DV11

OVERLAY FOR ITEP

MD-11-DZDVO-A

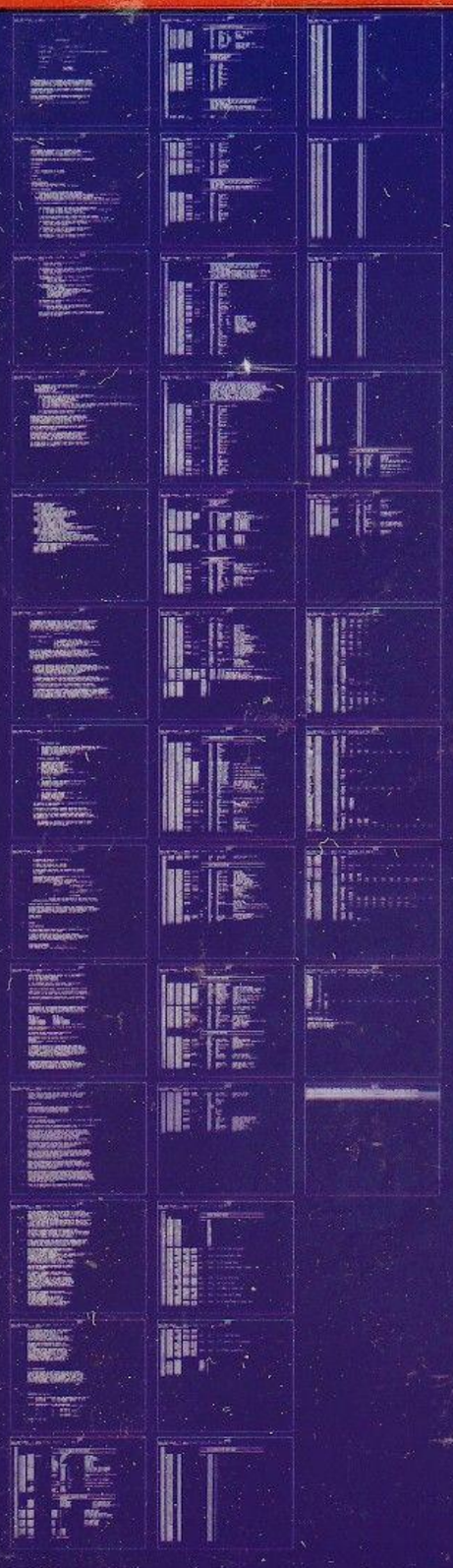
EP-DZDVO-A-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN USA



IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDVO-A-D

PRODUCT NAME: DV11 OVERLAY FOR INTERPROCESSOR TEST PROGRAM

PROGRAM DATE: OCTOBER 1976

MAINTAINER: DIAGNOSTICS

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1.0 ABSTRACT.

THIS PROGRAM IS DESIGNED AS A MAINTENANCE AID FOR
FIELD SERVICE PERSONEL. IT WILL VERIFY THE PROPER OPERATION
OF A COMPLETE COMMUNICATION LINK FROM ONE PDP-11
SYSTEM TO ANOTHER OR TO A COMMUNICATION TEST CENTER.

THIS PROGRAM MUST BE USED IN CONJUNCTION WITH THE INTERPROCESSOR
TEST PROGRAM(DZITP) ON A PDP-11 SYSTEM WITH A DL-11 INTERFACE.

2.0 REQUIREMENTS.

2.1 EQUIPMENT

A. PDP-11 SYSTEM WITH 4K OF CORE.
B. A DV11 COMMUNICATION INTERFACE.

2.2 STORAGE.

4K OF CORE

3.0 LOADING PROCEDURE
THIS PROGRAM IS IN ABSOLUTE FORMAT.
THE ABS LOADER MUST BE USED TO LOAD THE PROGRAM.

4.0 OPERATING PROCEDURES.

A. TWO METHODS OF ENTERING PARAMETERS ARE PROVIDED
1. LOAD ADDRESS 200 AND START TO ENTER PARAMS FROM CONSOLE TTY, PROCEED TO SECTION B.
2. LOAD ADDRESS 200 AND SET SWITCH REGISTER BIT 15 BEFORE
STARTING TO ENTER PARAMS FROM CONSOLE SWITCHES, PROCEED TO SECTION C.
*THE PROGRAM MAY BE RESTARTED AT LOC 204 (ONCE PARAMETERS HAVE ALREADY BEEN SELECTED)

B. CONSOLE DIALOGUE PARAMETER INPUT (CURRENT VALUES FOR PARAMETERS ARE FOUND IN OVERLAY)

1. THE PROGRAM WILL TYPEOUT THE NAME OF THE VARIABLE OVERLAY.
A. IF YOU WISH TO SETUP JUST THE INDICATED OVERLAY, TYPE A CARAGE RETURN
B. IF YOU WISH TO SETUP A DN11, TYPE IN DN.
C. IF YOU WISH TO SETUP A DM11BB, TYPE IN DMB.

IF DN OR DMB WAS TYPED IN STEP 1 ABOVE THEN THE BUS ADDRESS,
VECTOR ETC. REFERED TO IN STEPS 2 THRU 7, PERTAIN TO THE DN11 OR DMBB.

2. THE PROGRAM WILL TYPE THE DEFAULT BUS ADDRESS OF THE INTERFACE UNDER TEST.
A. TYPE A CAR. RETURN TO USE DEFAULT BUS ADDRESS
B. TYPEIN ACTUAL BUS ADDRESS

3. THE PROGRAM WILL TYPE OUT THE DEFAULT VECTOR ADDRESS
A. TYPE A CAR. RETURN TO USE DEFAULT ADDRESS
B. TYPEIN ACTUAL VECTOR ADDRESS

4. THE PROGRAM WILL TYPE OUT THE DEFAULT INTERFACE PRIORITY
NOTE: 200=PRIO 4, 240=PRIO 5, 300=PRIO 6, ETC.

A. TYPE A CAR. RETURN TO USE DEFAULT VALUE
B. TYPEIN ACTUAL VALUE

5. THE PROGRAM WILL TYPEOUT THE DEFAULT VALUE OF PARAM#1
IF REQUIRED BY THE ISR.(SEE SECT. 10.0 IN OVERLAY LISTING FOR PARAMETER DESCRIPTION.
A. TYPE A CAR. RETURN TO USE DEFAULT VALUE
B. TYPEIN ACTUAL VALUE

6. THE PROGRAM WILL TYPEOUT THE DEFAULT VALUE OF PARAM#2
IF REQUIRED BY THE ISR.
A. TYPE A CAR. RETURN TO USE DEFAULT VALUE
B. ENTER ACTUAL VALUE

7. THE PROGRAM WILL TYPEOUT THE DEFAULT VALUE OF PARAM#3
IF REQUIRED BY THE OVERLAY.
A. TYPE A CAR. RETURN TO USE DEFAULT VALUE
THE DN-11 WILL USE PARAM #3 AS THE # TO DIAL.
IF USING A MODEM WITHOUT AUTOMATIC HANDSHAKING,
THE NUMBER MUST TERMINATE WITH A
"END-OF-NUMBER" CHARACTER (:).
B. ENTER ACTUAL VALUE.

8. THE PROGRAM WILL RETURN TO STEP 91 IF THIS SETUP
WAS FOR DN11 OR DM1188.

9. THE PROGRAM WILL REQUEST THAT SWITCH REGISTER BE SET.
A. SETUP SWITCH REGISTER AS SPECIFIED IN STEP D.
AND TYPE A CAR. RETURN.

NOTE: IF ANY OF THE ABOVE ITEMS 2 THRU 7 WERE CHANGED BY ENTERING
NEW VALUES,THE NEW VALUE BECOMES THE DEFAULT VALUE FOR SUBSEQUENT
RESTARTS OF THE PROGRAM.

C. MANUAL PARAMETER INPUT FROM SWITCH REGISTER
1. THE PROGRAM HALTS FOR ISR(INTERFACE SERVICE ROUTINE) SPECIFICATION
SWR14=SETUP DM-11B ISR
SWR13=SETUP DN-11 ISR
SWR=000000=SETUP VARIABLE ISR

2. THE FOLLOWING HALTS ARE REPEATED FOR EACH ISR SPECIFIED.
SETUP SEQUENCE IS: DN11,DM11-BB THEN VARIABLE OVERLAY. (EACH ENTRY SET SWICHES THEN HIT CONTINUE.)
A. HALT FOR BUS ADDRESS OF INTERFACE
B. HALT FOR VECTOR ADDRESS OF INTERFACE
C. HALT FOR PRIORITY OF INTERFACE
D. HALT FOR INTERFACE PARAM #1 (SEE SECT. 10.0 IN OVERLAY LISTING FOR PARAMETER DESCRIPTION)
E. HALT FOR INTERFACE PARAM #2 (DN11 AND DM38 PARAMETERS ARE DISCUSSED IN SECT. 10.0 OF THE MONITOR.
F. GO BACK TO STEP A IF THIS SETUP WAS FOR DN OR DMB.

3. HALT FOR OPERATIONAL SWITCH SETTINGS. (SEE STEP D.)
A. PRESS CONTINUE TO START TESTING

BEFORE ATTEMPTING TO RUN THIS PROGRAM, THE OPERATOR MUST
ACCERTAIN THE COMPLETE COMMUNICATION LOOP AND PROCEEDURES
TO BE USED, INCLUDING THE TYPE OF MODEMS, THE TYPE OF
INTERFACE BEING USED AT THE OTHER CPU AND THE MODES OF OPERATION,
DATA AND PARAMETERS TO BE USED AT EACH CPU.

THIS WILL REQUIRED VOCAL COMMUNICATION WITH THE OPERATOR
AT THE OTHER CPU UNLESS ITS CONFIGURATION AND OPERATION
ARE FIXED AS A TEST CENTER.

AFTER DETERMINING THAT THE EQUIPMENTS ARE COMPATIBLE AND
AGREEING ON THE MODE AND VARIABLE PARAMETERS TO BE USED,
THE SYSTEM WHICH IS TO RECEIVE DATA FIRST SHOULD BE
LOADED AND STARTED. IF THE MODEM BEING USED ON THIS SYSTEM
HAS AN AUTOMATIC ANSWER FEATURE, IT SHOULD BE ENABLED.

THE SYSTEM WHICH IS TO TRANSMIT FIRST SHOULD THEN BE LOADED
AND STARTED AND THE CONNECTION ESTABLISHED EITHER MANUALLY
OR AUTOMATICALLY (VIA DN-11).

