DVID1: 1 BIT SET FOR EACH DH11 LINE. ITS POSITION SHOULD CORROSPOND WITH THE LINE #. E.G. IF DH11 LINE 6 IS USED 'DVID1' BIT 6 SHOULD BE SET.

6. DEVICE SETUP

A. THE USER MUST LOAD AND START TEST 21 OF MAINDEC-11-DBVTA IN THE VT20 PDP11/05 IN ORDER FOR THIS MODULE TO EXERCISE. CONSULT THE ABOVE DOCUMENT AND COMPLY WITH THE OPERATING INSTRUCTIONS FOR TEST 21 (SECTION 26). THIS DEC/X11 MODULE EXPECTS THE USER TO ENTER DATA ON EACH SELECTED TUBE AND SET EACH TUBE IN THE CONTINUOUS TRANSMIT MODE. THIS STEP IS TAKEN AFTER THE DEC/X11 EXERCISER HAS BEEN STARTED BY THE 'RUN' COMMAND. TYPICAL USER ACTION ON EACH SELECTED TUBE WILL BE AS FOLLOWS:

KEY	FUNCTION
CTRL E	CLEAR SCREEN
CTRL W	GENERATE WORST CASE CHARACTER PATTERN ON TOP OF SCREEN
CTRL T	CONTINUOUS TRANSMIT TO DEC/X11 MODULE (DEC/X11 MODULE WILL RECEIVE DATA AND TRANSMIT IT BACK TO BOTTOM OF SCREEN)

NOTE: IF THE CHARACTER PATTERN FAILS TO RETURN ON THE BOTTOM OF THE SCREEN AFTER ONE 'CTRL T', THEN RETRY AFTER 'END PASS' IS REPORTED FOR THIS DEC/X11 MODULE (DL11 RECEIVERS ARE TURNED OFF SECONDS BEFORE 'END PASS' MSG). IF DATA IS STILL NOT RETURNED FROM HOST COMPUTER (DEC/X11 SYSTEM) THEN VERIFY THE VT20 HOST COMPUTER BY RUNNING MAINDEC-11-DZVTE.

B. IF LINES WITH BAUD RATES OTHER THAT 9600 ARE TO BE USED, THEN THE VALUE OF THE CORRESPONDING WORD IN THE BAUD RATE TABLE (16 WORDS STARTING AT LOC 'LOBR') MUST BE MODIFIED. REFER TO THE PDP-11 PERIPHERALS AND INTERFACING HANDBOOK FOR THE EXACT VALUES NEEDED

8. OPERATOR OPTIONS

A. THE USER CAN MODIFY (VTA 14) "DVID1" TO SELECT OR DESELECT INDIVIDUAL VT20'S. THIS MODULE IS QUITE ABLE TO HANDLE VT20'S THAT DO NOT HAPPEN TO HAVE ADJACENT DH11 LINES.

B. THE USER CAN USE THE "MOD" COMMAND TO DUMP THE TABLES OR BUFFERS DESCRIBED IN 7.2 TO OBTAIN MORE DETAILED ERROR INFORMATION.

9. ERROR PRINTOUTS

9.1 ERROR FORMAT - RECEIVE

CSRA = CSR ADDRESS
CSRC = NRC WORD AS FOLLOWS:

THE # PRINTED OUT LABELED AS 'STATC' IS THE NEXT RECIEVED CHARACTER
BIT 15 = DATA PRESENT
BIT 14 = OVERRUN
BIT 13 = FRAMING
BIT 12 = PARITY
BIT 11-8 = LINE #
BIT 7-0 = DATA RECEIVED

WITH SOME ERRORS SUCH AS "NO DH11 LINES REMAIN SELECTED" THE CONTENTS OF THE DH11 REGISTERS ARE IRRELEVENT. IN SUCH CASES THEY ARE PRINTED ANYWAYS.

9.2 ERROR FORMAT - TRANSMIT

CSRA = CSR ADDRESS
CSRC = CSR CONTENTS AS FOLLOWS:

BIT 7 = XMITR READY
BIT 6 = XMITR INTERRUPT ENABLED

.REM -

IDENTIFICATION

PRODUCT CODE: AC-E956B-MC

PRODUCT NAME: CXVTBB0 DH11/VT20 MODULE

PRODUCT DATE: SEPTEMBER 1978

MAINTAINER: DEC/X11 SUPPORT GROUP

1. ABSTRACT

VTB IS AN IOMODX THAT EXERCISES UP TO FOUR VT20'S (DH11 LINES). IT IS INTENDED TO BE A DATA HANDLING ROUTINE USED IN CONJUNCTION WITH TEST 21 OF MAINDEC-11-DBVTA (PREVIOUSLY LOADED AND RUNNING IN THE VT20'S PDP11-05). DATA IS ENTERED AT EACH SELECTED TUBE AND SET INTO THE CONTINUOUS TRANSMIT MODE. THIS DATA IS THEN RECEIVED AND RETRANSMITTED BY THE VT20 HOST COMPUTER (THIS DEC/X11 MODULE). ALL LINES SELECTED FOR TEST CAN BE ACTIVATED AND RUN CONCURRENTLY. ALL TRANSMIT AND RECEIVE ERRORS ARE REPORTED ON THE CONSOLE TTY. NO DATA ERRORS ARE REPORTED BY THIS MODULE.

2. REQUIREMENTS

HARDWARE: AT LEAST ONE VT20 CONNECTED VIA A DH11

STORAGE:: VTB REQUIRES:
1. DECIMAL WORDS: 4002
2. OCTAL WORDS: 07642
3. OCTAL BYTES: 17504

3. PASS DEFINITION

ONE PASS OF THE VTAB MODULE CONSISTS OF CONTINUOUSLY RECEIVING AND TRANSMITTING THE DATA ENTERED ON ALL SELECTED LINES FOR THE PERIOD DEFINED BELOW.

4. EXECUTION TIME

EXECUTION TIME VARIES WITH THE NUMBER OF JOBS (MODULES) ACTIVE, THE BAUD RATE AND THE NUMBER OF TUBES BEING EXERCISED. HOWEVER, THIS MODULE RUNNING ALONE WILL TAKE NO MORE THAN 3 MINUTES WITH 16 TUBES AT 110 BAUD

5. CONFIGURATION PARAMETERS

DEFAULT PARAMETERS:

DVA:160020, VCT:350, BR1:5, BR2:0, DVC:1

LOBR-L17BR:IF ANY OF THE DH11 LINES IS NOT A 9600 BAUD LINE THE WORD ASSOCIATED WITH THAT LINE MUST BE MODIFIED BEFORE RUNNING

REQUIRED PARAMETERS:

DVC: NO OF VT20'S IF GREATER THAN 1

DVID1: 1 BIT SET FOR EACH DH11 LINE. ITS POSITION SHOULD CORRESPOND WITH THE LINE #. E.G. IF DH11 LINE 6 IS USED 'DVID1' BIT 6 SHOULD BE SET.

6. DEVICE SETUP

A. THE USER MUST LOAD AND START TEST 21 OF MAINDEC-11-DBVTA IN THE VT20 PDP11/05 IN ORDER FOR THIS MODULE TO EXERCISE. CONSULT THE ABOVE DOCUMENT AND COMPLY WITH THE OPERATING INSTRUCTIONS FOR TEST 21 (SECTION 26). THIS DEC/X11 MODULE EXPECTS THE USER TO ENTER DATA ON EACH SELECTED TUBE AND SET EACH TUBE IN THE CONTINUOUS TRANSMIT MODE. THIS STEP IS TAKEN AFTER THE DEC/X11 EXERCISER HAS BEEN STARTED BY THE 'RUN' COMMAND. TYPICAL USER ACTION ON EACH SELECTED TUBE WILL BE AS FOLLOWS:

KEY	FUNCTION
CTRL E	CLEAR SCREEN
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NOTE: IF THE CHARACTER PATTERN FAILS TO RETURN ON THE BOTTOM OF THE SCREEN AFTER ONE 'CTRL T', THEN RETRY AFTER 'END PASS' IS REPORTED FOR THIS DEC/X11 MODULE (DL11 RECEIVERS ARE TURNED OFF SECONDS BEFORE 'END PASS' MSG). IF DATA IS STILL NOT RETURNED FROM HOST COMPUTER (DEC/X11 SYSTEM) THEN VERIFY THE VT20 HOST COMPUTER BY RUNNING MAINDEC-11-D2VTE.

B. IF LINES WITH BAUD RATES OTHER THAT 9600 ARE TO BE USED, THEN THE VALUE OF THE CORRESPONDING WORD IN THE BAUD RATE TABLE (16 WORDS STARTING AT LOC "LOBR") MUST BE MODIFIED. REFER TO THE PDP-11 PERIPHERALS AND INTERFACING HANDBOOK FOR THE EXACT VALUES NEEDED

8. OPERATOR OPTIONS

A. THE USER CAN MODIFY (VTA 14) "DVID1" TO SELECT OR DESELECT INDIVIDUAL VT20-S. THIS MODULE IS QUITE ABLE TO HANDLE VT20'S THAT DO NOT HAPPEN TO HAVE ADJACENT DH11 LINES.

