```
                IMP SYSTEM

                .VERS.=3050

                DCA=0

                PRINTX /NETWORK VERSION /
                PNTNUM .VERS.
                PRINTX /
                /

                REPEAT 1IF VZ DCA,[
                PRINTX /ARPA NET SYSTEM

                /          ]

                REPEAT 0IF VZ DCA,[
                PRINTX /DCA NET SYSTEM

                /          ]
```

```
ACA=141216
ADD=14000 /516 OPCODES
ANA=6000
AOA=141206
CAL=141050
CAR=141044
CAS=22000
CHS=140024
CMA=140401
CRA=140040
CSA=140320
DXA=11
.ENB=401
ERA=12000
EXA=13
HLT=0
IAB=201
ICA=141340
ICL=141140
ICR=141240
IMA=26000
.INH=1001
INK=43
IRS=24000
JMP=2000
JST=20000
LDA=4000
LDX=72000
NOP=101000
OTK=171020
RCB=140200
SCB=140600
SKP=100000
SLN=101100
SLZ=100100
SMI=101400
SNZ=101040
SPL=100400
SRC=100001
SR1=100020
SR2=100010
SR3=100004
SR4=100002
```

```
                SSC=101001
                SSM=140500
                SSP=140100
                SS1=101020
                SS2=101010
                SS3=101004
                SS4=101002
                STA=10000
                STX=32000
                SUB=16000
                SZE=100040
                TCA=140407

                IRP [I,,ALS,ARS,ALR,ARR,LGL,LGR,LLS,LRS,LLR,LRR,LLL,LRL], [N,
                415,405,416,406,414,404,411,401,412,402,410,400]

                DEFINE I C
                0 0 N*00+100-C"A"77
                TERMINATE

                ENDIRP


                IRP [I,,INA,OCP,OTA,SKS,SMK],[N,,13,3,17,7,17]

                DEFINE I C
                0 0 N*0000 C
                TERMINATE

                ENDIRP


                X=40000
                I=100000
                XI=140000

                DEFINE BSS N
                          200000
                          0 0 , N-1/
                TERMINATE
```

```
                /SKS'S, OCP'S, ETC FOR PRODUCTION MACHINES

                IRP [NUM,,1,2,3,4,5]

                M'NUM'OUT=OCP 7'NUM
                M'NUM'UNXP=OCP 17'NUM
                M'NUM'LXP=OCP 27'NUM
                M'NUM'IXP=OCP 37'NUM
                M'NUM'IN=OCP 47'NUM

                M'NUM'ERR=SKS 47'NUM

                M'NUM'INIL=63 NUM
                M'NUM'OTIL=70 NUM

                M'NUM'INBP=16 NUM NUM
                M'NUM'OTBP=30 NUM NUM

                ENDIRP


                IRP [NUM,,1,2,3]

                H'NUM'ROUT=OCP 100+[10"T"NUM]
                H'NUM'IN=OCP 200+[10"T"NUM]
                H'NUM'FOUT=OCP 300+[10"T"NUM]
                H'NUM'XP=OCP 400+[10"T"NUM]
                H'NUM'UNXP=OCP 500+[10"T"NUM]
                H'NUM'ENAB=OCP 600+[10"T"NUM]

                H'NUM'ERR=SKS 100+[10"T"NUM]
                H'NUM'RDY=SKS 200+[10"T"NUM]
                H'NUM'EOM=SKS 300+[10"T"NUM]
                H'NUM'FULL=SKS 500+[10"T"NUM]

                H'NUM'OTIL=75 NUM
                H'NUM'INIL=77 NUM

                H'NUM'OTBP=42 NUM NUM
                H'NUM'INBP=46 NUM NUM

                ENDIRP
```

```
                H3OTIL=M5INIL               /HOST 3 IS A LITTLE STRANGE
                H3INIL=M5OTIL
                H3OTBP=54
                H3INBP=56
                H4OTIL=M4INIL               /HOST 4 IS YET STRANGER
                H4INIL=M4OTIL
                H4OTBP=M5INBP
                H4INBP=M5OTBP
                H4ROUT=OCP 51
                H4IN=OCP 151
                H4FOUT=OCP 251
                H4XP=OCP 351
                H4UNXP=OCP 451
                H4ENAB=OCP 551
                H4ERR=SKS 51
                H4RDY=SKS 151
                H4EOM=SKS 251
                H4FULL=SKS 451

                CLKON=OCP 40
                CLKOFF=OCP 1040
                RDCLOK=INA 1040
                CLOKIL=102

                TASK=OCP 41
                TASKIL=103

                WDT=OCP 26
                WDTIL=62
                PFIL=60
                SWDTIL=61

                LITES=OTA 26
                RDIMPN=INA 1041

                AMIMLC=SKS 42

                AMI516=SKS 26
```

```
                /SKS'S AND OCP'S NATIVE TO THE 516

                STDIL=63                    /STANDARD INTERRUPT LOCATION
                TTSIM=OCP 4                 /SELECT INPUT MODE
                TTSOM=OCP 104               /SELECT OUTPUT MODE
                TTSRDY=SKS 4
                TTSNBZ=SKS 104
                TTSNSC=SKS 504
                TTINA=INA 4
                TTINB=INA 204
                TTINAC=INA 1004
                TTINBC=INA 1204
                TTOTA=OTA 4
                TTOTB=OTA 204

                INTM=120                    /SMK TO SET THE PRIORITY INTERRUPT !
                JUNK=1
```

```
        EQUALS R,REPEAT
        EQUALS D,DEFINE
        EQUALS T,TERMINATE
        EQUALS P,PRINTX
        EQUALS PR,PRINT

        /MACROS TO TYPE OUT INTERESTING LOCATIONS

        D DEFPLC TX
        .TA,=.      100201/
        .TA,        .ASCII /TX*"Z"/
        .TA,/
        T DEFPLC

        D RELOAD TX
        .TA,=.      100301/
        .TA,+1      .ASCII /TX*"Z"/
        .TA,/
        T RELOAD

        D DEFHLT TX
        .TA,=.      100101/
        .TA,+1      .ASCII /TX*"Z"/
        .TA,/
        T DEFHLT

        /TITLES FOR DUMPED TEXTS
        100200/
                    .ASCII /USEFUL LOCATIONS
        "Z"/
        100100/
                    .ASCII /HALT LOCATIONS
        "Z"/
        100000/
                    .ASCII / PATCH   BEG     END         BUFS"Z"/
        100300/
                    .ASCII /CRASH=RELOAD LOCATIONS
        "Z"/
        100400/
                    .ASCII /   IMP BUFFERS ASSIGNED
          PAGE
        "Z"/
```

```
                /MACROS TO SET UP STATISTICS TABLES

                NSTATS=0
                MAXSTAT=22.

                /CALL DEFSTAT <INSTRUCTION>,<SUBR TO CALL>
                D DEFSTAT A,B
                .TA.=.
                .TB.=A     A
                R 1IF P,[
                SW1+NSTATS/                B
                SB1+NSTATS/                .TA.
                SC1+NSTATS/                .TB.
                .TA.+1/
                ]
                NSTATS=NSTATS+1
                R 1IF VP NSTATS-MAXSTAT,[
                PR "TOO MANY STATISTICS"
                NSTATS=NSTATS-1
                ]
                T DEFSTAT
```

```
                /MACROS FOR IMP/TIP INITIALIZATION
                NITB=0
                MAXITB=20,+4                /SATDEF USES 4
                /CALL TIPDEF <IMP INSTR>,<TIP INSTR>

                D TIPDEF A,B
                .TA.=.
                .TB.=A      BSS 1
                .TC.=B
                R 1IF P,[
                ITBLOC+NITB/                .TA.
                ITBIMP+NITB/                .TB.
                ITBTIP+NITB/                .TC.
                .TA.+1/
                ]
                NITB=NITB+1
                R 0IF VP MAXITB=NITB,[
                PR "TOO MANY IMP/TIP INSTRS"
                NITB=NITB-1
                ]
                T TIPDEF

                R 1IF P,[
                ITBLOC/
                R MAXITB,[
                          1
                ]
02236 000001    ]
02237 000001
02240 000001
02241 000001
02242 000001
02243 000001
02244 000001
02245 000001
02246 000001
02247 000001
02250 000001
02251 000001
02252 000001
02253 000001
02254 000001
02255 000001
02256 000001
02257 000001
02260 000001
02261 000001
02262 000001
02263 000001
02264 000001
02265 000001
```

```
/ VDH/IMP DEF MACRO
D VDHD LOC,VDH,IMP
.TA.=.
LOC/
.TC.=VDH
.TB.=IMP
BSS 1
ITBVDH+ITBVP/ .TC.
ITBNVD+ITBVP/ .TB.
ITBVDL+ITBVP/ LOC
ITBVP=ITBVP+1
R 0IF VP MAXVDH=ITBVP,[
PR "TOO MANY IMP/VDH INSTRS"
ITBVP=ITBVP-1
]
0+0+.TA./
T
/SAT/IMP DEF (RESTORE) MACRO
D SATDEF A
TIPDEF A,A
T SATDEF

/MACRO TO COMPUTE 16 BIT ADD CHECKSUM
/FOR ROUTING CODE, USED BY I2MLT AND RTGO

D K ARG
.TA.=ARG
CHK=0 0 177777"A"[CHK+0+.TA.]
ARG
T K
```

```
                /THE STANDARD IMP INTERRUPT LEVELS
                M2I=0       /MODEM-TO-IMP RUNS LOCKED
                I2M=M2I+2   /IMP-TO-MODEM - SKIP VDI
                I2H=I2M+1   /IMP-TO-HOST
                H2I=I2H+1   /HOST-TO-IMP
                T.O=H2I+1   /TIMEOUT
                TSK=T.O+1   /TASK
                BCK=TSK+1   /BACKGROUND

                /SOME OTHER LEVEL 0 TYPES
                INI=0       /INITIALIZATION
                TTY=0       /TELETYPE INTERRUPT
                WDI=0       /WATCH DOG TIMER INTERRUPT
                RSI=0       /POWER FAIL INTERRUPT
                SIN=0       /SOFTWARE INTERRUPT CALLS
                ALL=0       /UNINTERRUPTABLE CODE LIKE DXA JMP SEQUENCE
                FRE=0       /REFERENCES TO FREE LIST AND COUNT
                MSK=0       /REFERENCES TO INTERRUPT MASK

                /VDH LEVELS
                VDI=M2I+1   /INPUT INTERRUPT
                VDO=I2M     /OUTPUT INTERRUPT
                VDB=I2H     /BACKGROUND RUNS AT IMP-TO-HOST LEVEL

                /TIP LEVELS
                TPO=0       /OUTPUT INTERRUPT
                TPC=H2I     /CLOCK INTERRUPT
                TPB=BCK     /BACKGROUND

                /MISCELLANEOUS
                VAR=75      /VARIABLES
                CON=76      /CONSTANTS
                UND=77      /UNDEFINED
```

```
                /MACROS TO ESTABLISH INTERRUPT LEVELS FOR CODE AND DATA
                /XLEV IS HARDWARE LEVEL ESTABLISHED BY SMK INSTRUCTIONS
                /YLEV IS SOFTWARE LEVEL ESTABLISHED BY INH INSTRUCTIONS

                XLEV=0
                YLEV=0

                /MACROS WHICH ASSEMBLE CODE - INT,INH,ENB

                /DECLARE HARDWARE INTERRUPT ENTRANCE ON LEVEL N
                D INT N
                          XLEV=N
                          YLEV=0
                          WORD 0 0 300000+XLEV"T"100+YLEV
                          0
                T INT

                /INHIBIT INTERRUPTS FROM LEVELS IN LIST
                D INH LIST
                          R 0IF P,[
                          IRP [Q,,LIST]
                          R 1IF VP 0 0 Q-YLEV, [
                          PRINTX /REDUNDANT INH AT /
                          PNTNUM .
                          PRINTX /
                /         ]
                          ENDIRP
                          ]

                          YLEV=100
                          IRP [Q,,LIST]
                          R 1IF VP 0 0 YLEV-Q,YLEV=Q
                          ENDIRP

                          .INH
                          WORD 0 0 300000+XLEV"T"100+YLEV
                T INH

                /ENABLE HIGHER INTERRUPTS FROM LEVEL N
                D ENB N
                          R 0IF P,[
                          R 0IF VZ 0 0 XLEV-N, [
                          PRINTX /INCORRECT ENB AT /
                          PNTNUM .
                          PRINTX /
                /         ]
                          ]
                          YLEV=N
                          .ENB
                          WORD 0 0 300000+XLEV"T"100+YLEV
                T ENB
```

```
                /MORE INTERRUPT LEVEL MACROS
                /MACROS WHICH DO NOT ASSEMBLE CODE - LEV,LCK,RET

                /DECLARE CODE OR DATA TO BE AT LOGICAL LEVELS IN LIST
                D LEV LIST
                        XLEV=100
                        IRP [Q,,LIST]
                        R 1IF VP 0 0 XLEV-Q,XLEV=Q
                        ENDIRP
                        YLEV=XLEV
                        WORD 0 0 300000+XLEV"T"100+YLEV
                T LEV

                /DECLARE AN IMPLICIT INH IN CODE
                D LCK LIST
                        R 0IF P,[
                        IRP [Q,,LIST]
                        R 1IF VP 0 0 Q-YLEV, [
                        PRINTX /REDUNDANT LCK AT /
                        PNTNUM .
                        PRINTX /
                /       ]
                        ENDIRP
                        ]

                        YLEV=100
                        IRP [Q,,LIST]
                        R 1IF VP 0 0 YLEV-Q,YLEV=Q
                        ENDIRP

                        WORD 0 0 300000+XLEV"T"100+YLEV
                T LCK

                /DECLARE AN IMPLICIT ENB IN CODE
                D RET N
                        R 0IF P,[
                        R 0IF VZ 0 0 XLEV-N, [
                        PRINTX /INCORRECT RET AT /
                        PNTNUM .
                        PRINTX /
                /       ]
                        ]
                        YLEV=N
                        WORD 0 0 300000+XLEV"T"100+YLEV
                T RET
```

```
                /SOME SYSTEM PARAMETERS
                NH=4                        /NO OF REAL HOSTS
                FH=4                        /NO OF FAKE HOSTS
                TH=NH+FH
                BH=6                        /NO OF BACK HOSTS
                CH=5                        /NO OF PHONE LINES
                NIMP=64.                    /NO OF IMPS
                NACH=8                      /NO OF ACK CHANNELS PER LINE
                R 0IF VZ DCA,               BBNIMP=1  /DCA NCC IMP
                R 1IF VZ DCA,               BBNIMP=5  /ARPA NCC IMP
                BBNTIP=30.                  /IMP NO OF BBN TIP
                PDP1D=305                   /HOST PDP-1D AT BBN IMP
                DIAGTT=47.                  /DESTINATION FOR DIAG MESSAGES
                H.N=1                       /NUMBER OF VDH HOST
                M.N=2                       /NUMBER OF VDH MODEM (UCSB)
                PTCK=60.                    /NUMBER OF TICKS TO PROP ROUTING
                30SEC=47.                   /NUMBER OF TICKS IN 30 SECS
                MAXH=22.                    /MAX NO OF HOPS IN NET
                NSPD=4                      /# OF DIFFERENT LINE SPDS WE HANDLE

                /WORDS IN BUFFER
                IT=1                        /INPUT TIME
                ST=1                        /SENT TIME
                PTRT=2                      /PNTR TO TRACE BLOCK
                INCH=3                      /INPUT CHANNEL
                ACKH=4                      /ACKNOWLEDGE HEADER
                HEAD=5                      /HEADER = 4 WORDS
                HEAD1=6
                CNTL=7
                HEAD2=7
                HEAD3=8
                MINPL=HEAD3
                DATA=9                      /BEGINNING OF DATA STORAGE
                BUFE=73.                    /PNTR TO END OF DATA

                /WORDS IN TRACE BLOCK
                TIT=1                       /TRACE INPUT TIME
                TTT=2                       /TRACE TASK TIME
                TST=3                       /TRACE OUTPUT TIME
                TAT=4                       /TRACE ACKNOWLEDGE TIME
                THED=5                      /TRACE HEADER (4 WORDS)
                TQUE=9                      /TRACE QUEUE
                TDONE=10.                   /TRACE DONE (100000=DONE)

                /WORDS IN REASSEMBLY BLOCK
                RID=1                       /ID = MESS NO + IMP NO
                RMAX=2                      /NO OF PCKTS MAX
                REAS=3                      /BLOCK OF 8 PCKT PNTRS
                RSF=11.                     /NO OF PCKTS SO FAR = USED AS 9TH P
```

```
                /BITS IN INCH
                HSTMOD=100000           /1 IF FROM HOST, 0 IF FROM MODEM
                INPCHN=17               /INPUT CHANNEL

                /BITS IN ACKH
                ODEVEN=100000
                QUADAC=60000            /WHICH QUADRANT WE ARE ACKING
                CHANUM=17400            /CHANNEL NO FOR THIS PKT
                ACKBTS=377              /MAX OF 8 ACKS

                /BITS IN HEAD (REG MESSAGE)
                MESSNO=177400
                ONEOR8=200              /1= ONE-PACKET
                REQALL=100              /TRANSMIT ONLY
                RFNM=100                /REPLY ONLY
                ORDNO=60
                INCTRN=10               /1= INC (ALSO SET ON RFNM FOR GVB)
                TRNREP=4                /1=TRANS, 0=REPLY
                GVBALL=2                /TRANSMIT ONLY
                ALLOC=2                 /REPLY ONLY
                LINETS=1
                /BITS IN RUTHED (ROUTING MESSAGE)
                SNDCOR=100000
                RUTIMP=37400            /IMPNO TO IDENTIFY LOOPED LINES
                IHERDU=20
                RUTDMP=10               /1=CORE DUMP ON FIRST HOP FROM DEAD
                GETCOR=4                /1=DEMAND THE IMP TO RELOAD
                NULPKT=2                /1=NULL PKT WITH ACKS ONLY
                LINETS=1                /1=ROUTING MESSAGE

                /BITS IN HEAD1
                PRIBIT=100000
                FORIMP=40000
                TRACE=20000
                FOROCT=10000
                PKTNO=3400              /TRANSMIT ONLY
                PKTN1=400               /LOW ORDER BIT OF PACKET NUMBER
                REPDED=400              /REPLY ONLY - DEST DEAD
                DESTH=300
                DESTI=77
                DESTHI=377

                /BITS IN HEAD2
                LSTPKT=100000
                FRMIMP=40000
                FRMOCT=10000
                IHCODE=7400
                HICODE=7400
                ENDBIT=1000             /1=PKT FROM HI NO IMP ON LINE
                SRCEH=300
                SRCEI=77
                SRCEHI=377
```

```
                /BITS IN HEAD3
                LINKNO=177760
                SUBCOD=7                /IMP-TO-HOST SUB-CODES

                /BITS IN BUFE
                TWOQ=100000             /1 = ON TWO QUEUES (IN PPT)

                /BITS IN TMESS
                MESSNO=177400           /LAST MESS NO TRANSMITTED
                MESS1=400               /LOW ORDER BIT
                MSTO2=200
                MSTO1=100               /2 TIMEOUT BITS
                ORDNO=60                /LAST ORDER NO TRANSMITTED
                MESBTS=17               /1= MESS ANSWERED

                /BITS IN RMESS
                MESSNO=177400           /OLDEST INCOMPLETE MESS NO + 3
                ORDNO=60                /NEXT ORDER NO WE WANT
                MESBTS=17               /1= MESS COMPLETE

                /BITS IN AMESS
                MESSNO=177400           /NEXT MESS NO TO REPLY TO

                /BITS IN TALLY
                SRCEI=77                /FOREIGN IMP WHO ALLOCATED US 8

                /BITS IN RALLY
                ONEOR8=200
                RFNM=100

                /WORDS IN PPT
                PPT0=0
                PPT1=PPTL               /HOST STAT TIME SENT
                /BITS IN PPT0
                RETRAN=100000           /1= GOT AN ALLOCATE FOR HIM, MUST R
```

```
                /WORDS IN PLT
                PLT0=0
                PLT1=PLTL
                PLT2=PLTL+PLTL
                PLT3=PLTL+PLTL+PLTL      /HOST STAT TIME SENT

                /BITS IN PLT0
                MESSNO=177400
                PLTUSE=200               /1 = THIS PLT ENTRY IN USE
                REQALL=100               /USEFUL FOR INC TRN
                PLTHST=7                 /LOCAL HOST NO

                /BITS IN PLT1
                PRIBIT=100000
                FORIMP=40000
                TRACE=20000
                FOROCT=10000
                DESTHI=377

                /BITS IN PLT2
                LINKNO=177760
                SUBCOD=7                 /IMP-TO-HOST SUB-CODES

                /BITS IN TSEX
                ACKTAB=377

                /BITS IN RSEX
                ACKTAB=377

                /IH CODES
                CREG=0                   /REG
                CERRLD=400               /ERROR IN HI LEADER
                          CERR32=0       /ERROR IN FIRST 32 BITS
                          CSHORT=1       /LESS THAN 32 BITS IN MESSAGE
                          CILLGL=2       /ILLEGAL HI CODE
                CIMPDN=1000              /IMP GOING DOWN
                                         /BLOCKED LINK
                CNOP=2000                /NOP
                CRFNM=2400               /RFNM
                                         /LINK  TABLE FULL
                CDESTD=3400              /DESTINATION DEAD
                          CIMPD=0        /DEST IMP DEAD
                          CHSTD=1        /DEST HOST DEAD
                CERRDT=4000              /ERROR IN HI DATA
                CINCTR=4400              /INCOMPLETE TRANS
                          CSLOWD=0       /DEST HOST TOOK >30 SECS
                          CLONG=1        /MORE THAN 8095 BITS
                          CSLOWS=2       /SOURCE HOST TOOK >15 SECS
                          CLOST=3        /LOST IN SUBNET
                          CBLOCK=4       /SOURCE IMP TOOK > 15 SECS
                          CERROR=4       /ERROR BIT SET (BECOMES CERRDT)
                CRESET=5000              /IMP-TO-HOST RESET = READY LINE FLA
```

```
/MACROS TO COLLECT FREE SPACE AND PRINT TABLES
PAGES=32.
BUFL=BUFE+1

NBUFS=-1


D PAGEND A,U,E
P /PAGE / PNTNUM A        P /
/
FB=0 0 .+0'E
NB=0
R 1IF VZ A+0-FB"Q"1000, [
NB=1+0+[0 0 1000"T"[A+1]+0-FB]"Q"BUFL
NBUFS=NBUFS+NB]
0 0 SPAR+A-2/             FB"A"777-[NB+1]"T"1000
.TA.=FB+0+NB"T"BUFL
100004/
U
FB
.TA.
NB
.ASCII /"Z"/
100400+NB+1/              .TB.=FB    A
R NB,     .TB.            .TB.=.TB.+0+BUFL
.ASCII /"Z"/
.TA./
T PAGEND

/FB IS THE ADDRESS OF THE FIRST BUFFER ON THE PAGE
/NB IS THE NUMBER OF BUFFERS BETWEEN THIS PAGE AND THE NEXT
/FORMAT OF SPAR:
/HI 7 BITS = -(NB+1)
/LO 9 BITS = LO 9 BITS OF FB
```

```
                    104/
                    /  CONSTANTS  -   THESE FIRST FEW MUST NOT MOVE
                    LEV CON
00104 023033 C      DDSAI:    DDSA            /DDT S,A, START ADDRESS
00105 003050 C      VERS:     .VERS.          /VERSION NUMBER
00106        C      MINE:     BSS 1           /MY IMP NUMBER
                    /TIME CONSTANTS IN TERMS OF 640 MS TICKS
00107 177721 C      M30SEC:   -30SEC          /30 SECONDS
00110 177704 C      PTICKS:   -PTCK           /ROUTING PROPAGATION TIME
00111        C      ADDRET:   BSS 1           /CHKSM ADDER RETURN
00112 100000 C      SIGN:     100000
00113 000000 C      ZERO:     0
00114 000001 C      ONE:      1
00115 000002 C      TWO:      2
00116 000003 C      THREE:    3
00117 000004 C      FOUR:     4
00120 000007 C      SEVEN:    7
00121 177777 C      MINUS1:   -1
00122 177776 C      MINUS2:   -2
00123 177775 C      MINUS3:   -3
00124 177774 C      MINUS4:   -4
00125 177773 C      MINUS5:   -5
00126 177772 C      MINUS6:   -6
00127 177773 C      MICH:     -CH
00130 000004 C      PLNH:     NH
00131 177770 C      MITH:     -TH
                    MIN100:
00132 177700 C      MINIMP:   -NIMP
00133 000000 C      RSFLAG:   0               /FLAG TO DETECT WDT  AND RELOADS
                    /0=NONE, 1=RESTART, 2=RELOAD, 3=WDT, 4=POWER FAIL
                    LEV VAR
00134        V      PRIM:     BSS 1           /PRIORITY INTERRUPT MASK

                    /NCC OPERATIONS LOCATIONS 135-157 MUST NOT MOVE!