D. OPERATIONAL SWITCH SETTINGS.

SW15=1 HALT ON ERROR
SW14=1 SINGLE PASS
    SW14 HAS NO EFFECT IF SW04=0
SW13=1 INHIBIT ERROR TYPEOUTS
SW12=1 INHIBIT ALL TYPEOUTS EXCEPT ERRORS
    IF SW12=0 AND SW04=1 END PASS IS TYPED
    AND TRANSMITTED/RECEIVED DATA IS TYPED.
SW11=1 USE PREVIOUSLY SPECIFIED DATA
SW10=1 DATA SELECT (WITH SW09)
SW09=1 DATA SELECT (WITH SW10)
    00=1 GET DATA FROM OPERATOR
    01=1 TEST MESSAGE #1 ($A QUICK BROWN FOX)
    10=1 TEST MESSAGE #2 ($B NUMERICS)
    11=1 TEST MESSAGE #3 ($C COMTEST/QUICK BROWN FOX/NUMERICS)
SW08=1 TRANSMIT RECEIVED DATA (INTERNAL LOOPBACK MODE)
SW07=1 DO NOT TEST RECEIVED DATA
SW06=1 MONITOR TRANSMITTED DATA ON CONSOLE TTY.*
SW05=1 MONITOR RECEIVED DATA ON CONSOLE TTY.*
    * IN MANY CASES, NOT ALL DATA WILL APPEAR ON THE CONSOLE
    TTY. THIS IS ESPECIALLY TRUE WHEN THE COMM INTERFACE IS
    RUNNING AT A FASTER BAUD THAN THE CONSOLE, BUT EVEN AT EQUAL
    OR SLOWER BAUDS, ALL CHARACTERS MAY NOT APPEAR ON THE CONSOLE.

SW04=1 RETURN TO MONITOR FOR END PASS
    WHEN SW04=0 PROGRAM LOOPS IN THE OVERLAY NEVER RETURNING TO THE MONITOR.
SW03=1 INTERNAL LOOPBACK MODE
SW02=1 EXTERNAL LOOPBACK MODE
SW01=1 ONE-WAY-IN MODE
SW00=1 ONE-WAY-OUT MODE

THIS PROGRAM HAS BEEN MODIFIED TO RUN ON A PROCESSOR WITH OR WITHOUT
A HARDWARE SWITCH REGISTER. WHEN FIRST EXECUTED THE PROGRAM TESTS
THE EXISTENCE OF A HARDWARE SWITCH REGISTER. IF NOT FOUND A
SOFTWARE SWITCH REGISTER LOCATION (SWREG=LOC. 176) IS DEFAULTED TO.
IF THIS IS THE CASE, UPON EXECUTION THE CONTENTS OF THE SWREG ARE
DUMPED IN OCTAL ON THE CONSOLE TTY AND ANY CHANGES ARE REQUESTED

(IE) SWR=XXXXXX NEW=

POSSIBLE RESPONSES ARE:

1.	<CR>	IF NO CHANGES ARE TO BE MADE
2.	6 DIGITS 0-7	TO REPRESENT IN OCTAL THE NEW SWITCH REGISTER VALUE ;LAST DIGIT FOLLOWED BY <CR>.
3.	↑U	TO ALLOW REENTERING VALUE IF ERROR IS COMMITTED KEYING IN SWREG VALUE.

BUILT INTO THE PROGRAM IS THE ABILITY TO DYNAMICALLY CHANGE THE
CONTENTS OF SWREG DURING PROGRAM EXECUTION. BY STRIKING ↑G
(CNTL G) ON CONSOLE TTY THE OPERATOR SETS A REQUEST FLAG TO CHANGE
THE CONTENTS OF SWREG, WHICH IS PROCESSED IN KEY AREAS OF THE PROGRAM
CODE (IE) ERROR ROUTINES, AFTER HALTS END OF PASS, AND OTHER
APPLICABLE AREAS.

IF OPERATOR SPECIFIED DATA WAS INDICATED, THE PROGRAM WILL TYPE A
REQUEST FOR THE DATA. DATA MAY BE ENTERED AS ASCII CHARACTERS OR OCTAL CODE.
TYPE IN THE DATA TERMINATED WITH A CR. OCTAL CODE MAY BE ENTERED BY TYPING AN
↑(UP ARROW) FOLLOWED BY THE OCTAL CODE (IN THE RANGE 000 TO 377)
SEPERATED BY SPACES AND TERMINATED BY ↑(UP ARROW).
    I.E. ABCD↑ 000 123 377↑ EFG (CAR.RETURN)

A TYPICAL SWITCH SETTING FOR HALF-DUPLEX=003150 THIS SETTING USES
INTERNAL LOOPBACK MODE, LOOPS IN OVERLAY, MONITORS TRANSMITTED AND RECEIVED
DATA ON THE CONSOLE TTY, AND TESTS RECEIVED DATA USING TEST MESSAGE #3.

A TYPICAL SWITCH SETTING FOR FULL-DUPLEX=003144 THIS SETTING
IS THE SAME AS ABOVE EXCEPT IT USES THE EXTERNAL LOOPBACK MODE.

ALL STANDARD MESSAGES(TEST MESSAGES 1-3) ARE PRECEDED BY 2 FILL CHARACTERS(177),
AND ARE FOLLOWED BY A CR(015), LF(012),RECEIVE TERMINATING CHARACTER(001),
4 FILLS(177), AND A TRANSMIT TERMINATING CHARACTER(000). DURING TRANSMISSION,
WHEN A 000 CHARACTER IS SEEN THE TRANSMISSION IS STOPPED.DURING RECEPTION,
WHEN A 001 CHARACTER IS RECEIVED, THE RECEIVER IS SHUT OFF.
IF THE MESSAGE WAS INPUTED BY THE OPERATER, THE TERMINATING CHARACTERS ARE ADDED.

TEST MODES

INTERNAL LOOPBACK MODE

1. THE OVERLAY WAITS TO RECEIVE A MESSAGE (TERMINATED BY <DO1>)
2. VERFIES THE DATA AGAINST THE DATA SELECTED BY SW09 AND SW10(SW7=0)
3. TRANSMIT THE DATA SELECTED BY SW09 AND SW10 (SW8=0) OR
   TRANSMIT THE RECEIVED DATA (SW8=1)
4. RETURNS TO MONITOR FOR "END PASS" (SW4=1) OR
   GO TO STEP 1. (SW4=0)

EXTERNAL LOOPBACK MODE

1. THE OVERLAY SETS REQUEST TO SEND
2. WAIT FOR CLEAR TO SEND
3. TRANSMITS THE SELECTED DATA
4. RESETS REQUEST TO SEND
5. WAIT FOR MESSAGE TO BE RECEIVED
6. VERIFIES THE DATA (SW07=0)
7. RETURNS TO MONITOR FOR "END PASS". (SW04=1) OR
   GO TO STEP 1(SW04=0)

ONE-WAY-IN MODE

1. THE OVERLAY WAITS FOR MESSAGE TO BE RECEIVED.
2. VERIFIES THE DATA(SW07=0)
3. RETURNS TO MONITOR FOR "END PASS"(SW04=1) OR
   GO TO STEP 1 (SW04=0)

ONE-WAY-OUT MODE

1. THE OVERLAY SETS REQUEST TO SEND
2. WAITS FOR CLEAR TO SEND
3. TRANSMITS SELECTED DATA
4. RETURNS TO MONITOR FOR "END PASS". (SW04=1) OR
   GO TO STEP 1 (SW04=0)

E. THE OVERLAY IS THEN ENTERED AND A CONNECTION ESTABLISHED EITHER MANUALLY OR AUTOMATICALLY.

IF ONE-WAY-IN OR INTERNAL LOOPBACK MODES ARE SELECTED.
THE OVERLAY WILL SET DATA TERMINAL READY AND WAIT FOR DATA.

IF ONE-WAY-OUT OR EXTERNAL LOOPBACK MODES WERE SELECTED.
THE OVERLAY WILL SET DATA TERMINAL READY AND REQUEST TO SEND.
THE OVEPLAY WILL THEN WAIT FOR CLEAR TO SEND BEFORE ATTEMPTING TO TRANSMIT DATA.

THE PROGRAM WILL PRINTOUT A "WAITING FOR CLEAR TO SEND" MESSAGE AND THE CONTENTS OF THE XMIT CSR EVERY 60 SECS. UNTIL CLEAR TO SEND IS ASSERTED.

F. IF SW04=0 THE OVERLAY WILL CONTINUE TO
TRANSMIT/RECEIVE DATA.

IF SW04=1 THE OVERLAY WILL RETURN
TO THE MONITOR AND TYPE "END PASS".

IF BOTH SW04=1 AND SW14=1, THE PROGRAM WILL REQUEST
NEW INTERFACE PARAMS AFTER ONE PASS OF THE SELECTED
TEST MODE.

TEST EXECUTION MAY BE INTERRUPTED BY TYPING THE FOLLOWING
CHARACTERS ON THE CONSOLE TTY.
LINE FEED = RESTART PROGRAM AT LOCATION 200.
QUESTION MARK = PRINTOUT FIRST 8 WORDS OF INPUT BUFFER.(ASCII)
THEN TYPE EITHER:

*WXXXXXX	TO PRINTOUT THE 8 WORDS AT LOC XXXXXX.
*BXXXXXX	TO PRINTOUT THE 16 BYTES AFTER LOC XXXXXX.
*C	TO CONTINUE

PROGRAM MUST BE RESTARTED AT 200 AFTER PRINTING.
CARRIAGE RETURN = RESTART AT REQUEST FOR NEW OPERATIONAL SWITCHES.

5.0 PROGRAM AND/OR OPERATOR ACTION

IF THE OPERATOR WISHES TO MANUALY EXAMINE THE TRANSMIT OR RECEIVE
BUFFERS, DO THE FOLLOWING; TO FIND THE STARTING ADDRESS OF THE RECEIVE
BUFFER, LOAD ADDRESS 11020 AND EXAMINE. TO FIND THE STARTING ADDRESS
OF THE TRANSMIT BUFFER, LOAD ADDRESS 11022 AND EXAMINE.

5.1 NORMAL HALTS

SEE SECTION 4.

6.0 ERRORS

6.1 ERROR REPORTING

THE ONLY ERROR REPORT FROM THE CONTROL PROGRAM OCCURS IF THE
INTERFACE SPECIFIED IS NOT LOADED.

IF DATA IS RECEIVED AND SWITCH 7 (NO DATA COMPARE)
IS RESET, THE DATA WILL BE COMPARED AGAINST THE PRESELECTED
DATA AFTER A LINE FEED CHARACTER IS RECEIVED. IF THERE IS A
MISMATCH, THE FOLLOWING ERROR REPORT IS PRINTED:

```
RECEIVED DATA=RRRRRR
DATA SHOULD BE TTTTTT
DATA COMPARE ERROR;  BAD DATA=BBB  GOOD DATA=GGG
```

WHERE RRRRRR IS THE RECEIVE BUFFER (UP TO 512 CHARACTERS)
TTTTTT IS THE TRANSMIT BUFFER (UP TO 512 CHARACTERS)
BBB IS THE BAD DATA CHARACTER
GGG IS THE GOOD DATA CHARACTER

IF THE INTERFACE DETECTS A DATA ERROR, THE FOLLOWING
WILL BE PRINTED BEFORE THE DATA IS COMPARED:

THERE WAS A RECEIVER ERROR. RECEIVER DATA REGISTER =XXXXXX

WHERE XXXXXX IS THE CONTENTS OF THE RECEIVER DATA REGISTER
THE LOW BYTE IS THE DATA, AND THE HIGH BYTE IS THE ERROR BITS.

IF A RECEIVE TERMINATING CHARACTER<001> IS NOT DETECTED
WITHIN 512 CHARACTERS A "BUFFER FULL" PRINTOUT WILL OCCUR.