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WITH SOME ERRORS SUCH AS "NO DH11 LINES REMAIN SELECTED" THE CONTENTS OF THE DH11 REGISTERS ARE IRRELEVENT. IN SUCH CASES THEY ARE PRINTED ANYWAYS.

9.2 ERROR FORMAT - TRANSMIT

CSRA = CSR ADDRESS
CSRC = CSR CONTENTS AS FOLLOWS:

BIT 7 = XMITR READY
BIT 6 = XMITR INTERRUPT ENABLED

.LIST SEQ,BIN,TOC

```
                                        ;SOME DEFINITIONS
000000'                                 IOMODX  <VTBB >,160020,350,5,,,1,126    ;BR LEVEL 5, UP TO 16 DEVICES
000000'                                 MODULE  150000,VTBB ,160020,350,5,,,1,126
                                        .TITLE  VTBB DEC/X11 SYSTEM EXERCISER MODULE
                                ;       DDXCOM  VERSION  6      23-MAY-78
                                        .LIST   BIN
                                ;*****************************************************************************
000000'                                 BEGIN:
000000' 052126  041102     040  MODNAM: .ASCII  /VTBB / ;MODULE NAME.
000005'     000                 XFLAG:  .BYTE   OPEN                    ;USED TO KEEP TRACK OF WBUFF USAGE
000006' 160020                  ADDR:   160020+0                        ;1ST DEVICE ADDR.
000010' 000350                  VECTOR: 350+0                           ;1ST DEVICE VECTOR.
000012'     240                 BR1:    .BYTE   PRTY5+0                 ;1ST BR LEVEL.
000013'     000                 BR2:    .BYTE   PRTY+0                  ;2ND BR LEVEL.
000014' 000001                  DVID1:  +1                              ;DEVICE INDICATOR 1.
000016' 000000                  SR1:    OPEN                            ;SWITCH REGISTER 1
000020' 000000                  SR2:    OPEN                            ;SWITCH REGISTER 2
000022' 000000                  SR3:    OPEN                            ;SWITCH REGISTER 3
000024' 000000                  SR4:    OPEN                            ;SWITCH REGISTER 4
                                ;*****************************************************************************
000026' 150000                  STAT:   150000                          ;STATUS WORD.
000030' 000554'                 INIT:   START                           ;MODULE START ADDR.
000032' 000224'                 SPOINT: MODSP                           ;MODULE STACK POINTER.
000034' 000000                  PASCNT: 0                               ;PASS COUNTER.
000036' 000001                  ICONT:  1                               ;# OF ITERATIONS PER PASS=1
000040' 000000                  ICOUNT: 0                               ;LOC TO COUNT ITERATIONS
000042' 000000                  SOFCNT: 0                               ;LOC TO SAVE TOTAL SOFT ERRORS
000044' 000000                  HRDCNT: 0                               ;LOC TO SAVE TOTAL HARD ERRORS
000046' 000000                  SOFPAS: 0                               ;LOC TO SAVE SOFT ERRORS PER PASS
000050' 000000                  HRDPAS: 0                               ;LOC TO SAVE HARD ERRORS PER PASS
000052' 000000                  SYSCNT: 0                               ;# OF SYS ERRORS ACCUMULATED
000054' 000000                  RANNUM: 0                               ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
000056'                         CONFIG:                                 ;RESERVED FOR MONITOR USE
000056' 000000                  RES1:   0                               ;RESERVED FOR MONITOR USE
000060' 000000                  RES2:   0                               ;RESERVED FOR MONITOR USE
000062' 000000                  SVR0:   OPEN                            ;LOC TO SAVE R0.
000064' 000000                  SVR1:   OPEN                            ;LOC TO SAVE R1.
000066' 000000                  SVR2:   OPEN                            ;LOC TO SAVE R2.
000070' 000000                  SVR3:   OPEN                            ;LOC TO SAVE R3.
000072' 000000                  SVR4:   OPEN                            ;LOC TO SAVE R4.
000074' 000000                  SVR5:   OPEN                            ;LOC TO SAVE R5.
000076' 000000                  SVR6:   OPEN                            ;LOC TO SAVE R6.
000100' 000000                  CSRA:   OPEN                            ;ADDR OF CURRENT CSR.
000102'                         SBADR:                                  ;ADDR OF GOOD DATA, OR
000102' 000000                  ACSR:   OPEN                            ;CONTENTS OF CSR.
000104'                         WASADR:                                 ;ADDR OF BAD DATA, OR
000104' 000000                  ASTAT:  OPEN                            ;STATUS REG CONTENTS.
000106'                         ERRTYP:                                 ;TYPE OF ERROR
000106' 000000                  ASB:    OPEN                            ;EXPECTED DATA.
000110' 000000                  AWAS:   OPEN                            ;ACTUAL DATA.
000112' 000652'                 RSTRT:  RESTRT                          ;RESTART ADDRESS AFTER END OF PASS
000114' 000000                  WDTO:   OPEN                            ;WCRDS TO MEMORY PER ITERATION
000116' 000000                  WDFR:   OPEN                            ;WCRDS FROM MEMORY PER ITERATION
000120' 000000                  INTR:   OPEN                            ;# OF INTERRUPTS PER ITERATION
000122' 000126                  IDNUM:  126                             ;MODULE IDENTIFICATION NUMBER=126
                 000040                 .REPT   SPSIZ                   ;MODULE STACK STARTS HERE.
```



```
                                        .NLIST
                                        .WORD   0
                                        .LIST
                                        .ENDR
000224'                         MODSP:
                                ;*****************************************************************************
                                ;SOME POINTERS AND VARIABLES AND CONSTANTS UNIQUE TO THIS MODULE
000224' 000000                  SELCNT: 0                               ;PROGRAM SETS THIS LOC TO = # OF VT20'S SELECTED
000226' 000000                  SAVEIO: 000000                          ;PLACE TO STUFF IO WHILE SERVICING INTERRUPTS
000230' 000000                  WAITIM: 000000                          ;USED AS A COUNTER FOR THE INTERRUPT WAIT LOOP
000232' 000000                  RELOC:  000000                          ;# RELOCATION COUNT FOR INDEX REGISTERS IF NEEDED
000234' 000000                  SVT0:   000000
000236' 000000                  SVT1:   000000
000240' 000000                  XCNT:   000000                          ;COUNT FOR # OF XFERS TO DO EACH PASS
000242' 000000                  VIRTAD: 000000                          ;VIRTUAL ADDRESS
000244' 000000                  PHYSAD: 000000                          ;PHYSICAL ADDRESS
000246' 000000                  EXTAD:  000000                          ;EXTENDED ADDRESS BITS
000250' 000000                  DUNCNT: 000000                          ;# OF DEVICES FINISHED
000252' 000000                  WAITIM: 000000                          ;TIMER COUNT
000254' 000000                  TEMP:   000000                          ;TEMPORARY LOCATION
000256' 000000                  TEMP0:  0                               ;GENERAL PURPOSE TEMPORARY STORAGE
000260' 000000                  TEMP1:  0                               ;GENERAL PURPOSE TEMPORARY STORAGE
000262' 000000                  COUNT1: 000000                          ;SET BY BY USER AT CONFIGURATION TIME
                                                                        ;TO A 3 IF LINES OF 1200 BAUD OR LESS ARE USED
000264' 000000                  INTSW:  000000                          ;SWITCH=1 IF WE SHOULD RETURN FROM INTERRUPT
                                                                        ;SERVICE USING AN 'RTI' INSTRUCTION
000266' 000000                  FATERR: 000000                          ;SWITCH=1 TO SIGNAL A FATAL ERROR.
000270' 000000                  ERPT1:  000000                          ;POINTS TO LAST WORD SERVICED FROM ERROR QUEUE
000272' 000000                  ERPT2:  000000                          ;POINTS TO LAST WORD ENTERED IN ERROR QUEUE

000274' 002542'                 BPLIST: VTBF0                           ;POINTS TO ONE OF THE 16 BUFFERS
000276' 003350'                         VTBF1                           ;POINTS TO 1 OF THE 16 BUFFERS
000300' 004156'                         VTBF2                           ;POINTS TO 1 OF THE 16 BUFFERS
000302' 004764'                         VTBF3                           ;POINTS TO ONE OF THE 16 BUFFERS
000304' 005572'                         VTBF4           ;POINTS TO ONE OF THE 16 BUFFERS
000306' 006400'                         VTBF5           ;POINTS TO ONE OF THE 16 BUFFERS
000310' 007206'                         VTBF6           ;POINTS TO ONE OF THE 16 BUFFERS
000312' 010014'                         VTBF7           ;POINTS TO ONE OF THE 16 BUFFERS
000314' 010622'                         VTBF10          ;POINTS TO ONE OF THE 16 BUFFERS
000316' 011430'                         VTBF11          ;POINTS TO ONE OF THE 16 BUFFERS
000320' 012236'                         VTBF12          ;POINTS TO ONE OF THE 16 BUFFERS
000322' 013044'                         VTBF13          ;POINTS TO ONE OF THE 16 BUFFERS
000324' 013652'                         VTBF14          ;POINTS TO ONE OF THE 16 BUFFERS
000326' 014460'                         VTBF15          ;POINTS TO ONE OF THE 16 BUFFERS
000330' 015266'                         VTBF16          ;POINTS TO ONE OF THE 16 BUFFERS
000332' 016074'                         VTBF17          ;POINTS TO ONE OF THE 16 BUFFERS
                                ;EACH OF THE NEXT 8 WORDS IS SETUP BY THIS MODULE TO POINT TO A DH11 REGISTER
000334' 000000                  X00:    0               ;POINTS TO THE SYSTEM CONTROL REGISTER
000336' 000000                  X02:    0               ;POINTS TO THE NEXT CHARACTER RECEIVED REGISTER
000340' 000000                  X04:    0               ;POINTS TO THE LINE PARAMETER REGISTER
000342' 000000                  X06:    0               ;POINTS TO THE CURRENT ADDRESS REGISTER
000344' 000000                  X10:    0               ;POINTS TO THE BYTE COUNT REGISTER
000346' 000000                  X12:    0               ;POINTS TO THE BUFFER ACTIVE REGISTER
000350' 000000                  X14:    0               ;POINTS TO THE BREAK CONTROL REGISTER
000352' 000000                  X16:    0               ;POINTS TO THE SILO STATUS REGISTER
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                                ;TABLE OF BUFFER POINTERS FOR DH11 LINES
000354' 000000                  L0SW:   0                       ;BUFFER POINTER FOR DH11 LINE 0
000356' 000000                  L1SW:   0                       ;BUFFER POINTER FOR DH11 LINE 1
000360' 000000                  L2SW:   0                       ;BUFFER POINTER FOR DH11 LINE 2
000362' 000000                  L3SW:   0                       ;BUFFER POINTER FOR DH11 LINE 3
000364' 000000                  L4SW:   0                       ;BUFFER POINTER FOR DH11 LINE 4
000366' 000000                  L5SW:   0                       ;BUFFER POINTER FOR DH11 LINE 5
000370' 000000                  L6SW:   0                       ;BUFFER POINTER FOR DH11 LINE 6
000372' 000000                  L7SW:   0                       ;BUFFER POINTER FOR DH11 LINE 7
000374' 000000                  L10SW:  0                       ;BUFFER POINTER FOR DH11 LINE 10
000376' 000000                  L11SW:  0                       ;BUFFER POINTER FOR DH11 LINE 11
000400' 000000                  L12SW:  0                       ;BUFFER POINTER FOR DH11 LINE 12
000402' 000000                  L13SW:  0                       ;BUFFER POINTER FOR DH11 LINE 13
000404' 000000                  L14SW:  0                       ;BUFFER POINTER FOR DH11 LINE 14
000406' 000000                  L15SW:  0                       ;BUFFER POINTER FOR DH11 LINE 15
000410' 000000                  L16SW:  0                       ;BUFFER POINTER FOR DH11 LINE 16
000412' 000000                  L17SW:  0                       ;BUFFER POINTER FOR DH11 LINE 17

                                ;TABLE OF BAUD RATES FOR DH11 LINES
000414' 033500                  L0BR:   033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 0
000416' 033500                  L1BR:   033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 1
000420' 033500                  L2BR:   033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 2
000422' 033500                  L3BR:   033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 3
000424' 033500                  L4BR:   033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 4
000426' 033500                  L5BR:   033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 5
000430' 033500                  L6BR:   033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 6
000432' 033500                  L7BR:   033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 7
000434' 033500                  L10BR:  033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 10
000436' 033500                  L11BR:  033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 11
000440' 033500                  L12BR:  033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 12
000442' 033500                  L13BR:  033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 13
000444' 033500                  L14BR:  033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 14
000446' 033500                  L15BR:  033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 15
000450' 033500                  L16BR:  033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 16
000452' 033500                  L17BR:  033500                  ;DEFAULT BAUD RATE (9600) FOR DH11 LINE 17


                                ;EACH OF THE FOLLOWING 16 WORDS CONTAINS THE ERROR AND STATUS INFORMATION
                                ;FOR 1 DH11 LINE. THE HIGH ORDER BYTE HOLDS THE # OF ERRORS IN THAT LINE
                                ;AND THE LOW ORDER BYTE CONTAINS THE LINES CURRENT STATUS
                                ;LOW BYTE
                                ;       MODE
                                ;   0       UNSELECTED OR DROPPED
                                ;   2       ACTIVE MODE
                                ;   4       DONE RECIEVING
000454' 000000                  L0EC:   0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 0
000456' 000000                  L1EC:   0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 1
000460' 000000                  L2EC:   0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 2
000462' 000000                  L3EC:   0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 3
000464' 000000                  L4EC:   0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 4
000466' 000000                  L5EC:   0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 5
000470' 000000                  L6EC:   0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 6
000472' 000000                  L7EC:   0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 7
000474' 000000                  L10EC:  0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 10
000476' 000000                  L11EC:  0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 11
000500' 000000                  L12EC:  0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 12
```



