RISR2   | 011042 | 1897* |
| RISR20  | 011222 | 1897* |
| RISR21  | 011232 | 1897* |
| RISR22  | 011242 | 1897* |
| RISR23  | 011252 | 1897* |
| RISR24  | 011262 | 1897* |
| RISR25  | 011272 | 1897* |
| RISR26  | 011302 | 1897* |
| RISR27  | 011312 | 1897* |
| RISR3   | 011052 | 1897* |
| RISR30  | 011322 | 1897* |
| RISR31  | 011332 | 1897* |
| RISR32  | 011342 | 1897* |
| RISR33  | 011352 | 1897* |
| RISR34  | 011362 | 1897* |
| RISR35  | 011372 | 1897* |
| RISR36  | 011402 | 1897* |
| RISR4   | 011062 | 1897* |
| RISR5   | 011072 | 1897* |
| RISR6   | 011102 | 1897* |
| RISR7   | 011112 | 1897* |
| ROVER   | 013623 | 1632  |
| RREAD   | 003442 | 996   |
| RSTPC   | 002350 | 822*  |
| RSTPSW  | 002352 | 823*  |
| RSTREG= | 104012 | 530*  |
| RSTRG   | 002314 | 635   |
| RTN     | 003752 | 1084* |
| RXBJF   | 001202 | 600*  |
| RXBFT   | 007472 | 1599* |
| RXCSR   | 001200 | 599*  |
|         |        | 1346* |
|         |        | 1758  |
|         |        | 660*  |
|         |        | 1596  |
|         |        | 638   |
|         |        | 604*  |
|         |        | 603*  |
|         |        | 642*  |
|         |        | 529*  |
|         |        | 634   |
|         |        | 942*  |
|         |        | 1502  |
|         |        | 1186  |
|         |        | 1185* |
|         |        | 1061  |
|         |        | 1063  |
|         |        | 576*  |
|         |        | 585*  |
|         |        | 992   |
|         |        | 1188  |
|         |        | 575*  |
|         |        | 662*  |
|         |        | 578*  |
|         |        | 2079* |
|         |        | 998   |
|         |        | 830   |
|         |        | 829   |
|         |        | 885   |
|         |        | 822*  |
|         |        | 1092  |
|         |        | 1243* |
|         |        | 1600  |
|         |        | 857   |
|         |        | 1440* |
|         |        | 1764  |
|         |        | 908   |
|         |        | 907*  |
|         |        | 930   |
|         |        | 717   |
|         |        | 721   |
|         |        | 1088* |
|         |        | 1036  |
|         |        | 880   |
|         |        | 808*  |
|         |        | 949   |
|         |        | 966*  |
|         |        | 972   |
|         |        | 974   |
|         |        | 978*  |
|         |        | 207*  |
|         |        | 2007* |
|         |        | 1400  |
|         |        | 1073* |
|         |        | 1069* |
|         |        | 591   |
|         |        | 586*  |
|         |        | 993   |
|         |        | 1382  |
|         |        | 588   |
|         |        | 1086  |
|         |        | 580*  |
|         |        | 745   |
|         |        | 757   |
|         |        | 760   |
|         |        | 768   |
|         |        | 773   |
|         |        | 792   |
|         |        | 981*  |
|         |        | 982*  |
|         |        | 983*  |
|         |        | 988*  |
|         |        | 989*  |
|         |        | 995   |
|         |        | 997   |
|         |        | 999   |
|         |        | 1007* |
|         |        | 1008  |
|         |        | 1012  |
|         |        | 1014* |
|         |        | 1015  |
|         |        | 1016  |
|         |        | 1017  |
|         |        | 1098  |
|         |        | 845   |
|         |        | 875   |
|         |        | 911   |
|         |        | 1603  |
|         |        | 1193  |
|         |        | 1196  |
|         |        | 1200  |
|         |        | 1561  |
|         |        | 1702  |
|         |        | 1755  |
|         |        | 1000  |
|         |        | 1003  |
|         |        | 1010* |
|         |        | 832*  |
|         |        | 833*  |
|         |        | 1051  |
|         |        | 1142  |
|         |        | 1163  |
|         |        | 1255  |
|         |        | 1265  |
|         |        | 1272  |
|         |        | 1599  |
|         |        | 1742  |
|         |        | 1761  |
|         |        | 1766  |
|         |        | 1601  |
|         |        | 1681* |
|         |        | 1241* |
|         |        | 1251  |
|         |        | 1254* |
|         |        | 1258  |
|         |        | 1261* |
|         |        | 1264  |
|         |        | 1271  |
|         |        | 1289* |
|         |        | 1290  |
|         |        | 1341* |
|         |        | 1449* |
|         |        | 1453* |
|         |        | 1555* |
|         |        | 1577* |
|         |        | 1590* |
|         |        | 1594  |
|         |        | 1618* |
|         |        | 1626* |
|         |        | 1691* |
|         |        | 1738* |
|         |        | 1743  |
|         |        | 1251* |
|         |        | 1252  |
|         |        | 1258* |
|         |        | 1259  |
|         |        | 1264* |
|         |        | 1266  |
|         |        | 1271* |
|         |        | 1290* |
|         |        | 1292  |