7.0 RESTRICTIONS

THE OPERATION OF THIS PROGRAM REQUIRES COORDINATION BETWEEN
THE OPERATOR AND THE OPERATOR OF ANOTHER PDP-11 SYSTEM
UNLESS ONE OF THE SYSTEMS IS ALWAYS OPERATING IN A FIXED
MODE. THE FOLLOWING TABLE LISTS THE VALID COMBINATIONS:

CPU #1	CPU #2
ONE-WAY-OUT	ONE-WAY-IN
ONE-WAY-IN	ONE-WAY-OUT
EXTERNAL-LOOPBACK	INTERNAL-LOOPBACK
INTERNAL-LOOPBACK	EXTERNAL-LOOPBACK
EXTERNAL-LOOPBACK	EXTERNAL-LOOPBACK (FULL DUPLEX)

WHEN THE COMMUNICATION LINK INVOLVES MODEMS THE FOLLOWING
RESTRICTION APPLY:

IF RUNNING IN FULL DUPLEX MODE BOTH SYSTEMS
MUST BE IN EXTERNAL LOOP BACK MODE.

BOTH SYSTEMS SHOULD BE RUNNING IDENTICAL ROUTINES.
EXAMPLE:
SWITCHES 14,13,7,4 SHOULD BE THE SAME
ON BOTH CPU'S

IF PROGRAM IS WAITING IN A SCAN ROUTINE AND TYPES OUT
A "WAITING MESSAGE", IF AN INCOMING MESSAGE STARTS DURING
THE TYPE OUT, IT WILL BE LOST BECAUSE THE TYPEOUT PRIORITY
IS AT LEVEL 7. THIS WILL RESULT IN OVERRUN OR SILO OVER-
RUN ERRORS, DEPENDING ON THE DEVICE.TO AVOID THIS SITUATION
RUN WITH SWITCH 13 UP. IF OVERRUN DOES OCCURE DURING A
TYPEOUT THE PROGRAM SHOULD BE RESTARTED.

IF USING AN ASYNCRONOUS DEVICE, MODEMS AND THE
MAYNARD TEST STATION AND INITALIZE DOES NOT CLEAR THE
CONNECTION (EXAMPLE THE DJ11) IF THE PROGRAM IS RESTARTED
IN THE MIDDLE OF A MESSAGE AT LOC 204 OR BY HITTING CR
AN IMMEDEATE ERROR MESSAGE FROM MAYNARD WILL BE RE-

CEIVED. THIS IS BECAUSE THE TEST STATION IS STILL LOOKING
FOR THE REST OF THE INTERUPTED MESSAGE. TO AVOID THIS
ERROR, RESTART PROGRAM ONLY AT THE END OF THE MESSAGE
CURRENTLY BEING TRANSMITTED.

8.0 MISCELLANEOUS

ITEP WAS CHECKED OUT USING THE FOLLOWING BELL TELEPHONE MODEMS.
201A (HALF-DUPLEX SYNCHRONOUS 2000 BAUD)
202C (HALF-DUPLEX ASYNCHRONOUS 1200 BAUD)
103A (FULL-DUPLEX ASYNCHRONOUS 110 BAUD)

9.0 PROGRAM DESCRIPTION

9.1 THE DV11 INTERFACE SERVICE PARAMS ARE SETUP, AS SPECIFIED BY THE OPERATOR,
BY THE ITEP CONTROL PROGRAM.

TIME: PROVIDES A MEANS OF MEASURING ELASPED TIME. IT IS INCREMENTED
EVERY SECOND BY A CLOCK INTERRUPT ROUTINE IN ITEP.

9.2 WHEN THE OVERLAY IS FIRST ENTERED BY ITEP AT LOCATION START:,
THE CONTENTS OF THE SWITCH REGISTER ARE STORED IN REGISTER 0.
THE MODE AND DATA SELECTIONS ARE FIXED AT THIS TIME AND CANNOT
BE ALTERED WITHOUT RETURNING TO THE CONTROL PROGRAM.
THE INTERRUPT VECTORS AND VARIABLES ARE THEN SETUP.
THE SELECTED ROUTINE DETERMINED BY THE MODE IS THEN ENTERED

9.3 THE OVERLAY THEN LOOPS IN ROUTINES: $OWI ,IF "ONE WAY IN" MODE
WAS SELECTED. $OWO,IF "ONE WAY OUT" MODE WAS SELECTED.
$ILB, IF "INTERNAL LOOP BACK" MODE WAS SELECTED.
$XLB,IF "EXTERNAL LOOP BACK" WAS SELECTED.

9.31 $OWI: IN THIS ROUTINE THE RECEIVER IS INITIALIZED AND PROGRAM
LOOPS WAITING FOR THE RECEIVER TO FINISH.IF NOTHING IS RECEIVED
FOR 60 SECS A "WAITING" MESSAGE IS TYPED. WHEN THE RECEIVER IS
DONE,THE PROGRAM CHECKS DATA IF SWITCHES PERMIT,AND TYPES END
PASS DEPENDING ON SWITCH SETTINGS.

9.32 $OWO: THE TRANSMITTER IS INITIALIZED AND PROGRAM LOOPS
WAITING FOR TRANSMITTER TO FINISH,A "WAITING" MESSAGE IS TYPED
EVERY 60 SECS IF THERE IS NO ACTION. WHEN THE TRANSMITTER IS
DONE, THE PROGRAM EITHER LOOPS BACK TO $OWO OR TYPES END PASS
DEPENDING ON SWITCH SETTINGS.

9.33 $ILB: THE RECEIVER IS INITIALIZED AND PROGRAM LOOPS WAITING FOR
RECEIVER TO FINISH, A "WAITING" MESSAGE IS TYPED EVERY 60 SEC
IF NO ACTION. WHEN RECEIVER IS DONE PROGRAM CHECKS DATA IF SWITCH
SETTINGS PERMIT, AND END PASS IS TYPED IF SWITCH SETTINGS PERMIT.
THEN THE TRANSMITTER IS INITIALIZED, A "WAITING" MESSAGE IS TYPED
EVERY 60 SEC IF NO ACTION. WHEN TRANSMITTER IS DONE PROGRAM RETURNS
TO START OF ROUTINE. ($ILB)

9.34 $XLB: IF IN HALF DUPLEX THE TRANSMITTER IS INITIALIZED,
A "WAITING MESSAGE IS TYPED EVERY 60 SEC IF THERE IS NO ACTION

WHEN THE TRANSMITTER IS DONE THE RECEIVER IS INITIALIZED
,A "WAITING" MESSAGE IS TYPED EVERY 60 SEC IF THERE IS NO ACTION.
WHEN THE RECEIVER IS DONE,DATA IS CHECKED IF SWITCH SETTINGS
PERMIT AND END PASS IS TYPED IF SWITCHES ALLOW.THE PROGRAM NOW
REPEATS CYCLE STARTING AT $XLB.
IF IN FULL DUPLEX THE RECEIVER AND TRANSMITTER ARE INITIALIZED
, A "WAITING" MESSAGE IS TYPED EVERY 60 SEC IF THERE IS NO
ACTION. WHEN BOTH THE RECEIVER AND TRANSMITTER ARE DONE,DATA IS
CHECKED, END PASS IS TYPED AND PROGRAM LOOPS TO $XLB DEPENDING
ON THE SWITCH SETTINGS.

9.4 THE RETURN TO MONITOR ROUTINE FOR END PASS AT EOP:
LOCKS OUT INTERJPTS AND SAVES THE TRANSMITTER INTERUPT ENABLE
BIT AND ALL GENERAL REGISTERS. IT THEN RETURNS TO THE MONITOR
TO TYPE "END PASS". THE MONITOR CHECKS SW14 IF UP IT RETURNS
TO ENTER:, OTHERWISE IT RESTARTS THE PROGRAM.

9.5 ENTER: IS ENTEPED FROM THE MONITOR AFTER TYPEING "END PASS",
IT RESTORES THE GENERAL REGISTERS AND THE TRANSMITTER CSR
AS SAVED IN EOP. THE DELAY FLAG IS SET AND PROGRAM RETURNS TO
THE SCAN ROUTINE(OWO,OWI,ILB,XLB) WHERE IT CAME FROM.

9.6 THE INITIALIZE TRANSMIT SUBROUTINE AT STARTX:
SETS UP THE INTERFACE AND POINTERS NECESSARY TO
INITIATE A TRANSMIT OPERATION.
AFTER SETTING "DATA TERMINAL READY" AND "REQUEST TO SEND" A CHECK
IS MADE ON PARAM2 TO DETERMINE IF HALF DUPLEX OPERATION
WAS SELECTED BY THE OPERATOR. IF IT WAS, THE
SUBROUTINE WAITS FOR CLEAR TO SEND.
A 'WAITING FOR CLEAR TO SEND' PRINTOUT OCCURS
EVERY 30 SECONDS UNTIL CLEAR TO SEND IS ASSERTED.

9.7 THE INITIALIZE RECEIVED SUBROUTINE AT STARTR:
SETS UP THE INTERFACE AND POINTERS NECESSARY TO
RECEIVE A MESSAGE.

9.8 THE TRANSMIT INTERRUPT SERVICE ROUTINE,
AT XISR:, IS ENTERED VIA TRANSMIT INTERRUPTS
FROM THE INTERFACE.
A TEST IS MADE TO SEE IF THE LAST CHARACTER
TRANSMITTED WAS A NULL (ALL ZEROS) CHARACTER.
IF IT WAS; THE TRANSMIT LOGIC IN THE INTERFACE
IS RESET AND THE TRANSMIT COMPLETE FLAG IS SET.
AT XI 1: THE NEXT CHARACTER IS TRANSMITTED
AND PRINTED ON THE TTY IF THE MONITOR TRANSMIT
SWITCH IS SET.

9.9 THE RECEIVE INTERRUPT SERVICE ROUTINE
,AT RISR:, IS ENTERED VIA RECEIVER INTERRUPTS
FROM THE INTERFACE.
THE RECEIVED CHARACTER IS STORED IN
THE INPUT BUFFER AND PRINTED ON THE TTY IF
THE MONITOR RECEIVER SWITCH IS SET.
IF THE INPUT BUFFER IS FULL, A 'BUFFER FULL'
PRINTOUT WILL OCCUR. THIS INDICATES THAT A
LINE FEED CHARACTER WAS NOT RECOGNIZED

IN THE RECEIVED DATA (WITHIN 1000 CHARACTERS).
IF THE RECEIVED CHARACTER IS A LINE FEED,
THE RECEIVED LOGIC IS RESET AND THE
RECEIVE COMPLETE FLAG IS SET.
IF A 'RECEIVE ERROR' IS DETECTED AT RISR:, THE
CSR AND DBR WILL BE SAVED AND PRINTED OUT
AFTER THE COMPLETE MESSAGE HAS BEEN RECEIVED.

9.10 THE DATA TEST SUBROUTINE AT TESTD: IS
ENTERED AFTER A COMPLETE MESSAGE HAS BEEN
RECEIVED.
IF A 'RECEIVE ERROR' HAD BEEN DETECTED,
THE CONTENTS OF THE 'RECEIVE BUFFER' AT THE
TIME THE ERROR OCCURRED WILL BE PRINTED.
THE DATA IS COMPARED UNTIL A 'ALL ZEROS'
CHARACTER IS RECOGNIZED. 'FILL' (ALL ONES)
CHARACTERS ARE IGNORED. IF A MISMATCH
IS DETECTED, THE COMPLETE CONTENTS OF THE
INPUT BUFFER AND GOOD DATA IS PRINTED.