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000502' 000000                  L13EC:  0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 13
000504' 000000                  L14EC:  0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 14
000506' 000000                  L15EC:  0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 15
000510' 000000                  L16EC:  0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 16
000512' 000000                  L17EC:  0                       ;ERROR COUNT/LINE STATUS FOR DH11 LINE 17


                                ;TABLE OF CHARACTER COUNT LOCATIONS FOR DH11 LINES
000514' 000000                  L0CC:   0                       ;CHARACTER COUNT FOR DH11 LINE 0
000516' 000000                  L1CC:   0                       ;CHARACTER COUNT FOR DH11 LINE 1
000520' 000000                  L2CC:   0                       ;CHARACTER COUNT FOR DH11 LINE 2
000522' 000000                  L3CC:   0                       ;CHARACTER COUNT FOR DH11 LINE 3
000524' 000000                  L4CC:   0                       ;CHARACTER COUNT FOR DH11 LINE 4
000526' 000000                  L5CC:   0                       ;CHARACTER COUNT FOR DH11 LINE 5
000530' 000000                  L6CC:   0                       ;CHARACTER COUNT FOR DH11 LINE 6
000532' 000000                  L7CC:   0                       ;CHARACTER COUNT FOR DH11 LINE 7
000534' 000000                  L10CC:  0                       ;CHARACTER COUNT FOR DH11 LINE 10
000536' 000000                  L11CC:  0                       ;CHARACTER COUNT FOR DH11 LINE 11
000540' 000000                  L12CC:  0                       ;CHARACTER COUNT FOR DH11 LINE 12
000542' 000000                  L13CC:  0                       ;CHARACTER COUNT FOR DH11 LINE 13
000544' 000000                  L14CC:  0                       ;CHARACTER COUNT FOR DH11 LINE 14
000546' 000000                  L15CC:  0                       ;CHARACTER COUNT FOR DH11 LINE 15
000550' 000000                  L16CC:  0                       ;CHARACTER COUNT FOR DH11 LINE 16
000552' 000000                  L17CC:  0                       ;CHARACTER COUNT FOR DH11 LINE 17


                                ;DETERMINE IF ANY DH'S ARE SELECTED, IF SO SETUP DEVICE REGISTER
                                ;ADDRESSES, INTERRUPT VECTORS, AND START THE
                                ;MODULE PROCESSING... IF NOT, DROP THE MODULE FROM THE RUN

000554' 012767  000004  177336  START:  MOV     #4,INTR         ;4 INTERRUPTS / ITERATION
000562' 012767  000020  177324          MOV     #20,WDTO        ;20 WORDS TO MEM/ITERATION
000570' 012767  000020  177320          MOV     #20,WDFR        ;20 WORDS FROM MEM/ITERATION
000576' 012777  004400  177202          MOV     #4004400,@ADDR  ;INIT THE DH11
000604' 012767  000004  177440          MOV     #4,WAITLM       ;MAKE A LONG 1ST PASS TO ALLOW FOR STARTING VT20S
000612' 016706  177214                  MOV     SPOINT,SP       ;SETUP THE MODULE STACK
000616' 005767  177172                  TST     DVID1           ;CHECK FOR SELLECTED VT20'S
000622' 001155                          BNE     MODROP          ;ANY SELLECTED?
                                ;WE END UP AT "DROP" IF NO VT20 IS SELECTED FOR TEST (DVID1=0)
                                ;WE WILL NOW DROP THIS MODULE
000624' 016767  177156  177502  DROP:   MOV     ADDR,X00        ;SETUP ADDRESS OF THE DH11 CONTROL/STATUS REG
000632' 012777  004000  177474          MOV     #4000,@X00      ;RC. PREVENT DH11 INTERRUPTS
000640' 104403  000000' 017424-         MSG$,BEGIN,ERRMS        ;ASCII MESSAGE CALL WITH COMMON HEADER
000646' 104410  000000'                 END$,BEGIN              ;DROP THIS MODULE