                    LEV CON
                    DEFPLC [DDT STAND ALONE ENTRY]
00135 102104 C      DDT:      JMP DDSAI I
00136 000000 C      TIPRSF:   0               /ASSEMBLE IN A ZERO
                    DEFPLC [NICE-STOP AND RELOAD FLAG]
00137        C      SW3FG:    BSS 1           /ZERO=NICE STOP, THEN RELOAD
                                               />0=SPECIFIC LINE
                    DEFPLC [NICE-STOP AND RESTART FLAG]
00140        C      NRSTF:    BSS 1           /ZERO=NICE STOP, THEN RESTART
                                               /ONE=VDH RESTART
                    DEFPLC [HOST & MODEM INTERFACE CONTROL]
00141        C      HTPAR:    BSS 1           /MODEM TEST FLAG
                    DEFPLC [HOST INTERFACE TEST ENABLE AND TEST WORD]
00142        C      HLNM:     BSS 1           /# OF INTERFACE BEING TESTED
00143 177400 C      HL2WD:    177400          /SECOND WORD OF DATA - ONLY LEFT HA
                    DEFPLC [VDH RESTART FLAG]
00144 000000 C      VDHRSF:   0               /SET NON-ZERO TO RESTART VDH
                    DEFPLC [SAT RESTART FLAG]
00145 000000 C      SATRSF:   0
```

```
                    PG0FIX=160                  /START OF 2ND INVARIANT AREA
                    .TA.=.
                    100002/   .TA.              PG0FIX
                    .ASCII /"Z"/                PG0FIX/
                    LEV VAR
                    ZEROB:    /START ZEROING HERE
                    DEFPLC [NEIGHB]
                    /USED BY [M2I,TSK,BCK]
00160         V     NEIGHB:   BSS CH            /IMP NUMBER OF ADJACENT IMP
                    DEFPLC [RUT]
                    /USED BY [H2I,T.O,TSK,BCK]
00165         V     RUT:      BSS NIMP          /ROUTE USE TABLE
                    DEFPLC [SLT]
                    /USED BY [M2I,I2M,T.O,BCK]
00265         V     SLT:      BSS CH            /SEND LINE TEST (USED FOR RELOAD [^I

                    QUEUEB:                     /QUEUE START POINTERS
                                                /MUST PRECEDE COUNTA
                    /USED BY [I2H,TSK]
00272         V     SHQ:      BSS TH            /REG HOST
00302         V     SHPQ:     BSS TH            /PRI HOST
                    /USED BY [I2M,T.O,TSK]
00312         V     SMQ:      BSS CH            /REG MODEM
00317         V     SMPQ:     BSS CH            /PRI MODEM
                    /USED BY FRE
00324         V     FREE:     BSS 1             /FREE BUFFERS
                    /USED BY [TSK,BCK]
00325         V     TTF:      BSS 1             /FREE TRACE BLOCKS
                    /USED BY [T.O,TSK]
00326         V     RASF:     BSS 1             /FREE REASSEMBLY BLOCKS
00327         V     MESSTK:   BSS 1             /STACK OF COMPLETE REG MESSAGES
                    /USED BY [M2I,H2I,TSK,BCK]
00330         V     STQ:      BSS 1             /TASK
                    /USED BY [T.O,TSK,BCK]
00331         V     SRQ:      BSS 1             /REPLY,REROUTE,DEST DEAD
                    /USED BY [I2H,H2I,T.O,TSK,BCK]
00332         V     SHWQ:     BSS NH+1          /HOST WORD
00337         V     SHBQ:     BSS 1             /HOST ONE WORD BUFFERS
                    /USED BY [T.O,TSK]
00340         V     SHRQ:     BSS 1             /REASSEMBLY BLOCKS
                    /USED BY [TSK,BCK]
00341         V     STRQ:     BSS 1             /TRACE BLOCKS
                    /USED BY [ALL]
00342         V     DIAGQ:    BSS 1             /DIAG PACKET QUEUE
```

```
                    QUEUEE:                     /QUEUE END POINTERS
                    /USED BY [I2H,TSK]
00343          V    EHQ:        BSS TH
00353          V    EHPQ:       BSS TH
                    /USED BY [I2M,T,0,TSK]
00363          V    EMQ:        BSS CH
00370          V    EMPQ:       BSS CH
00375          V                BSS 4          /SPARE
                    /USED BY [M2I,H2I,TSK,BCK]
00401          V    ETQ:        BSS 1
                    /USED BY [T,0,TSK,BCK]
00402          V    ERQ:        BSS 1
                    /USED BY [I2H,H2I,T,0,TSK,BCK]
00403          V    EHWQ:       BSS NH+1
00410          V                BSS 4          /SPARE

                    QUEUEL=QUEUEE=QUEUEB
                    /USED BY [TSK,BCK]
00414          V    TTO:        BSS 1          /TRACE TABLE OVERFLOW
                    /USED BY ALL
00415          V    TIME:       BSS 1          /TIME IN FAST TICKS
                    /USED BY [I2H,T,0,TSK]
00416          V    TIMES:      BSS 1          /TIME IN SLOW TICKS
                    /USED BY [T,0,BCK]
00417          V    SYNC:       BSS 1          /TIME FOR STAT ROUTINES
                    /USED BY [M2I,T,0]
00420          V    THO:        BSS 1          /CHANNEL TO MAX NO IMP
                    /USED BY [I2M,TSK]
00421          V    SIHY:       BSS CH         /SEND I HEARD YOU IF NOT ZERO
                    /USED BY [T,0,TSK]
00426          V    LAC:        BSS CH         /LINE ALIVE COUNT
                    /USED BY [M2I,T,0,TSK]
00433          V    LINE:       BSS CH         /LINE ALIVE=DEAD STATUS
                    /USED BY [I2M,T,0,TSK]
00440          V    NONE:       BSS CH         /MODEM IDLE IF ZERO
                    /NEGATIVE= =(M30SEC=NO OF SLOW TICKS SINCE LAST OUTPUT)
00445          V    SNULL:      BSS CH         /SEND NULL PKT IF NON=ZERO
                    /USED BY [M2I,T,0,TSK]
00452          V    LUUP:       BSS 1          /NON=ZERO=SOME MODEM IS LOOPED
                    /USED BY [H2I,TSK,BCK]
                    TSKFLG:                     /TASK=HOST COMMUNICATION
                    DEFPLC [HILO]
00453          V    HILO:       BSS TH         /RETURN ADDRESSES WHERE HI LEFT OFF
00463          V                BSS BH         /0=NO ACTION, 1=NACK, 2=ACK
                    /USED BY BCK
00471          V                BSS 1          /TO PRESERVE PQ LOCATIONS
00472          V    DDTI:       BSS 1          /DDT INTERRUPT FLAG
00473          V    OVRDF:      BSS 1          /SS4 IS OVERRIDDEN IF THIS IS NON=
                    /USED BY [TTY,BCK]
00474          V    TTFG:       BSS 1          /TTY COMMUNICATION SWITCH
                    /USED BY VDB
00475          V    VD.OT:      BSS 1          /VDH TYPE OF OUTPUT FLAG
                    /USED BY T,0
00476          V    VD.RDY:     BSS 1          /NON=ZERO=VDH READY LINE FLAPPED
                    /USED BY [I2H,T,0,TSK,BCK]
00477          V    RALLCF:     BSS 1          /RALLY COMMUNICATION FLAG FOR PUT=G
```

```
                    /USED BY MSK
00500          V    IHM:      BSS 1          /IH MASK
00501          V    HIM:      BSS 1          /HI MASK
00502          V    MOM:      BSS 1          /MODEM OUT MASK
                    /USED BY [T,0,I2H(OWP)]
00503          V    WDTIME:   BSS 1          /SOFTWARE W,D,T,
                    /USED BY [H2I,I2H,T,0,TSK,BCK]
00504          V    HIHD:     BSS TH         /HOST STATUS
                    HSTUP=0   /HOST IS UP
                    HSTGDN=1  /GOT A HOST-GOING-DOWN MESSAGE
                    HSTTRD=2  /HOST WAS TARDY IN ACCEPTING AN IMP MESSAGE
                    HSTOFF=3  /HOST READY LINE IS DOWN
                    HSTIDN=4  /IMP IS COMING UP OR GOING DOWN
                    /USED BY TSK
00514          V    THIS:     BSS 1          /CURRENT TASK BUFFER
                    /USED BY FRE
00515          V    TWDP:     BSS 1          /SECOND WORD IN TWO WORD PUT
                    /USED BY I2H
00516          V    TWDG:     BSS 1          /SECOND WORD IN TWO WORD GET

                    COUNTA:                  /ADDITIVE COUNTS - KEEP IN ORDER
                    /USED BY [I2H,TSK]
00517          V    NHA:      BSS TH         /REG HOST QUEUE
00527          V              BSS TH         /PRI HOST QUEUE
                    /USED BY FRE
00537          V    NFA:      BSS 1          /FREE LIST
                    /USED BY [M2I,I2M,T,0,TSK]
00540          V    NSFA:     BSS 1          /STORE-AND-FORWARD COUNT
                    /USED BY [I2H,T,0,TSK]
00541          V    NREA:     BSS 1          /REASSEMBLY COUNT
                    /USED BY [T,0,TSK,BCK]
00542          V    NALA:     BSS 1          /ALLOCATE COUNT

                    COUNTS:                  /SUBTRACTIVE COUNTS
                    /USED BY [I2H,TSK]
00543          V    NHS:      BSS TH
00553          V              BSS TH
                    /USED BY FRE
00563          V    NFS:      BSS 1
                    /USED BY [M2I,I2M,T,0,TSK]
00564          V    NSFS:     BSS 1
                    /USED BY [I2H,T,0,TSK]
00565          V    NRES:     BSS 1
                    /USED BY [T,0,TSK,BCK]
00566          V    NALS:     BSS 1
                    COUNTL=COUNTS-COUNTA

                    /USED BY [BCK]
00567          V    VDHUPF:   BSS 1          /VDH UP/DOWN FLAG
                    ZEROE:
                    ZEROL=ZEROE-ZEROB
```

```
                        LEV CON
00570 000004 C  MINF:   CH=1            /MIN NUMBER OF FREE BUFFERS
00571        C  MAXS:   BSS 1           /MAX NUMBER OF S/F PACKETS
00572        C  MAXR:   BSS 1           /MAX NUMBER OF REASSEMBLY PACKETS
00573        C  MAXSI:  BSS 1           /S&F LIMIT USED BY MODEM TASK
00574        C  SW1:    BSS MAXSTAT     /ADDRES OF STAT GATHERING SUBRS

00622 032030 C  I2MTAB: I2MB0           /START ADDR OF BLOCK OF CHANNEL PNTI
00623 032040 C          I2MB1
00624 032050 C          I2MB2
00625 032060 C          I2MB3
00626 032070 C          I2MB4
                        LEV VAR
00627        V  I2MEND: BSS CH          /END ADDRESS OF EACH BLOCK
00634        V  I2MNXT: BSS CH          /PKT PNTR FOR LATEST OUTPUT
                        /0=ROUTE,NULL,OR NO OUTPUT, SIGN ON=ACK RECEIVED WHILE PKT O
                        DEFPLC [TSEX = TRANSMIT ODD-EVEN BITS]
00641        V  TSEX:   BSS CH          /ODD=EVEN BIT TO USE FOR NEXT OUTP
                        DEFPLC [RSEX = RECEIVE ODD-EVEN BITS]
00646        V  RSEX:   BSS CH          /COMP OF ODD=EVEN BIT WE EXPECT NEX
                        /USED BY [M2I,TSK]
00653        V  CHFREE: BSS CH
00660        V  RST,O:  BSS 1           /PTR TO RM OUTPUT AREA
00661        V  RST,F:  BSS 1           / "  "  "   FREE    "
00662        V  RST,N:  BSS 1           / "  "  "    NEW    "
00663        V  RST,C:  BSS 1           /  " "  "  COMPARE  "

                        LEV CON                 /ADDRESS CONSTANTS
00664 013210 C  JAM:    GAM             /GIVE A WORD FROM FAKE HOST TO IMP
00665 003234 C  DOZE:   BKX             /JAM WAIT
00666 017347 C  SUCK:   SUC             /GET A WORD FOR FAKE HOST FROM IMP
00667 003240 C  WAIT:   BKW             /SUCK WAIT
00670 015371 C  OWP:    OWPE            /ENTRY INTO ONE WORD PUT
00671 005373 C  FLUSHI: FLUSH           /PNTR TO SUBR TO FREE BUFFER
00672 017343 C  DODXA:  .DODXA          /ENTRY INTO DO DXA SUBROUTINE
                        DEFPLC [HOST SIMULATOR FLAG]
00673 000000 C  HSFG:   0               /NON=ZERO = START UP HOST SIMULATOR

                        LEV VAR
00674        V  MP:     BSS 1           /MODEM=TO=IMP CURRENT MODEM NO
00675        V  HIP:    BSS 1           /HOST=TO=IMP CURRENT HOST NO
00676        V  IHP:    BSS 1           /IMP=TO=HOST CURRENT HOST NO
                        LEV CON
00677 053333 C  HIXX:   HISP 0 X        /HOST=TO=IMP INDEXED SAVE PNTR
00700 056155 C  IHXX:   IHSP 0 X        /IMP=TO=HOST INDEXED SAVE PNTR
```

```
                    TIPCON=745
                    .TA.=.
                    100002/    .TA.             TIPCON
                    .ASCII /"Z"/

                    /LINKS TO TIP PROGRAM
                    TIPHST=2  /THE TIP TAKES THE HOST 2 SLOT
                    TIPBKG=40001
                    TIPVER=40000

                    TIPCON/
00745 022404 C      HLTNCC:   HLTWRD           /PNTR TO HALT REPORTING SUBR
00746 000000 C      HLTLOC:   0                /PC OF LAST HALT
00747        C      HLTA:     BSS 1            /A REG AT LAST HALT
00750        C      HLTX:     BSS 1            /X REG AT LAST HALT
                    8PKTS:                     /NO OF PKTS PER MESSAGE
                    CMINPL:                    /MIN PKT LENGTH
00751 000010 C      TEN:      10 0"A"MINPL
00752 000077 C      C77:      77
00753 000100 C      C100:     100
00754        C                BSS 9.           /SOME ROOM FOR TIP CONSTANTS
00765 000000 C      TPOPEN:   0                /COUNT OF NO OF OPEN CONNECTIONS ON
00766 016177 C                IHLSTP+TIPHST    /MINUS IF LAST IMP-TO-TIP PKT
00767 021664 C                TIPSKP           /SKP IF TIP UP, NOP IF TIP DOWN
00770        C      TIPLNK:   BSS 1            /IMP-TO-TIP DMC OUTPUT PNTR
00771        C                BSS 1            /IMP-TO-TIP DMC OUTPUT END PNTR
00772        C                BSS 1            /TIP-TO-IMP DMC INPUT PNTR
00773        C                BSS 1            /TIP-TO-IMP DMC INPUT END PNTR
00774 000000 C                0                /(IMP-TO-TIP PKT PNTR)
00775 013315 C                EMFH+TIPHST      /SKP IF LAST TIP-TO-IMP PKT, ELSE
00776 013141 C                HITT+TIPHST      /TIP-TO-IMP INTERFACE TIMER
00777        C                BSS 1            /LOC 777 USED BY RELOAD CODE
```

```
                        /WATCHDOG TIMER AND POWER FAIL ROUTINES

                        /THESE 2 INSTRS FOLLOW A COMPUTED SKS MODEM ERROR IN PAGE 0
                        LEV WDI
01000 003111 0                  JMP LD10
01001 003031 0                  JMP WDLUP
01002 001177 0          WDC4:   WDT1
01003 003021 0                  JMP WDTM2       /START HERE TO LOAD FROM THE NET
01004 003022 0                  JMP WDLOD       /START HERE TO LOAD FROM A LINE

                        DEFPLC [HOST34 SWITCH]
01005           0       HOST34:   BSS 1         /MEANING OF BITS 1&2 FOLLOWS
                        /0 FOR 5 MODEMS
                        />0 FOR 4 MODEMS, 3 HOSTS
                        /<0 FOR 3 MODEMS, 4 HOSTS
                        /USE >0 FOR TIP/MLC
                        /BIT 16 ZERO MEANS PAGE 27 IS BUFFERS
                        /BIT 16 NON-ZERO MEANS PAGE 27 IS NOT TO BE OVERLAID WITH BUI
                        /VDHF INDICATES WHETHER VDH CODE IS ACTUALLY PRESENT

01006           0               BSS 3           /FOR COMPATIBILITY WITH IMPLOD 2513

                        /** THIS IS THE CRITICAL CODE WHICH MUST NOT CHANGE **
                        /** BOTH LOCATION AND CONTENTS MUST STAY CONSTANT **
                        /** IN ORDER THAT ONE IMP VERSION MAY RELOAD ANOTHER **
01011 010045 0          LWAIT:  STA 45          /**THIS IS WHERE THE IMP WAITS
01012 024045 0                  IRS 45          /**AFTER SENDING A REQUEST FOR CORE
01013 003012 0                  JMP .-1         /**THIS CODE IS OVERLAID WITH THE
01014 024044 0                  IRS 44          /**NEW CORE IMAGE WHILE IT IS RUNI
01015 003011 0                  JMP LWAIT       /**SO IT MUST BE INVARIANT ITSELF
01016 003102 0                  JMP LD7

                        CORELO=60
                        COREHI=33000
                        /CORE IMAGE IS LOADED STARTING AT CORELO
                        /AND ENDING AT COREHI-1
```

```
                        WDTM:
00062 001017 0          WDTIL/      WDTM
01017 000000 0          WDTM/       INT WDI
01020 024133 0                      IRS RSFLAG
01021 140040 0          WDTM2:      CRA             /ENTER HERE FOR RANDOM RELOAD
                        LEV BCK     /COME HERE FROM NICE STOP CODE
01022 001001 7          WDLOD:      INH ALL         /ENTER HERE WITH LINE # (1-4) IN AC
01023 030040 7 0                    CLKON
01024 017560 7 0                    SUB (1)
01025 041577 7 0                    ALS 1
01026 010047 7 0                    STA 47
01027 005005 7 0                    LDA HOST34      /SAVE HOST CONFIGURATION
01030 010046 7 0                    STA 46          /SHOULD BE 51
                                    /LDA RSFLAG     /SAVE RESTART-RELOAD FLAG
                                    /STA 43
01031 005037 7 0 WDLUP:     LDA LD8
01032 101000 7 0                    NOP             /FOR FILLER
01033 000201 7 0                    IAB
01034 005561 7 0                    LDA (-23)       /DON'T LET CLOCK INTS IN
01035 000011 7 0                    DXA
01036 003154 7 0                    JMP CLEA
01037 001040 7 0 LD8:       .+1
01040 004047 7 0                    LDA 47
01041 101400 7 0                    SMI             /RANDOM RELOAD?
01042 003046 7 0                    JMP LD11        /NO
01043 131040 7 0                    RDCLOK          /YES
01044 003043 7 0                    JMP .-1
01045 007562 7 0                    ANA (6)         /GET TWO BIT NUMBER
01046 010000 7 0 LD11:      STA 0
01047 005563 7 0                    LDA (SENDC)     /SET UP REQUEST FOR CORE
01050 050032 7 0                    STA M1OTBP X
01051 015564 7 0                    ADD (4)
01052 050033 7 0                    STA M1OTBP+1 X
01053 005565 7 0                    LDA (CORELO 0 I)        /SET UP CORE IMAGE BOUNDS
01054 050020 7 0                    STA M1INBP X
01055 005566 7 0                    LDA (COREHI 0 I)
01056 050021 7 0                    STA M1INBP+1 X
01057 143137 7 0                    JMP LDT XI
01060 030071 7 0 LD1:       M1OUT           /SEND OUT REQUEST FOR CORE
01061 003213 7 0                    JMP LD12
01062 003073 7 0                    JMP LD5
01063 030072 7 0 LD2:       M2OUT
01064 003213 7 0                    JMP LD12
01065 003073 7 0                    JMP LD5
01066 030073 7 0 LD3:       M3OUT
01067 003213 7 0                    JMP LD12
01070 003073 7 0                    JMP LD5
01071 030074 7 0 LD4:       M4OUT
01072 003213 7 0                    JMP LD12
01073 005567 7 0 LD5:       LDA (-3000.)
01074 010044 7 0                    STA 44
                                    /JMP LWAIT
```

```
                                    /NOP                /TO KEEP LOC OF LD6 CONSTANT
                          /THE NEXT 5 REGS CAN COME OUT AFTER COMPATIBILITY WITH 2634
01075 010045 7 0 LD6:     STA 45
01076 024045 7 0          IRS 45
01077 003076 7 0          JMP .-1
01100 024044 7 0          IRS 44
01101 003075 7 0          JMP LD6
01102 044020 7 0 LD7:     LDA M1INBP X
01103 013566 7 0          ERA (COREHI 0 I)
01104 100040 7 0          SZE
01105 003031 7 0          JMP WDLUP
01106 045140 7 0          LDA LDERR X
01107 010777 7 0          STA 777
01110 002777 7 0          JMP 777

01111 031040 7 0 LD10:    CLKOFF
01112 004046 7 0          LDA 46          /SHOULD BE 51       /RESTORE HOST C
01113 011005 7 0          STA HOST34
                          /LDA 43         /RESTORE RESTART=RELOAD FLAG
                          /STA RSFLAG
01114 073570 7 0          LDX (56-104)    /SAVE INTERRUPT ENTRANCES
01115 044104 7 0          LDA 104 X
01116 111571 7 0          STA (30000 0 X) I
01117 024000 7 0          IRS 0
01120 003115 7 0          JMP .-3
01121 005127 7 0          LDA LD9
01122 000201 7 0          IAB
01123 005572 7 0          LDA (-21)
01124 070042 7 0          AMIMLC
01125 005573 7 0          LDA (-1)
01126 003154 7 0          JMP CLEA
01127 001130 7 0 LD9:     .+1
01130 073570 7 0          LDX (56-104)    /RESTORE INTERRUPT ENTRANCES
01131 105571 7 0          LDA (30000 0 X) I
01132 050104 7 0          STA 104 X
01133 024000 7 0          IRS 0
01134 003131 7 0          JMP .-3
01135 024133 7 0          IRS RSFLAG
01136 103574 7 0          JMP (INIT) I
01137 001060 7 0 LDT:     LD1
01140 070471 7 0 LDERR:   M1ERR
01141 001063 7 0          LD2
01142 070472 7 0          M2ERR
01143 001066 7 0          LD3
01144 070473 7 0          M3ERR
01145 001071 7 0          LD4
01146 070474 7 0          M4ERR

01147 040001 7 0 SENDC:   40001
01150 100001 7 0          SNDCOR 0 LINETS
01151 000000 7 0          0
01152 000000 7 0          0
01153 040001 7 0          -[40001 0 SNDCOR LINETS -3]
```

```
01154 170120 7 0 CLEA:    SMK 120
                  LEV BCK LCK ALL
01155 073575 7 0          LDX (STDIL-0-TASKIL)
01156 005002 7 0          LDA WDC4
01157 050104 7 0          STA TASKIL+1 X /RESET ALL INTERRUPT ENTRANCES
01160 024000 7 0          IRS 0
01161 003157 7 0          JMP .-2
01162 073576 7 0          LDX (-2)       /MUST UNPATCH TWICE !?
01163 030171 7 0 WDT2:    M1UNXP
01164 030172 7 0          M2UNXP
01165 030173 7 0          M3UNXP
01166 030174 7 0          M4UNXP
01167 030175 7 0          M5UNXP
01170 030470 7 0 HUNXPT:  H1UNXP         /THESE MUST BE IN ORDER!!