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 DZDLBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

|         |          |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
|---------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|--|--|--|
| TISR3   | 011442   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR30  | 011712   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR31  | 011722   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR32  | 011732   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR33  | 011742   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR34  | 011752   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR35  | 011762   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR36  | 011772   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR37  | 012002   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR4   | 011452   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR5   | 011462   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR6   | 011472   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TISR7   | 011502   | 1902# |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TKB     | 001222   | 608#  | 988   |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TKLVL   | 001232   | 612#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TKS     | 001220   | 607#  | 986   |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TKVTR   | 001230   | 611#  |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TLINE   | 013725   | 1378  | 2092# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TLINEX  | 013675   | 1120  | 2087# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TOPC    | 001340   | 648#  | 1212* | 1215  | 1228* | 1231* | 1234  | 1235* | 1236  |       |       |       |       |       |  |  |  |  |  |  |
| TPB     | 001226   | 610#  | 955*  | 992*  | 1668* |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TPINT   | 007422   | 1585  | 1668# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TPINTA  | 007442   | 1670  | 1672  | 1674# |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TPLVL   | 001236   | 614#  | 1586  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TPS     | 001224   | 609#  | 956   | 990   | 1622* | 1651  | 1652* | 1653  | 1657  | 1659* | 1663  | 1674* |       |       |  |  |  |  |  |  |
| TPVTR   | 001234   | 613#  | 1584  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TXBUF   | 001206   | 602#  | 1247* | 1565* | 1607* | 1642* | 1706* | 1723* | 1726* | 1760* |       |       |       |       |  |  |  |  |  |  |
| TXCSR   | 001204   | 601#  | 713*  | 714*  | 722*  | 1245* | 1399* | 1450* | 1566  | 1605  | 1621* | 1639  | 1662* | 1675  |  |  |  |  |  |  |
|         |          | 1707  | 1724  | 1727  | 1772  |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TXCSRT  | 001366   | 659#  | 905   | 1639* | 1640  |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TXEPR   | 002710   | 637   | 904#  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TXLVL   | 001216   | 606#  | 938   |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TXVTR   | 001214   | 605#  | 936   | 1234* |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYP     | 003122   | 625   | 942#  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPA    | 003136   | 946#  | 954   | 963   |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPC    | 003160   | 948   | 951#  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPD    | 003176   | 953   | 955#  | 960   | 962   |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPDAT  | 003242   | 946*  | 947   | 951   | 955   | 959*  | 961*  | 964#  |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPE =  | 104000   | 520#  | 682   | 727   | 736   | 742   | 754   | 762   | 765   | 770   | 789   | 834   | 898   | 975   |  |  |  |  |  |  |
|         |          | 1010  | 1095  | 1120  | 1185  | 1190  | 1222  | 1256  | 1273  | 1357  | 1378  | 1388  | 1401  | 1404  |  |  |  |  |  |  |
|         |          | 1410  | 1417  | 1423  | 1499  | 1501  | 1518  | 1526  | 1540  | 1551  | 1572  | 1687  | 1733  | 1739  |  |  |  |  |  |  |
|         |          | 1745  | 1748  | 1775  |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
|         |          | 521#  | 881   | 916   |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPES = | 104001   | 952   | 959#  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPF    | 003214   | 626   | 966#  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPS    | 003244   | 971   | 974#  |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPSA   | 003300   | 967#  | 977   |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPSAA  | 003250   | 969#  | 970   | 976#  |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| TYPSB   | 003306   | 1418  | 2121# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| UR      | 014162   | 1417  | 2125# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| URA     | 014212   | 721*  | 1110  | 1793  | 1806  | 1920  | 1832# |       |       |       |       |       |       |       |  |  |  |  |  |  |
| VECTAB  | 010334   | 1583* | 1598* | 1608  | 1617* | 1643* | 1646  | 1680# |       |       |       |       |       |       |  |  |  |  |  |  |
| WORDS   | 007470   | 1411  | 2110# |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |  |  |
| WRU     | 014065   | 656#  | 851*  | 852   | 856   | 1327* | 1342* |       |       |       |       |       |       |       |  |  |  |  |  |  |
| XMTDAT  | 001360   | 465#  | 482   | 488   | 574#  | 577#  | 598#  | 957   | 1116  | 1310  | 1478  | 1562  | 1567  | 1593  |  |  |  |  |  |  |
| .       | = 020630 | 1606  | 1654  | 1658  | 1676  | 1703  | 1708  | 1725  | 1728  | 1756  | 1762  | 1765  | 1773  | 2062# |  |  |  |  |  |  |