                                ;THIS IS THE RESTART ROUTINE. IT RESTARTS IN TRANSMIT MODE, ALL LINES THAT
                                ;FINISHED RECIEVING ON THE LAST PASS. ALL OTHER LINES IF IGNCRS
000652' 116767  177537  177360  RESTRT: MOVB    L0BR+1,XCNT     ;GET BAUD RATE INFO
000660' 042767  177774  177352          BIC     #177774,XCNT    ;A ROUGH GUESS
000666' 005267  177346                  INC     XCNT            ;AT HOW MANY XFERS WE SHOULD DO PER PASS
000672' 006167  177342                  ROL     XCNT            ;MULT XCNT BY 16
000676' 006167  177336                  ROL     XCNT            ;TO GET THE NUMBER
000702' 006167  177332                  ROL     XCNT            ;OF TRANSFERS TO DO
000706' 006167  177326                  ROL     XCNT            ;EACH PASS
000712' 005467  177322                  NEG     XCNT            ;MAKE IT NEGATIVE
000716' 005000                  NXTFER: CLR     R0              ;START WITH LINE 0
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000720' 012767  000003  177324          MOV     #3,WAIT1M       ;REGULAR PASS TIMEOUT
000726' 005067  177324                  CLR     TEMP0           ;INIT WORD WE ARE GOING TO SEND TO X12
000732' 005067  177312                  CLR     DUNCNT          ;CLEAR OUT COUNT FOR # OF LINES
000736' 126027  000454' 000004  1$:     CMPB    LQEC(0),#4      ;IS LINE READY TO XMIT?
000744' 001054                          BNE     2$              ;IF NOT, GO SEE ABOUT NEXT LINE
000746' 012760  000003  000454'         MOV     #3,LQEC(0)      ;IF IT IS READY, SET IT TO ACTIVE MODE
000754' 000261                          SEC                     ;SET THE C BIT AND
000756' 006067  177274                  ROR     TEMP0           ;ROTATE IT INTO THE NEW "BAR" REGISTER
000762' 005367  177262                  DEC     DUNCNT          ;ADD 1 TO LINE COUNT
000766' 016067  177262                  MOV     R0,TEMP         ;GRAB THE LINE #
000772' 006067  177256                  ROR     TEMP            ;DIVIDE IT BY2 TO MAKE IT REAL
000776' 042767  177760  177250          BIC     #177760,TEMP    ;MAKE SURE ONLY THE LINE # IS SET
001004' 016777  177244  177322          MOV     TEMP,@X00       ;PUT IT INTO THE STATUS REGISTER
001012' 016067  000514' 177234          MOV     LOCC(0),TEMP    ;NOW GET THE CHARACTER COUNT
001020' 005467  177230                  NEG     TEMP            ;USE ITS 2'S COMPLIMENT
001024' 016777  177224  177312          MOV     TEMP,@X10       ;AND SETUP THE BYTE COUNT REGISTER WITH IT
001032' 016067  000554' 177202          MOV     LOSW(0),VIRTAD  ;GET VIRTUAL ADDRESS OF THE BUFFER
001040' 104415  000000' 000242'         GETPA$,BEGIN,VIRTAD     ;GET PHYSICAL ADDRESS FROM 16-BIT VIRTAD
001046' 042767  177177  177172          BIC     #177(7),EXTAD   ;CLEAR ALL BUT THE EXTEND BITS
001054' 056777  177166  177252          BIS     EXTAD,@X00      ;SET ADDRESS EXTEND BITS IN STATUS REG
001062' 016777  177156  177252          MOV     PHYSAD,@X06     ;SETUP CURRENT ADDRESS FOR THIS LINE
001070' 005060  000514'                 CLR     LOCC(0)         ;AND REINIT ITS CHARACTER COUNT
001074' 000403                          BR      3$              ;GO SEE IF WE HAVE CHECKED ALL LINES YET
001076' 000241                  2$:     CLC                     ;CLEAR C BIT TO
001100' 006067  177152                  ROR     TEMP0           ;MAKE SURE THAT THIS LINES "BAR" REGISTER BIT IS CLEAR
001104' 062700  000002          3$:     ADD     #2,R0           ;GO ON TO THE NEXT LINE
001110' 020027  000040                  CMP     R0,#40          ;HAVE WE DONE ALL LINES YET?
001114' 001310                          BNE     1$              ;IF NOT, GO DO ANOTHER
001116' 005767  177134                  TST     TEMP0           ;ALL DONE, ARE ANY LINES STILL ACTIVE?
001122' 001010                          BNE     4$              ;IF SO, GO START EM UP XMITING
001124' 012777  004000  177202          MOV     #4000,@X00      ;NO LINES REMAIN. STOP THE DH11
001132' 104403  000000' 017432'         MSG$,BEGIN,ERRNR        ;ASCII MESSAGE CALL WITH COMMON HEADER
001140' 104410  000000'                 END$,BEGIN              ;AND DROP THIS MODULE
001144' 016777  177106  177174  4$:     MOV     TEMP0,@X12      ;SET THE BAR REGISTER
001152' 000167  000004                  JMP     MAIN            ;GO WAIT FOR SOMTHING TO HAPPEN
001156' 004767  001060          NODROP: JSR     PC,SETUP        ;DO A BUNCH OF INITIALIZATION

                                ;THIS IS THE MAIN PROGRAM LOOP
                                ;NOTHING IS DONE HERE EXCEPT TO CONTINUOUSLY TEST TO SEE IF ENOUGH TIME HAS PASSED
                                ;FOR AN END OF PASS, CHECK FOR ERRORS, AND CALL THE
                                ;INTERRUPT SERVICE ROUTINE TO CLEAN OUT THE SILO IN CASE IT HAS STUFF
                                ;IN IT, BUT NOT ENOUGH STUFF TO CAUSE AN INTERRUPT