01171 030460 7 0          H2UNXP
01172 030450 7 0          H3UNXP
01173 030451 7 0          H4UNXP
01174 024000 7 0          IRS 0
01175 003163 7 0          JMP WDT2
01176 021177 7 0          JST WDT1       /AND WAIT

01177 000000 7 0 WDT1:    0              /NULL INTERRUPT ENTRY
01200 000011 7 0          DXA            /ALL INTERRUPTS COME HERE TO DIE
01201 003202 7 0          JMP . 1
01202 000401 7 0          ENB BCK
01203 073577 7            LDX (0)
01204 024000 7            IRS 0
01205 003204 7            JMP .-1        /WAIT 600 MS
01206 000201 7            IAB            /B=>X
01207 026000 7            IMA 0          /0=>A
01210 170120 7            SMK 120        /NOW WE BLOCK ALL FUTURE INTERRUPTS
                  LEV WDI
01211 001001 0            INH ALL
01212 042000 0            JMP 0 X        /GO TO LD8+1
01213 005600 0 LD12:      LDA (-533.)
01214 010044 0            STA 44
01215 010045 0 LD13:      STA 45
01216 024045 0            IRS 45
01217 003216 0            JMP .-1
01220 024044 0            IRS 44
01221 003215 0            JMP LD13
01222 043223 0            JMP .+1 X
01223 030471 0            M1IN
01224 003073 0            JMP LD5
01225 030472 0            M2IN
01226 003073 0            JMP LD5
01227 030473 0            M3IN
01230 003073 0            JMP LD5
01231 030474 0            M4IN
01232 003073 0            JMP LD5
```

```
                        LEV CON
01233 000001 C  BITTAB:  1              /BITS FOR ACK AND MESSAGE STUFF
01234 000002 C           2
01235 000004 C           4
01236 000010 C           10
01237 000020 C           20
01240 000040 C           40
01241 000100 C           100
01242 000200 C  SWCHB:   200
01243 000400 C           400
01244 001000 C           1000
01245 002000 C           2000

01246 000010 C  MBITS:   10
01247 000004 C           4
01250 000002 C           2
01251 000001 C           1

                        SWDT:
00061 001252 C  SWDTIL/  SWDT           /SOFTWARE W-D-T INTERRUPT CALL
                        SWDT/
01252 000000 0           INT WDI
01253 001001 0           INH ALL
01254 111601 0           STA (37775) I  /SAVED A
01255 133602 0           STX (37776) I  /SAVED X
01256 005252 0           LDA SWDT       /IF NOT MEM PROTECT (MAY NEED TO BE
01257 111603 0           STA (37774) I  /SAVED P/Y
01260 120062 0           JST WDTIL I

                        RSTR:                   /POWER FAIL COMES HERE
00060 001261 0  PFIL/    RSTR
01261 000000 0  RSTR/    INT RSI
01262 030026 0           WDT                    /POKE WATCHDOG TIMER SO WE DON'T (
01263 140040 0           CRA
01264 010324 0           STA FREE               /COPY SOME PROGRAM INTO PAGE 0
01265 005604 0           LDA (3)
01266 010133 0           STA RSFLAG             /SO THAT RESTART WILL INDICATE POWE
01267 005273 0           LDA RST2A              /THESE ARE FOR WHEN THE POWER COMES
01270 010517 0           STA NHA
01271 073274 0           LDX RST3
01272 002324 0           JMP FREE               /GO LOCK UP THE MACHINE
01273 002000 0  RST2A:   2000
01274 102517 0  RST3:    JMP NHA I
```

```
                    /CORE DUMP TO PDP-1D AT BBN
                    /COPY EACH 100-WORD BLOCK OF CORE INTO CORBUF=>CORBUF+77
                    /SEND BLOCK 1 FROM ITSELF, THEN 2-277 (OR HIGHER), THEN BLOCK
                    /USE CORBUF-4=>CORBUF-1 AS HEADER AND TEMP STORE
                    CORBUF=100
                    CORCNT=CORBUF-4          /ACKH - USE AS TEMP
                    CORHED=CORBUF-3          /HEAD - FIXED HEADER, GOES AS ROUTIN
                    CORPUT=CORBUF-2          /HEAD1 - USE AS TEMP
                    CORGET=CORBUF-1          /HEAD2 - FIRST LOCATION OF BLOCK BE
                                             /HEAD3 THRU BUFE-1 ARE 100 DATA WORD

                    LEV BCK
                    DEFPLC [CORE DUMP]
01275 001001 7      CORE:    INH ALL
01276 000013 7 0             EXA
01277 030451 7 0             H4UNXP
01300 030551 7 0             H4ENAB
01301 030251 7 0             H4FOUT
01302 000201 7 0             IAB             /ENTER WITH LINE NO 1-5 IN AC
01303 073605 7 0             LDX (-104)
01304 044200 7 0             LDA CORCNT+104 X
01305 051551 7 0             STA CORSAV+104 X        /SAVE CORBUF-4=>CORBUF+77
01306 024000 7 0             IRS 0
01307 003304 7 0             JMP .-3
01310 024000 7 0             IRS 0
01311 003310 7 0             JMP .-1         /WAIT FOR READY LINE
01312 000201 7 0             IAB
01313 041577 7 0             ALS 1
01314 010000 7 0             STA 0           /SAVE 2*MODEM NO
01315 131041 7 0             RDIMPN
01316 003315 7 0             JMP .-1
01317 013606 7 0             ERA (BBNIMP)
01320 101040 7 0             SNZ             /ARE WE THE BBN IMP?
01321 010000 7 0             STA 0           /YES, THEN WE SEND CORE OUT TO HOST
01322 005607 7 0             LDA (RUTDMP 0 LINETS)
01323 010075 7 0             STA CORHED      /SET UP FIXED HEADER
01324 005610 7 0             LDA (CORBUF)
01325 010077 7 0             STA CORGET      /SET UP BLOCK TO COPY FROM
```

```
01326 004000 7 0 CORNXT:   LDA 0
01327 100040 7 0           SZE                 /ARE WE SENDING TO A HOST?
01330 005611 7 0           LDA (CORPUT-CORCNT)      /NO, NEED FULL HEADER FO
01331 015612 7 0           ADD (CORCNT)    /NEED ONLY LEADER TO HOST
01332 050030 7 0           STA H4OTBP X    /SET UP DMC PNTRS
01333 005613 7 0           LDA (CORBUF+77)
01334 050031 7 0           STA H4OTBP+1 X
01335 005610 7 0           LDA (CORBUF)
01336 010076 7 0           STA CORPUT      /SET UP BLOCK TO COPY INTO
01337 140407 7 0           TCA
01340 010074 7 0           STA CORCNT      /SET UP COPY COUNT
01341 004077 7 0           LDA CORGET
01342 100040 7 0           SZE                 /ARE WE DOING BLOCK 0?
01343 003347 7 0           JMP CORCOP      /NO
01344 024077 7 0           IRS CORGET      /YES, START WITH REG 1
01345 024076 7 0           IRS CORPUT      /SINCE CORBUF HAS HIGHEST CORE BLOCK
01346 024074 7 0           IRS CORCNT
01347 104077 7 0 CORCOP:   LDA CORGET I    /DO THE COPY
01350 110076 7 0           STA CORPUT I
01351 024077 7 0           IRS CORGET
01352 024076 7 0           IRS CORPUT
01353 024074 7 0           IRS CORCNT
01354 003347 7 0           JMP CORCOP
01355 043356 7 0           JMP COROCP X    /DO OCP OUTPUT

01356 030251 7 0 COROCP:   H4FOUT
01357 003371 7 0           JMP CORWAT
01360 030071 7 0           M1OUT
01361 003371 7 0           JMP CORWAT
01362 030072 7 0           M2OUT
01363 003371 7 0           JMP CORWAT
01364 030073 7 0           M3OUT
01365 003371 7 0           JMP CORWAT
01366 030074 7 0           M4OUT
01367 003371 7 0           JMP CORWAT
01370 030075 7 0           M5OUT
```

```
01371 004077 7 0 CORWAT:  LDA CORGET
01372 013610 7 0          ERA (CORBUF)
01373 101040 7 0          SNZ                 /DID WE JUST SEND BLOCK 0?
01374 003426 7 0          JMP COREND          /YES
01375 005614 7 0          LDA (100000)
01376 010074 7 0          STA CORCNT
01377 024074 7 0          IRS CORCNT
01400 003377 7 0          JMP .-1             /WAIT
01401 030026 7 0          WDT                 /JUST IN CASE
01402 004077 7 0          LDA CORGET
01403 017615 7 0          SUB (30000)
01404 100400 7 0          SPL                 /HAVE WE DONE FIRST 12K YET?
01405 003326 7 0          JMP CORNXT          /NO, KEEP GOING
01406 104077 7 0          LDA CORGET I        /YES, NOW WE MUST CHECK FOR PRESENCI
01407 140401 7 0          CMA                 /ABOVE 12K MINIMUM
01410 126077 7 0          IMA CORGET I
01411 122077 7 0          CAS CORGET I
01412 100000 7 0          SKP
01413 003416 7 0          JMP .+3             /NO TRANSITION, NO MORE MEMORY
01414 110077 7 0          STA CORGET I        /RESTORE TEST CELL
01415 003326 7 0          JMP CORNXT          /AND KEEP GOING
01416 140040 7 0          CRA
01417 026077 7 0          IMA CORGET          /RESET PTR TO BLOCK 0
01420 010100 7 0          STA CORBUF          /SAVE HIGHEST CORE BLOCK IN CORBUF
01421 131041 7 0          RDIMPN
01422 003421 7 0          JMP .-1
01423 012100 7 0          ERA CORBUF          /PUT IMP NO IN RIGHT PART OF REG C
01424 010100 7 0          STA CORBUF
01425 003326 7 0          JMP CORNXT          /GO BACK AND SEND BLOCK 0

01426 073616 7 0 COREND:  LDX (-4)
01427 045451 7 0          LDA CORSAV+4 X
01430 050200 7 0          STA CORCNT+CORBUF+4 X
01431 024000 7 0          IRS 0               /RESTORE CORBUF-4=>CORBUF-1 IN THE
01432 003427 7 0          JMP .-3
01433 024000 7 0          IRS 0
01434 003433 7 0          JMP .-1             /WAIT
01435 073605 7 0          LDX (-104)
01436 045551 7 0          LDA CORSAV+104 X
01437 050200 7 0          STA CORCNT+104 X          /RESTORE CORBUF-4=>CORBUF
01440 024000 7 0          IRS 0
01441 003436 7 0          JMP .-3
01442 030026 7 0          WDT
01443 000000 7 0          HLT                 /DONE
01444 003442 7 0          JMP .-2
                  CORSAV:                     /SAVE SPACE FOR CORBUF-4=>CORBUF+77
                                              /NEXT 104 LOCS USED BY COR DMP
```

```
                        /THIS CODE IS THE ADD CHAIN WHICH COMPUTES PACKET CHECKSUMS
                        /IT IS RE-ENTRANT AND IS CALLED BY DIFFERENT INTERRUPTS
                        LEV ALL
01445 054115 0  ADDTOP:   ADD BUFE+4 X
01446 054114 0            ADD BUFE+3 X
01447 054113 0            ADD BUFE+2 X
01450 054112 0            ADD BUFE+1 X
01451 054111 0            ADD BUFE X
01452 054110 0            ADD BUFE-1 X
01453 054107 0            ADD DATA+76 X
01454 054106 0            ADD DATA+75 X
01455 054105 0            ADD DATA+74 X
01456 054104 0            ADD DATA+73 X
01457 054103 0            ADD DATA+72 X
01460 054102 0            ADD DATA+71 X
01461 054101 0            ADD DATA+70 X
01462 054100 0            ADD DATA+67 X
01463 054077 0            ADD DATA+66 X
01464 054076 0            ADD DATA+65 X
01465 054075 0            ADD DATA+64 X
01466 054074 0            ADD DATA+63 X
01467 054073 0            ADD DATA+62 X
01470 054072 0            ADD DATA+61 X
01471 054071 0            ADD DATA+60 X
01472 054070 0            ADD DATA+57 X
01473 054067 0            ADD DATA+56 X
01474 054066 0            ADD DATA+55 X
01475 054065 0            ADD DATA+54 X
01476 054064 0            ADD DATA+53 X
01477 054063 0            ADD DATA+52 X
01500 054062 0            ADD DATA+51 X
01501 054061 0            ADD DATA+50 X
01502 054060 0            ADD DATA+47 X
01503 054057 0            ADD DATA+46 X
01504 054056 0            ADD DATA+45 X
01505 054055 0            ADD DATA+44 X
01506 054054 0            ADD DATA+43 X
01507 054053 0            ADD DATA+42 X
01510 054052 0            ADD DATA+41 X
01511 054051 0            ADD DATA+40 X
```

```
01512 054050 0                ADD DATA+37 X
01513 054047 0                ADD DATA+36 X
01514 054046 0                ADD DATA+35 X
01515 054045 0                ADD DATA+34 X
01516 054044 0                ADD DATA+33 X
01517 054043 0                ADD DATA+32 X
01520 054042 0                ADD DATA+31 X
01521 054041 0                ADD DATA+30 X
01522 054040 0                ADD DATA+27 X
01523 054037 0                ADD DATA+26 X
01524 054036 0                ADD DATA+25 X
01525 054035 0                ADD DATA+24 X
01526 054034 0                ADD DATA+23 X
01527 054033 0                ADD DATA+22 X
01530 054032 0                ADD DATA+21 X
01531 054031 0                ADD DATA+20 X
01532 054030 0                ADD DATA+17 X
01533 054027 0                ADD DATA+16 X
01534 054026 0                ADD DATA+15 X
01535 054025 0                ADD DATA+14 X
01536 054024 0                ADD DATA+13 X
01537 054023 0                ADD DATA+12 X
01540 054022 0                ADD DATA+11 X
01541 054021 0                ADD DATA+10 X
01542 054020 0                ADD DATA+7 X
01543 054017 0                ADD DATA+6 X
01544 054016 0                ADD DATA+5 X
01545 054015 0                ADD DATA+4 X
01546 054014 0                ADD DATA+3 X
01547 054013 0                ADD DATA+2 X
01550 054012 0                ADD DATA+1 X
01551 054011 0                ADD DATA X
01552 054010 0                ADD HEAD3 X
01553 054007 0                ADD HEAD2 X
01554 054006 0                ADD HEAD1 X
01555 054005 0                ADD HEAD X
01556 054004 0   ADDBOT:      ADD ACKH X
01557 102111 0                JMP ADDRET I    /RETURN TO CALLING INTERRUPT ROUTIN
```

```
01560 000001 C    LEV CON   CONSTANTS
01561 177755 C
01562 000006 C
01563 001147 C
01564 000004 C
01565 100060 C
01566 133000 C
01567 172110 C
01570 177752 C
01571 070000 C
01572 177757 C
01573 177777 C
01574 002000 C
01575 177760 C
01576 177776 C
01577 000000 C
01600 176753 C
01601 037775 C
01602 037776 C
01603 037774 C
01604 000003 C
01605 177674 C
01606 000005 C
01607 000011 C
01610 000100 C
01611 000002 C
01612 000074 C
01613 000177 C
01614 100000 C
01615 030000 C
01616 177774 C
01777 000000 C    1777/     0              /LOC 1777 USED IN SWCH CODE
                                           /FOR MEM PROTECT TEST
```

```
                    /INITIALIZATION
                    LEV BCK
02000 120672 7      INIT:     JST DODXA I     RET BCK
02001 001001 7                INH INI
02002 140040 7 0              CRA
02003 170120 7 0              SMK INTM        /LOCK OUT INTERRUPTS FOR INIT
02004 010134 7 0              STA PRIM
02005 026133 7 0              IMA RSFLAG
02006 141206 7 0              AOA
02007 111465 7 0              STA (RSFNCC) I /SET UP RSTART INDICATOR FOR NCC
02010 022114 7 0              CAS ONE         /RESTART
02011 022116 7 0              CAS THREE       /OR POWERFAIL (4)
02012 003202 7 0              JMP INIVDH      /==>SEE IF VDH GETS RESTARTED
02013 101000 7 0              NOP             /   (MUST COME BEFORE ZEROING 0-AF
02014 140040 7 0              CRA
02015 010145 7 0              STA SATRSF
02016 010136 7 0 INIVDR:      STA TIPRSF
02017 010765 7 0              STA TPOPEN
02020 073466 7 0              LDX (-MAXITB)   /MUST PRECEDE ZEROING
02021 045346 7 0 INIT1:       LDA ITBTIP+MAXITB X       /SO THAT APPROPRIATE INT
02022 070042 7 0              AMIMLC          /ENTRIES ARE CLEARED
02023 045316 7 0              LDA ITBIMP+MAXITB X
02024 151266 7 0              STA ITBLOC+MAXITB XI      /INIT TIP-HOST3 LOCS
02025 024000 7 0              IRS 0
02026 003021 7 0              JMP INIT1
02027 073467 7 0              LDX (-MAXVDH)
02030 045361 7 0              LDA ITBNVD+MAXVDH X
02031 151374 7 0              STA ITBVDL MAXVDH XI
02032 024000 7 0              IRS 0
02033 003030 7 0              JMP .-3
02034 073470 7 0              LDX (-INITZN)   /INIT THE ZERO STORAGE AREAS
02035 045221 7 0 INIT0:       LDA INITZB+INITZN X
02036 011212 7 0              STA IT1
02037 045226 7 0              LDA INITZL+INITZN X
02040 011213 7 0              STA IT2
02041 140040 7 0              CRA             /MUST PRECED QUEUE INIT
02042 111212 7 0              STA IT1 I
02043 025212 7 0              IRS IT1
02044 025213 7 0              IRS IT2
02045 003042 7 0              JMP .-3
02046 024000 7 0              IRS 0
02047 003035 7 0              JMP INIT0
02050 010144 7 0              STA VDHRSF      /VDH WILL NOT RESTART
02051 131041 7 0              RDIMPN
02052 003051 7 0              JMP .-1
02053 010106 7 0              STA MINE        /INIT MINE
02054 005471 7 0              LDA (NS1)
02055 111472 7 0              STA (NSRR) I
```

```
02056 073473 7 0            LDX (-QUEUEL)
02057 005474 7 0            LDA (QUEUEB)   /INIT QUEUE PNTRS
02060 050414 7 0 INIT3:     STA QUEUEE+QUEUEL X
02061 141206 7 0            AOA
02062 024000 7 0            IRS 0
02063 003060 7 0            JMP INIT3
02064 005475 7 0            LDA (ZERO)
02065 010324 7 0            STA FREE
02066 105476 7 0            LDA (HOST34) I
02067 006115 7 0            ANA TWO
02070 100040 7 0            SZE
02071 004116 7 0            LDA THREE
02072 111477 7 0            STA (SATNO) I
02073 105476 7 0            LDA (HOST34) I
02074 006114 7 0            ANA ONE
02075 010000 7 0            STA 0
02076 101040 7 0            SNZ
02077 010144 7 0            STA VDHRSF     /JUST IN CASE
02100 100040 7 0            SZE
02101 005500 7 0            LDA (-CH 0 M,N)          /SET VDHNO FOR VDH IMPS,,
02102 111501 7 0            STA (VDHNO) I  /...0 FOR NON-VDH
02103 045405 7 0            LDA P36END X
02104 011445 7 0            STA SPAR+36-2  /SET UP END OF P36 FOR VDH OR NOT
02105 045407 7 0            LDA P37END X
02106 011446 7 0            STA SPAR+37-2  /SET UP END OF P37 AND BEYOND
02107 004115 7 0            LDA TWO        /START COLLECTING BUFFERS ON P2
02110 011212 7 0            STA IT1
02111 073502 7 0            LDX (-PAGES+2)
02112 045447 7 0 INIT4:     LDA SPAR+PAGES-2 X
02113 040167 7 0            LRS 9.         /PICK UP NUMBER OF BUFFERS ON THIS
                    /NOTE THAT NO MORE THAN 64 BUFFERS CAN BE CLAIMED PER ENTRY
02114 011213 7 0            STA IT2
02115 005212 7 0            LDA IT1        /PICK UP PAGE NUMBER
02116 025212 7 0            IRS IT1
02117 041167 7 0            LLS 9.         /PICK UP START OF BUFFER STORAGE
02120 003126 7 0            JMP INIT6

02121 024537 7 0 INIT5:     IRS NFA        /COUNT ANOTHER FREE BUFFER
02122 026324 7 0            IMA FREE
02123 110324 7 0            STA FREE I     /ADD TO FREE LIST
02124 004324 7 0            LDA FREE
02125 015503 7 0            ADD (BUFL)
02126 025213 7 0 INIT6:     IRS IT2        /HAVE WE TAKEN ALL THE BUFFERS
02127 003121 7 0            JMP INIT5      /NO, MORE ON THIS PAGE
02130 024000 7 0            IRS 0          /YES, GO ON TO NEXT PAGE
02131 003112 7 0            JMP INIT4
```

```
02132 005504 7 0            LDA (4"T"CH)
02133 010571 7 0            STA MAXS
02134 010573 7 0            STA MAXSI
02135 140407 7 0            TCA
02136 014537 7 0            ADD NFA
02137 014751 7 0            ADD BPKTS
02140 040575 7 0            ARS 3
02141 041575 7 0            ALS 3
02142 014115 7 0            ADD TWO
02143 010572 7 0            STA MAXR
02144 072122 7 0            LDX MINUS2      /INIT THE FREE REAS+TRACE LISTS
02145 045230 7 0 INIT7:     LDA INIBLK+2 X
02146 011212 7 0            STA IT1
02147 045232 7 0            LDA INIQUE+2 X
02150 151234 7 0            STA INISTR+2 XI
02151 011213 7 0            STA IT2
02152 055236 7 0 INIT8:     ADD INILNG+2 X
02153 111213 7 0            STA IT2 I
02154 011213 7 0            STA IT2
02155 025212 7 0            IRS IT1
02156 003152 7 0            JMP INIT8
02157 140040 7 0            CRA
02160 111213 7 0            STA IT2 I
02161 024000 7 0            IRS 0
02162 003145 7 0            JMP INIT7
02163 004132 7 0            LDA MINIMP
02164 011212 7 0            STA IT1
02165 072113 7 0            LDX ZERO
02166 021374 7 0 INIT9:     JST MESINI      /INIT TMESS,RMESS
02167 024000 7 0            IRS 0
02170 025212 7 0            IRS IT1
02171 003166 7 0            JMP INIT9
02172 005505 7 0            LDA (TALLY)
02173 111506 7 0            STA (TALLYI) I
02174 073507 7 0            LDX (0 0-2"T"FH-BH)
02175 045465 7 0 INIT13:    LDA TTOI+FH+FH+BH X
02176 111510 7 0            STA (DZTB+FH+FH+BH 0 X) I
02177 024000 7 0            IRS 0
02200 003175 7 0            JMP INIT13
02201 103511 7 0            JMP (INITNP) I
```

```
02202 004567 7 0 INIVDH:   LDA VDHUPF      /PWR FAIL OR PLAIN RESTART
02203 010144 7 0           STA VDHRSF      /THEN RESTART VDH IF IT WAS UP
02204 004145 7 0           LDA SATRSF
02205 140100 7 0           SSP
02206 010145 7 0           STA SATRSF
02207 004136 7 0           LDA TIPRSF
02210 140100 7 0           SSP             /0=>0, -=>+
02211 003016 7 0           JMP INIVDR

                       LEV VAR
02212          V   IT1:    BSS 1
02213          V   IT2:    BSS 1
                       LEV CON
02214 000160 C     INITZB: ZEROB
02215 032030 C             I2MB0
02216 032030 C             TABZB
02217 030434 C             PARAMT
02220 100063 C             STDIL 0 I       /IN CASE NON-EXA IMP RELOADS FROM
02221 177370 C     INITZL: -ZEROL
02222 177730 C             -[CH"T"NACH]
02223 176201 C             -TABZL
02224 177740 C             -PARAML
02225 177760 C             STDIL-0-TASKIL
                       INITZN=INITZL-0-INITZB
02226 177771 C     INIBLK: -NREAB+0+1
02227 177771 C             -NTRCB+0+1
02230 033317 C     INIQUE: REASQ
02231 032131 C             TRACEQ
02232 000326 C     INISTR: RASF
02233 000325 C             TTF
02234 000014 C     INILNG: REASL
02235 000013 C             TRACEL


02236          C   ITBLOC: BSS MAXITB
02266          C   ITBIMP: BSS MAXITB
02316          C   ITBTIP: BSS MAXITB
                       MAXVDH=11.