DV11 RESTRICTIONS

IF A DM11BB EXISTS IN THE SYSTEM WITH THE DV11 BEING
TESTED, BUT MODEM CONTROL IS NOT DESIRED AND THE DM11BB
WAS NOT INITALIZED BY ITEP,THE PROGRAM WILL HANG IN THE
DV11 TRANSMITTER INITALIZATION ROUTINE. TO CORRECT THIS
LOAD LOCATION "DMBB" WITH AN ADDRESS THAT WILL TIME OUT(NO
SLAVE SYNC RESPONSE). THE ADDRESS OF DMBB CAN BE FOUND
IN THE CROSS REFERENCE TABLE IN THE BACK OF THIS LISTING.

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10.0 PARAMETERS FOR THE DV11

PARAM#1 IS USED TO DETERMINE THE LINE NUMBERS FOR XMIT AND RCV.
BITS 11:08 RCV LINE NUMBER---DEFAULT TO LN# 0
BITS 03:00 XMIT LINE NUMBER--DEFAULT TO LN# 0

PARAM#2 CONTAINS SPECIFIC LINE INFORMATION
BITS 15:08 CONTAINS SYNC CODE--DEFAULT =26

BIT 1 =1 USE SYNC B
=0 USE SYNC A (DEFAULT)

BIT 0 =1 FULL DUPLEX
=0 HALF DUPLEX (DEFAULT)

PARAM#3 IS NOT USED

```
                                ;*****************************************************************
                                ;       DV11 INTERFACE SERVICE PARAMS
                                ;*****************************************************************
                 011000                 .=11000
011000  053104  000040         DV11:   .ASCIZ  /DV /           ;ISR NAME
011004  160020                 BA:     160020                  ;BUS ADDRESS
011006  000300                 RIV:    300                     ;VECTOR ADDRESS
011010  000240                 PRIOR:  240                     ;PRIORITY
011012  000000                 PARAM1: 0                       ;PARAM #1
011014  013000                 PARAM2: 13000                   ;PARAM #2
011016  177777                 PARAM3: 177777                  ;PARAM #3
011020  000000                 IRDA:   .WORD   0               ;INITIAL READ DATA ADDRESS
011022  000000                 IXDA:   .WORD   0               ;INITIAL XMIT DATA ADDRESS
011024  000000                 SETTLE: .WORD   0               ;LINE SETTLE DELAY FLAG
011026  000000                         .WORD   0               ;
011030  000000                 B2016:  .WORD   0               ;ADDR OF BIN TO OCT TYPE ROUTINE
011032  000000                 TIME:   .WORD   0               ;TIMER
011034  000000                         .WORD   0               ;
011036  011102                         .WORD   START           ;ADDR OF START OF PROGRAM
011040                         TX.TERM:
011040     000                         .BYTE   000             ;TRANSMITTER TERMINATING CHAR.
011041                         RX.TERM:
011041     001                         .BYTE   001             ;RECEIVER TERMINATING CHAR.
011042  000000                 FLAG:   .WORD   0               ;
011044  177570                 SWR:    177570
011046  177570                 DISPLAY:177570

                                ;*****************************************************************
                                ;       CONSTANTS + WORKING STORAGE
                                ;*****************************************************************
                 000000                 STAT=R0
                 100000                 XFLG=100000                     ;XMIT COMPLETE FLAG
                 040000                 RFLG=40000                      ;RCV COMPLETE FLAG
                 020000                 DSFLG=20000                     ;DATA SET STATUS CHANGE FLAG
                 020000                 BIT13=20000                     ;INHIBIT PRINTOUTS

011050  000000                 SXCSR:  0                       ;SAVED XMIT CSR
011052  000000                 SRCSR:  0                       ;SAVED RCV CSR
011054  000000                 ERCSR:  0                       ;RCV CSR SAVED ON ERROR
011056  000000                 ERDBR:  0                       ;RCV DATA REG SAVED ON ERROR
011060  000000                 DSSTAT: 0                       ;RCV CSR SAVED ON DS CHANGE

011062  000000                 XCC:    0                       ;XMIT CHAR COUNT
011064  000000                 RCC:    0                       ;RCV CHAR COUNT
011066  000000                 RDA:    0                       ;RCV DATA ADDR.
011070  000000                 XDA:    0                       ;XMIT DATA ADDR.

011072  177560                 TKS:    177560
011074  177562                 TKB:    177562
011076  177564                 TPS:    177564
011100  177566                 TPB:    177566

                 000001         FULL.DUPLEX=000001
```

```
                                ;*****************************************************************
                                ;       DV11-A INTERFACE SERVICE ROUTINE
                                ;*****************************************************************
011102  000240          START:  NOP
011104  017700  177734          MOV     @SWR,   R0      ;SETUP MODE IN R0
011110  042700  177400          BIC     #177400,R0      ;STRIP JUNK
011114  013702  011006          MOV     RIV,    R2      ;SETUP
011120  012722  014016          MOV     #RISR,  (R2)+   ;INTERRUPT
011124  013722  011010          MOV     PRIOR,  (R2)+   ;VECTORS
011130  012722  013436          MOV     #XISR,  (R2)+   ;
011134  013722  011010          MOV     PRIOR,  (R2)+   ;
011140  013704  011004          MOV     BA,     R4      ;SETUP BUS ADDR INDEX
011144  004737  015330          JSR     PC,RAMCLR       ;CLEAR OUT RAM
011150  004737  015402          JSR     PC,SETUP        ;CALCULATE BYTE CNT AND SYNCS
011154  005214                  INC     (R4)            ;START UCPU


                                ;*************************************
                                ;       ROUTINE USED TO GOTO
                                ;       SUBROUTINE DEPENDENT
                                ;       ON MODE SELECTED.
                                ;*************************************

011156  005037  011032  GO:     CLR     TIME
011162  005037  013056          CLR     DELAY
011166  005037  013062          CLR     STOP
011172  032700  000001          BIT     #OWO,MODE
011176  001402                  BEQ     1$
011200  000137  011354          JMP     $OWO
011204  032700  000002  1$:     BIT     #OWI,MODE
011210  001402                  BEQ     2$
011212  000137  011246          JMP     $OWI
011216  032700  000010  2$:     BIT     #ILB,MODE
011222  001402                  BEQ     3$
011224  000137  011452          JMP     $ILB
011230  032700  000004  3$:     BIT     #XLB,MODE
011234  001402                  BEQ     4$
011236  000137  011702          JMP     $XLB
011242  000000  4$:     HALT
011244  000776                  BR      .-2


                                ;*****************************************************************
                                ;       ROUTINE USED IF "ONE WAY IN" MODE WAS SELECTED.
                                ;       NOTE THAT WHEN IN THIS MODE HALF DUPLEX IS THE
                                ;       ONLY MODE AVAILABLE.
                                ;       "ONE WAY IN" MEANS THAT ONLY THE RECEIVER IS
                                ;       ENABLED. THE TRANSMITTER IS NEVER "TURNED ON".
                                ;*****************************************************************


011246  104416          $OWI:   KBDIN
011250  004737  013620          JSR     PC,STARTR
```

```
011254 032700 040000          1$:     BIT     #RFLG,STAT
011260 001013                         BNE     2$
011262 023727 011032 000100           CMP     TIME,#100
011270 103771                         BLO     1$
011272 011402                         MOV     @RCSR,R2
011274 016403 000000                  MOV     XCSR(R4),R3
011300 104001                         HLT     1
011302 005037 011032                  CLR     TIME
011306 000762                         BR      1$

011310 032777 000200 177526   2$:     BIT     #NODAT,@SWR
011316 001002                         BNE     3$
011320 004737 012272                  JSR     PC,TESTD
011324 042700 040000          3$:     BIC     #RFLG,STAT
011330 032777 000020 177506           BIT     #LOOP,@SWR
011336 001405                         BEQ     4$
011340 012737 011352 013060           MOV     #4$,BACK
011346 000137 012132                  JMP     EOP
011352 000735                 4$:     BR      $OWI


                              ;********************************************************************
                              ;       ROUTINE USED IF "ONE WAY OUT" WAS SELECTED.
                              ;       NOTE THAT WHEN IN THIS MODE HALF DUPLEX IS THE ONLY
                              ;       MODE AVAILABLE.
                              ;       "ONE WAY OUT" MEANS THAT ONLY THE TRANSMITTER IS
                              ;       ENABLED. THE RECEIVER IS NEVER "TURNED ON.
                              ;********************************************************************

011354 104416                 $OWO:   KBDIN
011356 004737 013064                  JSR     PC,STARTX
011362 005037 011032                  CLR     TIME
011366 032700 100000          1$:     BIT     #XFLG,STAT
011372 001013                         BNE     2$
011374 023727 011032 000100           CMP     TIME,#100
011402 103771                         BLO     1$
011404 011402                         MOV     @RCSR,R2
011406 016403 000000                  MOV     XCSR(R4),R3
011412 104001                         HLT     1
011414 [illegible] 011032             CLR     TIME
011420 [illegible]                    BR      1$
011422 042700 100000          2$:     BIC     #XFLG,STAT
011426 032777 000020 177410           BIT     #LOOP,@SWR
011434 001405                         BEQ     3$
011436 012737 011450 013060           MOV     #3$,BACK
011444 000137 012132                  JMP     EOP
011450 000741                 3$:     BR      $OWO
```

```
                                ;*****************************************************************
                                ;       ROUTINE USED IF INTERNAL LOOP BACK" WAS SELECTED.
                                ;       NOTE THAT WHEN IN THIS MODE; HALF DUPLEX IS THE
                                ;       ONLY MODE AVAILABLE.
                                ;       "INTERNAL LOOP BACK" MEANS THAT THE RECEIVER IS "TURNED ON"
                                ;       AND A COMLPETE MESSAGE IS RECEIVED. IF DATA IS TO BE CHECKED
                                ;       IT IS; IF "END PASS" IS DESIRED; IT IS GIVEN.
                                ;       THEN THE TRANSMITTER IS ENABLED. AFTER THE WHOLE MESSAGE
                                ;       IS TRANSMITTED; THE CYCLE IS REPETED AS ABOVE.
                                ;*****************************************************************

011452  104416                  SILB:   KBCIN
011454  004737  013620                  JSR     PC,STARTR
011460  005037  011032                  CLR     TIME
011464  032737  040000          1$:     BIT     #RFLG,STAT
011472  001373                  BNE     2$
011474  023727  011032  000100        CMP     TIME,#100
011502  103771                  BLO     1$
011504  011402                  MOV     @RCSR,R2
011506  016403  000000                MOV     XCSR(R4),R3
011512  104001                  HLT     1
011514  005037  011032                CLR     TIME
011520  000762                  BR      1$
011522  032777  000200  177316  2$:     BIT     #NODAT,@SWR
011530  001002                  BNE     3$
011532  004737  012272                JSR     PC,TESTD
011536  042700  000200        3$:     BIC     #RFLG,STAT
011542  032777  000020  177276        BIT     #LOOP,@SWR
011550  001405                  BEQ     4$
011552  012737  011562  013060        MOV     #4$,BACK
011560  000137  012132                JMP     EOP
011564  032777  000400  177254  4$:     BIT     #400,   @SWR    ;USE EXTERNAL DATA?
011572  001416                  BEQ     7$              ;BR IF NO
011574  013702  011020                MOV     IRDA,   R2      ;SET POINTER
011600  013703  011022                MOV     IXDA,   R3      ;SET POINTER
011604  010337  011070                MOV     R3,     XDA     ;SETUP XMIT DATA ADDR
011610  112223                  MOVB    (R2)+,  (R3)+   ;MOVE INPUT TO OUTPUT
011612  001376                  BNE     .-2             ;LOOP IF NOT ZERO CHAR
011614  112743  000177                MOVB    #177,   -(R3)   ;INSERT A FILL CHAR
011620  005203                  INC     R3              ;BUMP ADDRESS
011622  112723  000177                MOVB    #177,   (R3)+   ;INSERT ANOTHER FILL
011626  105223                  INCB    (R3)+           ;INSERT ZERO CHAR
011630  005037  011032          7$:     CLR     TIME
011634  004737  013064                JSR     PC,STARTX
011640  032700  100000          5$:     BIT     #XFLG,STAT
011644  001013                  BNE     6$
011646  023727  011032  000100        CMP     TIME,#100
011654  103771                  BLO     5$
011656  011402                  MOV     @RCSR,R2
011660  016403  000000                MOV     XCSR(R4),R3
011664  104001                  HLT     1
011666  005037  011032                CLR     TIME
011672  000762                  BR      5$
011674  042700  100000          6$:     BIC     #XFLG,STAT
011700  000137  011452                JMP     SILB
```