001162' 012777  000040  177162  MAIN:   MOV     #40,@X16        ;SET SILO TO INTERRUPT ON 40(OCTAL) CHARS
001166' 012706  176636                  MOV     SPOINT,SP       ;MAKE SURE THAT THE STACK POINTER IS RIGHT
001174' 012777  030100  177132          MOV     #030100,@X00    ;ENABLE INTERRUPTS
001202' 012746  000000          MLOOP:  MOV     #0,-(SP)        ;PUT FAKE PS ONTO STACK
001206' 012746  001216'                 MOV     #BRAKE,-(SP)    ;AND A FAKE PC
001212' 000167  000464                  JMP     INTSRV          ;PRETEND THAT WE JUST HAD AN INTERRUPT
001216'                         BRAKE:
                                BREAK$,BEGIN                    ;TEMPORARY RETURN TO MONITOR....
001220' 104407  000000'                 BREAK$,BEGIN            ;THEN CONTINUE AT NEXT INSTRUCTION.
001226' 027767  177036  177036  TSTRE:  CMP     ERPT1,ERPT2     ;ANY RECEIVE ERRORS?
001234' 001430                          BEQ     1$              ;IF NOT GO CHECK FOR FATAL ERRORS
001236' 016701  177026                  MOV     ERPT1,R1        ;IF SO, MAKE THE ERROR QUEUE POINTER MORE ACCESSABLE
001242' 016767  177066  176630          MOV     X00,CSRA        ;SETUP THE CONTROL REG ADDRESS FOR PRINTING
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001250' 012167  176626                  MOV     (R1)+,ACSR      ;SETUP THE CONTROL REG CONTENTS FOR PRINTING
001254' 012167  176624                  MOV     (R1)+,ASTAT     ;SETUP THE STATUS REG CONTENTS FOR PRINTING
001260' 104403  000000' 017464'         MSG$,BEGIN,ERRRE        ;ASCII MESSAGE CALL WITH COMMON HEADER
001266' 012767  000017  176612          MOV     #17,ERRTYP      ;RECEIVER ERROR
                                ;*****************************************************************
001274' 104405  000000' 000000          ERDER$,BEGIN,NULL       ;RECEIVE ERROR - NON FATAL
                                ;*****************************************************************
001302' 010167  176762                  MOV     R1,ERPT1        ;UPDATE THE ERROR QUEUE POINTER
001306' 026767  176756  176756          CMP     ERPT1,ERPT2     ;IS THE ERROR QUEUE EMPTY?
001314' 001006                          BNE     TSTFE           ;IF IT IS NOT EMPTY, IGNORE IT FOR A MOMENT
001316' 012767  016702' 176744  1$:     MOV     #ERQUEU,ERPT1   ;ERROR QUEUE IS EMPTY. REINITIALIZE THE
001324' 012767  016702' 176740          MOV     #ERQUEU,ERPT2   ;ERROR QUEUE POINTERS
001332' 005767  176730          TSTFE:  TST     FATERR          ;HAVE WE HAD ANY FATAL ERRORS?
001336' 001132                          BNE     ERRPT           ;IF SO, GO REPORT IT AND DROP THIS MODULE
001340' 005767  176704                  TST     DUMCNT          ;HAVE ALL ACTIVE LINES FINISHED RECIEVING?
001344' 001406                          BEQ     ALDONE          ;IF SO GO CLEAN UP AND END THIS PASS
001346' 005267  176656                  INC     WAIT1M          ;NO, TICK GOES THE WAIT TIMER
001352' 001513                          BNE     MLOOP           ;HAVE THESE DEVICES HAD ENOUGH TIME TO FINISH?
001354' 005367  176672                  DEC     WAIT1M          ;HAD ENOUGH TIME TO FINNISH
001360' 001310                          BNE     MLOOP           ;IF NOT.
001362' 042777  030100  176744  ALDONE: BIC     #30100,@X00     ;ENOUGH TIME! PREVENT FURTHER DH11 INTERRUPTS
001370' 005000                          CLR     R0              ;SETUP A LINE INDEX REGISTER TO 0
001372' 105760  000454'         1$:     TSTB    LQEC(0)         ;FIND OUT IF THE LINE IS SELECTED
001376' 001442                          BEQ     2$              ;IF NOT GO TEST FOR ERRORS ON IT
001400' 126027  000454' 000004          CMPB    LQEC(0),#4      ;IF IT IS CHECK THAT IT HAS FINISHED RECIEVING
001406' 001432                          BEQ     3$              ;IF IT DID AT LEAST 1 TRANSFER, DONT PRINT AN ERROR
001410' 012760  000000  000454'         MOV     #0,LQEC(0)      ;DIDNT FINISH. SET THE LINE TO DROPPED MODE
001416' 016767  176712  176454          MOV     X00,CSRA        ;SETUP FOR PRINTING THE ADRESS OF THE CONTROL/STATUS REG
001424' 016767  176704  176450          MOV     @X00,ACSR       ;SETUP FCR PRINTING THE CONTENTS OF THE CONTROL/STATUS R
001432' 016767  176620  176444          MOV     TEMP0,ASTAT     ;SETUP TO PRINT CONTENTS OF THE NEXT CHAR RECIEVED REC
001440' 010067  001070                  MOV     R0,NUMBA1       ;SAVE IT
001444' 006067  001064                  ROR     NUMBA1
                                ;*****************************************************************
                                        ;CONVERT NUMBA1 TO ASCII AND
001450' 104420  000000' 002534'         OTOA$,BEGIN,NUMBA1,MESNM0       ;STORE AT MESNM0
001456' 017405
                                ;*****************************************************************
001460' 104403  000000' 017440'         MSG$,BEGIN,ERRDR        ;ASCII MESSAGE CALL WITH COMMON HEADER
001466' 012767  000023  176412          MOV     #23,ERRTYP      ;FAILED TO INTERRUPT
                                ;*****************************************************************
001474' 104405  000000' 000000          ERDER$,BEGIN,NULL       ; A DH11 LINE HUNG
                                ;*****************************************************************
001502' 000434                          BR      3$              ;GO TRY THE NEXT LINE FOR ERRORS
001504' 105760  000455'         2$:     TSTB    LQEC+1(0)       ;ANY ERRORS ON THIS UNSELECTED LINE?
001510' 001431                          BEQ     3$              ;IF NOT TRY THE NEXT LINE
001512' 010046                          MOV     R0,-(SP)        ;PUT THE LINE # INDEX ONTO THE STACK
001514' 006016                          ROR     (SP)            ;DIVIDE BY 2 TO GET THE LINE #
001516' 005046                          CLR     -(SP)           ;CLEAR OUT THE FIRST WORD ON THE STACK
001520' 116027  000455'                 MOVB    LQEC+1(0),(SP)  ;SO THAT WE CAN PUT THE # OF ERRORS INTO LOW BYTE
001524' 011667  001006                  MOV     (SP),NUMBA2     ;SAVE
                                ;*****************************************************************
                                        ;CONVERT NUMBA2 TO ASCII AND
                                        ;STORE AT MESNM0
001530' 104420  000000' 002536'         OTOA$,BEGIN,NUMBA2,MESNM0
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  525  001536' 017405
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  527  001540' 005726
  528  001542' 010046
  529  001544' 000241
  530  001546' 006016
  531  001550' 011667
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  535  001554' 104420
  536  001562' 017414
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  538  001564' 005726
  539  001566' 104403
  540  001574' 162700
  541  001600' 027700
  542  001604' 001272
  543  001606' 005267
  544  001612' 001402
  545  001614' 000167
  546  001620'
  547  001620' 104413
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  552  001624' 016767
  553  001632' 017767
  554  001640' 017767
  555  001646' 012777
  556  001654' 104403
  557  001662' 012767
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  559  001670' 104405
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  561  001676' 104410
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  586  001702' 032777
  587  001710' 001412
  588  001712' 012777
  589  001720' 017767
  590  001726' 012767
  591  001734' 000002
  592  001736'
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  594  001736' 000004
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  596  001744' 010067
  597  001750' 012767
  598  001756' 017767
  599  001764' 100077
  600  001766' 116767
  601  001774' 016700
  602  002000' 006100
  603  002002' 042700
  604  002006' 005760
  605  002012' 001011
  606  002014' 105260
  607  002020' 005367
  608  002024' 001354
  609  002026' 016700
  610  002032' 104400
  611  002036' 116770
  612  002044' 005260
  613  002050' 005760
  614  002054' 032767
  615  002062' 001425
  616  002064' 105260
  617  002070' 026727
  618  002076' 001003
  619  002100' 012767
  620  002106' 017777
  621  002114' 062767
  622  002122' 016777
  623  002130' 062767
  624  002136' 152767
  625  002144' 001417
  626  002146' 005367
  627  002152' 001301
  628  002154' 016700
  629  002160' 104400
  630  002164' 016700
  631  002170' 104400
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  634  002174' 042777
  635  002202' 000002
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  749  017156' 042040  042111  047040  MESDH1: .ASCIZ  / DID NOT COMPLETE 1 TRANSFER IN TIME/
  750  017164' 052117  041440  046517
  751  017172' 046120  052105  020105
  752  017200' 020061  051124  047101
  753  017206' 043123  051105  044440
  754  017214' 020116  044524  042515
  755  017222'     000
  756  017223'     123  020117  042527  MESDH2: .ASCIZ  /SO WE ARE DROPING THE LINE/
  757  017230' 040440  042522  042040
  758  017236' 047522  044520  043516
  759  017244' 052040  042510  046040
  760  017252' 047111  000105
  761  017256' 042440  051122  051117  MESUS:  .ASCIZ  / ERRORS ON UNSELECTED LINE/
  762  017264' 020123  047117  052440
  763  017272' 051516  046105  041505
  764  017300' 042524  020104  044514
  765  017306' 042516     000
  766  017311'     040  044523  047514  MESSO:  .ASCIZ  / SILO OVERFLOW... ITS FATAL/
  767  017316' 047440  042526  043122
  768  017324' 047514  027127  027056
  769  017332' 044440  051524  043040
  770  017340' 052101  046101     000
  771  017345'     040  020101  042522  MESRE:  .ASCIZ  / A RECEIVER ERROR BIT WAS SET/
  772  017352' 042503  053117  051105
  773  017360' 042440  051122  051117
  774  017366' 041040  051111  053440
  775  017374' 051501  051440  052105
  776  017402'     000
  777  017403'     045      000  MESBE:  .ASCIZ  /%/
  778  017405'     060  030060  030060  MESNM0: .ASCIZ  /000000/
  779  017412' 000060
  780  017414' 030060  030060  030060  MESNM1: .ASCIZ  /000000/
  781  017422'     000
  782          017424'                 .EVEN                   ;IN CASE THERE IS AN ODD # OF BYTES IN THE A
  783
  784                                  ;TABLE OF ERROR MESSAGE POINTERS & TERMINATORS (COMMENTED!)
  785  017424' 017403'         ERRMS:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
  786  017426' 017433'                 MESES                   ;POINTS TO AN ASCIZ ERROR MESSAGE
  787  017430' 177777                 177777                  ;TERMINATOR. ONLY 1 MESSAGE THIS TIME
  788  017432' 017403'         ERRNR:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
  789  017434' 017012'                 MESNR                   ;POINTS TO "NO LINES REMAIN ACTIVE" MESSAGE
  790  017436' 177777                 177777                  ;TERMINATE MESSAGE
  791  017440' 017403'         ERRDH:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
  792  017442' 017147'                 MESDH                   ;POINTS TO 1ST PART OF "RUNG" ERROR MESSAGE
  793  017444' 017405'                 MESNM0                  ;POINTS TO LINE # ASCIZ
  794  017446' 017156'                 MESDH1                  ;POINTS TO PART OF MESSAGE
  795  017450' 017403'                 MESBE                   ;RETURN
  796  017452' 017223'                 MESDH2                  ;DROPING A LINE MESSAGE
  797  017454' 177777                 177777                  ;END OF MESSAGE
  798  017456' 017403'         ERRSO:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
  799  017460' 017311'                 MESSO                   ;POINTS TO ASCIZ TEXT OF FATAL ERROR MESSAGE
  800  017462' 177777                 177777                  ;THIS INDICATES THAT NO MORE MESSAGES FOLLOW
  801  017464' 017403'         ERRRE:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
  802  017466' 017345'                 MESRE                   ;POINTS TO ASCIZ TEXT OF THE RECEIVER ERROR
  803  017470' 177777                 177777                  ;TERMINATOR
  804  017472' 017403'         ERRUS:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
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  805  017474' 017405'                 MESNM0          ;POINTS TO ASCIZ FOR # OF ERRORS
  806  017476' 017256'                 MESUS           ;POINTS TO TEXT PART OF MESSAGE
  807  017500' 017414'                 MESNM1          ;POINTS TO ASCIZ FOR LINE #
  808  017502' 177777                 177777          ;SIGNALS END OF MESSAGE TO DECX/11
  809
  810          000001                 ;END OF MESSAGE TABLE
                                      .END
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                                ;THIS ROUTINE IS ENTERED WHEN A LINE FINISHES RECIEVING
002204' 112760  000004  000454' XMIT:   MOVB    #4,LOEC(0)      ;SET LINE TO "RECIEVE DONE" MODE
002212' 166060  000514' 000354'         SUB     LOCC(0),LOSW(0) ;RESET THE LINES BUFFER POINTER
002220' 005267  176024                  INC     DUNCNT          ;ALSO TALLY UP 1 MORE FINISHED DEVICE
002224' 005367  176034                  DEC     INTSW           ;20 CHARS PULLED YET?
002230' 001352                          BNE     YYYY            ;IF NOT GO BACK AND DO ANOTHER
002232' 016700  175624                  MOV     SVR0,R0         ;YES, DONE 4 ALREADY. RESTORE R0
002236' 104400  000000'                 EXITS,BEGIN                     ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.