02346          C   ITBNVD: BSS MAXVDH
02361 000001 C     ITBVDL: REPEAT MAXVDH,JUNK
02362 000001 C
02363 000001 C
02364 000001 C
02365 000001 C
02366 000001 C
02367 000001 C
02370 000001 C
02371 000001 C
02372 000001 C
02373 000001 C
```

```
                        LEV [INI,T,0]
02374 000000 0  MESINI:  0
02375 005512 0           LDA (0 0 177777"X"MST01"X"MST02)
02376 111513 0           STA (TMESS 0 X) I
02377 005514 0           LDA (0 0 3"T"400) 0"A"MESSNO
02400 111515 0           STA (RMESS 0 X) I
02401 140040 0           CRA
02402 111516 0           STA (AMESS 0 X) I
02403 111517 0           STA (RALLY 0 X) I
02404 103374 0           JMP MESINI I

                        LEV CON
02405 170067 C  P36END:  P36FB"A"777-[P36NB+1]"T"1000
02406 171067 C           P36FB"A"777-[P36NB]"T"1000
02407 172075 C  P37END:  P37FB"A"777-[P37NB]"T"1000
02410 177777 C           VDHEND"A"777-[0+1]"T"1000

02411        C  SPAR:    BSS PAGES-2    /TABLE OF ENDS-OF-PAGES
                        /FORMAT IS HI 7 BITS = -(NUMBER OF BUFFS ON PAGE+1)
                        /LO 9 BITS = STARTING ADDRESS OF FIRST BUFFER

                        /FAKE HOST OUTPUT (JAM) SLOTS IN DZTB
02447 025117 C  TTOI:    TTYI           /FH0 (TTY) OUTPUT FROM IMP TO FH
02450 023066 C           DOTI           /FH1 (DDT) OUTPUT FROM IMP TO FH
02451 030477 C           BTRE           /FH2 (TRACE) OUTPUT FROM IMP TO FH
02452 030056 C           STTI           /FH3 (STAT) OUTPUT FROM IMP TO FH
                        /FAKE HOST INPUT (SUCK) SLOTS IN WTTB
02453 025310 C           TTO0           /FH0 (TTY) INPUT TO IMP FROM FH
02454 024012 C           DIN4           /FH1 (DDT) INPUT TO IMP FROM FH
02455 030414 C           BEST           /FH2 (PARAM CHANGE) INPUT TO IMP F
02456 030474 C           STXY           /FH3 (DISCARD) INPUT TO IMP FROM FH
                        /BACK HOST SLOTS IN SLTB
02457 004101 C           BACK0          /BH0 (SEND RFNMS+ALLOCATES)
02460 004206 C           BACK1          /BH1 (SEND INCOMPLETE TRANSMISSIONS
02461 004302 C           BACK2          /BH2 (SEND GIVE BACKS)
02462 004347 C           BACK3          /BH3 (RETRANSMIT FROM PPT)
02463 004356 C           BACK4          /BH4 (SEND OUT-OF-RANGE REPLIES)
                                        /    (REROUTE DEAD LINE STUFF)
                                        /    (RETURN DESTINATION DEADS)
02464 004365 C           BACK5
```

```
02465 003560 C    LEV CON   CONSTANTS
02466 177750 C
02467 177765 C
02470 177773 C
02471 003452 C
02472 003450 C
02473 177727 C
02474 000272 C
02475 000113 C
02476 001005 C
02477 005153 C
02500 177775 C
02501 020544 C
02502 177742 C
02503 000112 C
02504 000024 C
02505 032261 C
02506 015155 C
02507 177762 C
02510 043433 C
02511 003074 C
02512 177477 C
02513 072271 C
02514 001400 C
02515 072371 C
02516 072471 C
02517 072571 C
02411 174524 C              PAGEND 2,UNCON,4
```

```
                    /CONSTANTS, VARIABLE FOR NEW INIT PAGE

                    LEV VAR
03062          V    IT3:        BSS 1

                    LEV CON
03063 010047   C    M2IIT:      M2I1A
03064 010073   C                M2I2A
03065 010117   C                M2I3A
03066 010143   C                M2I4A
03067 010167   C                M2I5A

03070          C    HIM,I:      TIPDEF 177660,177664
02236 003070   C
02266 177660   C
02316 177664   C
03071          C    HIM,I4:     TIPDEF 177460,177464
02237 003071   C
02267 177460   C
02317 177464   C
03072          C    IHM,I:      TIPDEF 173600,173624
02240 003072   C
02270 173600   C
02320 173624   C
03073          C    IHM,I4:     TIPDEF 163400,163424
02241 003073   C
02271 163400   C
02321 163424   C
```

```
                    LEV BCK    LCK INI
03074 105561 7 0 INITNP:    LDA (HOST34) I /THIS IS <>0 IF 3 OR 4 HOSTS
03075 006124 7 0            ANA MINUS4
                    /=0 FOR 5 MODEMS, 2 HOSTS
                    />0 FOR 4 MODEMS, 3 HOSTS
                    /<0 FOR 3 MODEMS, 4 HOSTS
03076 072132 7 0            LDX MIN100      /5M,2H
03077 100040 7 0            SZE
03100 073072 7 0            LDX IHM,I       /4M,3H
03101 100400 7 0            SPL
03102 073073 7 0            LDX IHM,I4      /3M,4H
03103 032500 7 0            STX IHM         /*
03104 073562 7 0            LDX (-20)       /5M,2H
03105 100040 7 0            SZE
03106 073070 7 0            LDX HIM,I       /4M,3H
03107 100400 7 0            SPL
03110 073071 7 0            LDX HIM,I4      /3M,4H
03111 032501 7 0            STX HIM         /*
03112 073563 7 0            LDX (-4000)     /5M,2H
03113 100040 7 0            SZE
03114 073564 7 0            LDX (-10000)    /4M,3H
03115 100400 7 0            SPL
03116 073565 7 0            LDX (-20000)    /3M,4H
03117 032502 7 0            STX MOM         /*
03120 072113 7 0            LDX ZERO        /5M,2H
03121 100040 7 0            SZE
03122 072121 7 0            LDX MINUS1      /4M,3H
03123 100400 7 0            SPL
03124 072122 7 0            LDX MINUS2      /3M,4H
03125 133566 7 0            STX (MODNO) I   /*
03126 073567 7 0            LDX (M2I5)      /5M
03127 100040 7 0            SZE
03130 073570 7 0            LDX (IH2E)      /4M OR 3M
03131 032070 7 0            STX M5INIL      /*
03132 073571 7 0            LDX (M2I4)      /5M OR 4M
03133 100400 7 0            SPL
03134 073572 7 0            LDX (IH3E)      /3M
03135 032067 7 0            STX M4INIL      /*
03136 073573 7 0            LDX (I2M5)      /5M
03137 100040 7 0            SZE
03140 073574 7 0            LDX (HI2E)      /4M OR 3M
03141 032075 7 0            STX M5OTIL      /*
03142 073575 7 0            LDX (I2M4)      /5M OR 4M
03143 100400 7 0            SPL
03144 073576 7 0            LDX (HI3E)      /3M
03145 032074 7 0            STX M4OTIL      /*
```

```
03146 121577 7 0            JST (RUTINI) I /INIT ROUTING TABLES
03147 121600 7 0            JST (TOI) I    /INITIALIZE TIMEOUT
03150 131040 7 0            RDCLOK
03151 003150 7 0            JMP .-1        /WAIT 3 SECONDS
03152 101400 7 0            SMI
03153 003150 7 0            JMP .-3        /BEFORE STARTING INTERRUPT PROGRAM
03154 121601 7 0            JST (SWCH) I   /FIRE OFF A TRBL REPT NOW - FOLLOWS
                      /START MODEM INPUT - MUST FOLLOW TOI
03155 073602 7 0            LDX (-[2"T"CH])
03156 005603 7 0            LDA (I 0 1)
03157 050032 7 0 INIT17:    STA M1INBP+2"T"CH X
03160 024000 7 0            IRS 0
03161 003157 7 0            JMP INIT17
03162 005604 7 0            LDA (M1IN)
03163 011174 7 0            STA INIT19
03164 072127 7 0            LDX MICH
03165 005605 7 0 INIT18:    LDA (JMP+0+1000+M2II"A"777)
03166 151070 7 0            STA M2IIT+CH XI          /FIRST IN WILL BE DISCAR
03167 105606 7 0            LDA (VDHNO) I  /SKIP FOR VDH'S MODEM
03170 016000 7 0            SUB 0
03171 100040 7 0            SZE
03172 117607 7 0            SUB (SATNO) I  /ENTERING AC IS -C(0)
03173 100040 7 0            SZE
03174        7 0 INIT19:    BSS 1          /STARTUP MODEM INS
03175 025174 7 0            IRS INIT19
03176 024000 7 0            IRS 0
03177 003165 7 0            JMP INIT18
                      /START THE HOST/IMP AND IMP/HOST ROUTINES
03200 004131 7 0            LDA MITH
03201 011062 7 0            STA IT3        /COUNTING ON X=0 AT THIS POINT
03202 004117 7 0 INIT15:    LDA FOUR 0"A"HSTIDN      /HOSTS ARE DOWN WHILE IMP
03203 050504 7 0            STA HIMD X
03204 121610 7 0            JST (IHIN) I   /** MUST BE IN THIS ORDER
03205 121611 7 0            JST (HIST) I   /**
03206 024000 7 0            IRS 0
03207 025062 7 0            IRS IT3
03210 003202 7 0            JMP INIT15
03211 004121 7 0            LDA MINUS1
03212 010137 7 0            STA SW3FG
03213 010140 7 0            STA NRSTF
03214 010134 7 0            STA PRIM
03215 170120 7 0            SMK INTM
03216 000401 7 0            ENB BCK
03217 131040 7              RDCLOK         /ALLOW ALL T/O PROGRAMS TO RUN
03220 003217 7              JMP .-1
03221 100400 7              SPL
03222 003217 7              JMP .-3        /BEFORE BACK BEGINS
                      /FALL INTO BACKST -----
```

```
                    /BACKGROUND LOOP
                    LEV BCK
03223 005612 7      BACKST:   LDA (BBNIMP)    /1ST REPORT MUST GO TO NCC
03224 111613 7      BACK:     STA (TRBD) I
03225 005614 7                LDA (-FH)
03226 011410 7                STA BT1
03227 005410 7      BKV:      LDA BT1
03230 017614 7                SUB (-FH)
03231 010000 7                STA 0
03232 011412 7                STA FAKENO      /FOR DEBUG
03233 143415 7                JMP DZTB XI     /RESUME WHERE JAM LEFT OFF

03234 000000 7      BKX:      0               /JAM WAIT (DOZE)
03235 005234 7                LDA BKX
03236 051415 7                STA DZTB X
03237 143421 7                JMP WTTB XI     /RESUME WHERE SUCK LEFT OFF

03240 000000 7      BKW:      0               /SUCK WAIT (WAIT)
03241 005240 7                LDA BKW
03242 051421 7                STA WTTB X
03243 000401 7                ENB BCK
03244 025410 7                IRS BT1
03245 003227 7                JMP BKV
03246 005615 7                LDA (-BH)
03247 011410 7                STA BT1
03250 072113 7                LDX ZERO
03251 133616 7      BKY:      STX (BACKNO) I
03252 072114 7                LDX ONE
03253 001001 7                INH ALL
03254 143260 7 0 DXATS1:      JMP DXATST XI   /ARE WE EXA OR DXA?
                    DEFHLT [BACKGROUND IN EXA MODE (BACK0)!]
03255 021262 7 0              JST DXABUG      /DXA
03256 173616 7 0 DXATS2:      LDX (BACKNO) I  /EXA
03257 143425 7 0              JMP SLTB XI     /RESUME WHERE BACK HOSTS LEFT OFF
```

```
                    LEV CON
03260 003254 C      DXATST:   DXATS1
03261 003256 C                DXATS2
                    LEV BCK   LCK ALL
03262 000000 7 0    DXABUG:   0
03263 120745 7 0              JST HLTNCC I
03264 000011 7 0              DXA
03265 103262 7 0              JMP DXABUG I

                              RET BCK
03266 000000 7      BKZ:      0                 /BACK HOST WAIT (SLEEP)
03267 000401 7                ENB BCK
03270 173616 7                LDX (BACKNO) I
03271 005266 7                LDA BKZ
03272 051425 7                STA SLTB X
03273 024000 7      B5Z:      IRS 0
03274 025410 7                IRS BT1
03275 003251 7                JMP BKY
03276 140040 7                CRA
03277 100004 7                SR3
03300 010137 7                STA SW3FG         /DO NICE STOP IF SS3
03301 004137 7                LDA SW3FG         /REMOTE NICE-STOP+RELOAD
03302 100400 7                SPL
03303 004140 7                LDA NRSTF
03304 101400 7                SMI
03305 021446 7                JST NSRT          /NICE-STOP IF SW3FG>=0 OR NRSTF>=0
```

```
03306 004415 7              LDA TIME
03307 027413 7              IMA WDTOLD      /IS T.O RUNNING?
03310 013413 7              ERA WDTOLD
03311 100040 7              SZE
03312 003316 7              JMP BKT         /TIME CHANGED...YES
03313 025414 7              IRS WDTBAK
03314 003320 7              JMP BKU         /DON'T GIVE UP YET
                    RELOAD [BACKGROUND SAW TIMEOUT STOP]
03315 120061 7              JST SWDTIL I

03316 005617 7    BKT:      LDA (-10000.)   /GIVE T.O A LONG TIME TO RUN
03317 011414 7              STA WDTBAK      /AND RESET BACK-WDT
03320 000401 7    BKU:      ENB BCK
03321        7              TIPDEF [JMP BKS],[LDA TIPRSF]
02242 003321 7
02272 003334 7
02322 004136 7
03322 101040 7              SNZ
03323 003331 7              JMP BKR
03324 000013 7              EXA
03325 121620 7              JST (TIPBKG) I
03326 001001 7              INH ALL
03327 120672 7 0            JST DODXA I     RET BCK
03330 003334 7              JMP BKS
03331 004063 7    BKR:      LDA STDIL
03332 010101 7              STA H2INIL
03333 010077 7              STA H2OTIL
03334 073621 7    BKS:      LDX (-LITN)     /LIGHTS DISPLAY
03335 145446 7    LIT2:     LDA LITT+LITN XI
03336 100040 7              SZE
03337 140500 7              SSM
03340 041277 7              LLR 1
03341 024000 7              IRS 0
03342 003335 7              JMP LIT2
03343 140040 7              CRA
03344 040267 7              LRR LITN
03345 012452 7              ERA LUUP
03346 011434 7              STA LITS
03347 001001 7              INH ALL
03350 000013 7 0            EXA
03351 105433 7 0            LDA LITP I
03352 120672 7 0            JST DODXA I     RET BCK
03353 100020 7              SR1
03354 004121 7              LDA MINUS1      /LAMP TEST
03355 170026 7              LITES
03356 101000 7              NOP
03357 000201 7              IAB
03360 025411 7              IRS BACKX       /KEEP COUNT OF BACK LOOPS
03361 101000 7              NOP
```

```
03362 140040 7              CRA
03363 026144 7              IMA VDHRSF      /CHECK AND RESET VDH RESTART FLAG
03364 100040 7              SZE
03365 121622 7              JST (VD,I) I    /YES, RESTART
03366 101000 7   VDH2:      NOP             /VDH BACKGROUND CALL
03367 004172 7              LDA RUT+BBNIMP
03370 101400 7              SMI 0"A"RUTDED /IS NCC IMP UP?
03371 003223 7              JMP BACKST      /YES
03372 072132 7              LDX MINIMP      /MUST FIND RANDOM IMP UP
03373 044265 7   BKWD1:     LDA RUT+NIMP X
03374 101400 7              SMI 0"A"RUTDED /DEAD?
03375 101040 7              SNZ 0"A"RUTUS
03376 003403 7              JMP BKWD2       /DON'T USE OURSELVES EXCEPT AS A LA
03377 004000 7              LDA 0           /GOT ONE
03400 016132 7              SUB MINIMP
03401 013623 7   BKWD3:     ERA (DESTH 0 FORIMP)     /TO DISCARD
03402 003224 7              JMP BACK
03403 024000 7   BKWD2:     IRS 0
03404 003373 7              JMP BKWD1
03405 004106 7              LDA MINE        /EVERYONE IS DEAD, USE OURSELVES
03406 003401 7              JMP BKWD3
03407 037511 7   VDH2.:     VD.B

                 LEV VAR
03410         V  BT1:       BSS 1
03411         V  BACKX:     BSS 1           /NO OF BACK LOOPS
03412         V  FAKENO:    BSS 1
03413         V  WDTOLD:    BSS 1           /OLD TIME READING
03414         V  WDTBAK:    BSS 1           /BACK WDT TIMER
                 /THESE 3 TABLES MUST STAY IN ORDER!!
                 DEFPLC [DZTB - GOES WITH JAM]
03415         V  DZTB:      BSS FH
                 DEFPLC [WTTB - GOES WITH SUCK]
03421         V  WTTB:      BSS FH
                 DEFPLC [SLTB - GOES WITH SLEEP (BACK HOSTS)]
03425         V  SLTB:      BSS 8H

                 DEFPLC [LIGHT DISPLAY POINTER AND NOMINAL DISPLAY WORD]
03433 003434  V  LITP:      LITS
03434         V  LITS:      BSS 1

                 /LIGHTS TABLE  AND CONDITION INDICATED BY LIT LIGHT
                 LEV CON
03435 000433  C  LITT:      LINE            /1 = 100000 1ST CHANNEL DEAD
03436 000434  C             LINE+1          /2 =  40000 2ND CHANNEL DEAD
03437 000435  C             LINE+2          /3 =  20000 3RD CHANNEL DEAD
03440 000436  C             LINE+3          /4 =  10000 4TH CHANNEL DEAD
03441 000504  C             HIHD            /5 =   4000 HOST 1 DEAD
03442 000505  C             HIHD+1          /6 =   2000 HOST 2 DEAD
03443 000506  C             HIHD+2          /7 =   1000 HOST 3 DEAD
03444 000507  C             HIHD+3          /8 =    400 HOST 4 DEAD
03445 000765  C             TPOPEN          /9 =    200 TIP HAS OPEN CONNECTION
                 LITN=0 0 .-LITT
```

```
                    / NICE STOP ROUTINE
                            LEV BCK
03446 000000 7      NSRT:   0
03447 103450 7              JMP NSRR I
03450 000000 7      NSRR:   0
03451 103446 7              JMP NSRT I
03452 004137 7      NS1:    LDA SW3FG       /SET UP RSFNCC WORD FOR NICE STOP
03453 006120 7              ANA SEVEN
03454 041675 7              ALR 3
03455 012140 7              ERA NRSTF
03456 007624 7              ANA (177770)
03457 012140 7              ERA NRSTF
03460 012752 7              ERA C77
03461 041675 7              ALR 3
03462 101004 7              SS3             /DO NOT SET RSFNCC FOR SS3
03463 011560 7              STA RSFNCC
03464 140040 7              CRA             /SEND IMP GOING DOWN IN 30 SEC
03465 021525 7              JST IHDOWN      LCK FRE
03466 000401 7 0            ENB BCK
03467 021543 7              JST NSWT        /WAIT 5 SECONDS
03470 004117 7              LDA FOUR 0"A"HSTIDN
03471 010504 7              STA HIHD        /STOP NET TRAFFIC TO AND FROM HOSTS
03472 010505 7              STA HIHD+1      /MARK HOSTS DEAD, IMP NOT UP
03473 010506 7              STA HIHD+2
03474 010507 7              STA HIHD+3
03475 021543 7              JST NSWT        /WAIT 5 SECONDS
03476 004121 7              LDA MINUS1      /STOP STORE-AND-FORWARD TRAFFIC BY
03477 010573 7              STA MAXSI       /MAKING MAXS COPY SMALL
03500 021543 7              JST NSWT        /WAIT 5 SECONDS
03501 004127 7              LDA MICH
03502 011556 7              STA BT2         /STOP EXCHANGE OF ROUTING AND ACKNO
03503 072113 7              LDX ZERO        /TURNING OFF ALL LINES
03504 001001 7              INH [M2I,T,O,TSK]
03505 121625 7 0 NS3:       JST (KILLIN) I /KILL LINE AT ONCE
03506 024000 7 0            IRS 0
03507 025556 7 0            IRS BT2
03510 003505 7 0            JMP NS3
03511 000401 7 0            ENB BCK
03512 021543 7              JST NSWT        /WAIT 5 SECONDS
03513 021543 7              JST NSWT        /WAIT UNTIL SLT DELAY OVER
03514 004140 7              LDA NRSTF
03515 101400 7              SMI             /RESTART?
03516 103626 7              JMP (INIT) I    /GO TO 2000
03517 004137 7              LDA SW3FG       /FOR VDH OR NON-VDH
03520 101004 7              SS3             /STOP OR RELOAD?
03521 103627 7              JMP (WDLOD) I
03522 030026 7              WDT
03523 000000 7              HLT
03524 003522 7              JMP .-2
```

```
03525 000000 7    IHDOWN:   0                 /NOTIFY ALL HOSTS OF IMP DOWN
03526 001001 7              INH FRE
03527 010515 7 0            STA TWDP
03530 004131 7 0            LDA MITH
03531 011556 7 0            STA BT2
03532 005556 7 0 NS2:       LDA BT2
03533 016131 7 0            SUB MITH
03534 010000 7 0            STA 0
03535 005630 7 0            LDA (CIMPDN)    /IMP GOING DOWN MESSAGE
03536 120670 7 0            JST OWP I
03537 101000 7 0            NOP
03540 025556 7 0            IRS BT2
03541 003532 7 0            JMP NS2
03542 103525 7 0            JMP IHDOWN I

03543 000000 7 0 NSWT:      0               /WAIT 5 SECONDS
03544 030026 7 0            WDT
03545 004415 7 0            LDA TIME
03546 011557 7 0            STA NSTM
03547 021450 7 0 NS5:       JST NSRR
03550 004415 7 0            LDA TIME
03551 017557 7 0            SUB NSTM
03552 141044 7 0            CAR             /WAIT FIVE SECONDS
03553 101040 7 0            SNZ
03554 003547 7 0            JMP NS5
03555 103543 7 0            JMP NSWT I

                            LEV VAR
03556         V   BT2:      BSS 1           /TEMP
03557         V   NSTM:     BSS 1           /FOR STOP
03560         V   RSFNCC:   BSS 1           /RESTART FLAGE FOR NCC -FORMAT FOLL
                  /RSFNCC HAS THE FORM 000XYZ WHERE X,Y,Z ARE OCTAL DIGITS
                  /X IS RELOAD REQUEST INDICATOR, X=0 NO REQUEST
                  /X=7 RANDOM RELOAD, X=6 RELOAD FOR LINE 1, X=5 LINE 2, X=4 L
                  /X=3 LINE 4, X=2 LINE 5
                  /Y IS RESTART REQUEST INDICATOR, Y=0 NO REQUEST
                  /Y=7 RESTART AT 2000 - NON-VDH, X=6 RESTART AT 2001 - VDH
                  /Z IS PROGRAM INITIALIZATION INDICATOR, Z=0 NO INIT
                  /Z=1 RESTARTED, Z=2 RELOADED, Z=3 WATCH DOG TIMER RELOADED
                  /Z=4 POWER FAIL RESTARTED
```

```
03561 001005 C    LEV CON   CONSTANTS
03562 177760 C
03563 174000 C
03564 170000 C
03565 160000 C
03566 020545 C
03567 010163 C
03570 016020 C
03571 010137 C
03572 016012 C
03573 012107 C
03574 013064 C
03575 012113 C
03576 013056 C
03577 026070 C
03600 020075 C
03601 022320 C
03602 177766 C
03603 100001 C
03604 030471 C
03605 003207 C
03606 020544 C
03607 005153 C
03610 016217 C
03611 013256 C
03612 000005 C
03613 030456 C
03614 177774 C
03615 177772 C
03616 004420 C
03617 154360 C
03620 040001 C
03621 177767 C
03622 037025 C
03623 040300 C
03624 177770 C
03625 011133 C
03626 002000 C
03627 001022 C
03630 001000 C
02412 175637 C    PAGEND 3,UNCON,4
```

```
                    /SEND OFF ALLOCATED RFNMS AND ALLOCATES AND RFNMS
                    LEV BCK
04063 140040 7      B0AA:     CRA
04064 011157 7                STA BALLOC
04065 121417 7      B0A:      JST SLEEP I
04066 021372 7      B0B:      JST GETFRE      LCK FRE   /GET A BUFFER FOR OUR AI
04067 003065 7 0              JMP B0A         /NOT NOW, WAIT
04070 005155 7 0              LDA BRALLY 0"A"DESTI      /GET OUR RALLY
04071 007603 7 0              ANA (DESTI)
04072 050006 7 0              STA HEAD1 X     /SAVE IN HEADER
04073 013155 7 0              ERA BRALLY 0"A"[MESSNO 0 ONEOR8 RFNM]
04074 013157 7 0              ERA BALLOC 0"A"TRNREP     /SET ALLOC BIT OR NOT
04075 013160 7 0              ERA BREPIN 0"A"INCTRN
04076 050005 7 0              STA HEAD X
04077 021435 7 0              JST GIVTSK      RET BCK   /GIVE RALLY TO TASK
04100 121417 7      B0C:      JST SLEEP I
04101 021473 7      BACK0:    JST RALLYG      /GET NEXT RALLY TO GO
04102 003100 7                JMP B0C
04103 100000 7                SKP             /GOOD RETURN
04104 003100 7                JMP B0C         /GOT A DESTINATION DEAD, SENT ALREA
04105 011155 7                STA BRALLY      /SAVE RALLY
04106 007604 7                ANA (ONEOR8 0 RFNM)
04107 013604 7                ERA (ONEOR8 0 RFNM)
04110 101040 7                SNZ             /IS THIS JUST A 1-PKT RFNM?