N04.

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DZDLBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

2185# 2187# 2189#



|     |     |     |     |     |     |      |      |      |      |      |
|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| 855 | 856 | 879 | 904 | 907 | 915 | 1119 | 1189 | 1377 | 1403 | 1416 |
|-----|-----|-----|-----|-----|-----|------|------|------|------|------|



|      |                    |              |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
|------|--------------------|--------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|--------------|--------------|--------------|
| ADD  | 698<br>699<br>1813 | 730<br>1009  | 775<br>1022         | 777<br>1040         | 779<br>1043         | 781<br>1088         | 783<br>1091         | 785<br>1107         | 787<br>1170          | 803<br>1171          | 887<br>1242          | 922<br>1244          | 927<br>1246  | 935<br>1280  | 944<br>1799  |
| ASL  | 720<br>1100        | 748<br>1101  | 759<br>1118         | 901<br>1208         | 1004<br>1209        | 1005<br>1210        | 1006                | 1288                | 1419                 | 1466                 |                      |                      |              |              |              |
| ASR  | 1083<br>693        | 1167<br>718  |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| BBS  | 1201<br>1645       | 1233<br>1647 | 769<br>1260<br>1649 | 793<br>1299<br>1664 | 853<br>1305<br>1670 | 952<br>1313<br>1672 | 994<br>1315<br>1676 | 996<br>1364<br>1703 | 1024<br>1435<br>1754 | 1059<br>1472<br>1756 | 1061<br>1560<br>1759 | 1063<br>1562<br>1769 | 1087<br>1609 | 1194<br>1613 | 1197<br>1615 |
| BGT  | 999                |              |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| BIC  | 713<br>1354        | 722<br>1393  | 746<br>1385         | 758<br>1414         | 802<br>1432         | 851<br>1457         | 989<br>1479         | 1042<br>1492        | 1045<br>1618         | 1067<br>1626         | 1071<br>1662         | 1075<br>1674         | 1079<br>1767 | 1099         | 1211         |
| BIS  | 713<br>1738        | 714<br>1739  | 1261<br>1739        | 1317<br>1739        | 1359<br>1739        | 1406<br>1739        | 1422<br>1739        | 1462<br>1739        | 1555<br>1739         | 1577<br>1739         | 1588<br>1739         | 1590<br>1739         | 1621<br>1739 | 1622         | 1691         |
| BIT  | 768<br>1393        | 875<br>1428  | 911<br>1445         | 1058<br>1561        | 1060<br>1663        | 1062<br>1675        | 1086<br>1702        | 1193<br>1743        | 1196<br>1755         | 1200<br>1759         | 1252<br>1796         | 1259<br>1809         | 1266<br>1823 | 1363         | 1371         |
| BLE  | 1003               |              |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| BFL  | 761<br>1000        |              |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| BFL  | 1291<br>691        | 1310<br>1468 |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| BNE  | 691<br>1253        | 735<br>1267  | 1595<br>1282        | 1602<br>1293        | 1604<br>1297        | 1611<br>1326        |                     | 1027<br>1332        | 1030<br>1351         | 1050<br>1372         | 1085<br>1386         | 1109<br>1394         | 1116<br>1429 | 1131<br>1437 | 1141<br>1446 |
|      | 1478<br>846        | 1484<br>957  | 1486<br>987         | 1491<br>991         | 1699<br>1567        | 1711<br>1597        | 1716<br>1606        | 1744<br>1641        | 1786<br>1654         | 1797<br>1659         | 1802<br>1708         | 1910<br>1725         | 1916<br>1728 | 1924<br>1762 | 1929<br>1765 |
| BPL  | 1773               |              |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| BR   | 579<br>1064        | 581<br>1068  | 590<br>1072         | 697<br>1076         | 700<br>1080         | 731<br>1092         | 764<br>1169         | 772<br>1203         | 870<br>1270          | 906<br>1493          | 954<br>1522          | 963<br>1544          | 977<br>1568  | 1009<br>1593 | 1013<br>1627 |
| CLR  | 1701<br>674        | 1718<br>677  | 1747<br>685         | 1774<br>693         | 1777<br>738         |                     |                     |                     |                      |                      |                      |                      |              |              |              |
|      | 1583<br>1125       | 1591<br>1125 | 1617<br>1125        | 1635<br>1125        | 1652<br>1125        | 1750<br>1125        |                     |                     |                      |                      |                      |                      |              |              |              |