                                ;THIS IS THE INITIALIZATION ROUTINE.
                                ;FIRST IT CLEARS OUT THE FATAL ERROR SWITCH
                                ;THEN IT SETS UP POINTERS TO ALL OF THE DH11 REGISTERS
                                ;THEN IT ACCESSES EACH DH11 REGISTER WITH A 'TST' INSTRUCTION TO
                                ;MAKE SURE IT IS REALLY THERE.
                                ;THEN IT ACCESSES EACH DH11 REGISTER USING A 'TST' INSTRUCTION SO THAT IF
                                ;THE REGISTER DOES NOT EXIST OR HAS MAJOR PROBLEMS, WE FIND OUT RIGHT AWAY
                                ;THEN IT SETS UP DH11 VECTORS
                                ;THEN IT INITIALIZES THE ERROR QUEUE POINTERS
                                ;THEN IT ASSIGNS BUFFER POINTERS TO ALL SELECTED LINES
002242' 005067  176020  SETUP:  CLR     FATERR          ;INIT FATAL ERROR SWITCH = NO FATAL ERRORS
002246' 016700  175534          MOV     ADDR,R0         ;MAKE THE DEVICE REGISTER ADDRESS EASY TO ACCESS
002252' 010067  176056          MOV     R0,X00          ;SETUP ADDRESS OF THE SYSTEM CONTROL REGISTER
002256' 005720                  TST     (R0)+           ;TRAP IF IT DOES NOT EXIST
002260' 010067  176052          MOV     R0,X02          ;SETUP ADDRESS OF NEXT CHARACTER RECEIVED REGISTER
002264' 005720                  TST     (R0)+           ;TRAP IF IT DOES NOT EXIST
002266' 010067  176046          MOV     R0,X04          ;SETUP ADDRESS OF LINE PARAMETER REGISTER
002272' 005720                  TST     (R0)+           ;TRAP IF IT DOES NOT EXIST
002274' 010067  176042          MOV     R0,X06          ;SETUP ADDRESS OF CURRENT ADDRESS REGISTER
002300' 005720                  TST     (R0)+           ;TRAP IF IT DOES NOT EXIST
002302' 010067  176036          MOV     R0,X10          ;SETUP ADDRESS OF BYTE COUNT REGISTER
002306' 005720                  TST     (R0)+           ;TRAP IF IT DOES NOT EXIST
002310' 010067  176032          MOV     R0,X12          ;SETUP ADDRESS OF BUFFER ACTIVE REGISTER
002314' 005720                  TST     (R0)+           ;TRAP IF IT DOES NOT EXIST
002316' 010067  176026          MOV     R0,X14          ;SETUP ADDRESS OF BREAK CONTROL REGISTER
002322' 005720                  TST     (R0)+           ;TRAP IF IT DOES NOT EXIST
002324' 010067  176022          MOV     R0,X16          ;SETUP THE ADDRESS OF THE SILO STATUS REGISTER
002330' 005720                  TST     (R0)+           ;TRAP IF IT DOES NOT EXIST
                                ;NOW SETUP DH11 INTERRUPT VECTORS. THERE ARE 2 OF THEM, ONE
                                ;FOR RECEIVER INTERRUPTS, AND 1 FOR TRANSMITER INTERRUPTS
002332' 016700  175452          MOV     VECTOR,R0       ;GET THE VECTOR ADDRESS
002336' 012720  001702'         MOV     #INTSER,(R0)+   ;POINT VECTOR TO RECEIVER INTERRUPT SERVICE
002342' 116720  175444          MOVB    BR1,(R0)+       ;SET PRIORITY LEVEL FOR THE INTERRUPT ROUTINE
002346' 105020                  CLRB    (R0)+           ;SET R0 TO AN EVEN ADDRESS
002350' 012720  002174'         MOV     #XINT,(R0)+     ;POINT VECTOR AT TRANSMITER SERVICE ROUTINE
002354' 116720  175432          MOVB    BR1,(R0)+       ;PRIORITY LEVEL FOR THE TRANSMITER INTERRUPT RCUTINE
002360' 105020                  CLRB    (R0)+           ;SET R0 TO AN EVEN ADDRESS
                                ;NOW SETUP ERROR QUEUE POINTERS
002362' 012767  016702' 175700          MOV     #ERQUEU,ERPT1   ;SET THE "WHERE WE'VE SERVICED TO" ERROR QUEUE
                                                                ;POINTER TO THE BEGINING OF THE QUEUE AREA
002370' 012767  016702' 175674          MOV     #ERQUEU,ERPT2   ;SET THE "WHERE WE'VE PUT STUFF" ERROR QUEUE
                                                                ;POINTER TO THE BEGINING OF THE QUEUE AREA
                                ;NOW ASSIGN BUFFER POINTERS TO SELECTED LINES (DONE ONLY ONCE AT THE BEGINING)
002376' 005067  175622          CLR     SELCNT          ;INIT DEVICE SELECT COUNT TO 0 BEFORE COUNTING VT20'S
002402' 005067  175642          CLR     DUNCNT          ;AND OF COURSE NONE HAVE FINISHED YET
002406' 016701  175402          MOV     DVID1,R1        ;MAKE BITMAP OF SELECTED VT20 LINES MORE ACCESSABLE
002412' 005000                  CLR     R0              ;INIT FOR 16 POSSIBLE LINES
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002414' 005067  175636          CLR     TEMPQ           ;INIT THE LINE #
002420' 005060  000454'  1$:    CLR     LOEC(0)         ;ASSUME LINE IS UNSELECTED UNTIL PROVEN OTHERWISE
002424' 006001                  ROR     R1              ;PUT A BIT INTO THE C-BIT
002426' 103031                  BCC     2$              ;IS THE LINE TO BE USED ?
002430' 016067  000274' 000354'         MOV     BUFLIST(0),LOSW(0)      ;YES, ASSIGN A BUFFER POINTER TO THAT LINE
002436' 042777  000017  175670          BIC     #17,@#X00       ;CLEAR OUT LINE SELECTION BITS
002444' 005367  175600                  DEC     DUNCNT          ;ADD 1 TO COUNT OF ACTIVE DEVICES
002450' 000240                  NOP
002452' 156777  175600  175654          BISB    TEMPQ,@X00      ;SET LINE SELECTION BITS FOR THIS LINE
002460' 016077  000414' 175652          MOV     LOBR(0),@X04    ;SETUP BAUD RATES FOR THIS LINE
002466' 052777  000023  175644          BIS     #23,@#X04       ;PARITY-FULL DUPLEX-8 BIT
002474' 005060  000514'                 CLR     LOCC(0)         ;CLEAR OUT THIS LINES CHARACTER COUNT
002500' 012760  000003  000454'         MOV     #3,LOEC(0)      ;START OUT THE LINE IN RECIEVE MODE
002506' 005267  175512                  INC     SELCNT          ;UPDATE COUNT OF SELLECTED VT2C'S
002512' 062700  000002          2$:     ADD     #2,R0           ;GO ON TO THE NEXT LINE
002516' 005267  175534                  INC     TEMPQ           ;NEXT LINE
002522' 026727  175530  000017          CMP     TEMPQ,#17       ;CHECKED ALL LINES FOR SELECTION YET ?
002530' 001333                  BNE     1$              ;IF NOT, GO BACK AND CHECK THE NEXT ONE
002532' 000207                  RTS     PC              ;RETURN