04111 003063 7                JMP B0AA        /YES, NO ALLOC NECESSARY
04112 005155 7                LDA BRALLY
04113 007605 7                ANA (ONEOR8)
04114 100040 7                SZE
04115 005606 7                LDA (-7) 0"A"8PKTS
04116 014751 7                ADD 8PKTS
04117 011157 7                STA BALLOC
04120 004415 7                LDA TIME
04121 011156 7                STA BALLTO
04122 121417 7      B0D:      JST SLEEP I
04123 004415 7                LDA TIME
04124 017156 7                SUB BALLTO
04125 017607 7                SUB (40.)
04126 100400 7                SPL             /HAVE WE BEEN WAITING 1 SEC?
04127 003134 7                JMP B0F         /NOT YET
04130 005155 7                LDA BRALLY
04131 007610 7                ANA (RFNM)
04132 100040 7                SZE             /ARE WE SENDING AN ALLOCATED RFNM?
04133 003063 7                JMP B0AA        /YES, SEND IT OFF WITHOUT ALLOC
```

```
04134 001001 7    B0F:      INH [T,O,TSK]
04135 004542 7 5            LDA NALA
04136 016566 7 5            SUB NALS
04137 014541 7 5            ADD NREA
04140 016565 7 5            SUB NRES
04141 015157 7 5            ADD BALLOC
04142 022572 7 5            CAS MAXR        /CAN WE HAVE THE ROOM?
04143 003122 7 5            JMP B0D         /NOT YET
04144 003122 7 5            JMP B0D
04145 005611 7 5            LDA (ALLOC)
04146 027157 7 5            IMA BALLOC      /SET ALLOC BIT IN OUR REPLY
04147 014542 7 5            ADD NALA
04150 010542 7 5            STA NALA        /YES, SO TAKE IT
04151 004107 7 5            LDA M30SEC      /2 MINUTES BEFORE WE ARE IDLE
04152 041576 7 5            ALS 2
04153 011161 7 5            STA SNTALL
04154 003066 7 5            JMP B0B

                  LEV VAR
04155          V  BRALLY:   BSS 1           /OUR ALLOCATE TO MAKE
04156          V  BALLTO:   BSS 1           /TIME WE STARTED TO TRY FOR ALLOC
04157          V  BALLOC:   BSS 1           /NO OF BUFFERS WE NEED TO ALLOC
04160          V  BREPIN:   BSS 1           /BIT ON IF INC TRN REPLY
04161          V  SNTALL:   BSS 1           /TIMER FOR GARBAGE COLLECTION OF
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                    LEV BCK
                    /SEND OFF INCOMPLETE TRASMISSIONS IF ANY TMESS NO OVERDUE
                    LCK [H2I,T,0,TSK]
04162 121612 7 4 B1A:       JST (PPTGET) I /GET THE PPT ENTRY
04163 003257 7 4            JMP B1F        /NOT IN PPT OR PLT, SO ITS A GVB
04164 044111 7 4            LDA BUFE X
04165 140100 7 4            SSP 0"A"TWOQ
04166 011262 7 4            STA BACK1T     /SAVE PTR TO PKT CKSUM
04167 044010 7 4            LDA HEAD3 X
04170 007613 7 4            ANA (0 0 177777"X"SUBCOD)
04171 013614 7 4            ERA (CLOST)    /MARK MESS AS LOST IN NET
04172 066010 7 4            IMA HEAD3 X
04173 056010 7 4            SUB HEAD3 X
04174 115262 7 4            ADD BACK1T I   /ADJUST CKSUM
04175 111262 7 4            STA BACK1T I
04176 005605 7 4            LDA (ONEOR8)   /MARK AS INC TRN FOR ONE-PKT
04177 073430 7 4 B1B:       LDX HOLD+1     /GET OUR PKT
04200 052005 7 4            ERA HEAD X
04201 050005 7 4            STA HEAD X
04202 021435 7 4            JST GIVTSK     RET BCK   /AND GIVE TO TASK
04203 005261 7   B1C:       LDA BACK1P     /LOOK AT NEXT TMESS ENTRY
04204 141206 7              AOA
04205 023615 7              CAS (TMESS 0 NIMP)
04206 005615 7   BACK1:     LDA (TMESS 0 NIMP)       /SHOULDNT HAPPEN
04207 014132 7              ADD MINIMP     /WRAPAROUND TMESS TABLE
04210 011261 7              STA BACK1P     /SAVE PNTR TO TMESS
04211 121417 7   B1D:       JST SLEEP I
04212 001001 7              INH [H2I,T,0,TSK]
04213 105261 7 4            LDA BACK1P I
04214 007604 7 4            ANA (MSTO1 0 MSTO2)
04215 013604 7 4            ERA (MSTO1 0 MSTO2)
04216 100040 7 4            SZE            /HAS THIS MESS NO TIMED OUT?
04217 003203 7 4            JMP B1C        /NO
04220 011262 7 4            STA BACK1T     /INIT TEMP COUNTER, USED LATER
04221 021372 7 4            JST GETFRE     /YES, GET A BUFFER FOR OUR INC TRN
04222 003211 7 4            JMP B1D        /NOT NOW, TRY AGAIN
04223 033430 7 4            STX HOLD+1
04224 005261 7 4            LDA BACK1P
04225 017616 7 4            SUB (TMESS)    /SET UP OUR DEST
04226 050006 7 4            STA HEAD1 X 0"A"DESTI
04227 105261 7 4            LDA BACK1P I
04230 007617 7 4            ANA (0 0 177777"X"MSTO1"X"MSTO2)
04231 111261 7 4            STA BACK1P I   /CLEAR TIMEOUT BITS
04232 025262 7 4 B1E:       IRS BACK1T     /1 MEANS OLDEST, 2 NEXT OLDEST ...
04233 040677 7 4            ARR 1
04234 100400 7 4            SPL            /IS THE OLDEST POSSIBLE MESS INC?
04235 003232 7 4            JMP B1E        /NO, COUNT ONE MORE BACKWARDS
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04236 005262 7 4            LDA BACK1T
04237 141240 7 4            ICR             /GET NO OF MESS NOS TO ROLL BACK
04240 115261 7 4            ADD BACK1P I
04241 141044 7 4            CAR 0"A"MESSNO
04242 015620 7 4            ADD (INCTRN 0 -2000 TRNREP 0"A"LINETS)
04243 050005 7 4            STA HEAD X      /SET UP INC TRN WITH RIGHT MESS NO
04244 141044 7 4            CAR 0"A"MESSNO
04245 052006 7 4            ERA HEAD1 X     /SET UP MESS NO + IMP NO
04246 121621 7 4            JST (PLTGET) I /GET THE PLT ENTRY
04247 003162 7 4            JMP B1A         /NOT IN PLT, TRY PPT
04250 044030 7 4            LDA PLT2 X
04251 007613 7 4            ANA (0 0 177777"X"SUBCOD)
04252 013614 7 4            ERA (CLOST)     /MARK MESS AS LOST IN NET
04253 050030 7 4            STA PLT2 X
04254 044000 7 4            LDA PLT0 X
04255 007610 7 4            ANA (REQALL)
04256 003177 7 4            JMP B1B

04257 005622 7 4 B1F:       LDA (GVBALL 0 ONEOR8)
04260 003177 7 4            JMP B1B         /MAKE UP AN INC GVB
                    LEV VAR
04261          V    BACK1P: BSS 1           /PNTR TO TMESS ENTRY
04262          V    BACK1T: BSS 1           /COUNT OF NO OF MESS NOS TO GO BACK

                    /SEND OFF GIVE BACKS WHEN ALLOCATES TIME OUT
                    LEV BCK
04263 121417 7      B2A:    JST SLEEP I
04264 021372 7      B2B:    JST GETFRE      LCK FRE   /GET A BUFFER FOR OUR GIV
04265 003263 7 0            JMP B2A         /NOT NOW, WAIT
04266 033431 7 0            STX HOLD+2
04267 121417 7 0 B2C:       JST SLEEP I     RET BCK
04270 073431 7              LDX HOLD+2
04271 005314 7              LDA BACK2D 0"A"PRIBIT    /GET OUR DEST
04272 050006 7              STA HEAD1 X     /PUT IN PKT (NOT PRI)
04273 001001 7              INH H2I
04274 121623 7 4            JST (MESGET) I
04275 003267 7 4            JMP B2C         /CANT HAVE MESS NO
04276 013622 7 4            ERA (GVBALL 0 ONEOR8 0"A"LINETS"A"INCTRN)
04277 050005 7 4            STA HEAD X      /SET UP GVB
04300 021435 7 4            JST GIVTSK      RET BCK   /GIVE THE GVB TO TASK
04301 121417 7      B2D:    JST SLEEP I
04302 001001 7      BACK2:  INH (H2I,T,O)
04303 004126 7 4            LDA MINUS6      /ALLOCATES TIME OUT IN 125 MS
04304 115624 7 4            ADD (TALLYC) I
04305 100400 7 4            SPL             /IS ALLOC TOO OLD?
04306 003301 7 4            JMP B2D         /NOT USED UP YET
04307 105625 7 4            LDA (TALLY) I  /GET TOP TALLY ENTRY
04310 121626 7 4            JST (TALLYG) I /PULL IT OFF
04311 003301 7 4            JMP B2D         /NOT THERE?
04312 011314 7 4            STA BACK2D      /SAVE OUR DEST
04313 003264 7 4            JMP B2B
                    LEV VAR
04314          V    BACK2D: BSS 1           /DEST OF GIVE BACK
```

```
                        /DO RETRANSMISSSIONS OF REQ1 IN PPT THAT HAS GOT ALL1 IN RETU
                        LEV BCK
04315 121417 7    B3B:      JST SLEEP I
04316 173353 7              LDX BACK3P I
04317 044111 7              LDA BUFE X
04320 100400 7              SPL 0"A"TWOQ    /IS THIS PKT STILL ON 2 QUEUES?
04321 003315 7              JMP B3B         /YES, NEED TO DELAY WHILE ACK IS PRI
04322 011354 7              STA B3T1        /TEMP CKSUM POINTER
04323 140500 7              SSM 0"A"TWOQ
04324 050111 7              STA BUFE X      /PPT ENTRY GOES ON 2 QUEUES AGAIN
04325 044005 7              LDA HEAD X
04326 007627 7              ANA (0 0 177777"X"REQALL)
04327 050005 7              STA HEAD X      /TURN OFF REQ BIT, KEEP SAME MESS NU
04330 105353 7              LDA BACK3P I
04331 140100 7              SSP 0"A"RETRAN
04332 111353 7              STA BACK3P I
04333 105354 7              LDA B3T1 I
04334 015610 7              ADD (REQALL)    /NOW ADJUST CHECKSUM
04335 111354 7              STA B3T1 I
04336 140040 7              CRA             /GIVTSK WON'T MAKE CHECKSUM
04337 021435 7              JST GIVTSK      /GIVE TO TASK
04340 121417 7    B3C:      JST SLEEP I
04341 105353 7              LDA BACK3P I    /LOOK AT NEXT PPT ENTRY
04342 100400 7              SPL 0"A"RETRAN /MUST WE RETRANSMIT IT?
04343 003315 7              JMP B3B         /YES
04344 005353 7              LDA BACK3P
04345 141206 7              AOA             /GET NEXT PPT SLOT
04346 023630 7              CAS (PPT+0+PPTL)
04347 005630 7    BACK3:    LDA (PPT+0+PPTL)          /SHOULDNT HAPPEN
04350 017631 7              SUB (PPTL)      /WRAPAROUND PPT
04351 011353 7              STA BACK3P      /SAVE PPT SLOT
04352 003340 7              JMP B3C
                        LEV VAR
04353         V     BACK3P: BSS 1           /PNTR TO PPT ENTRY
04354         V     B3T1:   BSS 1           /PNTR TO CHKSM IN PKT
```

```
                        /SEND OFF PACKETS FROM A LINE WHICH JUST DIED - REROUTE
                        /SEND OFF DESTINATION DEAD MESSAGES TO SOURCE
                        LEV BCK
04355 121417 7          B4A:    JST SLEEP I
04356 073632 7          BACK4:  LDX (SRQ)       /GET NEXT REPLY
04357 001001 7                  INH [I2H,T,0]
04360 121633 7 3                JST (GETQ) I
04361 003355 7 3                JMP B4A         /NONE, SO SLEEP
04362 140040 7 3                CRA             /TELL GIVTSK NOT TO CKSUM
04363 021435 7 3                JST GIVTSK      RET BCK   /GIVE THE REPLY TO TASK
04364 003355 7                  JMP B4A

                        /SATELLITE BACK HOST
                        LEV BCK
04365 004145 7          BACK5:  LDA SATRSF
04366        7          B5A:    SATDEF SZE
02243 004366 7
02273 100040 7
02323 100040 7
04367 121634 7                  JST (SATBCK) I
04370 121417 7                  JST SLEEP I
04371 003365 7                  JMP BACK5

                        SATBCK=37700

                        LEV [VDB,BCK]
04372 000000 3          GETFRE: 0               /GET A FREE BUFFER FOR A BACK HOST
04373 001001 3                  INH FRE
04374 004537 3 0                LDA NFA
04375 016563 3 0                SUB NFS
04376 016570 3 0                SUB MINF
04377 100400 3 0                SPL
04400 103372 3 0                JMP GETFRE I    /NOT ENOUGH BUFFERS FOR MODEM INPU
04401 104324 3 0                LDA FREE I
04402 101040 3 0                SNZ
04403 103372 3 0                JMP GETFRE I
04404 026324 3 0                IMA FREE
04405 010000 3 0                STA 0
04406 024563 3 0                IRS NFS
04407 014751 3 0                ADD CMINPL 0"A"TWOQ
04410 050111 3 0                STA BUFE X
04411 004106 3 0                LDA MINE
04412 050007 3 0                STA HEAD2 X     /SET UP SOURCE IMP
04413 140040 3 0                CRA
04414 050000 3 0                STA 0 X
04415 025372 3 0                IRS GETFRE      /SKIP=SUCCESS
04416 103372 3 0                JMP GETFRE I

                        LEV CON
04417 003266 C          SLEEP:  BKZ             /BACK HOST WAIT
                        LEV VAR
04420        V          BACKNO: BSS 1           /NO OF BACK HOST CURRENTLY ACTIVE
04421        V          GIVTST: BSS BH          /RETURN ADDRS FOR BACK HOSTS GIVING
04427        V          HOLD:   BSS BH          /PKT PNTRS FOR BACK HOSTS GIVING
```

```
                    LEV BCK
04435 000000 7   GIVTSK:   0
04436 101040 7             SNZ
04437 003446 7             JMP GIVT0      /NOT GENERATING A CHECKSUM
04440 004117 7             LDA FOUR 0"A"[MINPL-ACKH]
04441 056004 7             SUB ACKH X
04442 056005 7             SUB HEAD X
04443 056006 7             SUB HEAD1 X
04444 056007 7             SUB HEAD2 X
04445 050010 7             STA HEAD3 X    /THERE'S THE CHECKSUM
04446 005420 7   GIVT0:    LDA BACKNO 0"A"INPCHN
04447 015635 7             ADD (HSTMOD 0 TH)
04450 050003 7             STA INCH X     /SET UP INPUT CHANNEL
04451 004000 7             LDA 0
04452 073420 7             LDX BACKNO
04453 140100 7             SSP 0"A"RETRAN /NEC FOR BACK3
04454 051427 7             STA HOLD X     /SAVE PKT PNTR
04455 005435 7             LDA GIVTSK
04456 051421 7             STA GIVTST X   /SAVE RETURN ADDR
04457 045427 7   GIVT1:    LDA HOLD X
04460 001001 7             INH M2I
04461 110401 7 0           STA ETQ I
04462 010401 7 0           STA ETQ        /PUT ON TASK QUEUE
04463 030041 7 0           TASK           /POKE TASK
04464 121417 7 0           JST SLEEP I    RET BCK
04465 140040 7             CRA
04466 066463 7             IMA TSKFLG+TH X
04467 101100 7             SLN            /TASK REFUSED IT
04470 143421 7             JMP GIVTST XI  /TASK TOOK IT
04471 121417 7             JST SLEEP I    /WAIT ONE BACKGROUND LOOP
04472 003457 7             JMP GIVT1      /THEN TRY AGAIN
```

```
                        LEV BCK
04473 000000 7  RALLYG:  0               /GET AN ENTRY IN RALLY TABLE
04474 140040 7           CRA
04475 026477 7           IMA RALLCF
04476 101040 7           SNZ             /ANY ALLOCATES TO GO?
04477 103473 7           JMP RALLYG I    /NO
04500 140040 7           CRA
04501 011600 7           STA RALLYX
04502 005636 7           LDA (MESS1)
04503 011602 7           STA RALADD      /PRESET TABLE INCREMENTER
04504 073601 7           LDX RALTRY
04505 105637 7  RALLG:   LDA (RALLY+NIMP 0 X) I
04506 101040 7           SNZ             /ANY RALLY ENTRIES TO GO?
04507 003565 7           JMP RALLG0      /NO
04510 025600 7           IRS RALLYX      /COUNT SOMETHING THERE
04511 105640 7           LDA (AMESS+NIMP 0 X) I
04512 141140 7           ICL
04513 006116 7           ANA THREE       /GET NEXT MESS NO TO USE
04514 041576 7           ALS 2
04515 140407 7           TCA
04516 015641 7           ADD (ALR 0
04517 011523 7           STA RALGS1
04520 013642 7           ERA (1000)
04521 011534 7           STA RALGS2
04522 005643 7           LDA (17)
04523        7  RALGS1:  BSS 1           /SHIFT MASK OVER
04524 001001 7           INH [I2H,TSK]
04525 107637 7 3         ANA (RALLY+NIMP 0 X) I
04526 101040 7 3         SNZ             /ANYTHING IN NEXT SLOT TO GO?
04527 003565 7 3         JMP RALLG0      /NO
04530 113637 7 3         ERA (RALLY+NIMP 0 X) I
04531 127637 7 3         IMA (RALLY+NIMP 0 X) I   /TURN OFF BITS
04532 113637 7 3         ERA (RALLY+NIMP 0 X) I
04533 000401 7 3         ENB BCK
04534        7  RALGS2:  BSS 1           /SHIFT BACK THE BITS IN QUESTION
04535 023644 7           CAS (13)
04536 025473 7           IRS RALLYG      /DEST DEAD, DOUBLE SKIP
04537 101000 7           NOP
04540 011160 7           STA BREPIN
04541 007631 7           ANA (INCTRN)
04542 027160 7           IMA BREPIN      /GET INCTRN BIT AND SAVE IT
04543 006116 7           ANA THREE       /EXTRACT THEM
04544 012115 7           ERA TWO 0"A"[ONEOR8 0 RFNM]
04545 101040 7           SNZ             /IS THIS A REQ FOR 1
04546 011602 7           STA RALADD      /YES, DO NOT BUMP MESSAGE NO
04547 012115 7           ERA TWO         /RESTORE A
04550 041672 7           ALR 6 0"A"[ONEOR8 0 RFNM]
04551 113640 7           ERA (AMESS+NIMP 0 X) I
04552 014000 7           ADD 0
04553 016132 7           SUB MINIMP      /OR IN MESS NO AND IMP NO
04554 127640 7           IMA (AMESS+NIMP 0 X) I
04555 015602 7           ADD RALADD      /BUMP NEXT MESS TO REPLY TO
04556 127640 7           IMA (AMESS+NIMP 0 X) I
```

```
04557 024000 7              IRS 0
04560 100000 7              SKP
04561 072132 7              LDX MINIMP
04562 033601 7              STX RALTRY
04563 025473 7              IRS RALLYG
04564 003576 7              JMP RALLEX

04565 000401 7   RALLG0:    ENB BCK
04566 024000 7              IRS 0
04567 003505 7              JMP RALLG
04570 004132 7              LDA MINIMP
04571 027601 7              IMA RALTRY
04572 013601 7              ERA RALTRY
04573 101040 7              SNZ             /DID WE MAKE A COMPLETE PASS?
04574 005600 7              LDA RALLYX
04575 100040 7              SZE             /AND DID WE FIND NOTHING AT ALL?
04576 010477 7   RALLEX:    STA RALLCF      /IF NO FOR EITHER, MUST COME BACK A
04577 103473 7              JMP RALLYG I    /IF YES FOR BOTH, LEAVE RALLCF ALO '
                 /IF ENTRIES WERE PUT DURING OUR PASS, RALLCF WILL HAVE BEEN

                 LEV VAR
04600         V  RALLYX:    BSS 1           /NON-ZERO = SOMETHING IN RALLY
04601         V  RALTRY:    BSS 1
04602         V  RALADD:    BSS 1           /INCREMENT TO AMESS = 0 OR MESS1
```

```
04603 000077 C    LEV CON    CONSTANTS
04604 000300 C
04605 000200 C
04606 177771 C
04607 000050 C
04610 000100 C
04611 000002 C
04612 015033 C
04613 177770 C
04614 000003 C
04615 032371 C
04616 032271 C
04617 177477 C
04620 176014 C
04621 015205 C
04622 000202 C
04623 015161 C
04624 020210 C
04625 032261 C
04626 015114 C
04627 177677 C
04630 033467 C
04631 000010 C
04632 000331 C
04633 015504 C
04634 037700 C
04635 100010 C
04636 000400 C
04637 072671 C
04640 072571 C
04641 041700 C
04642 001000 C
04643 000017 C
04644 000013 C
02413 175663 C                PAGEND 4,UNCON,4
```

```
                        TSKI:     LEV TSK          /TASK INTERRUPT
00103 005107 6          TASKIL/   TSKI
05107 000000 6 0        TSKI/     INT TSK          /TASK INTERRUPT COMES HERE
05110 000011 6 0                  DXA
05111 003112 6 0                  JMP .+1
05112 011140 6 0                  STA TA1
05113 033141 6 0                  STX TX1
05114 000043 6 0                  INK
05115 011142 6 0                  STA TK1
05116 004122 6 0        TSKMSK:   LDA MINUS2
05117 170120 6 0                  SMK INTM
05120 010134 6 0                  STA PRIM
05121 000401 6 0        TSKL:     ENB TSK          /ALL TASKS RETURN HERE
05122 004330 6                    LDA STQ
05123 001001 6                    INH MSK
05124 100040 6 0                  SZE              /IS TASK QUEUE EMPTY?