E02


```
                                ;*****************************************************************
                                ;       ROUTINE USED IF "EXTERNAL LOOP BACK" WAS SELECTED.
                                ;       EITHER HALF OR FULL DUPLEX MAY BE SELECTED IN THIS MODE.
                                ;       "EXTERNAL LOOP BACK" MEANS THAT THE TRANSMITTER IS FIRST
                                ;       TURNED ON (IF HALF DUPLEX) AND THE WHOLE MESSAGE IS TRANSMITTED;
                                ;       THEN THE RECEIVER IS ENABLED. AFTER THE WHOLE MESSAGE IS RECEIVED
                                ;       DATA WILL THEN BE CHECKED IF DESIRED AND END PASS WILL
                                ;       BE GIVEN IF DESIRED.    THEN THE CYCLE IS REPEATED
                                ;       AS ABOVE.  IF RUNNING IN FULL DUPLEX THE PROGRAM
                                ;       WAITS FOR BOTH THE RECEIVER AND TRANSMITTER TO
                                ;       FINISH THEN RESTARTS THE RECEIVER AND TRANSMITTER.
                                ;*****************************************************************
011702  104416                  SXLB:   KBDIN
011704  032737  000001  011014          BIT     #FULL.DUPLEX,PARAM2
011712  001402                        BEQ     1$
011714  004737  013620                JSR     PC,STARTR
011720  004737  013064          1$:     JSR     PC,STARTX
011724  005037  011032                CLR     TIME
011730  032700  100000          2$:     BIT     #XFLG,STAT
011734  001016                        BNE     3$
011736  032700  040000          7$:     BIT     #RFLG,STAT
011742  001024                        BNE     4$
011744  023727  011032  000100        CMP     TIME,#100
011752  103766                        BLO     2$
011754  011402                        MOV     @RCSR,R2
011756  016403  000000                MOV     XCSR(R4),R3
011762  104001                        HLT     1
011764  005037  011032                CLR     TIME
011770  000757                        BR      2$
011772  032737  000001  011014  3$:     BIT     #FULL.DUPLEX,PARAM2
012000  001356                        BNE     7$
012002  042700  100000                BIC     #XFLG,STAT
012006  004737  013620                JSR     PC,STARTR
012012  000746                        BR      2$
012014  032737  000001  011014  4$:     BIT     #FULL.DUPLEX,PARAM2
012022  001420                        BEQ     8$
012024  032700  100000                BIT     #XFLG,STAT
012030  001013                        BNE     6$
012032  023727  011032  000100        CMP     TIME,#100
012040  103765                        BLO     4$
012042  011402                        MOV     @RCSR,R2
012044  016403  000000                MOV     XCSR(R4),R3
012050  104001                        HLT     1
012052  005037  011032                CLR     TIME
012056  000756                        BR      4$
012060  042700  100000          6$:     BIC     #XFLG,STAT
012064  042700  040000          8$:     BIC     #RFLG,STAT
012070  005037  011032                CLR     TIME
012074  032777  000200  176742        BIT     #NODAT,@SWR
012102  001002                        BNE     5$
012104  004737  012272                JSR     PC,TESTD
012110  032777  000020  176726  5$:     BIT     #LOOP,@SWR
012116  001671                        BEQ     $XLB
012120  012737  011702  013060        MOV     #$XLB,BACK
012126  000137  012132                JMP     EOP
```

```
                                        ;*****************************
                                        ;       ROUTINE TO RETURN
                                        ;       TO MONITOR FOR
                                        ;       END PASS.
                                        ;*****************************

012132                                  EOP:
012132  104414  000340                          STPS,PRTY7              ;SET PS PRIORITY TO 7
012136  016437  000000  012270                   MOV     XCSR(R4),@TPIE  ;SAVE TX CSR
012144  042737  157777  012270                   BIC     #1C<TIE>,@TPIE  ;CLEAR ALL BUT TX IE
012152  042764  020000  000300                   BIC     #TIE,XCSR(R4)   ;CLEAR TX IE (EVEN IF IT WASN'T SET)
012160  012766  012220  000002                   MOV     #ENTER,2(SP)    ;SET FOR RETURN IF SW 14=1
012166  010037  013042                           MOV     R0,SAVR0        ;SAVE REGISTER 0
012172  010137  013044                           MOV     R1,SAVR1        ;SAVE REGISTER 1
012176  010237  013046                           MOV     R2,SAVR2        ;SAVE REGISTER 2
012202  010337  013050                           MOV     R3,SAVR3        ;SAVE REGISTER 3
012206  010437  013052                           MOV     R4,SAVR4        ;SAVE REGISTER 4
012212  010537  013054                           MOV     R5,SAVR5        ;SAVE REGISTER 5
012216  000207                                  RTS     PC              ;RETURN TO CONTROL PROGRAM

012220                                  ENTER:
012220  013700  013042                           MOV     SAVR0,R0        ;RESTORE R0
012224  013701  013044                           MOV     SAVR1,R1        ;RESTORE R1
012230  013702  013046                           MOV     SAVR2,R2        ;RESTORE R2
012234  013703  013050                           MOV     SAVR3,R3        ;RESTORE R3
012240  013704  013052                           MOV     SAVR4,R4        ;RESTORE R4
012244  013705  013054                           MOV     SAVR5,R5        ;RESTORE R5
012250  012737  177777  013056                   MOV     #-1,DELAY
012256  053764  012270  000000                   BIS     @TPIE,XCSR(R4)  ;IF ORGINALLY SET; SET TX IE
012264  000177  000570                           JMP     @BACK
012270  000000                          @TPIE:  000000

                                        ;*********************************
                                        ;       SUBROUTINE TO CHECK
                                        ;       RECEIVER DATA.
                                        ;*********************************
012272  013746  011056                  TESTD:  MOV     @ERRBR,-(SP)    ;WAS THERE A RECEIVE ERROR?
012276  001413                                  BEQ     TSTDAT          ;BR IF NO
012300  032777  020000  176536                   BIT     #BIT13,@SWR     ;INHIBIT PRINTOUTS?
012306  001007                                  BNE     TSTDAT          ;BR IF YES
012310  104400  012502                           TYPE    ,MSG0           ;<15><12>THERE WAS A RECEIVE ERROR. RBUF=
012314  004077  176510                           JSR     R0,@32016       ;PRINT CONTENTS OF RBUF
012320  005746                                  TST     -(SP)
012322  104400  012563                           TYPE    ,MSG1           ;<15><12>
012326  013701  011022                  TSTDAT: MOV     @XDA,   R1      ;SETUP XMIT DATA ADDR
012332  013702  011020                          MOV     @RDA,   R2      ;SETUP RCV DATA ADDR
012336  122122                          SCAN4:  CMPB    (R1)+,  (R2)+   ;DATA OK ?
012340  001776                                  BEQ     SCAN4           ;BR IF OK
012342  123741  011040                          CMPB    TX.TERM,-(R1)   ;IS IT END OF DATA
012346  001453                                  BEQ     TESTDX          ;BR IF YES
012350  122742  000002                          CMPB    #002,-(R2)
012354  001005                                  BNE     2$
012356  010237  012364                          MOV     R2,1$
012362  104400                                  TYPE
```

```
  923  012364  000000                    1$:     .WORD   0
  924  012366  000443                            BR      TESTDX
  925  012370                          2$:
  926  012370  105712                            TSTB    (R2)            ;
  927  012372  001441                            BEQ     TESTDX          ;BR IF YES
  928  012374  122721  000177                    CMPB    #177,   (R1)+   ;IS IT FILL CHAR?
  929  012400  001756                            BEQ     SCAN4           ;BR IF YES
  930  012402  005301                            DEC     R1              ;BACKUP
  931  012404  122722  000177                    CMPB    #177,   (R2)+   ;IS IT FILL?
  932  012410  001752                            BEQ     SCAN4           ;BR IF YES
  933  012412  105742                            TSTB    -(R2)           ;BACK UP POINTER
  934  012414  123722  011015                    CMPB    PARAM2+1,(R2)+  ;WAS SYNC CHAR IN BUFFER?
  935  012420  001746                            BEQ     SCAN4           ;BR IF CHAR WAS SYNC
  936  012422  000240                  SCAN5:    NOP                     ;DATA ERROR
  937  012424  032777  020000  176412            BIT     #BIT13,@SHR     ;INHIBIT PRINTOUTS
  938  012432  001016                            BNE     DERR            ;BR IF YES
  939  012434  104400  012566                    TYPE    ,MSG2           ;<15><12>RECEIVED DATA = <15><12>
  940  012440  013737  011020  012450            MOV     @RDA,   RDAX    ;SETUP DATA ADRESS
  941  012446  104400                            TYPE                    ;PRINT RECEIVED DATA
  942  012450  000000                  RDAX:     0                       ;RECEIVED DATA ADDR.
  943  012452  104400  012613                    TYPE    ,MSG3           ;<15><12>DATA SHOULD BE<15><12>
  944  012456  013737  011022  012466            MOV     @XDA,   .+10    ;SETUP ADDR.
  945  012464  104400                            TYPE                    ;PRINT GOOD DATA
  946  012466  011022                            IXDA
  947  012470  111103                  DERR:     MOVB    (R1),R3 ;SETUP XMIT DATA
  948  012472  114202                            MOVB    -(R2),R2        ;SETUP RCV DATA
  949  012474  104007                            HLT+7                   ;DATA ERROR HALT
  950  012476  005726                  TESTDX:   TST     (SP)+           ;POP STACK
  951  012500  000207                            RTS     PC              ;RETURN FROM SUB/ROUT
  952
  953  012502  005015  044124  051105  MSG0:     .ASCIZ  <15><12>/THERE WAS A RECEIVER ERROR. REGISTER (SEL 2) =/
(1)    012563     015  000012          MSG1:     .ASCIZ  <15><12>
(1)    012566  005015  042522  042503  MSG2:     .ASCIZ  <15><12>/RECEIVED DATA = /<15><12>
(1)    012613     015  042012  052101  MSG3:     .ASCIZ  <15><12>/DATA SHOULD BE/<15><12>
(1)    012636  005015  046120  040505  MSG4:     .ASCII <15><12>/PLEASE MAKE CONNECTION (DIAL NUMBER)./
(1)    012705     015  053412  042510            .ASCIZ <15><12>/WHEN CONNECTION COMPLETE; HIT CONTINUE SWITCH./<15><12>
(1)    012770  005015  046120  040505  MSG5:     .ASCIZ <15><12>/PLEASE MAKE CONNECTION (DIAL NUMBER)./<15><12>
(1)                                    .EVEN
(1)    013042  000000                  SAVR0:    0
 954   013044  000000                  SAVR1:    0
 955   013046  000000                  SAVR2:    0
 956   013050  000000                  SAVR3:    0
 957   013052  000000                  SAVR4:    0
 958   013054  000000                  SAVR5:    0
 959   013056  000000                  DELAY:    0
 960   013060  000000                  BACK:     0
 961   013062  000000                  STOP:     0
 962
```

```
                                        ;*****************************************************************
                                        ;       TRANSMITTER INIT ROUTINE
                                        ;*****************************************************************

013064  042700  100000          STARTX: BIC     #XFLG,STAT      ;CLEAR XMIT DONE FLAG
013070  005737  013056                  TST     DELAY
013074  001415                          BEQ     2$
013076  005037  014706                  CLR     TEMP1
013102  012737  000007  014710          MOV     #7,TEMP2
013110  005237  014706          1$:     INC     TEMP1
013114  001375                          BNE     1$
013116  005337  014710                  DEC     TEMP2
013122  001372                          BNE     1$
013124  005037  013056                  CLR     DELAY
013130  005037  011032          2$:     CLR     TIME
013134  113764  011012  000020          MOVB    PARAM1,20(R4)
013142  113764  011012  000006          MOVB    PARAM1,6(R4)    ;SELECT LINE #
013150  112764  000000  000007          MOVB    #TPCA,7(R4)     ;
013156  012764  014720  000010          MOV     #SYNC,10(R4)    ;LOAD TPCA WITH SYNC ADDRESS
013164  112764  000001  000007          MOVB    #TPBC,7(R4)
013172  012764  177772  000010          MOV     #-6,10(R4)      ;LOAD TPBC WITH # OF SYNCS
013200  112764  000002  000007          MOVB    #TACA,7(R4)
013206  013764  011022  000010          MOV     IXDA,10(R4)     ;LOAD TACA WITH MESSAGE ADDRESS
013214  112764  000003  000007          MOVB    #TABC,7(R4)
013222  013764  014716  000010          MOV     BCNT,10(R4)     ;LOAD TABC WITH MESSAGE BYTE COUNT
013230  112764  000012  000007          MOVB    #LPP,7(R4)
013236  012764  000100  000010          MOV     #100,10(R4)     ;SET DDCMP MODE XMIT
013244  032737  000002  011014          BIT     #BIT1,PARAM2    ;USE SYNC A OR SYNC B
013252  001406                          BEQ     12$             ;DEFAULT TO SYNC A
013254  052764  102000  000004          BIS     #BIT10+BIT15,4(R4)      ;SETUP FOR SYNC B
013262  005764  000004          13$:    TST     4(R4)           ;WAIT FOR CONTROL STROBE