002534' 000000          NUMBA1: .WORD   0
002536' 000000          NUMBA2: .WORD   0
002540' 000000          NUMBA3: .WORD   0

002542' 000303          VTBF0:  .BLKW   195.            ;BUFFER SPACE FOR 1ST SELLECTED DH11 LINE
003350' 000303          VTBF1:  .BLKW   195.            ;BUFFER SPACE FOR 2ND SELECTED DH11 LINE
004156' 000303          VTBF2:  .BLKW   195.            ;BUFFER SPACE FOR 3RD SELLECTED DH11 LINE
004764' 000303          VTBF3:  .BLKW   195.            ;BUFFER SPACE FOR 4TH SELLECTED DH11 LINE
005572' 000303          VTBF4:  .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
006400' 000303          VTBF5:  .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
007206' 000303          VTBF6:  .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
010014' 000303          VTBF7:  .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
010622' 000303          VTBF10: .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
011430' 000303          VTBF11: .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
012236' 000303          VTBF12: .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
013044' 000303          VTBF13: .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
013652' 000303          VTBF14: .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
014460' 000303          VTBF15: .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
015266' 000303          VTBF16: .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
016074' 000303          VTBF17: .BLKW   195.            ;BUFFER SPACE FOR A SELLECTED DH11 LINE
016702' 000074          ERQUEU: .BLKW   60.             ;RECEIVER ERROR QUEUE SPACE
017072' 000000          ERQOFL: .WORD   0               ;ERROR QUEUE OVERFLOW BOUNDARY


                                ;FOLLOWING IS THE TEXT FOR ALL ASCII ERROR MESSAGES
017074' 047516  046040  047111  MESNR:  .ASCIZ  /NO LINES REMAIN ACTIVE/
017102' 051505  051040  046505
017110' 044501  020116  041501
017116' 044524  042526  000
017123'     040 047516  053040  MESWS:  .ASCIZ  / NO VT20'S SELECTED/
017130' 031124  023460  020123
017136' 042524  042514  052103
017144' 042105  000
017147'     040 044514  042516  MESDH:  .ASCIZ  / LINE /
017154' 000040
```