| CLRB | 1125               |              |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| CMP  | 593<br>1350        | 691<br>1427  | 760<br>1434         | 792<br>1436         | 970<br>1473         | 1002<br>1477        | 1112<br>1485        | 1115<br>1490        | 1296<br>1559         | 1304<br>1608         | 1309<br>1646         | 1312<br>1753         | 1314<br>1753 | 1325<br>1699 | 1331<br>1715 |
| CMPB | 1350<br>852        | 1427<br>947  | 1434<br>951         | 1436<br>993         | 1473<br>995         | 1477<br>997         | 1485<br>999         | 1490<br>1612        | 1559<br>1614         | 1608<br>1644         | 1646<br>1648         | 1753<br>1669         | 1753<br>1671 | 1699         | 1715         |
| DEC  | 1768               |              |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| EMT  | 1026<br>520        | 1029<br>520  | 1049<br>522         | 1084<br>523         | 1108<br>524         | 1130<br>525         | 1140<br>526         | 1155<br>527         | 1281<br>528          | 1710<br>529          | 1785<br>530          | 1801<br>531          | 1815<br>532  | 1828<br>533  | 534          |
| HALT | 483                |              |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| INC  | 684<br>1771        | 690<br>1129  | 729<br>1129         | 1001<br>1129        | 1168<br>1129        | 1303<br>1129        | 1308<br>1129        | 1330<br>1129        | 1349<br>1129         | 1476<br>1129         | 1482<br>1129         | 1599<br>1129         | 1643<br>1129 | 1709<br>1129 | 1714         |
| INCB | 1129               |              |                     |                     |                     |                     |                     |                     |                      |                      |                      |                      |              |              |              |
| JMP  | 596<br>1902        | 740<br>1902  | 749<br>1902         | 795<br>1902         | 805<br>1902         | 837<br>1902         | 902<br>1902         | 1225<br>1902        | 1333<br>1902         | 1439<br>1902         | 1441<br>1902         | 1448<br>1902         | 1454<br>1902 | 1678<br>1902 | 1897         |
| JSR  | 702<br>916         | 706<br>953   | 711<br>960          | 723<br>962          | 744<br>1097         | 756<br>1120         | 767<br>1154         | 791<br>1159         | 855<br>1187          | 856<br>1190          | 857<br>1214          | 859<br>1219          | 880<br>1354  | 905<br>1373  | 908<br>1378  |
|      | 1381<br>1513       | 1387<br>1517 | 1397<br>1529        | 1400<br>1533        | 1404<br>1534        | 1412<br>1535        | 1417<br>1539        | 1421<br>1553        | 1431<br>1554         | 1451<br>1556         | 1503<br>1563         | 1506<br>1564         | 1510<br>1574 | 1511<br>1575 | 1512<br>1576 |
|      | 1583<br>1689       | 1583<br>1689 | 1583<br>1689        | 1583<br>1689        | 1583<br>1689        | 1583<br>1689        | 1583<br>1689        | 1583<br>1689        | 1583<br>1689         | 1583<br>1689         | 1583<br>1689         | 1583<br>1689         | 1583<br>1689 | 1583<br>1689 | 1583<br>1689 |
| MOV  | 578<br>688         | 580<br>689   | 582<br>701          | 584<br>710          | 585<br>716          | 586<br>719          | 587<br>721          | 591<br>732          | 594<br>733           | 595<br>745           | 575<br>747           |                      | 678<br>751   | 679<br>757   | 687<br>773   |
|      | 776<br>812         | 778<br>814   | 780<br>815          | 782<br>816          | 784<br>822          | 786<br>823          | 788<br>824          | 798<br>825          | 800<br>826           | 804<br>827           | 808<br>828           | 809<br>829           | 810<br>830   | 811<br>839   | 812<br>867   |
|      | 868<br>926         | 871<br>928   | 872<br>929          | 873<br>930          | 874<br>934          | 877<br>936          | 893<br>937          | 895<br>938          | 897<br>942           | 900<br>943           | 905<br>945           | 908<br>949           | 909<br>966   | 910<br>967   | 913<br>969   |
|      | 972<br>1065        | 974<br>1066  | 981<br>1069         | 982<br>1070         | 983<br>1073         | 1014<br>1074        | 1016<br>1077        | 1017<br>1078        | 1021<br>1081         | 1023<br>1089         | 1025<br>1098         | 1037<br>1102         | 1038<br>1103 | 1039<br>1104 | 1041<br>1105 |