013266  100775                          BMI     13$
013270  052764  000003  000022  12$:    BIS     #BIT0+BIT1,22(R4)  ;TERMINAL READY, LINE ENABLE
013276  005737  013062                  TST     STOP
013302  001005                          BNE     6$
013304  104400  012636                  TYPE    ,MSG4
013310  000000                          HALT                    ;WAIT FOR CONNECTION TO BE MADE
013312  005137  013062                  COM     STOP
013316  032737  000001  011014  6$:     BIT     #FULL.DUPLEX,PARAM2     ;HALF OR FULL DUPLEX?
013324  001006                          BNE     8$              ;BRANCH IF FULL
013326  032764  000100  000022  7$:     BIT     #100,22(R4)     ;IS CHARIER ON
013334  001374                          BNE     7$              ;WAIT FOR CARRIER TO DIE
013336  005037  011032                  CLR     TIME
013342  052764  000004  000022  8$:     BIS     #BIT2,22(R4)    ;SET RQTS
013350  032764  000040  000022  9$:     BIT     #BIT5,22(R4)    ;IS CTS UP YET
013356  001016                          BNE     11$             ;YES
013360  023727  011032  000036          CMP     TIME,#36
013366  103770                          BLO     9$
013370  005002                          CLR     R2              ;DONT PRINT OUT
013372  005003                          CLR     R3              ;
013374  032777  010000  175442          BIT     #SW12,@SWR      ;INHIBIT PRINTOUT
013402  001001                          BNE     10$             ;YES
013404  104002                          HLT     2               ;TYPE WAITING TO TRANSMIT
013406  005037  011032          10$:    CLR     TIME            ;CLEAR TIMER
013412  000756                          BR      9$              ;WAIT FOR CTS
013414  052714  030000          11$:    BIS     #30000,(R4)     ;GOT CTS ON TRANSMIT
```

```
 1019  013420  112764  000013  000007          MOVB    #LS,7(R4)       ;POINT TO LINE STATE REG.
 1020  013426  052764  000004  000010          BIS     #4,10(R4)       ;SET XMIT GO
 1021  013434  000207                          RTS     PC
 1022
 1023                                  ;*****************************************************************
 1024                                  ;       XMIT SERVICE ROUTINE
 1025                                  ;*****************************************************************
 1026
 1027  013436  000240                  XISR:   NOP
 1028  013440  016437  000014  014706          MOV     14(R4),TEMP1    ;READ MSR
 1029  013446  005737  014706                  TST     TEMP1           ;VALID DATA
 1030  013452  100046                          BPL     4$              ;NO UNEXPECTED INTERRUPT
 1031  013454  032737  000400  014706          BIT     #BIT8,TEMP1     ;IS XMIT DONE
 1032  013462  001430                          BEQ     1$              ;NO MUST BE ERROR
 1033  013464  032737  001000  014706          BIT     #BIT9,TEMP1     ;PRINCIPAL OR ALTER?
 1034  013472  001447                          BEQ     3$              ;PRINCIPAL DONE-SYNCS OUT
 1035  013474  052700  100000                  BIS     #XFLG,STAT      ;SET XMIT DONE FLAG
 1036  013500  032737  000001  011014          BIT     #FULL.DUPLEX,PARAM2     ;1/2 OR FULL DUPLEX
 1037  013506  001003                          BNE     6$              ;BRANCH IF FULL DUPLEX
 1038  013510  042764  000004  000022          BIC     #BIT2,22(R4)    ;CLEAR RQTS
 1039  013516  032777  000100  175320  6$:     BIT     #BIT6,@SWR      ;MONITOR DATA?
 1040  013524  001432                          BEQ     3$              ;NO-EXIT
 1041  013526  105777  175344                  TSTB    @TPS            ;TTY READY
 1042  013532  100027                          BPL     3$              ;CAN'T WAIT-EXIT
 1043  013534  112777  000124  175336          MOVB    #'T,@TPB        ;TYPE "T" FOR TRANSMIT
 1044  013542  000423                          BR      3$
 1045  013544  005002                  1$:     CLR     R2              ;NO RCV CSR
 1046  013546  013703  014706                  MOV     TEMP1,R3        ;TYPE OUT MSR
 1047  013552  032703  007400                  BIT     #BIT8!BIT9!BIT10!BIT11,R3  ;ERROR ON PRINCIPAL CAR
 1048  013556  001002                          BNE     2$              ;NO ON ALT
 1049  013560  104012                          HLT     12              ;TELL OPERATOR OF ERROR NXM PRIN CAR
 1050  013562  000403                          BR      5$              ;EXIT
 1051  013564  104013                  2$:     HLT     13              ;NXM ALT CAR
 1052  013566  000401                          BR      5$
 1053  013570  104011                  4$:     HLT     11              ;UNEXPECTED INTERRUPT
 1054  013572  112764  000013  000007  5$:     MOVB    #LS,7(R4)       ;POINT TO SECONDARY LS REGISTER
 1055  013600  042764  000060  000010          BIC     #BIT4!BIT5,10(R4)  ;CLEAR ERROR BITS
 1056  013606  000137  013064                  JMP     STARTX          ;TRY AGAIN
 1057  013612  005037  011032          3$:     CLR     TIME
 1058  013616  000002                          RTI
 1059
```

```
                                ;*****************************************************************
                                ;       RECEIVE INIT ROUTINE
                                ;*****************************************************************

013620  113764  011013  000020  STARTR: MOVB    PARAM1+1,20(R4)
013626  113764  011013  000006          MOVB    PARAM1+1,6(R4)
013634  042700  040000                  BIC     #RFLG,STAT      ;CLEAR RCV DONE FLAG
013640  112764  000004  000007          MOVB    #RCA,7(R4.      ;POINT TO RCV CURRENT ADDRESS REG
013646  013764  011020  000010          MOV     IRDA,10(R4)     ;LOAD IT WITH RCV BUFF ADD
013654  112764  000005  000007          MOVB    #RBC,7(R4)      ;POINT TO RCV BYTE COUNT REG
013662  012764  177000  000010          MOV     #-1000,10(R4)   ;LOAD IT
013670  112764  000011  000007          MOVB    #RCTBA,7(R4)    ;POINT TO RCV CONTROL TABLE REG
013676  012764  014726  000010          MOV     #CORTAB,10(R4)  ;LOAD IT
013704  112764  000012  000007          MOVB    #LPP,7(R4)      ;POINT TO LINE PROTOCOL REG
013712  012764  000002  000010          MOV     #2,10(R4)       ;SET STRIP SYNC
013720  112764  000015  000007          MOVB    #RMB,7(R4)      ;POINT TO RCV MODE REG
013726  105064  000010                  CLRB    10(R4)          ;MODE 0

013732  052764  000002  000022          BIS     #DTR,22(R4)     ;SET DATA TERMINAL READY
013740  005737  013062                  TST     STOP            ;SEE IF FIRST TIME
013744  001013                          BNE     1$
013746  104400  012770                  TYPE    ,MSGS           ;TYPE MESSAGE
013752  005137  013062                  COM     STOP
013756  032737  000002  011014          BIT     #BIT1,PARAM2    ;SYNC A OR SYNC B
013764  001403                          BEQ     1$              ;DEFAULT TO SYNC A
013766  052764  002000  000004          BIS     #BIT10,4(R4)    ;SET SYNC B
013774  052764  120000  000004  1$:     BIS     #BIT15+BIT13,4(R4)  ;SET RCV ENABLE+CONTROL STROBE
014002  005764  000004          2$:     TST     4(R4)           ;LOOP ON CONTROL
014006  100775                          BMI     2$              ;STROBE TO SETTLE
014010  052714  000100                  BIS     #BIT6,(R4)      ;SET INT ENABLE
014014  000207                          RTS     PC              ;EXIT

                                ;*****************************************************************
                                ;       RCV SERVICE ROUTINE
                                ;*****************************************************************

014016  000240          RISR:   NOP                             ;SPARE
014020  016437  000002  014706          MOV     2(R4),TEMP1     ;SAVE RIC REGISTER
014026  032737  170000  014706          BIT     #170000,TEMP1   ;CHECK FOR SPECIAL CHARACTER INTR
014034  001043                          BNE     1$              ;NO-BRANCH
014036  123737  014706  011041          CMPB    TEMP1,RX.TERM   ;WAS IT TERM CHARACTER
014044  001037                          BNE     1$              ;NO-BRANCH
014046  032777  000040  174770          BIT     #BIT5,@SWR      ;MONITOR RCV DATA
014054  001406                          BEQ     2$              ;NO
014056  105777  175014                  TSTB    @TPS
014062  100003                          BPL     2$
014064  112777  000122  175006          MOVB    #'R,@TPB        ;TYPE "R" FOR RCV
014072  052700  040000          2$:     BIS     #RFLG,STAT      ;SET RCV DONE FLAG
014076  052714  000400                  BIS     #BIT8,(R4)      ;SET RCV INT SRV COMPLETE
014102  000240                          NOP
014104  000240                          NOP
014106  042714  000100                  BIC     #BIT6,(R4)      ;RESET RCV INT. ENABLE
014112  012764  100000  000004          MOV     #BIT15,4(R4)    ;TURN OFF RECV.
014120  005764  000004          5$:     TST     4(R4)           ;WAIT FOR CONTROL STROB
014124  100775                          BMI     5$              ;TO CLEAR
```

```
 1116  014126  112764  000013  000007          MOVB    #LS,7(R4)       ;POINT TO LS REG
 1117  014134  012764  000002  000010          MOV     #BIT1,10(R4)    ;SET RCV RESYNC
 1118  014142  000002                          RTI                     ;EXIT
 1119  014144  005003                  1$:     CLR     R3
 1120  014146  013702  014706                  MOV     TEMP1,R2
 1121  014152  004737  014206                  JSR     PC,B$
 1122  014156  104400  014621                  TYPE    ,FATAL
 1123  014162  104400                          TYPE
 1124  014164  000000                  4$:     000000
 1125  014166  104000                          HLT     0
 1126  014170  023737  000006  014706          CMP     6,TEMP1
 1127  014176  002335                          BGE     2$
 1128  014200  104400  014655                  TYPE    ,NOREC
 1129  014204  000000                          HALT
 1130  014206  005046                  8$:     CLR     -(SP)           ;CLEAR LOCATION ON STACK
 1131  014210  116416  000003                  MOVB    3(R4),(SP)      ;GET HIGH - BYTE OF RIC
 1132  014214  042716  000017                  BIC     #17,(SP)        ;CLEAR LINE NUMBER
 1133  014220  006016                          ROR     (SP)            ;ROTATE UNTIL (INT CODE)X2
 1134  014222  006016                          ROR     (SP)            ;IN LOW BYTE
 1135  014224  111637  014706                  MOVB    (SP),TEMP1      ;SAVE FOR LATTER
 1136  014230  062716  014242                  ADD     #ERRTAB,(SP)    ;GET OFFSET
 1137  014234  012637  014164                  MOV     (SP)+,4$        ;MAKE ADDRESS OF MSG
 1138  014240  000207                          RTS     PC              ;EXIT
 1139
```

```
1140
1141                            ;*****************************************************************
1142                            ;       ERROR MESSAGE TABLES
1143                            ;*****************************************************************
1144
1145  014242  014302            ERRTAB: EM0
1146  014244  014327                    EM1
1147  014246  014353                    EM2
1148  014250  014373                    EM3
1149  014252  014431                    EM4
1150  014254  014577                    UNOF
1151  014256  014577                    UNOF
1152  014260  014577                    UNOF
1153  014262  014431                    EM4
1154  014264  014577                    UNOF
1155  014266  014452                    EM12
1156  014270  014577                    UNOF
1157  014272  014577                    UNOF
1158  014274  014467                    EM15
1159  014276  014515                    EM16
1160  014300  014540                    EM17
1161
1162  014302  005015  054122  052056  EM0:    .ASCIZ  <15><12>/RX.TERM NOT UNIQUE/
1163  014310  051105  020115  047516
1164  014316  020124  047125  050511
1165  014324  042525      000
1166  014327      015  041412  040510  EM1:    .ASCIZ  <15><12>/CHAR PARITY ERROR/
1167  014334  020122  040520  044522
1168  014342  054524  042440  051122
1169  014350  051117      000
1170  014353      015  047412  042526  EM2:    .ASCIZ  <15><12>/OVERRUN ERROR/
1171  014360  051122  047125  042440
1172  014366  051122  051117      000
1173  014373      015  041412  040510  EM3:    .ASCIZ  <15><12>/CHAR PARITY ERROR + OVERRUN/
1174  014400  020122  040520  044522
1175  014406  054524  042440  051122
1176  014414  051117  025440  047440
1177  014422  042526  051122  047125
1178  014430      000
1179  014431      015  051012  053103  EM4:    .ASCIZ  <15><12>/RCV BYTE CNT=0/
1180  014436  041040  052131  020105
1181  014444  047103  036524  000060
1182  014452  005015  054116  020115  EM12:   .ASCIZ  <15><12>/NXM IN RCA/
1183  014460  047111  051040  040503
1184  014466      000
1185  014467      015  047012  046530  EM15:   .ASCIZ  <15><12>/NXM IN CONTROL BYTE/
1186  014474  044440  020116  047503
1187  014502  052116  047522  020114
1188  014510  054502  042524      000
1189  014515      015  046412  046505  EM16:   .ASCIZ  <15><12>/MEM PARITY ERROR/
1190  014522  050040  051101  052111
1191  014530  020131  051105  047522
1192  014536  000122
1193  014540  005015  040520  044522  EM17:   .ASCIZ  <15><12>/PARITY ERROR IN CONTROL BYTE/
1194  014546  054524  042440  051122
1195  014554  051117  044440  020116
```