05125 003161 6 0                  JMP TSKM         /GOT A TASK
05126 140401 6 0                  CMA              /YES, TURN ON ALL BITS IN PRTY INT
05127 010134 6 0                  STA PRIM
05130 170120 6 0                  SMK INTM         /RESTORE REGISTERS AND KEYS
05131 073141 6 0                  LDX TX1
05132 000013 6 0                  EXA
05133 005142 6 0                  LDA TK1
05134 171020 6 0                  OTK
05135 005140 6 0                  LDA TA1
05136 000401 6 0                  ENB TSK
05137 103107 6                    JMP TSKI I

                        LEV VAR
05140          V        TA1:      BSS 1            /TEMP A
05141          V        TX1:      BSS 1            /TEMP X
05142          V        TK1:      BSS 1            /TEMP KEYS
05143          V        TASKIN:   BSS 1            /INPUT CHAN = SIGN ON=FROM HOST
05144          V        ACKBIT:   BSS 1            /BIT PNTR FOR OUR ACK
05145          V        OURR:     BSS 1            /OUR OUTPUT MODEM CHANNEL
05146          V        I2MSLT:   BSS 1            /THE CHANNEL PNTR WE NEED
05147          V        I2MBIT:   BSS 1            /ODD=EVEN BIT POSITION FOR THIS PKT
05150          V        ACKCH:    BSS 1            /TRANSMIT ACK CHANNEL FOR THIS PKT
05151          V        ACKP:     BSS 1            /PNTR TO RELEVANT RSEX ENTRY
05152          V        SWPCHT:   BSS 1            /TEMP FOR SWPCHK
05153          V        SATNO:    BSS 1            /0 IF NONE, CH#+1 ELSE
```

```
                    LEV TSK    LCK MSK
05154 005710 6 0 TSKM2:     LDA (STQ)       /CLEAN UP Q PNTRS
05155 010401 6 0            STA ETQ
05156 003171 6 0            JMP TSKM1
                    LEV TSK
05157 105151 6   TSKM3:     LDA ACKP I
05160 003215 6              JMP TSKM4

                    LEV TSK    LCK MSK
05161 010000 6 0 TSKM:      STA 0           /TASK
05162 010514 6 0            STA THIS        /STORE BUFF ADDR IN X AND THIS
05163 140040 6 0            CRA
05164 050002 6 0            STA PTRT X      /CLEAR TRACE PTR
05165 066000 6 0            IMA 0 X         /CLEAR BUFF CHAIN PNTR AND LOAD IN
05166 010330 6 0            STA STQ         /STORE NEW ADDR IN HEAD OF Q
05167 101040 6 0            SNZ             /WAS THIS LAST ENTRY IN Q?
05170 003154 6 0            JMP TSKM2       /YES
05171 000401 6 0 TSKM1:     ENB TSK         /X HAS BUFF ADDR
05172 044003 6              LDA INCH X
05173 011143 6              STA TASKIN      /SAVE INPUT CHANNEL
05174 100400 6              SPL 0"A"HSTMOD  /FROM HOST?
05175 003220 6              JMP TSKFOR      /YES
05176 015711 6              ADD (RSEX)      /NO,FROM MODEM, MUST DUPLICATE=DETE
05177 011151 6              STA ACKP
05200 044005 6              LDA HEAD X
05201 100100 6              SLZ 0"A"LINETS  /IS THIS A ROUTING MESSAGE?
05202 003407 6              JMP TSKRUT      /YES
05203 044004 6              LDA ACKH X
05204 141340 6              ICA
05205 006120 6              ANA SEVEN 0"A"CHANUM     /GET CHANNEL NO
05206 015712 6              ADD (BITTAB)
05207 011144 6              STA ACKBIT      /CONVERT TO BIT PNTR TABLE ADDR
05210 044004 6              LDA ACKH X
05211 100400 6              SPL 0"A"ODEVEN  /GET ODD=EVEN BIT FROM PKT
05212 003157 6              JMP TSKM3       /JUMP IF BIT IS ONE
05213 105151 6              LDA ACKP I      /COMPARE WITH WHAT WE WANT
05214 140401 6              CMA
05215 107144 6   TSKM4:     ANA ACKBIT I    /MASK WITH CONTENTS OF BITTAB
05216 100040 6              SZE
05217 003642 6              JMP FQMOD       /IF DUPLICATE ==FREE AND QUIT MODEM
05220 044006 6   TSKFOR:    LDA HEAD1 X
05221 007713 6              ANA (DESTI)
05222 010000 6              STA 0           /STOR DEST NO FROM HEADER IN X
05223 044165 6              LDA RUT X       /GET ROUTE
05224 101040 6              SNZ 0"A"RUTUS   /IS IT FOR US?
05225 103714 6              JMP (FORUS) I   /YES
05226 100400 6              SPL 0"A"RUTDED
05227 003601 6              JMP FQOK        /FOR DEAD GUY, RUT WD WAS MINUS
05230 007715 6              ANA (RUTDLC)
05231 016114 6              SUB ONE         /TASK STORE=AND=FORWARD
05232 010000 6              STA 0           /STORE SHIFTED ROUTE IN X (0 TO C
05233 044433 6              LDA LINE X      /TEST FOR LINE TEST STATUS
05234 100040 6              SZE             /IS LINE DEAD?
05235 003637 6              JMP FQNG        /YES, WAIT TILL ROUTING STABLE
```

```
05236 001001 6            INH [M2I,I2M,H2I]
05237 004540 6 0          LDA NSFA        /COMPUTE NO SF BUFFS IN USE
05240 016564 6 0          SUB NSFS
05241 141206 6 0          AOA             /WE NEED ONE MORE
05242 022573 6 0          CAS MAXSI       /ENOUGH S-F ROOM?
05243 003637 6 0          JMP FQNG        /NO
05244 003637 6 0          JMP FQNG        /NO
05245 004537 6 0          LDA NFA
05246 016563 6 0          SUB NFS         /COMPUTE NO OF FREE BUFFS AVAIL,
05247 016542 6 0          SUB NALA        /CONSIDERING ALLOCATED AND USED
05250 014566 6 0          ADD NALS
05251 016570 6 0          SUB MINF
05252 100400 6 0          SPL             /DO WE HAVE MIN FREE BUFFS?
05253 003637 6 0          JMP FQNG        /NO
05254 044653 6 0          LDA CHFREE X    /FREE SLOT BITS
05255 140407 6 0          TCA
05256 046653 6 0          ANA CHFREE X    /SINGLE LEAST SIGNIFICANT BIT SET
05257 101040 6 0          SNZ
05260 003637 6 0          JMP FQNG        /ALL CHANNELS ARE IN USE
05261 011147 6 0          STA I2MBIT      /FOR MARKING CHANNEL LATER
05262 052653 6 0          ERA CHFREE X    /NOW MARK IT ASSIGNED
05263 050653 6 0          STA CHFREE X
05264 000401 6 0          ENB TSK         /YES
05265 033145 6            STX OURR        /SAVE OUR ROUTE (0 TO CH-1)
```

```
05266 005147 6              LDA I2MBIT
05267 022116 6              CAS THREE
05270 040575 6              ARS 3           /CH 2=7
05271 100000 6              SKP             /CAS IS NEVER EQUAL
05272 003277 6              JMP GOTCHN      /CH 0=1
05273 022116 6              CAS THREE
05274 040575 6              ARS 3           /CH 5=7
05275 014116 6              ADD THREE       /CAS IS NEVER EQUAL
05276 014116 6              ADD THREE
05277 016114 6   GOTCHN:    SUB ONE         /GOT CHANNEL 0=7
05300 011150 6              STA ACKCH
05301 054622 6              ADD I2MTAB X    /GET PTR TO SLOT
05302 011146 6              STA I2MSLT
05303 005147 6              LDA I2MBIT
05304 111146 6              STA I2MSLT I    /MARK SLOT IN USE
05305 046641 6              ANA TSEX X      /GET O/E BIT IN TSEX
05306 100040 6              SZE             /WAS IT ZERO?
05307 005716 6              LDA (200) 0"A"ODEVEN      /NO, SET O/E BIT
05310 013150 6              ERA ACKCH       /PUT SLOT NO IN A
05311 141240 6              ICR             /PUT IN LEFT HALF
05312 072514 6              LDX THIS        /BUFF ADDR TO X
05313 011147 6              STA I2MBIT      /USED AS A TEMP WORD
05314 044111 6              LDA BUFE X
05315 140100 6              SSP 0"A"TWOQ
05316 027147 6              IMA I2MBIT      /NOW HAS PTR TO CHECKSUM
05317 066004 6              IMA ACKH X      /SAVE BIT, CHANNEL IN ACKHEADER
05320 056004 6              SUB ACKH X
05321 115147 6              ADD I2MBIT I    /AND ADJUST CHECKSUM
05322 111147 6              STA I2MBIT I
05323 044007 6              LDA HEAD2 X     /NOW PUT IN BIT FOR LO=HI LINE END
05324 007717 6              ANA (0 0 177777"X"ENDBIT)
05325 073145 6              LDX OURR        /THIS BIT DETECTS LOOPED LINES
05326 113720 6              ERA (LEND 0 X) I
05327 072514 6              LDX THIS
05330 066007 6              IMA HEAD2 X
05331 056007 6              SUB HEAD2 X     /ADJUST CHECKSUM AGAIN
05332 115147 6              ADD I2MBIT I
05333 111147 6              STA I2MBIT I
```

```
05334 044006 6            LDA HEAD1 X
05335 007721 6            ANA (TRACE)
05336 100040 6            SZE                 /MUST WE TRACE HIM?
05337 021504 6            JST TSUB            /TRACE HIM IF NECESSARY
05340 005146 6            LDA I2MSLT          /PUT OUR SLOT IN PKT
05341 050003 6            STA INCH X          /AND I2M WILL SET IT UP AT OUTPUT
05342 044005 6            LDA HEAD X
05343 007722 6            ANA (TRNREP)        /GET TRNREP BIT
05344 001001 6            INH SIN
05345 101040 6 0          SNZ                 /IS THIS A REPLY?
05346 003357 6 0          JMP SFPRI           /YES
05347 044006 6 0          LDA HEAD1 X
05350 100400 6 0          SPL 0"A"PRIBIT      /IS THIS A PRI TRN?
05351 003357 6 0          JMP SFPRI           /YES
05352 004514 6 0          LDA THIS            /NO, SO PUT ON REG MODEM QUEUE
05353 073145 6 0          LDX OURR
05354 150363 6 0          STA EMQ XI          /LINK BUFF TO END OF REG CHL Q
05355 050363 6 0          STA EMQ X
05356 003363 6 0          JMP SFALL

05357 004514 6 0 SFPRI:   LDA THIS            /YES, SO PUT ON PRI MODEM QUEUE
05360 073145 6 0          LDX OURR
05361 150370 6 0          STA EMPQ XI         /LINK BUFF TO END OF PRI CHL Q
05362 050370 6 0          STA EMPQ X
05363 024540 6 0 SFALL:   IRS NSFA            /COUNT A S-F PKT
05364 044440 6 0          LDA NONE X
05365 100040 6 0          SZE                 /POKE MODEM OUTPUT IF IDLE
05366 003604 6 0          JMP GOODM           /NO NEED
05367 121723 6 0          JST (I2MSB) I       RET TSK
05370 001001 6            INH ALL
05371 000011 6 0          DXA
05372 003604 6 0          JMP GOODM           /RETURN GOOD ACK

                    LEV FRE                   /CALL WITH INTERRUPTS LOCKED
05373 000000 0      FLUSH:0                   /RETURN BUFFER TO FREE LIST
05374 044111 0            LDA BUFE X
05375 100400 0            SPL 0"A"TWOQ        /IS PACKET ON 2 QUEUES?
05376 003404 0            JMP FLUSH1          /YES
05377 004324 0            LDA FREE            /NO, SO FREE IT
05400 050000 0            STA 0 X             /STORE PNTR TO FREE LIST
05401 032324 0            STX FREE            /STORE PNTR TO PACKET
05402 024537 0            IRS NFA             /INCREASE NO OF FREE PKTS
05403 103373 0            JMP FLUSH I
05404 140100 0      FLUSH1:SSP 0"A"TWOQ       /MARK PACKET AS ON ONE QUEUE
05405 050111 0            STA BUFE X
05406 103373 0            JMP FLUSH I
```

```
                        LEV TSK
05407 073143 6   TSKRUT:   LDX TASKIN      /INPUT CHL NO
05410 040677 6            ARR 1 0"A"NULPKT
05411 100100 6            SLZ             /THIS A NULL PACKET?
05412 003446 6            JMP TSKNUL      /YES
05413 041677 6            ALR 1
05414 141140 6            ICL             /GET OTHER GUYS IMPNO
05415 066160 6            IMA NEIGHB X    /SAVE IT
05416 100040 6            SZE             /DO NOT KILL LINE IF WE JUST DID
05417 052160 6            ERA NEIGHB X
05420 100040 6            SZE             /DO KILL LINE IF NEIGHBOR HAS CHANGI
05421 003452 6            JMP NEIKIL
05422 065565 6            IRS E123 X      /INCREMENT NUMBER OF RECD RUT MSGS
05423 101000 6            NOP
05424 044160 6            LDA NEIGHB X    /COMPUTE AND SET HI-LO BIT
05425 016106 6            SUB MINE
05426 100040 6            SZE
05427 003433 6            JMP TSKCPY      /COPY IN ROUTING INFO
05430 004114 6            LDA ONE
05431 010452 6            STA LUUP        /BLINK LUUPED LITE
05432 003642 6            JMP FQMOD

05433 001001 6   TSKCPY:   INH MSK
05434 004124 6 0          LDA MINUS4      /LOCK OUT SLOW T,O
05435 170120 6 0          SMK INTM        /SHARED CODE & TABLES
05436 010134 6 0          STA PRIM        LEV T,O   LCK MSK
05437 140040 5 0          CRA             /MARK AS REAL INPUT
05440 000401 5 0          ENB T,O
05441 121724 5            JST (RSTINP) I
05442 072514 5            LDX THIS
05443 001001 5            INH [MSK,FRE]
05444 021373 5 0          JST FLUSH
05445 003116 5 0          JMP TSKMSK

                        LEV TSK
05446 040675 6   TSKNUL:   ARR 3 0"A"IHERDU
05447 100100 6   TSKNU2:   SLZ             /DID WE GET AN IHEARD YOU?
05450 064426 6   TSKNU3:   DEFSTAT IRS LAC X, TSKIH /YES
00574 031212 6
31770 005450 6
32010 064426 6
05451 003642 6   TSKNU4:   JMP FQMOD

05452 001001 6   NEIKIL:   INH ALL
05453 011576 6 0          STA NEIT
05454 121725 6 0          JST (KILLIN) I
05455 005576 6 0          LDA NEIT
                        DEFHLT [NEIGHBOR IMP CHANGED]
05456 021635 6 0          JST THLTNG
```

```
                    LEV TSK    LCK [H2I,T,0]
05457 000000 6 4    SWPCHK:    0
05460 011152 6 4               STA SWPCHT      /BITS TO PUT INTO HEAD1
05461 044006 6 4               LDA HEAD1 X
05462 007726 6 4               ANA (FORIMP 0 FOROCT DESTHI)
05463 066007 6 4               IMA HEAD2 X     /SWITCH SRC FOR DEST AND V.V.
05464 007726 6 4               ANA (FRMIMP 0 FRMOCT SRCEHI)
05465 013152 6 4               ERA SWPCHT
05466 050006 6 4               STA HEAD1 X
05467 044111 6 4               LDA BUFE X
05470 006112 6 4               ANA SIGN 0"A"TWOQ
05471 014000 6 4               ADD 0
05472 015727 6 4               ADD (MINPL+1)   /FIX LENGTH OF REPLY
05473 050111 6 4               STA BUFE X
05474 005730 6 4               LDA (MINPL-ACKH+1)
05475 056004 6 4               SUB ACKH X
05476 056005 6 4               SUB HEAD X
05477 056006 6 4               SUB HEAD1 X     /BUILD CHECKSUM
05500 056007 6 4               SUB HEAD2 X
05501 056010 6 4               SUB HEAD3 X
05502 050011 6 4               STA DATA X      /NOW STORE IT
05503 103457 6 4               JMP SWPCHK I

                    LEV TSK    /TSUB DOES THE TASK PART OF TRACING
05504 000000 6      TSUB:      0
05505 004416 6                 LDA TIMES       /GET TIME IN SLOW TICKS
05506 016107 6                 SUB M30SEC
05507 050003 6                 STA INCH X      /GIVE PKT 30 SEC. TO LIVE
05510 044006 6                 LDA HEAD1 X
05511 007721 6                 ANA (TRACE)
05512 100040 6                 SZE             /MUST WE TRACE HIM?
05513 105731 6      TSUB2:     LDA (TRON) I
05514 101040 6                 SNZ
05515 103504 6                 JMP TSUB I
05516 004325 6                 LDA TTF         /FREE TRACE BLOCK PNTR
05517 100040 6                 SZE
05520 003524 6                 JMP TS2         /JUMP IF THERE ARE FREE TRACE BLOCK
05521 141206 6                 AOA
05522 010414 6                 STA TTO         /MARK TRACE TABLE OVERFLOW
05523 103504 6                 JMP TSUB I
```

```
05524 033572 6   TS2:     STX SPB          /SAVE BUFFER PNTR
05525 011573 6             STA STB          /FREE TRC BLK BUFF PNTR
05526 050002 6             STA PTRT X       /SET UP TRACE POINTER
05527 026341 6             IMA STRQ         /GET STRT OF ACTIVE TRC Q
05530 127573 6             IMA STB I        /LINK TO TOP OF TRACE Q
05531 010325 6             STA TTF          /STORE ADDR OF NEXT FREE BLK
05532 004341 6             LDA STRQ         /ADDR OF NEW TOP OF Q
05533 015732 6             ADD (THED+4 X)   /SET UP LAST TRC BUFF ADDR
05534 011574 6             STA ITB
05535 005572 6             LDA SPB          /ADDR OF PKT BUFF
05536 015732 6             ADD (HEAD+4 X)   /SET UP LAST PKT BUFF ADDR
05537 011575 6             STA IMB
05540 072124 6             LDX MINUS4       /TRANSFER PKT BUFF TO TRC BUFF
05541 105575 6             LDA IMB I
05542 111574 6             STA ITB I
05543 024000 6             IRS 0            /FINISHED?
05544 003541 6             JMP .-3          /NO
05545 073572 6             LDX SPB          /YES
05546 044001 6             LDA IT X         /SAVE INPUT TIME IN TRACE TABLE
05547 073573 6             LDX STB
05550 050001 6             STA TIT X
05551 073572 6             LDX SPB
05552 044111 6             LDA BUFE X
05553 140100 6             SSP 0"A"TWOQ
05554 016000 6             SUB 0
05555 016117 6             SUB FOUR 0"A"ACKH        /CALCULATE PACKET LENGTH
05556 073573 6             LDX STB
05557 050012 6             STA TDONE X
05560 131040 6             RDCLOK
05561 003560 6             JMP .-1          /SAVE TASK TIME IN TRACE TABLE
05562 050002 6             STA TTT X
05563 073572 6             LDX SPB          /RESTORE BUFFER PNTR IN X
05564 103504 6             JMP TSUB I

                 LEV VAR
05565          V   E123:    BSS CH           /NUMBER OF RUT MSGS RECD FROM CHL(
05572          V   SPB:     BSS 1            /SAVE PACKET BUFFER
05573          V   STB:     BSS 1            /SAVE TRACE BUFFER
05574          V   ITB:     BSS 1            /INDIRECT TO TRACE BUFFER
05575          V   IMB:     BSS 1            /INDIRECT TO PACKET BUFFER
05576          V   NEIT:    BSS 1            /TEMP
```

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                        /END-OF-TASK ROUTINES
                        /RETURN A NACK OR ACK TO THE SENDING MODEM, HOST, OR BACK
                        LEV TSK    LCK ALL
05577 000000 6 0 THLTOK:    0                /REPORT BUG AND GIVE GOOD RETURN
05600 120745 6 0            JST HLTNCC I
                        LEV TSK
05601 072514 6    FQOK:     LDX THIS         /FREE+QUIT, GOOD RETURN
05602 001001 6              INH [FRE,SIN]
05603 021373 6 0            JST FLUSH        /FREE THE BUFFER
05604 005143 6 0 GOODM:     LDA TASKIN       /GOOD RETURN
05605 100400 6 0            SPL 0"A"HSTMOD   /FROM HOST?
05606 003622 6 0            JMP GOODH        /YES
05607 010000 6 0            STA 0 0"A"INPCHN
05610 105144 6 0            LDA ACKBIT I     /FROM MODEM, GIVE ACK
05611 050445 6 0            STA SNULL X      /SEND A NULL PKT IF NECESSARY TO C
05612 052646 6 0            ERA RSEX X       /REVERSE PROPER BIT IN RSEX
05613 050646 6 0            STA RSEX X
05614 044440 6 0            LDA NONE X       /CHECK ACTIVITY ON MODEM
05615 101040 6 0            SNZ              /RESTART I2M IF NECESSARY FOR MY AC
05616 121723 6 0            JST (I2MSB) I    RET TSK
05617 001001 6              INH ALL
05620 000011 6 0            DXA
05621 003121 6 0            JMP TSKL

05622 140100 6 0 GOODH:     SSP 0"A"HSTMOD   /NEED TO CLEAR SIGN FOR HISB
05623 010000 6 0            STA 0 0"A"INPCHN
05624 064453 6 0            IRS TSKFLG X     /DOUBLE SKIP = GOOD RETURN
05625 064453 6 0            IRS TSKFLG X
05626 014131 6 0            ADD MITH
05627 000013 6 0            EXA
05630 100400 6 0            SPL              /FROM BACK HOST?
05631 121733 6 0            JST (HISB) I     RET TSK    /NO, POKE HOST WAITING FO
05632 001001 6              INH ALL
05633 000011 6 0            DXA
05634 003121 6 0            JMP TSKL

                        LEV TSK    LCK ALL
05635 000000 6 0 THLTNG:    0                /REPORT BUG AND GIVE BAD RETURN
05636 120745 6 0            JST HLTNCC I
                        LEV TSK
05637 005143 6    FQNG:     LDA TASKIN       /FREE+QUIT, BAD RETURN
05640 100400 6              SPL 0"A"HSTMOD   /FROM HOST?
05641 003646 6              JMP BADH
05642 072514 6    FQMOD:    LDX THIS         /FROM MODEM, DO NOT ACK
05643 001001 6              INH FRE
05644 021373 6 0            JST FLUSH
05645 003121 6 0            JMP TSKL

                        LEV TSK
05646 010000 6    BADH:     STA 0 0"A"INPCHN          /YES, RETURN A NACK TO HO
05647 064453 6              IRS TSKFLG X     /SINGLE SKIP = BAD RETURN
05650 003121 6              JMP TSKL         /DO NOT POKE HOST (ALLOW BACK TO RU
```

```
                        LEV TSK   LCK FRE
05651 004326 6 0 NEWMES:  LDA RASF        /NEW MULTI-PACKET MESSAGE FOR US
05652 101040 6 0          SNZ             /GET REAS BLOCK
                        DEFHLT [NO REAS BLOCK FOR MULTI-PKT MESS]
05653 121734 6 0          JST (THLTNG) I
05654 004751 6 0          LDA 8PKTS
05655 014541 6 0          ADD NREA        /CHECK REAS ROOM
05656 016565 6 0          SUB NRES
05657 022572 6 0          CAS MAXR
05660 101000 6 0          NOP             /NO ROOM, FOUL-UP
                        DEFHLT [MAXR EXCEEDED BY NON-REQUEST MULTI-PKT MESS]
05661 121734 6 0          JST (THLTNG) I
05662 004537 6 0          LDA NFA
05663 016563 6 0          SUB NFS
05664 016751 6 0          SUB 8PKTS
05665 016570 6 0          SUB MINF
05666 100400 6 0          SPL
                        DEFHLT [MINF VIOLATED BY NON-REQUEST MULTI-PKT MESS]
05667 121734 6 0          JST (THLTNG) I
05670 104326 6 0          LDA RASF I
05671 026326 6 0          IMA RASF
05672 010000 6 0          STA 0
05673 026340 6 0          IMA SHRQ        /PUT ON REAS QUEUE
05674 050000 6 0          STA 0 X
05675 004751 6 0          LDA 8PKTS
05676 014541 6 0          ADD NREA        /NOW TAKE ROOM
05677 010541 6 0          STA NREA
05700 004751 6 0          LDA 8PKTS
05701 014566 6 0          ADD NALS
05702 010566 6 0          STA NALS
05703 004112 6 0          LDA SIGN        /INIT RMAX
05704 050002 6 0          STA RMAX X
05705 105735 6 0          LDA (MESSID) I /ESTABLISH RID
05706 050001 6 0          STA RID X
                        /RSF IS SET UP AT INIT AND AFTER USE TO BE ZERO
                        /THE SAME IS TRUE OF REAS PNTRS
05707 103736 6 0          JMP (OLDMES) I
```

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05710 000330 C    LEV CON   CONSTANTS
05711 000646 C
05712 001233 C
05713 000077 C
05714 006056 C
05715 000037 C
05716 000200 C
05717 176777 C
05720 050254 C
05721 020000 C
05722 000004 C
05723 012604 C
05724 026120 C
05725 011133 C
05726 050377 C
05727 000011 C
05730 000005 C
05731 030434 C
05732 040011 C
05733 013106 C
05734 005635 C
05735 006664 C
05736 006313 C
02414 176744 C              PAGEND 5,UNCON,4
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                    /TASK REASSEMBLY
                    LEV TSK
06056 072514 6      FORUS:    LDX THIS        /PNTR TO PKT BUFF
06057 044007 6                LDA HEAD2 X     /TASK FOR US
06060 007674 6                ANA (SRCEI)     /SOURCE IMP MASK
06061 011673 6                STA SOURCE      /PREPARE MESS TABLE ENTRY
06062 044005 6                LDA HEAD X
06063 141044 6                CAR 0"A"MESSNO
06064 011661 6                STA MESNUM      /SAVE OUR MESS NO
06065 013673 6                ERA SOURCE
06066 011664 6                STA MESSID      /PREPARE MESSAGE ID
06067 044005 6                LDA HEAD X
06070 007675 6                ANA (TRNREP)
06071 100040 6                SZE
06072 005676 6                LDA (0 0 RMESS"X"TMESS)
06073 013677 6                ERA (TMESS)     /PICK TRANSMIT OR REPLY TABLE
06074 015673 6                ADD SOURCE
06075 011660 6                STA MESTAB
06076 001001 6                INH [H2I,T,O]
06077 105660 6 4              LDA MESTAB I    /GET OLDEST MSG NO WE ARE EXPECTING
06100 141044 6 4              CAR 0"A"MESSNO /GET MESS NO WE WANT
06101 017661 6 4              SUB MESNUM      /COMPARE WITH MESS NO WE GOT
06102 100400 6 4              SPL             /IS MESS NO WE GOT TOO HIGH?