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 DZDLBB.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

|        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|        | 1106 | 1110 | 1111 | 1114 | 1126 | 1127 | 1136 | 1137 | 1138 | 1147 | 1148 | 1149 | 1150 | 1151 | 1152 |
|        | 1153 | 1158 | 1188 | 1192 | 1195 | 1198 | 1202 | 1206 | 1207 | 1212 | 1213 | 1228 | 1230 | 1234 | 1236 |
|        | 1241 | 1243 | 1245 | 1247 | 1251 | 1258 | 1264 | 1271 | 1277 | 1278 | 1279 | 1287 | 1289 | 1290 | 1321 |
|        | 1322 | 1323 | 1324 | 1337 | 1338 | 1339 | 1340 | 1341 | 1345 | 1346 | 1353 | 1367 | 1368 | 1369 | 1370 |
|        | 1380 | 1382 | 1384 | 1399 | 1413 | 1415 | 1420 | 1440 | 1449 | 1450 | 1453 | 1487 | 1505 | 1514 | 1515 |
|        | 1516 | 1528 | 1532 | 1536 | 1537 | 1538 | 1557 | 1565 | 1576 | 1584 | 1585 | 1596 | 1587 | 1594 | 1599 |
|        | 1619 | 1620 | 1639 | 1651 | 1659 | 1692 | 1693 | 1696 | 1700 | 1706 | 1712 | 1717 | 1751 | 1760 | 1781 |
|        | 1782 | 1783 | 1784 | 1787 | 1788 | 1792 | 1793 | 1794 | 1795 | 1798 | 1805 | 1806 | 1807 | 1808 | 1811 |
|        | 1812 | 1820 | 1821 | 1822 | 1825 | 1826 | 1897 | 1902 |      |      |      |      |      |      |      |
| MOV8   | 946  | 955  | 959  | 551  | 988  | 992  | 1044 | 1128 | 1139 | 1172 | 1302 | 1307 | 1327 | 1328 | 1342 |
|        | 1343 | 1347 | 1475 | 1481 | 1504 | 1558 | 1600 | 1607 | 1636 | 1642 | 1668 | 1697 | 1723 | 1726 | 1752 |
|        | 1765 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| NOP    | 695  | 696  | 715  | 1286 | 1320 | 1336 | 1352 | 1360 | 1465 | 1498 |      |      |      |      |      |
| RESET  | 676  | 752  | 996  | 1736 |      |      |      |      |      |      |      |      |      |      |      |
| ROL    | 801  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| ROR    | 1046 | 1047 | 1048 | 1082 |      |      |      |      |      |      |      |      |      |      |      |
| RTI    | 817  | 831  | 842  | 848  | 865  | 888  | 923  | 931  | 939  | 950  | 973  | 1032 | 1238 | 1295 | 1301 |
|        | 1306 | 1311 | 1316 | 1318 | 1361 | 1376 | 1398 | 1407 | 1433 | 1470 | 1480 | 1488 | 1616 | 1623 | 1630 |
|        | 1633 | 1637 | 1650 | 1660 | 1665 | 1673 | 1677 |      |      |      |      |      |      |      |      |