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1196  014562  047503  052116  047522
1197  014570  020114  054502  042524
1198  014576     000
1199  014577     015  052412  042116  UNDF:   .ASCIZ  <15><12>/UNDEFINED ERROR/
1200  014604  043105  047111  042105
1201  014612  042440  051122  051117
1202  014620     000
1203  014621     015  042412  051122  FATAL:  .ASCIZ  <15><12>/ERROR RIC 15:12 INDICATES/
1204  014626  051117  051040  041511
1205  014634  030440  035065  031061
1206  014642  044440  042116  041511
1207  014650  052101  051505     000
1208  014655     015  043012  052101  NOREC:  .ASCIZ  <15><12>/FATAL NON-RECOV-HALT!/
1209  014662  046101  047040  047117
1210  014670  051055  041505  053117
1211  014676  044055  046101  020524
1212  014704     000
1213
1214          014706                  .EVEN
1215  014706  000000                  TEMP1:  0
1216  014710  000000                  TEMP2:  0
1217  014712  000000                  TEMP3:  0
1218  014714  000000                  TEMP4:  0
1219  014716  000000                  BCNT:   0
1220  014720  000000                  SYNC:   0
1221  014722  000000                          0
1222  014724  000000                          0
1223
```

```
1224                                ;*****************************************************************
1225                                ;       DV11 CONTROL BYTE CORE TABLE
1226                                ;*****************************************************************
1227
1228  014726  000                   CORTAB: .BYTE   0
1229  014727  001                           .BYTE   1
1230  014730  000                           .BYTE   0
1231  014731  000                           .BYTE   0
1232  014732  000                           .BYTE   0
1233  014733  000                           .BYTE   0
1234  014734  000                           .BYTE   0
1235  014735  000                           .BYTE   0
1236  014736  000                           .BYTE   0
1237  014737  000                           .BYTE   0
1238  014740  000                           .BYTE   0
1239  014741  000                           .BYTE   0
1240  014742  000                           .BYTE   0
1241  014743  000                           .BYTE   0
1242  014744  000                           .BYTE   0
1243  014745  000                           .BYTE   0
1244  014746  000                           .BYTE   0
1245  014747  000                           .BYTE   0
1246  014750  000                           .BYTE   0
1247  014751  000                           .BYTE   0
1248  014752  000                           .BYTE   0
1249  014753  000                           .BYTE   0
1250  014754  000                           .BYTE   0
1251  014755  000                           .BYTE   0
1252  014756  000                           .BYTE   0
1253  014757  000                           .BYTE   0
1254  014760  000                           .BYTE   0
1255  014761  000                           .BYTE   0
1256  014762  000                           .BYTE   0
1257  014763  000                           .BYTE   0
1258  014764  000                           .BYTE   0
1259  014765  000                           .BYTE   0
1260  014766  000                           .BYTE   0
1261  014767  000                           .BYTE   0
1262  014770  000                           .BYTE   0
1263  014771  000                           .BYTE   0
1264  014772  000                           .BYTE   0
1265  014773  000                           .BYTE   0
1266  014774  000                           .BYTE   0
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1269  014777  000                           .BYTE   0
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1271  015001  000                           .BYTE   0
1272  015002  000                           .BYTE   0
1273  015003  000                           .BYTE   0
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1276  015006  000                           .BYTE   0
1277  015007  000                           .BYTE   0
1278  015010  000                           .BYTE   0
1279  015011  000                           .BYTE   0
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1284  015016  000                    .BYTE   0
1285  015017  000                    .BYTE   0
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1287  015021  000                    .BYTE   0
1288  015022  000                    .BYTE   0
1289  015023  000                    .BYTE   0
1290  015024  000                    .BYTE   0
1291  015025  000                    .BYTE   0
1292  015026  000                    .BYTE   0
1293  015027  000                    .BYTE   0
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1335  015101  000                    .BYTE   0
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1391  015171  000                    .BYTE   0
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1402  015204  000                     .BYTE   0
1403  015205  000                     .BYTE   0
1404  015206  000                     .BYTE   0
1405  015207  000                     .BYTE   0
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1409  015213  000                     .BYTE   0
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1411  015215  000                     .BYTE   0
1412  015216  000                     .BYTE   0
1413  015217  000                     .BYTE   0
1414  015220  000                     .BYTE   0
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1416  015222  000                     .BYTE   0
1417  015223  000                     .BYTE   0
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1419  015225  000                     .BYTE   0
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1421  015227  000                     .BYTE   0
1422  015230  000                     .BYTE   0
1423  015231  000                     .BYTE   0
1424  015232  000                     .BYTE   0
1425  015233  000                     .BYTE   0
1426  015234  000                     .BYTE   0
1427  015235  000                     .BYTE   0
1428  015236  000                     .BYTE   0
1429  015237  000                     .BYTE   0
1430  015240  000                     .BYTE   0
1431  015241  000                     .BYTE   0
1432  015242  000                     .BYTE   0
1433  015243  000                     .BYTE   0
1434  015244  000                     .BYTE   0
1435  015245  000                     .BYTE   0
1436  015246  000                     .BYTE   0
1437  015247  000                     .BYTE   0
1438  015250  000                     .BYTE   0
1439  015251  000                     .BYTE   0
1440  015252  000                     .BYTE   0
1441  015253  000                     .BYTE   0
1442  015254  000                     .BYTE   0
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1445  015257  000                     .BYTE   0
1446  015260  000                     .BYTE   0
1447  015261  000                     .BYTE   0
```

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1452  015266  000                    .BYTE   0
1453  015267  000                    .BYTE   0
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1455  015271  000                    .BYTE   0
1456  015272  000                    .BYTE   0
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1469  015307  000                    .BYTE   0
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1471  015311  000                    .BYTE   0
1472  015312  000                    .BYTE   0
1473  015313  000                    .BYTE   0
1474  015314  000                    .BYTE   0
1475  015315  000                    .BYTE   0
1476  015316  000                    .BYTE   0
1477  015317  000                    .BYTE   0
1478  015320  000                    .BYTE   0
1479  015321  000                    .BYTE   0
1480  015322  000                    .BYTE   0
1481  015323  000                    .BYTE   0
1482  015324  000                    .BYTE   0
1483  015325  000                    .BYTE   0
1484  015326  000                    .BYTE   0
1485  015327  000                    .BYTE   0
1486
1487                    ;*****************************************************************
1488                    ;       DV11 RAM CLEAR ROUTINE
1489                    ;*****************************************************************
1490
1491  015330  012714  004000  RAMCLR: MOV     #4000,(R4)      ;CLEAR PRIMARY REGS
1492  015334  010246                  MOV     R2,-(SP)        ;SAVE R2
1493  015336  010346                  MOV     R3,-(SP)        ;SAVE R3
1494  015340  012703  000017          MOV     #17,R3          ;SET UP LINE # COUNT IN R3
1495  015344  012702  000017  1$:     MOV     #17,R2          ;SET UP REGISTER # COUNT IN R2
1496  015350  110264  000007  2$:     MOVB    R2,7(R4)
1497  015354  110364  000006          MOVB    R3,6(R4)        ;SET UP SRS REGISTER
1498  015360  005064  000010          CLR     10(R4)          ;CLEAR IT
1499  015364  005302                  DEC     R2              ;FIRST CLEAR ALL REGS. FOR LN #
1500  015366  100370                  BPL     2$
1501  015370  005303                  DEC     R3              ;NOW CLEAR GO TO NEXT LN #
1502  015372  100364                  BPL     1$
1503  015374  012603                  MOV     (SP)+,R3        ;RESTORE R3
```