06103 003375 6 4              JMP MESOUT      /YES
06104 141140 6 4              ICL
06105 022116 6 4              CAS THREE       /IS MESS NO WE GOT TOO LOW?
06106 003375 6 4              JMP MESOUT      /YES
06107 101000 6 4              NOP             /GOOD MESS NO
06110 015700 6 4              ADD (MBITS)     /NOW CONVERT DIFF BETWEEN MESSNOS
06111 011662 6 4              STA MESBIT      /INTO A BIT = 1,2,4, OR 10
06112 044005 6 4              LDA HEAD X
06113 007701 6 4              ANA (INCTRN 0 TRNREP)
06114 013701 6 4              ERA (INCTRN 0 TRNREP)
06115 101040 6 4              SNZ             /IS IT AN INCOMPLETE TRANS?
06116 003431 6 4              JMP INCGOT      /YES
06117 105662 6 4              LDA MESBIT I    /NO, LOAD DIFFERENCE BIT
06120 107660 6 4              ANA MESTAB I    /CHECK AGAINST MSG NO
06121 000401 6 4              ENB TSK
06122 100040 6                SZE             /IS MESS NO A DUPLICATE?
06123 103702 6                JMP (FQOK) I    /YES, DISCARD PKT
06124 044005 6                LDA HEAD X      /GOOD MESSAGE FOR US
06125 007675 6                ANA (TRNREP)
06126 101040 6                SNZ             /IS IT A REPLY?
06127 103703 6                JMP (REPGOT) I /YES
06130 073673 6                LDX SOURCE
06131 001001 6                INH [FRE,H2I,T,O]
06132 044165 6 0              LDA RUT X
06133 100400 6 0              SPL
                    DEFHLT [RECVD TRANSMISSION FROM DEAD IMP]
06134 121704 6 0              JST (THLTOK) I
06135 007705 6 0              ANA (0 0 177777"X"RUTCMU)
06136 050165 6 0              STA RUT X
06137 072514 6 0              LDX THIS
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06140 044005 6 0            LDA HEAD X
06141 007706 6 0            ANA (GVBALL)
06142 100040 6 0            SZE                 /IS IT A REGULAR TRANSMIT?
06143 003447 6 0            JMP GUDGVB          /NO, WE MUST RETURN A REPLY
06144 044006 6 0            LDA HEAD1 X
06145 121707 6 0            JST (HOSTNO) I
06146 000401 6 0            ENB TSK
06147 010000 6              STA 0
06150 044504 6              LDA HIHD X 0"A"HSTUP
06151 072514 6              LDX THIS
06152 100040 6              SZE                 /IS THIS TRANS FOR A DEAD HOST?
06153 005710 6              LDA (0 0 TRNDED"X"TRNDIS)
06154 013711 6              ERA (JMP TRNDIS)          /PICK REGULAR OR DEAD DISI
06155 011164 6              STA TRNJMP
06156 044005 6              LDA HEAD X          /GOOD TRANSMISSION FOR US
06157 141050 6              CAL
06160 040572 6              ARS 6 0"A"ONEOR8"A"REQALL
06161 015164 6              ADD TRNJMP
06162 011164 6              STA TRNJMP
06163 001001 6              INH FRE
06164        6 0 TRNJMP:    BSS 1               /DISPATCH ON 1 OR 8 PKT, REQ OR RE
06165 003302 6 0 TRNDIS:    JMP TRNGT8          /NON-REQ 8 PKT
06166 003455 6 0            JMP GUDRQ8          /REQ 8 PKT
06167 003227 6 0            JMP TRNGT1          /NON-REQ 1 PKT
06170 105662 6 0            LDA MESBIT I        /REQ 1 PKT
06171 012114 6 0            ERA ONE
06172 101040 6 0            SNZ                 /IS THIS REQ THE NEXT TO GO?
06173 003204 6 0            JMP TRNDS1          /YES
06174 044006 6 0            LDA HEAD1 X         /NO
06175 101400 6 0            SMI 0"A"PRIBIT /IS IT A PRI REQ?
06176 003222 6 0            JMP GUDRQ1          /NOT PRI, SO WE CAN GO NO FURTHER
06177 105660 6 0            LDA MESTAB I
06200 052005 6 0            ERA HEAD X
06201 007712 6 0            ANA (ORDNO)
06202 100040 6 0            SZE                 /IS HIS PRI ORD NO UP YET?
06203 003222 6 0            JMP GUDRQ1          /NO, SO HE MUST WAIT
06204 004542 6 0 TRNDS1:    LDA NALA
06205 016566 6 0            SUB NALS
06206 014541 6 0            ADD NREA
06207 016565 6 0            SUB NRES
06210 141206 6 0            AOA
06211 022572 6 0            CAS MAXR
06212 003222 6 0            JMP GUDRQ1          /NO ROOM FOR 1 PKT MESS, TREAT AS R
06213 003222 6 0            JMP GUDRQ1          /NO ROOM FOR 1 PKT MESS, TREAT AS R
06214 004563 6 0            LDA NFS
06215 016537 6 0            SUB NFA
06216 141206 6 0            AOA
06217 014570 6 0            ADD MINF
06220 100400 6 0            SPL
06221 003244 6 0            JMP GUDTR1
                        /NOTE THAT NO DUPLICATE DETECTION IS DONE HERE
06222 005664 6 0 GUDRQ1:    LDA MESSID          /ENTER HIS REQUEST
06223 013713 6 0            ERA (ONEOR8)        /FOR ONE BUFFER
06224 121714 6 0            JST (RALLYP) I
                        DEFHLT [RALLY ENTRY ALREADY PRESENT FOR REQ 1 PKT]
06225 121704 6 0            JST (THLTOK) I
06226 103702 6 0            JMP (FQOK) I        /DO NOT MARK MESS NO COMPLETE
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06227 004541 6 0 TRNGT1:   LDA NREA        /CHECK REAS ROOM
06230 016565 6 0           SUB NRES
06231 141206 6 0           AOA             /ROOM FOR ONE MORE?
06232 022572 6 0           CAS MAXR
                       DEFHLT [MAXR EXCEEDED BY A NON-REQUEST 1 PKT MESS]
06233 101000 6 0           NOP
06234 121715 6 0           JST (THLTNG) I /NO, A FOUL-UP
06235 004563 6 0           LDA NFS
06236 016537 6 0           SUB NFA
06237 141206 6 0           AOA
06240 014570 6 0           ADD MINF
06241 101400 6 0           SMI             /DO WE HAVE ENOUGH FREE?
                       DEFHLT [MINF VIOLATED BY A NON-REQUEST 1 PKT MESS]
06242 121715 6 0           JST (THLTNG) I /NO, A FOUL-UP
06243 024566 6 0           IRS NALS
06244 024541 6 0 GUDTR1:   IRS NREA        /YES, SO TAKE IT
06245 000401 6 0           ENB TSK
06246 033670 6             STX READY       /SAVE PACKET POINTER
06247 003350 6             JMP GUDTRN      /NOW TRY TO GIVE TO HOST

                       LCK FRE
06250 003276 6 0 TRNDED:   JMP TRNDD8      /NON-REQ 8 PKT
06251 003455 6 0           JMP GUDRQ8      /REQ 8 PKT
06252 024566 6 0           IRS NALS        /NON-REQ 1 PKT - ONLY HAPPENS IF I
06253 064010 6 0 TRNDD1:   IRS HEAD3 X 0"A"CHSTD    /REQ 1 PKT
06254 044005 6 0           LDA HEAD X
06255 007716 6 0           ANA (0 0 177777"X"INCTRN"X"TRNREP"X"ALLOC)
06256 050005 6 0           STA HEAD X
06257 005717 6 0           LDA (REPDED)    /SWAP SRC&DEST
06260 121720 6 0           JST (SWPCHK) I /AND CHECKSUM IT
06261 005664 6 0           LDA MESSID
06262 072112 6 0           LDX SIGN        /MARK ENTRY FOR DEST DEAD
06263 121714 6 0           JST (RALLYP) I /PUT IN A DUMMY ENTRY
                       DEFHLT [RALLY ENTRY ALREADY PRESENT FOR DESTINATION DEAD]
06264 121704 6 0           JST (THLTOK) I
06265 072514 6 0           LDX THIS
06266 132402 6 0           STX ERQ I       /HAND TO BAK
06267 032402 6 0           STX ERQ
06270 021537 6 0           JST REASGT
06271 003463 6 0           JMP NXMES1      /NO PKTS CAME IN SO FAR
06272 044000 6 0           LDA 0 X
06273 111667 6 0           STA TEND I      /SPLICE UP REAS Q
06274 121721 6 0           JST (REASF) I  /AND FREE UP THIS BLK
06275 003463 6 0           JMP NXMES1

06276 004751 6 0 TRNDD8:   LDA 8PKTS
06277 014566 6 0           ADD NALS
06300 010566 6 0           STA NALS        /MUST TAKE BACK ROOM WE ALLOCATED
06301 003253 6 0           JMP TRNDD1
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06302 000401 6 0 TRNGT8:   ENB TSK
06303 044006 6             LDA HEAD1 X     /MULTI-PACKET TRANS FOR US
06304 141340 6             ICA
06305 006120 6             ANA SEVEN 0"A"PKTNO      /GET PACKET NO
06306 011663 6             STA PKTN
06307 015722 6             ADD (REAS 0 X)
06310 011666 6             STA ORS         /SAVE POST-INDEXED PNTR TO OUR REAS
06311 021537 6             JST REASGT      LCK T,0   /FIND OUR GUY IN REAS
06312 103723 6 5           JMP (NEWMES) I /NOT THERE, SO START A NEW MESS
06313 033665 6 5 OLDMES:   STX ORB         /SAVE PNTR TO OUR REAS BLOCK
06314 105666 6 5           LDA ORS I
06315 100040 6 5           SZE             /IS IT EMPTY?
06316 103702 6 5           JMP (FQOK) I    /NO, A DUPLICATE PACKET
06317 004514 6 5           LDA THIS
06320 111666 6 5           STA ORS I       /PUT PACKET IN OUR REAS SLOT
06321 010000 6 5           STA 0
06322 044007 6 5           LDA HEAD2 X
06323 073665 6 5           LDX ORB
06324 101400 6 5           SMI 0"A"LSTPKT /IS THIS THE LAST PACKET?
06325 003334 6 5           JMP NOTL        /NO
06326 005663 6 5           LDA PKTN        /GET PACKET NO
06327 050002 6 5           STA RMAX X      /SAVE IN REAS BLOCK
06330 016120 6 5           SUB SEVEN 0"A"8PKTS
06331 140407 6 5           TCA
06332 014565 6 5           ADD NRES
06333 010565 6 5           STA NRES        /ADJUST REAS COUNT FOR SURPLUS
06334 044013 6 5 NOTL:     LDA RSF X
06335 062002 6 5           CAS RMAX X      /IS REAS DONE?
06336 100000 6 5           SKP             /NO
06337 003342 6 5           JMP DONE        /YES
06340 064013 6 5           IRS RSF X
06341 103724 6 5           JMP (GOODM) I

06342 044000 6 5 DONE:     LDA 0 X         /REAS COMPLETE
06343 111667 6 5           STA TEND I      /REMOVE BLOCK FROM QUEUE
06344 000401 6 5           ENB TSK
06345 005665 6             LDA ORB
06346 140500 6             SSM             /MARK AS MULTI-PACKET
06347 011670 6             STA READY

06350 021360 6   GUDTRN:   JST MESSOK      LCK [H2I,T,0]
06351 100100 6 4           SLZ             /IS MESS NO THE ONE WE WANT?
06352 003555 6 4           JMP T2H         /YES, GIVE TO HOST
06353 005670 6 4           LDA READY       /NO, PUT BUFFER OR BLOCK
06354 026327 6 4           IMA MESSTK      /ON COMPLETED MESSAGE STACK
06355 072327 6 4           LDX MESSTK      /DO THIS SINCE SIGN BIT MAY BE SET
06356 050000 6 4           STA 0 X
06357 003471 6 4           JMP SMSTK       /AND SEARCH FOR NEXT MESS
```

```
                    LEV TSK
06360 000000 6      MESSOK:   0                 /MARK MESS NO TO PREVENT DUPLICATES
06361 001001 6                INH [H2I,T,0]
06362 105660 6 4              LDA MESTAB I
06363 141044 6 4              CAR 0"A"MESSNO
06364 017661 6 4              SUB MESNUM
06365 141140 6 4              ICL
06366 015700 6 4              ADD (MBITS)
06367 011662 6 4              STA MESBIT
06370 105662 6 4              LDA MESBIT I
06371 113660 6 4              ERA MESTAB I    /TURN ON GOT-IT BIT
06372 007725 6 4              ANA (0 0 177777"X"MST01"X"MST02)
06373 111660 6 4              STA MESTAB I    /TURN OFF TIME OUT BITS
06374 103360 6 4              JMP MESSOK I
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                    LEV TSK    LCK [H2I,T,0]
06375 044005 6 4 MESOUT:    LDA HEAD X
06376 007701 6 4            ANA (INCTRN 0 TRNREP)
06377 013701 6 4            ERA (INCTRN 0 TRNREP)
06400 100040 6 4            SZE             /IS THIS AN INC TRN?
06401 103702 6 4            JMP (FQOK) I    /NO, OUT OF RANGE, DISCARD PKT
06402 044005 6 4 INCREP:    LDA HEAD X      /THIS CODE IS FOR OUT-OF-RANGE MESS
06403 007726 6 4            ANA (0 0 177777"X"INCTRN"X"TRNREP"X"GVBALL"X"RFNM)
06404 013676 6 4            ERA (RFNM)      /RFNM ON IN ALL RPLYS XCPT REQ8
06405 066005 6 4            IMA HEAD X
06406 007727 6 4            ANA (ONEOR8 0 REQALL)
06407 013676 6 4            ERA (REQALL)
06410 100040 6 4            SZE             /REQ FOR 8?
06411 003415 6 4            JMP PUTREP      /NO, MAKE A REPLY
06412 005730 6 4            LDA (ALLOC 0 RFNM)      /Y, TURN OFF RFNM, TURN
06413 052005 6 4            ERA HEAD X
06414 050005 6 4            STA HEAD X
06415 140040 6 4 PUTREP:    CRA             /SWAP DEST FOR SRC
06416 121720 6 4            JST (SWPCHK) I /AND CHECKSUM IT
06417 132402 6 4            STX ERQ I       /ADD TO REPLY QUEUE
06420 032402 6 4            STX ERQ
06421 103724 6 4            JMP (GOODM) I   /AND GIVE GOOD RETURN

06422 021537 6 4 INCGT8:    JST REASGT      /FIND THIS INC TRN IN REAS
06423 003427 6 4            JMP SNDRP8      /NOT THERE, WE NEVER SAW HIM
06424 044000 6 4            LDA 0 X
06425 111667 6 4            STA TEND I      /REMOVE FROM REAS QUEUE
06426 121721 6 4            JST (REASF) I   /FREE REAS BLOCK AND PKTS
06427 005676 6 4 SNDRP8:    LDA (RFNM)      /CREATE A REPLY TO 8-PKT INC TRN
06430 003453 6 4            JMP SNDRP1

06431 105662 6 4 INCGOT:    LDA MESBIT I    /GOT AN INC TRANS
06432 107660 6 4            ANA MESTAB I    /EXPLICITLY PERMIT DUPLICATES
06433 100040 6 4            SZE             /HAVE WE SEEN HIM COMPLETED YET?
06434 003402 6 4            JMP INCREP      /YES, SEND BACK DUPLICATE REPLY
06435 044005 6 4            LDA HEAD X
06436 007727 6 4            ANA (ONEOR8 0 REQALL)
06437 101040 6 4            SNZ             /8 PKT INC TRN?
06440 003422 6 4            JMP INCGT8      /YES
06441 007713 6 4            ANA (ONEOR8)
06442 101040 6 4            SNZ             /8 PKT REQ FOR ALL?
06443 003455 6 4            JMP GUDRQ8      /YES, IT IS INSIDE WINDOW
06444 044005 6 4            LDA HEAD X      /NEVER SAW THIS 1 PKT GUY
06445 007706 6 4            ANA (GVBALL)
06446 100040 6 4            SZE             /IS THIS A GVB?
06447 004751 6 4 GUDGVB:    LDA 8PKTS       /YES
06450 014566 6 4            ADD NALS        /REMOVE BUFFER FROM ALLOCATE COUNT
06451 010566 6 4            STA NALS
06452 005727 6 4            LDA (ONEOR8 0 RFNM)
06453 072121 6 4 SNDRP1:    LDX MINUS1      /MAKE A REPLY TO 1-PKT INC TRN
06454 003456 6 4            JMP GUDRAL
                    /SINCE IT MAY HAVE BEEN A REPLY TO AN INC TRN THAT WAS LOST
                    /WE SHOULD KEEP A RECORD OF THE HOST QUEUE LAST FLUSHED
                    /THIS WAY WE COULD SEND THE CORRECT DUPLICATE REPLY
```

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06455 140040 6 4 GUDRQ8:   CRA
06456 013664 6 4 GUDRAL:   ERA MESSID
06457 121714 6 4           JST (RALLYP) I /SET UP ENTRY TO REPLY
                   DEFHLT [RALLY ENTRY ALREADY PRESENT FOR INC OR REQ8]
06460 121704 6 4           JST (THLTOK) I
06461 072514 6 4           LDX THIS
06462 120671 6 4           JST FLUSHI I
06463 021360 6 4 NXMES1:   JST MESSOK      /MARK MESS NO AS COMPLETED
06464 105660 6 4 NXTMES:   LDA MESTAB I
06465 101100 6 4           SLN             /IS THIS THE MESS NO WE WANT?
06466 103724 6 4           JMP (GOODM) I   /NO
06467 073660 6 4           LDX MESTAB
06470 121731 6 4           JST (UPMESS) I

                   RET TSK
06471 005732 6   SMSTK:    LDA (MESSTK)    /SEARCH THE MESSAGE STACK
06472 011667 6             STA TEND        /FOR MESSAGES WHOSE NUMBERS ARE UP
06473 001001 6             INH T,0
06474 004327 6 5           LDA MESSTK      /GET CONTENTS OF STACK ENTRY
06475 101040 6 5 SRCSTK:   SNZ             /IS STACK EMPTY?
06476 003464 6 5           JMP NXTMES      /YES
06477 011670 6 5           STA READY
06500 010000 6 5           STA 0
06501 100400 6 5           SPL             /IS THIS A REAS BLOCK?
06502 044003 6 5           LDA REAS X      /YES, SO GET A PACKET
06503 010000 6 5           STA 0
06504 044007 6 5           LDA HEAD2 X     /GET SOURCE OF THIS PACKET
06505 013673 6 5           ERA SOURCE      /COMPARE WITH OURS
06506 007674 6 5           ANA (SRCEI)
06507 100040 6 5           SZE             /MATCH?
06510 003532 6 5           JMP SRCSTL      /NO
06511 044006 6 5           LDA HEAD1 X
06512 101400 6 5           SMI 0"A"PRIBIT /IS IT PRIORITY?
06513 003520 6 5           JMP SRCST2      /NO
06514 105660 6 5           LDA MESTAB I    /GET ORD NO WE WANT
06515 052005 6 5           ERA HEAD X      /COMPARE WITH THIS PACKET
06516 007712 6 5           ANA (ORDNO)
06517 003524 6 5           JMP SRCST3
06520 105660 6 5 SRCST2:   LDA MESTAB I    /GET MESS NO WE WANT
06521 017733 6 5           SUB (0 0 3"T"400)
06522 052005 6 5           ERA HEAD X      /COMPARE WITH THIS PACKET
06523 141044 6 5           CAR 0"A"MESSNO
06524 100040 6 5 SRCST3:   SZE             /IS THIS THE NEXT TO GO?
06525 003532 6 5           JMP SRCSTL      /NO
06526 073670 6 5           LDX READY
06527 066000 6 5           IMA 0 X         /YES
06530 111667 6 5           STA TEND I      /REMOVE FROM MESS STACK
06531 003555 6 5           JMP T2H         /AND GIVE TO HOST

06532 005670 6 5 SRCSTL:   LDA READY       /LOOP BACK FOR MORE
06533 140100 6 5           SSP
06534 011667 6 5           STA TEND
06535 105667 6 5           LDA TEND I
06536 003475 6 5           JMP SRCSTK
```

```
                    LEV TSK
06537 000000 6      REASGT:   0                 /FIND A MATCH ON MESSID IN REAS STOR
06540 073734 6                LDX (SHRQ)
06541 001001 6                INH T,0           /LOOK FOR THIS MESSAGE IN REAS
06542 044000 6 5    RELOOK:   LDA 0 X           /NEXT REAS BLOCK
06543 101040 6 5              SNZ               /NO MORE REAS BLOCKS?
06544 103537 6 5              JMP REASGT I      /YES, SO RETURN NO SKIP
06545 033667 6 5              STX TEND          /SAVE END PNTR
06546 010000 6 5              STA 0
06547 044001 6 5              LDA RID X         /GET THIS MESS ID
06550 013664 6 5              ERA MESSID        /COMPARE WITH OURS
06551 100040 6 5              SZE               /IS THIS OUR MESSAGE?
06552 003542 6 5              JMP RELOOK        /NO
06553 025537 6 5              IRS REASGT        /SKIP=SUCCESS
06554 103537 6 5              JMP REASGT I

06555 000401 6 5 T2H:         ENB TSK
06556 004114 6                LDA ONE
06557 011672 6                STA NPKTS
06560 073670 6                LDX READY         /LOAD THE PACKET PNTR
06561 005670 6                LDA READY         /REGULAR MESSAGE READY FOR HOST
06562 100400 6                SPL               /IS THIS A SINGLE PACKET?
06563 003625 6                JMP T2H8          /NO
06564 011671 6                STA READYE        /SAVE END PNTR
06565 121735 6    T2HL1:      JST (TSUB) I
06566 044006 6                LDA HEAD1 X
06567 001001 6                INH [I2H,H2I,T,0]
06570 121707 6 3              JST (HOSTNO) I /GET HOST NUMBER
06571 044006 6 3              LDA HEAD1 X
06572 006112 6 3              ANA SIGN 0"A"PRIBIT
06573 100040 6 3              SZE               /PICK PRI OR REG QUEUE
06574 005736 6 3              LDA (EHPQ+0-EHQ)
06575 115737 6 3              ADD (LOCHST) I /ADD OFFSET GENERATED IN HOSTNO
06576 026000 6 3              IMA 0             /PUT IN X AND GET PKT PNTR
06577 150343 6 3              STA EHQ XI        /PUT ON HOST QUEUE
06600 005671 6 3              LDA READYE
06601 050343 6 3              STA EHQ X
06602 005672 6 3              LDA NPKTS         /NUM PKTS IN MSG
06603 054517 6 3              ADD NHA X         /NUM PKTS FOR HOST
06604 050517 6 3              STA NHA X         /ADJUST COUNTS
06605 073670 6 3              LDX READY
06606 044006 6 3              LDA HEAD1 X
06607 073660 6 3              LDX MESTAB
06610 101400 6 3              SMI 0"A"PRIBIT /PRIORITY?