| RTS    | 958  | 1018 | 1052 | 1090 | 1117 | 1122 | 1132 | 1143 | 1164 | 1173 | 1199 | 1248 | 1275 | 1293 | 1459 |
|        | 1453 | 1729 | 1789 | 1803 | 1817 | 1830 |      |      |      |      |      |      |      |      |      |
| SUB    | 799  | 840  | 878  | 914  | 1007 | 1157 | 1166 | 1231 | 1235 |      |      |      |      |      |      |
| TST    | 588  | 680  | 694  | 717  | 734  | 845  | 1012 | 1015 | 1113 | 1232 | 1255 | 1265 | 1272 | 1299 | 1300 |
|        | 1392 | 1458 | 1471 | 1483 | 1601 | 1610 | 1742 | 1761 | 1800 | 1814 | 1827 |      |      |      |      |
| TSTB   | 956  | 986  | 990  | 1292 | 1467 | 1566 | 1596 | 1603 | 1605 | 1640 | 1653 | 1657 | 1707 | 1724 | 1727 |
|        | 1764 | 1772 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| WAIT   | 1521 | 1543 | 1592 |      |      |      |      |      |      |      |      |      |      |      |      |
| .ASCII | 1903 | 1910 | 1914 | 1919 | 1920 | 1922 | 1924 | 1927 | 1932 | 1937 | 1940 | 1942 | 1945 | 1947 | 1949 |
|        | 1952 | 1955 | 1956 | 1958 | 1960 | 1962 | 1964 | 1966 | 1973 | 1980 | 1987 | 1992 | 1995 | 2007 | 2013 |
|        | 2017 | 2027 | 2030 | 2034 | 2036 | 2038 | 2041 | 2043 | 2044 | 2045 | 2048 | 2049 | 2054 | 2059 | 2061 |
|        | 2064 | 2073 | 2076 | 2079 | 2085 | 2087 | 2090 | 2092 | 2095 | 2104 | 2110 | 2121 | 2125 | 2126 | 2132 |
|        | 2139 | 2145 | 2149 | 2154 | 2165 | 2168 | 2175 | 2181 |      |      |      |      |      |      |      |
| .BYTE  | 1182 | 2042 | 2063 |      |      |      |      |      |      |      |      |      |      |      |      |
| .ENABL | 442  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| .END   | 2191 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| .EVEN  | 2062 | 2185 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| .MACR  | 538  | 545  | 551  | 557  | 561  | 565  | 569  |      |      |      |      |      |      |      |      |
| .REPT  | 1    | 484  | 1866 | 1873 | 1880 | 1887 | 1893 | 1898 |      |      |      |      |      |      |      |
| .TITLE | 441  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

ERRORS DETECTED: 0  
 DEFAULT GLOBALS GENERATED: 0

\*.DZDLBB.SEO/SOL/CRF/PAGNUM=DZDLBB  
 RUN-TIME: 9 16 3 SECONDS  
 RUN-TIME RATIO: 93/30=3.0  
 CORE USED: 11K (21 PAGES)



Spooler runtime 8 Seconds, 249 KCS, 220 disk reads, 4 disk writes, 55 pages

[illegible]