F03


```
1504  015376  012602                          MOV     (SP)+,R2        ;RESTORE R2
1505  015400  000207                          RTS     PC              ;EXIT
1506
1507  015402  010146                  SETUP:  MOV     R1,-(SP)        ;SAVE R1
1508  015404  010046                          MOV     R0,-(SP)        ;SAVE R0
1509  015406  013700  011022                  MOV     IXDA,R0
1510  015412  005001                          CLR     R1
1511  015414  123720  011040          3$:     CMPB    TX.TERM,(R0)+   ;FIGURE OUT BYTE COUNT-
1512  015420  001402                          BEQ     4$              ;OF MESSAGE TO BE-
1513  015422  005201                          INC     R1              ;TRANSMITTED
1514  015424  000773                          BR      3$
1515  015426  010137  014716          4$:     MOV     R1,BCNT
1516  015432  005437  014716                  NEG     BCNT
1517  015436  012700  014720                  MOV     #SYNC,R0        ;SET UP CORE LABEL OF
1518  015442  012701  000006                  MOV     #6,R1           ;SYNC CHARACTERS FOUND
1519  015446  113720  011015          5$:     MOVB    PARAM2+1,(R0)+  ;IN HIGH-BYTE OF PARAM2
1520  015452  005301                          DEC     R1
1521  015454  001374                          BNE     5$
1522  015456  012600                          MOV     (SP)+,R0        ;RESTORE R0
1523  015460  012601                          MOV     (SP)+,R1        ;RESTORE R1
1524  015462  000207                          RTS     PC              ;EXIT
1525          000001                          .END
```

```
BA      011004            602#    661
BACK    013060            722*    750*    785*    865*    896     960#
BCNT    014716            987    1219#   1515*   1516*
BIT0  = 000001            596#    995
BIT1  = 000002            596#    990     995    1084    1117
BIT10 = 002000            596#    992    1047    1086
BIT11 = 004000            596#   1047
BIT12 = 010000            596#
BIT13 = 020000            596#    631#    907     937    1087
BIT14 = 040000            596#
BIT15 = 100000            596#    992    1087    1113
BIT2  = 000004            596#   1006    1038
BIT3  = 000010            596#
BIT4  = 000020            596#   1055
BIT5  = 000040            596#   1007    1055    1103
BIT6  = 000100            596#   1039    1090    1112
BIT7  = 000200            596#
BIT8  = 000400            596#   1031    1047    1109
BIT9  = 001000            596#   1033    1047
B2016   011030            612#    910
CORTAB  014726           1073    1228#
DELAY   013056            674*    894*    959#    968     976#
DEFR    012470            938     947#
DISPLA  011046            622#
DSFLG = 020000            596#    630#
DSSTAT  011060            637#
DTR   = 000002            596#   1079
DV11    011000            601#
EM0     014302           1145    1162#
EM1     014327           1146    1166#
EM12    014452           1155    1182#
EM15    014467           1158    1185#
EM16    014515           1159    1189#
EM17    014540           1160    1193#
EM2     014353           1147    1170#
EM3     014373           1148    1173#
EM4     014431           1149    1153    1179#
ENTER   012220            878     887#
EOP     012132            723     751     786     866     873#
ERCSR   011054            635#
ERC3R   011056            636#    905
ERRTAB  014242           1136    1145#
FATAL   014621           1122    1203#
FLAG    011042            620#
FULL.D= 000001            649#    825     841     846    1001    1036
GO      011156            673#
ILB   = 000010            596#    682
IROA    011020            608#    789     914     940    1069
IXOA    011022            609#    790     913     944     946     985    1509
KBDIN = 104416            596#    704     735     767     824
LOOP  = 000020            596#    720     748     783     863
LP    = 000016            596#
LPP   = 000012            596#    988    1074
LS    = 000013            596#   1019    1054    1116
MSG0    012502            909     953#
MSG1    012563            912     953#
```

```
MSG2    012566            939     953#
MSG3    012613            943     953#
MSG4    012636            953#    998
MSG5    012770            953#   1082
NODAT = 000200            596#    716     779     860
NOREC   014655           1128    1208#
OWI   = 000002            596#    679
OWO   = 000001            596#    676
PARAM1  011012            605#    978     979    1065    1066
PARAM2  011014            606#    825     841     846     934     990    1001    1036    1084    1519
PARAM3  011016            607#
PRIOR   011010            604#    658     660
PRTY0 = 000000            596#
PRTY1 = 000040            596#
PRTY2 = 000100            596#
PRTY3 = 000140            596#
PRTY4 = 000200            596#
PRTY5 = 000240            596#
PRTY6 = 000300            596#
PRTY7 = 000340            596#    874
QTPIE   012270            875*    876#    895     897#
RABCC = 000007            596#
RAMCLR  015330            662    1491#
RBC   = 000005            596#   1070
RCA   = 000004            596#   1068
RCBM  = 000017            596#
RCC     011064            640#
RCTBA = 000011            596#   1072
RDA     011066            641#
RDAX    012450            940#    942#
RFLG  = 040000            629#    706     719     770     782     832     858    1067    1108
RISR    014016            657    1097#
RIV     011006            603#    656
RMB   = 000015            596#   1076
RWAIT = 104410            596#
RX.TER  011041            618#   1101
SAVR0   013042            879#    888     953#
SAVR1   013044            880#    889     954#
SAVR2   013046            881#    890     955#
SAVR3   013050            882#    891     956#
SAVR4   013052            883#    892     957#
SAVR5   013054            884#    893     958#
SCAN4   012336            915#    916     929     932     935
SCAN5   012422            936#
SETTLE  011024            610#
SETUP   015402            663    1507#
SRCSR   011052            634#
START   011102            615     653#
STARTR  013620            705     768     827     844    1065#
STARTX  013064            736     799     828     967#   1056
STOP    013062            675#    961#    996    1000#   1080    1083#
STPS  = 104414            596#    874
SWR     011044            621#    654     716     720     748     779     783     787     860     863     907     937    1013
                         1039    1103
SW12  = 010000            596#   1013
SXCSR   011050            633#
```

```
SYNC    014720            981    1220#  1517
TABC  = 000003            596#    986
TABCC = 000006            596#
TACA  = 000002            596#    984
TCTBA = 000010            596#
TEMP1   014706            970#    972#  1028#  1029   1031   1033   1046   1098#  1099   1101   1120   1126   1135#
                         1215#
TEMP2   014710            971#    974#  1216#
TEMP3   014712           1217#
TEMP4   014714           1218#
TESTD   012272            718     781    862    905#
TESTDX  012476            918     924    927    950#
TIE   = 020000            596#    876    877
TIME    011032            613#    673#   708    713#   737#   740    745#   769#   772    777#   798#   802    807#
                          829#    834    839#   850    855#   859#   977#  1005#  1009   1016#  1057#
TKB     011074            645#
TKS     011072            644#
TMB   = 000014            596#
TPB     011100            647#   1043#  1107#
TPBC  = 000001            596#    922
TPCA  = 000000            596#    940
TPS     011076            646#   1041   1105
TSTDAT  012326            906     908    913#
TX.TER  011040            616#    917   1511
TYPE  = 104400            596#    909    912    922    939    941    943    945    998   1082   1122   1123   1128
UNOF    014577           1150    1151   1152   1154   1156   1157   1199#
XCC     011062            639#
XCSR  = 000000            596#    711    743    775    805    837    853    875    877#   895#
XDA     011070            642#    791#
XFLG  = 100000            628#    738    747    800    809    830    843    848    857    967   1035
XISR    013436            659    1027#
XLB   = 000004            596#    685
XWAIT = 104412            596#
$ILB    011452            684     767#   810
$OWI    011246            681     704#   724
$OWO    011354            678     735#   752
$XLB    011702            687     824#   864    865
.     = 015464            600#    683    793    944#  1214#
```

J03


```
BOX          1#    597     624     650     963    1023    1061    1093    1141    1224    1487
DCPARM       1#
DHDOC1       1#
DHPARM       1#
DJPARM       1#
DLPARM       1#
DPPARM       1#
DQDOC1       1#
DQPARM       1#
DUPARM       1#
DUPPAR       1#
DVDOC1       1#    560
DVPARM       1#    576
DZPARM       1#
HELLO        1#
HLT        596#    712     744     776     806     838     854     949    1015    1049    1051    1053    1125
$EQUAT       1#    596
$INTF        1#    596
$ITEP        1#    666
$SERV        1#    639

. ABS.  015464     000

 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 .DZDVOA.SEQ/SOL/CRF/ML:TOC=ITEP1.MAC,DZDVOA.P11
RUN-TIME: 11 15 .8 SECONDS
RUN-TIME RATIO: 75/28=2.6
CORE USED:  16K  (31 PAGES)
```