```
   749  017156' 042040  042111  047040  MESDH1: .ASCIZ  / DID NOT COMPLETE 1 TRANSFER IN TIME/
   750  017164' 052117  041440  046517
   751  017172' 046120  052105  020105
   752  017200' 020061  051124  047101
   753  017206' 043123  051105  044440
   754  017214' 020116  044524  042515
   755  017222'     0  000
   756  017223'   123  020117  042527  MESDH2: .ASCIZ  /SO WE ARE DROPING THE LINE/
   757  017230' 040440  042522  042040
   758  017236' 047522  044520  043516
   759  017244' 052040  042510  046040
   760  017252' 047111  000105
   761  017256' 042440  051124  051117  MESUS:  .ASCIZ  / ERRORS ON UNSELECTED LINE/
   762  017264' 020123  047105  052440
   763  017272' 051516  046105  041505
   764  017300' 042524  020104  044514
   765  017306' 042516      0  000
   766  017311'   040  044523  047514  MESSO:  .ASCIZ  / SILO OVERFLOW... ITS FATAL/
   767  017316' 047440  042526  043122
   768  017324' 047514  051127  042456
   769  017332' 044440  051524  043040
   770  017340' 052101  046101      0  000
   771  017345'   040  020101  042522  MESRE:  .ASCIZ  / A RECEIVER ERROR BIT WAS SET/
   772  017352' 042503  053111  051105
   773  017360' 042440  051122  051117
   774  017366' 041040  052111  053440
   775  017374' 051501  051440  052105
   776  017402'     0  000
   777  017403'    45      0  000  MESBE:  .ASCIZ  /%/
   778  017405'    60  030060  030060  MESNM0: .ASCIZ  /000000/
   779  017412' 000060
   780  017414' 030060  030060  030060  MESNM1: .ASCIZ  /000000/
   781  017422'     0  000
   782          017424'                        .EVEN                   ;IN CASE THERE IS AN ODD # OF BYTES IN THE ABOVE MESSAGE
   783
   784                                 ;TABLE OF ERROR MESSAGE POINTERS & TERMINATORS (COMMENTED!)
   785  017424' 017403'                ERRMS:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
   786  017426' 017443'                        MESMS                   ;POINTS TO AN ASCIZ ERROR MESSAGE
   787  017430' 177777'                        177777                  ;TERMINATOR, ONLY 1 MESSAGE THIS TIME
   788  017432' 017403'                ERRNR:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
   789  017434' 017074'                        MESNR                   ;POINTS TO "NO LINES REMAIN ACTIVE" MESSAGE
   790  017436' 177777'                        177777                  ;TERMINATE MESSAGE
   791  017440' 017403'                ERRDH:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
   792  017442' 017147'                        MESDH                   ;POINTS TO 1ST PART OF "HUNG" ERROR MESSAGE ASCIZ
   793  017444' 017405'                        MESNM0                  ;POINTS TO LINE # ASCIZ
   794  017446' 017156'                        MESDH1                  ;POINTS TO PART OF MESSAGE
   795  017450' 017403'                        MESBE                   ;RETURN
   796  017452' 017233'                        MESDH2                  ;DROPING A LINE MESSAGE
   797  017454' 177777'                        177777                  ;END OF MESSAGE
   798  017456' 017403'                ERRSO:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
   799  017460' 017311'                        MESSO                   ;POINTS TO ASCIZ TEXT OF FATAL ERROR MESSAGE
   800  017462' 177777'                        177777                  ;THIS INDICATES THAT NO MORE MESSAGES FOLLOW
   801  017464' 017403'                ERRRE:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
   802  017466' 017345'                        MESRE                   ;POINTS TO ASCIZ TEXT OF THE RECEIVER ERROR MESSAGE
   803  017470' 177777'                        177777                  ;TERMINATOR
   804  017472' 017403'                ERRUS:  MESBE                   ;POINTS TO A CARRIAGE RETURN-LINE FEED
```



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   805  017474' 017405'                        MESNM0          ;POINTS TO ASCIZ FOR # OF ERRORS
   806  017476' 017256'                        MESUS           ;POINTS TO TEXT PART OF MESSAGE
   807  017500' 017412'                        MESNM1          ;POINTS TO ASCIZ FOR LINE #
   808  017502' 177777                        177777          ;SIGNALS END OF MESSAGE TO DECX/11
   809
   810          000001                 ;END OF MESSAGE TABLE
                                       .END
```

```
ACSR     000102R          233#  469*  497*  553*
ADDR     000006R          199#  390*  397   657
ADDR22=  001000           251#
ALDONE   001362R          484   489#
ASB      000106R          237#
ASTAT    000104R          235#  470*  498*  554*
AWAS     000110R          238#
BEGIN    000000R          196#  399   400   439   444   445   463   464   471   474   504   507   510
                          524   535   539   547   556   559   561   594   610   629   631   644
BIT0   =  000001           251#
BIT1   =  000002           251#
BIT10  =  002000           251#
BIT11  =  004000           251#
BIT12  =  010000           251#
BIT13  =  020000           251#
BIT14  =  040000           251#
BIT15  =  100000           251#
BIT2   =  000004           251#
BIT3   =  000010           251#
BIT4   =  000020           251#
BIT5   =  000040           251#
BIT6   =  000100           251#
BIT7   =  000200           251#
BIT8   =  000400           251#
BIT9   =  001000           251#
BPLIST   000274R          275#  697
BRAKE    001216R          460   462#
BREAK$=  104407           251#  463   464
BR1      000012R          201#  678   681
BR2      000013R          202#
BTOD$  = 104421           251#
CDATA$=  104412           251#
CONFIG   000056R          221#
COUNT1   000262R          267#
CSRA     000100R          231#  468*  496*  552*
DATCK$=  104411           251#
DATER$=  104404           251#
DROP     000624R          397#
DUNCNT   000250R          262#  415*  421*  483   640*  690*  699*
DVID1    000014R          203#  393   691
ENDIT$=  104413           251#  547
END$   = 104410           251#  400   445   561
ERPT1    000270R          272#  465   467   476*  477   479*  684*
ERPT2    000272R          273#  465   477   480*  617   619*  620*  621*  622*  623*  686*
ERQUEL   017072R          617   736#
ERQUEU   016702R          479   480#  619   684   686   735#
ERRDH    017440R          507   791#
ERRHW    017432R          444   788#
ERRNS    017424R          399   785#
ERRPT    001624R          482   552#
ERRRE    017464R          471   801#
ERRSO    017456R          556   798#
ERRTYP   000106R          236#  472#  508*  557*
ERRUS    017472R          539   804#
EXIT$  = 104400           251#  610*  629   631   644
EXTAD    000246R          261#  431*  432
```



```
FATERR   000266R          271#  481   589*  656*
GETPA$=  104415           251#  430
GWBUF$=  104414           251#
HRDCNT   000044R          216#
HRDERS=  104405           251#  474   510   559
HRDPAS   000050R          218#
ICONT    000036R          213#
ICOUNT   000040R          214#
IDNUM    000122R          243#
INIT     000030R          210#
INTR     000120R          242#  387*
INTSRV   001702R          461   586#  677
INTSW    000264R          269#  590*  597*  607*  626*  641*
LOBR     000414R          321#  404   702
LOCC     000514R          365#  426   434*  613*  639   704*
LOEC     000454R          346#  416   418*  491   493   495*  514   519   604   606*  616*  638*  694*
                          709#
LOSW     000354R          302#  429   611*  612*  639*  697*
L1BR     000416R          322#
L1CC     000516R          366#
L1EC     000456R          347#
L1SW     000356R          303#
L10BR    000434R          329#
L10CC    000534R          373#
L10EC    000474R          354#
L10SW    000374R          310#
L11BR    000436R          330#
L11CC    000536R          374#
L11EC    000476R          355#
L11SW    000376R          311#
L12BR    000440R          331#
L12CC    000540R          375#
L12EC    000500R          356#
L12SW    000400R          312#
L13BR    000442R          332#
L13CC    000542R          376#
L13EC    000502R          357#
L13SW    000402R          313#
L14BR    000444R          333#
L14CC    000544R          377#
L14EC    000504R          358#
L14SW    000404R          314#
L15BR    000446R          334#
L15CC    000546R          376#
L15EC    000506R          359#
L15SW    000406R          315#
L16BR    000450R          335#
L16CC    000550R          379#
L16EC    000510R          360#
L16SW    000410R          316#
L17BR    000452R          336#
L17CC    000552R          380#
L17EC    000512R          361#
L17SW    000412R          317#
L2BR     000420R          323#
L2CC     000520R          367#
```

```
L2EC    000460R  348#
L2SW    000360R  304#
L3BR    000422R  324#
L3CC    000522R  368#
L3EC    000462R  349#
L3SW    000362R  305#
L4BR    000424R  325#
L4CC    000524R  369#
L4EC    000464R  350#
L4SW    000364R  306#
L5BR    000426R  326#
L5CC    000526R  370#
L5EC    000466R  351#
L5SW    000366R  307#
L6BR    000430R  327#
L6CC    000530R  371#
L6EC    000470R  352#
L6SW    000370R  308#
L7BR    000432R  328#
L7CC    000532R  372#
L7EC    000472R  353#
L7SW    000372R  309#
MAIN    001162R  447    456#
MAP22$= 104416   251#
MESBE   017403R  777#   785     788     791     795     798     801     804
MESDH   017147R  747#   782
MESDH1  017156R  749#   784
MESDH2  017223R  756#   796
MESHW   017405R  504     524     778#    793     805
MESHW1  017414R  535     780#    807
MESNR   017074R  739#   789
MESNS   017123R  743#   786
MESRE   017345R  771#   802
MESSO   017311R  766#   799
MESUS   017256R  761#   806
MLOOP   001202R  459#   486     488
MODNAM  000000R  197#
MODSP   000224R  211     249#
MSGW$ = 104403   251#   399     444     471     507     539     556
MSGS$ = 104402   251#
MSG$  = 104401   251#
MODROP  001156R  394#   448#
NOERR   002136R  615     624#
NULL  = 000000   251#   474#
NUMBA1  002534R  496#   500*    510     559
NUMBA2  002536R  520*    524     715#
NUMBA3  002540R  531*    535     717#
NXTPER  000716R  412#   545
OPE#  = 000000   199     204     205     206     207     224     225     226     227     228     229     230     231
                 235     236     237     238     240     241     242     251#
OTOA$ = 104420   251#   504     524     535
PASCNT  000034R  212#
PHYSAD  000244R  260#   433
PIRQ$ = 000004   251#   594
POPSP = 005726   251#
POPSP2= 022626   251#
```



```
PRTY  = 000000   202     251#
PRTY0 = 000000   251#
PRTY1 = 000040   251#
PRTY2 = 000100   251#
PRTY3 = 000140   251#
PRTY4 = 000200   251#
PRTY5 = 000240   201     251#
PRTY6 = 000300   251#
PRTY7 = 000340   251#
PS    = 177776   251#
PSW   = 177776   251#
PUSH    005746   251#
PUSH2   024646   251#
RAND$ = 104417   251#
RANNUM  000054R  220#
RCVMOD  002036R  605     611#
RELOC   000232R  255#
RESTRT  000652R  539     404#
RES1    000056R  222#
RES2    000060R  223#
RETRN   002164R  588     639#
RINT    001736R  587     592#
RSTRT   000112R  239#
SAVR0   000226R  253#
SBADR   000102R  232#
SELCNT  000224R  252#   689*    706*
SETUP   002242R  448     656#
SOFCNT  000042R  215#
SOFFAS= 104406   251#
SOFFAS  000040R  214#
SPOINT  000032R  211     392     457
SPSIZ = 000040   1       244
SR1     000016R  204#
SR2     000020R  205#
SR3     000022R  206#
SR4     000024R  207#
START   000548R  210     387#
STAT    000026R  209#
SVR0    000062R  224#   596*    609     628     630     643
SVR1    000064R  225#
SVR2    000066R  226#
SVR3    000070R  227#
SVR4    000072R  228#
SVR5    000074R  229#
SVR6    000076R  230#
SVT0    000234R  256#
SVT1    000236R  257#
SYSCNT  000052R  219#
TEMP    000254R  264#   422*    423*    434*    435     436*    437*    438
TEMP0   000256R  265#   432*    439*    441     446     498     596*    600     611     622     624     693*
                 701     708*    709
TEMP1   000260R  266#   600*    601     614
TRPDFD= 000022   251#
TSTFE   001332R  478     481#
TSTRE   001226R  465#
VECTOR  000010R  200#   676
```

```
VIRTAD  000242R          259#    429*    430
VTBF0   002542R          275     719#
VTBF1   003350R          276     720#
VTBF10  010622R          283     727#
VTBF11  011430R          284     728#
VTBF12  012236R          285     729#
VTBF13  013044R          286     730#
VTBF14  013652R          287     731#
VTBF15  014460R          288     732#
VTBF16  015266R          289     733#
VTBF17  016074R          290     734#
VTBF2   004156R          277     721#
VTBF3   004764R          278     722#
VTBF4   005572R          279     723#
VTBF5   006400R          280     724#
VTBF6   007206R          281     725#
VTBF7   010014R          282     726#
WAITIM  000230R          252#    485*
WAITIN  000252R          263#    391*    413*    487*
WASADR  000104R          234#
WDFR    000116R          241#    389*
WDTQ    000114R          240#    388*
XCNT    000240R          258#    404*    405*    406*    407*    408*    409*    410*    411*    543*
XFLAG   000005R          198#
XINT    002174R          634#    680
XMIT    002204R          636     638#
XXXX    001744R          593     596#
X00     000334R          292#    397*    398*    425*    432*    443*    458*    466*    489*    496     497     552     553
                         555*    586     588*    620     634*    658*    698*    701*
X02     000336R          293#    598     660*
X04     000340R          294#    662*    703*
X06     000342R          295#    433*    664*
X10     000344R          296#    426*    666*
X12     000346R          297#    446*    668*
X14     000350R          298#    670*
X16     000352R          299#    456*    554     672*
YYYY    001756R          598#    608     627     645
.       = 017504R        719#    720#    721#    722#    723#    724#    725#    726#    727#    728#    729#    730#    731#
                         732#    733#    734#    735#    782#

. ABS.  000000      000
        017504      001

ERRORS DETECTED:  0
DEFAULT GLOBALS GENERATED:  0

XVTBB0,XVTBB0/SQL/CRF:SYM=DDXCOM,XVTBB0
RUN-TIME:  1  2  .4 SECONDS
RUN-TIME RATIO:  20/5=4.0
CORE USED:  7K  (13 PAGES)
```