06611 003622 6 3              JMP T2HL2         /NO
06612 121740 6 3              JST (UPORD) I  /YES, SO BUMP ORD NO
06613 073670 6 3              LDX READY
06614 105660 6 3              LDA MESTAB I   /GET MESS NO WE WANT
06615 017733 6 3              SUB (0 0 3"T"400)
06616 052005 6 3              ERA HEAD X        /COMPARE WITH WHAT WE GOT
06617 141044 6 3              CAR 0"A"MESSNO
06620 073660 6 3              LDX MESTAB
06621 101040 6 3              SNZ               /MATCH?
06622 121731 6 3 T2HL2:       JST (UPMESS) I /BUMP MESS NO
06623 121741 6 3              JST (TASK2H) I RET TSK   /POKE HOST IF NECESSARY
06624 003471 6                JMP SMSTK         /GO BACK FOR MORE
```

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                        /THE FIRST PKT IS COUNTED FIRST, IN T2H
                        /AND TRACED LAST, IN T2HL1
                        /SUBSEQUENT PKTS ARE COUNTED AND TRACED IN T2H81
                        LEV TSK
06625 140100 6          T2H8:     SSP              /MULTI-PACKET MESSAGE READY
06626 011665 6                    STA ORB          /OUR REASSY BLOCK
06627 044003 6                    LDA REAS X       /LOAD PKT PNTR
06630 011670 6                    STA READY
06631 140040 6                    CRA
06632 050013 6                    STA REAS+8 X 0"A"RSF
                        /A TRICK TO INIT RSF AND MAKE IT LOOK LIKE PKT 9
06633 044004 6          T2H81:    LDA REAS+1 X     /LOAD ADDR OF NEXT PACKET
06634 150003 6                    STA REAS XI      /CHAIN PACKETS TOGETHER
06635 101040 6                    SNZ              /IS THIS THE LAST PKT?
06636 003650 6                    JMP T2H82        /YES
06637 033671 6                    STX READYE       /NO, STORE THE PKT PNTR
06640 010000 6                    STA 0
06641 121735 6                    JST (TSUB) I     /TRACE PKT IF NECESSARY
06642 073671 6                    LDX READYE
06643 140040 6                    CRA              /CLEAR REAS PNTR
06644 050003 6                    STA REAS X
06645 024000 6                    IRS 0            /INCREMENT ADDRESS
06646 025672 6                    IRS NPKTS        /INCREMENT PKT COUNT
06647 003633 6                    JMP T2H81        /CHAIN NEXT PACKET

06650 066003 6          T2H82:    IMA REAS X       /CLEAR REAS PNTR
06651 011671 6                    STA READYE       /AND SAVE LAST PKT PNTR
06652 073670 6                    LDX READY        /LOAD FIRST PKT PNTR
06653 005665 6                    LDA ORB          /LOAD REASSY BLOCK PNTR
06654 001001 6                    INH T,O
06655 026326 6 5                  IMA RASF         /FREE REAS BLOCK AND LINK TO TOP
06656 110326 6 5                  STA RASF I       /OF FREE LIST
06657 003565 6 5                  JMP T2HL1

                        LEV VAR
06660          V        MESTAB:   BSS 1            /PNTR TO MESS TAB ENTRY
06661          V        MESNUM:   BSS 1            /MESSNO OF THIS PKT
06662          V        MESBIT:   BSS 1            /BIT CORRESPONDING TO OUR MESSAGE
06663          V        PKTN:     BSS 1            /NUMBER OF THIS PACKET
06664          V        MESSID:   BSS 1            /MESSAGE ID (MESS NO+SRCE IMP)
06665          V        ORB:      BSS 1            /OUR REAS BLOCK
06666          V        ORS:      BSS 1            /OUR REAS SLOT
06667          V        TEND:     BSS 1            /TEMP END PNTR
06670          V        READY:    BSS 1            /PNTR TO PACKET TO GIVE TO HOST
06671          V        READYE:   BSS 1            /END PNTR FOR READY
06672          V        NPKTS:    BSS 1            /PKT COUNTER
06673          V        SOURCE:   BSS 1            /SOURCE IMP FOR THIS PACKET
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06674 000077 C    LEV CON   CONSTANTS
06675 000004 C
06676 000100 C
06677 032271 C
06700 001246 C
06701 000014 C
06702 005601 C
06703 007063 C
06704 005577 C
06705 177437 C
06706 000002 C
06707 007244 C
06710 000335 C
06711 003165 C
06712 000060 C
06713 000200 C
06714 015303 C
06715 005635 C
06716 177761 C
06717 000400 C
06720 005457 C
06721 021321 C
06722 040003 C
06723 005651 C
06724 005604 C
06725 177477 C
06726 177661 C
06727 000300 C
06730 000102 C
06731 015347 C
06732 000327 C
06733 001400 C
06734 000340 C
06735 005504 C
06736 000010 C
06737 007257 C
06740 015361 C
06741 007222 C
02415 176751 C                PAGEND 6,UNCON,1
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                        LEV TSK
07063 044005 6          REPGOT:  LDA HEAD X      /REPLY TO A TRANSMISSION OF OURS
07064 007327 6                   ANA (ONEOR8)
07065 101040 6                   SNZ             /IS IT A REPLY TO A MULTI-PACKET?
07066 003134 6                   JMP REPGT8      /YES
07067 105330 6                   LDA (MESSID) I
07070 001001 6                   INH [H2I,T,0]
07071 121331 6 4                 JST (PPTGET) I  /FIND OUR TRANS IN PPT
07072 003220 6 4                 JMP GOTGVB      /NOT THERE, MUST BE A GVB
07073 011131 6 4                 STA PPTASK      /SAVE PPT PNTR
07074 000401 6 4                 ENB TSK
07075 072514 6                   LDX THIS
07076 044005 6                   LDA HEAD X
07077 007332 6                   ANA (ALLOC)
07100 101040 6                   SNZ             /IS THIS REPLY AN ALLOCATE OF 1?
07101 003113 6                   JMP NOALL1      /NO
07102 173131 6                   LDX PPTASK I    /YES, CHECK FOR DUPLICATE ALLOC
07103 044005 6                   LDA HEAD X
07104 007333 6                   ANA (REQALL)
07105 101040 6                   SNZ             /WAS REQUEST BIT SET?
07106 103334 6                   JMP (FQOK) I    /NO, SO ALLOC IS A DUPLICATE
07107 105131 6                   LDA PPTASK I    /YES, SO WE MARK PPT
07110 140500 6                   SSM 0"A"RETRAN /FOR RETRANSMISSION FROM BACK
07111 111131 6                   STA PPTASK I
07112 103334 6                   JMP (FQOK) I    /MESS NO NOT REPLIED TO YET

07113 021260 6          NOALL1:  JST RFNM1       /SET UP TWDPA FOR RFNM OR INC
07114 003125 6 0 LCK FRE         JMP DDEAD1      /GIVE HOST A DESTINATION DEAD
07115 173131 6          LEV TSK  LDX PPTASK I
07116 044010 6                   LDA HEAD3 X     /PICK UP LINK WORD
07117 021306 6                   JST RFNM2       LCK FRE
07120 044007 6 0                 LDA HEAD2 X
07121 021244 6 0                 JST HOSTNO
07122 044006 6 0                 LDA HEAD1 X     /GET SOURCE OF MESS
07123 007335 6 0                 ANA (0 0 177777"X"LSTPKT"X"HICODE)
07124 013132 6 0                 ERA TWDPA       /PUT IN IH MESS TYPE
07125 073257 6 0 DDEAD1:         LDX LOCHST
07126 120670 6 0                 JST OWP I       /DO A 2 WRD PUT
07127 003213 6 0                 DEFSTAT JMP PPTFRE, HS6
00575 031304 6 0
31771 007127 6 0
32011 003213 6 0
07130 103336 6 0                 JMP (FQNG) I    /NO ROOM FOR 2 WRD MESS

                        LEV VAR
07131          V        PPTASK:  BSS 1           /POINTER TO OUR PPT OR PLT SLOT
07132          V        TWDPA:   BSS 1           /FIRST WORD OF 2 WRD PUT
07133          V        LOCHNO:  BSS 1
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                        LEV TSK
07134 105330 6          REPGT8:   LDA (MESSID) I /REPLY TO A MULTI-PCKT TRANS
07135 001001 6                    INH [H2I,T,0]
07136 121337 6 4                  JST (PLTGET) I /FIND OUR TRANS IN PLT
                        DEFHLT [CANT FIND MULTI-PKT MESS FOR THIS REPLY]
07137 121340 6 4                  JST (THLTOK) I /NOT THERE, FOUL-UP
07140 033131 6 4                  STX PPTASK     /SAVE PLT PNTR
07141 044000 6 4                  LDA PLT0 X
07142 006120 6 4                  ANA SEVEN 0"A"PLTHST
07143 011133 6 4                  STA LOCHNO     /GET LOCAL HOST NO
07144 072514 6 4                  LDX THIS
07145 044005 6 4                  LDA HEAD X
07146 007332 6 4                  ANA (ALLOC)
07147 000401 6 4                  ENB TSK
07150 101040 6                    SNZ            /IS THIS REPLY AN ALLOCATE OF 8?
07151 003166 6                    JMP NOALL8     /NO
07152 001001 6                    INH [SIN,H2I,T,0]
07153 105341 6 0                  LDA (TALLYI) I /GET IN PNTR
07154 013342 6 0                  ERA (TALLY+TALLYL)       /COMPARE WITH END PNTR
07155 101040 6 0                  SNZ            /AT END?
07156 103336 6 0                  JMP (FQNG) I   /YES, NO ROOM FOR ALLOCATE SO NACK
07157 105343 6 0                  LDA (SOURCE) I /GET SOURCE OF ALLOC
07160 111344 6 0                  STA (TALLYI 0 I) I       /STUFF THRU IN PNTR
07161 125341 6 0                  IRS (TALLYI) I /BUMP IN PNTR
07162 044005 6 0                  LDA HEAD X
07163 007333 6 0                  ANA (RFNM)
07164 101040 6 0                  SNZ            /IS THIS REPLY AN ALLOCATED RFNM?
07165 003233 6 0                  JMP GUDAL8     /NO, JUST AN ALLOCATE OF 8, POKE HO
                        RET TSK
07166 021260 6          NOALL8:   JST RFNM1      /SET UP TWDPA FOR RFNM OR INC
07167 003176 6 0 LCK FRE  JMP DDEAD8     /GIVE HOST A DESTINATION DEAD
07170 073131 6   LEV TSK  LDX PPTASK
07171 044030 6            LDA PLT2 X     /PICK UP LINK WORD
07172 021306 6            JST RFNM2      LCK FRE
07173 044014 6 0          LDA PLT1 X     /GET SOURCE OF MESS
07174 007335 6 0          ANA (0 0 177777"X"LSTPKT"X"HICODE)
07175 013132 6 0          ERA TWDPA      /PUT IN IH MESS TYPE
07176 073133 6 0 DDEAD8:  LDX LOCHNO
07177 033257 6 0          STX LOCHST
07200 120670 6 0          JST OWP I      /DO A 2 WRD PUT
07201 003215 6 0          DEFSTAT JMP GUDRP0, HS7  /AND POKE HOST
00576 031313 6 0
31772 007201 6 0
32012 003215 6 0

07202 072514 6 0          LDX THIS       /NO ROOM FOR 2 WRD MESS
07203 044005 6 0          LDA HEAD X
07204 007332 6 0          ANA (ALLOC)
07205 101040 6 0          SNZ            /WAS REPLY AN ALLOCATE OF 8?
07206 103336 6 0          JMP (FQNG) I   /NO, SO QUIT
07207 105343 6 0          LDA (SOURCE) I /YES, GET SOURCE
07210 121345 6 0          JST (TALLYG) I /AND GET TALLY ENTRY BACK AGAIN
07211 103336 6 0          JMP (FQNG) I   /NOT THERE, FOUL-UP
07212 103336 6 0          JMP (FQNG) I   /AND QUIT
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07213 173131 6 0 PPTFRE:   LDX PPTASK I
07214 120671 6 0           JST FLUSHI I    /FREE PPT ENTRY NOW THAT RFNM IS IN
07215 021222 6 0 GUDRP0:   JST TASK2H      /POKE HOST IF NECESSARY
                 LEV TSK
07216 140040 6   GUDRP1:   CRA
07217 111131 6             STA PPTASK I    /CLEAR PPT OR PLT ENTRY
07220 121346 6   GOTGVB:   JST (MESSOK) I  /MARK MESS NO AS REPLIED
                 LCK [H2I,T,0]
07221 103334 6 4           JMP (FQOK) I

                 LCK SIN
07222 000000 6 0 TASK2H:   0               /GOT SOMETHING FOR HOST OUTPUT
07223 073257 6 0           LDX LOCHST
07224 104700 6 0           LDA IHXX I
07225 000013 6 0           EXA
07226 101040 6 0           SNZ             /IS HOST IDLE?
07227 121347 6 0           JST (IHSB) I    RET TSK   /YES, SO POKE IT
07230 001001 6             INH ALL
07231 120672 6 0           JST DODXA I     RET TSK
07232 103222 6             JMP TASK2H I

                 LCK SIN
07233 073133 6 0 GUDAL8:   LDX LOCHNO      /GOT AN ALLOCATE OF 8 FOR HOST INPU
07234 044453 6 0           LDA HILO X
07235 017350 6 0           SUB (HIALL)
07236 000013 6 0           EXA
07237 101040 6 0           SNZ             /IS HOST HUNG ON ALLOCATE?
07240 121351 6 0           JST (HISB) I    RET TSK   /POKE HIM SINCE HE IS WAI
07241 001001 6             INH ALL
07242 120672 6 0           JST DODXA I     RET TSK
07243 003216 6             JMP GUDRP1

                 LEV [T,0,TSK]
07244 000000 5   HOSTNO:   0               /COMPUTE HOST NO
07245 011257 5             STA LOCHST
07246 007352 5             ANA (DESTH)
07247 040672 5             ARR 6
07250 027257 5             IMA LOCHST      /SAVE DEST HOST
07251 007353 5             ANA (FORIMP)
07252 100040 5             SZE             /FAKE HOST?
07253 004130 5             LDA PLNH        /YES
07254 015257 5             ADD LOCHST
07255 011257 5             STA LOCHST
07256 103244 5             JMP HOSTNO I
                 LEV VAR
07257        V   LOCHST:   BSS 1           /WHICH HOST WE ARE FEEDING
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```
                    LEV TSK
07260 000000 6      RFNM1:  0                   /DISTINGUISH BETWEEN RFNM AND INC TR
07261 044006 6              LDA HEAD1 X
07262 007354 6              ANA (REPDED)
07263 100040 6              SZE                 /IS THIS A DESTINATION DEAD?
07264 003275 6              JMP RFNMD           /YES
07265 044005 6              LDA HEAD X
07266 007355 6              ANA (INCTRN)
07267 100040 6              SZE                 /IS THIS REPLY MARKED INCOMPLETE?
07270 005356 6              LDA (0 0 CRFNM"X"CINCTR) /YES
07271 013357 6              ERA (CRFNM)         /NO
07272 011132 6              STA TWDPA           /SAVE IH MESS TYPE
07273 025260 6              IRS RFNM1
07274 103260 6              JMP RFNM1 I

07275 044010 6      RFNMD:  LDA HEAD3 X 0"A"CHSTD
07276 001001 6              INH FRE
07277 010515 6 0            STA TWDP            /SAVE LINK WORD AND CODE
07300 044006 6 0            LDA HEAD1 X
07301 021244 6 0            JST HOSTNO
07302 044007 6 0            LDA HEAD2 X
07303 007335 6 0            ANA (0 0 177777"X"LSTPKT"X"HICODE)
07304 013360 6 0            ERA (CDESTD)        /PUT IN DEST DEAD CODE
07305 103260 6 0            JMP RFNM1 I

                    LEV TSK
07306 000000 6      RFNM2:  0                   /TRANSLATE SOME INCOMPLETES INTO
07307 001001 6              INH FRE             /ERROR IN DATA MESS
07310 010515 6 0            STA TWDP            /SAVE LINK WORD
07311 007361 6 0            ANA (SUBCOD)
07312 013362 6 0            ERA (CERROR)
07313 100040 6 0            SZE                 /WAS THIS MARKED AS AN ERROR AT SOU
07314 003317 6 0            JMP .+3             /NO
07315 005363 6 0            LDA (CERRDT)        /YES, SO CHANGE IH MESS TYPE
07316 011132 6 0            STA TWDPA
07317 005132 6 0            LDA TWDPA
07320 013364 6 0            ERA (CINCTR)
07321 101040 6 0            SNZ                 /IS THE IH MESS TYPE INC TRN?
07322 103306 6 0            JMP RFNM2 I         /YES, KEEP SUB CODE
07323 004515 6 0            LDA TWDP            /NO, A RFNM OR ERROR IN DATA
07324 007365 6 0            ANA (LINKNO)
07325 010515 6 0            STA TWDP            /WE MAY HAVE PUT IN AT INC? TIME
07326 103306 6 0            JMP RFNM2 I
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07327 000200 C    LEV CON   CONSTANTS
07330 006664 C
07331 015033 C
07332 000002 C
07333 000100 C
07334 005601 C
07335 070377 C
07336 005637 C
07337 015205 C
07340 005577 C
07341 015155 C
07342 032271 C
07343 006673 C
07344 115155 C
07345 015114 C
07346 006360 C
07347 016042 C
07350 014445 C
07351 013106 C
07352 000300 C
07353 040000 C
07354 000400 C
07355 000010 C
07356 006000 C
07357 002400 C
07360 003400 C
07361 000007 C
07362 000004 C
07363 004000 C
07364 004400 C
07365 177760 C
02416 173373 C               PAGEND 7,UNCON,4
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                    PAGM2I:   LEV M2I          / MODEM TO IMP (M2I)
00064 010043 0      M1INIL/   M2I1
00065 010067 0      M2INIL/   M2I2
00066 010113 0      M3INIL/   M2I3
00067 010137 0      M4INIL/   M2I4
00070 010163 0      M5INIL/   M2I5
                    PAGM2I/
10043 000000 0      M2I1:     INT M2I          /MODEM 1 ENTRANCE
10044 000011 0                DXA
10045 033244 0                STX TX           /SAVE X REG
10046 072113 0                LDX ZERO         /SET UP ACTIVE MODEM NO
10047        0      M2I1A:    BSS 1            /INITIALLY A JMP M2II UNTIL AN INPU
10050 000043 0                INK
10051 011245 0                STA TK           /SAVE KEYS
10052 070471 0                DEFSTAT M1ERR,MI1
00577 031202 0
31773 010052 0
32013 070471 0
10053 003231 0      M1OK:     JMP M2I0         /THIS IS A NOP WHEN THE LINE GOES DI
10054 004021 0      DIS1:     LDA M1INBP+1
10055 017625 0                SUB (BUFE-ACKH)
10056 010020 0      M2I1B:    STA M1INBP
10057 030471 0                M1IN             /ERROR- NEW "IN" INTO SAME BUFFER
10060 005245 0      DPP1:     LDA TK
10061 000013 0                EXA
10062 171020 0                OTK
10063 005243 0                LDA TA
10064 073244 0                LDX TX
10065 000401 0                ENB M2I
10066 103043 0                JMP M2I1 I

10067 000000 0      M2I2:     INT M2I          /MODEM 2 ENTRANCE
10070 000011 0                DXA
10071 033244 0                STX TX
10072 072114 0                LDX ONE
10073        0      M2I2A:    BSS 1
10074 000043 0                INK
10075 011245 0                STA TK
10076 070472 0                DEFSTAT M2ERR,MI1A
00600 031226 0
31774 010076 0
32014 070472 0
10077 003231 0      M2OK:     JMP M2I0
10100 004023 0      DIS2:     LDA M2INBP+1
10101 017625 0                SUB (BUFE-ACKH)
10102 010022 0                STA M2INBP
10103 030472 0                M2IN
10104 005245 0      DPP2:     LDA TK
10105 000013 0                EXA
10106 171020 0                OTK
10107 005243 0                LDA TA
10110 073244 0                LDX TX
10111 000401 0                ENB M2I
10112 103067 0                JMP M2I2 I
```

```
10113 000000 0   M2I3:    INT M2I          /MODEM 3 ENTRANCE
10114 000011 0            DXA
10115 033244 0            STX TX
10116 072115 0            LDX TWO
10117        0   M2I3A:   BSS 1
10120 000043 0            INK
10121 011245 0            STA TK
10122 070473 0            DEFSTAT M3ERR,MI1B
00601 031236 0
31775 010122 0
32015 070473 0
10123 003231 0   M3OK:    JMP M2I0
10124 004025 0   DIS3:    LDA M3INBP+1
10125 017625 0            SUB (BUFE-ACKH)
10126 010024 0            STA M3INBP
10127 030473 0            M3IN
10130 005245 0   DPP3:    LDA TK
10131 000013 0            EXA
10132 171020 0            OTK
10133 005243 0            LDA TA
10134 073244 0            LDX TX
10135 000401 0            ENB M2I
10136 103113 0            JMP M2I3 I

10137 000000 0   M2I4:    INT M2I          /MODEM 4 ENTRANCE
10140 000011 0            DXA
10141 033244 0            STX TX
10142 072116 0            LDX THREE
10143        0   M2I4A:   BSS 1
10144 000043 0            INK
10145 011245 0            STA TK
10146 070474 0            DEFSTAT M4ERR,MI1C
00602 031246 0
31776 010146 0
32016 070474 0
10147 003231 0   M4OK:    JMP M2I0
10150 004027 0   DIS4:    LDA M4INBP+1
10151 017625 0            SUB (BUFE-ACKH)
10152 010026 0            STA M4INBP
10153 030474 0            M4IN
10154 005245 0   DPP4:    LDA TK
10155 000013 0            EXA
10156 171020 0            OTK
10157 005243 0            LDA TA
10160 073244 0            LDX TX
10161 000401 0            ENB M2I
10162 103137 0            JMP M2I4 I
```

```
10163 000000 0   M2I5:     INT M2I         /MODEM 5 ENTRANCE
10164 000011 0             DXA
10165 033244 0             STX TX
10166 072117 0             LDX FOUR
10167        0   M2I5A:    BSS 1
10170 000043 0             INK
10171 011245 0             STA TK
10172 070475 0             DEFSTAT M5ERR,MI1D
00603 031256 0
31777 010172 0
32017 070475 0
10173 003231 0   M5OK:     JMP M2I0
10174 004031 0   DIS5:     LDA M5INBP+1
10175 017625 0             SUB (BUFE-ACKH)
10176 010030 0             STA M5INBP
10177 030475 0             M5IN
10200 005245 0   DPP5:     LDA TK
10201 000013 0             EXA
10202 171020 0             OTK
10203 005243 0             LDA TA
10204 073244 0             LDX TX
10205 000401 0             ENB M2I
10206 103163 0             JMP M2I5 I

                           /SOME OFFSETS WE NEED FOR THE FIRST MODEM INPUT TO GRAB A BU
                           DIS10=DIS1-0-M2I1
                           M2I1A0=M2I1A-0-M2I1
                           M2I1B0=M2I1B-0-M2I1
10207 011243 0   M2II:     STA TA
10210 044064 0             LDA M1INIL X
10211 010000 0             STA 0           /BASE REG FOR OUR INSTR MODIFICATIO
10212 044011 0             LDA DIS10 X
10213 015626 0             ADD (STA-0-LDA)
10214 011223 0             STA M2II1
10215 104324 0             LDA FREE I
10216 101040 0             SNZ
10217 003227 0             JMP M2II2
10220 026324 0             IMA FREE
10221 024563 0             IRS NFS
10222 015627 0             ADD (BUFE 0 I)
10223        0   M2II1:    BSS 1           /SET UP FIRST REAL INPUT BUFFER
10224 005207 0             LDA M2II
10225 050004 0             STA M2I1A0 X
10226 042011 0             JMP DIS10 X

10227 005630 0   M2II2:    LDA (I 0 1)
10230 042013 0             JMP M2I1B0 X
```

```
10231 032674 0   M2I0:     STX MP          /SAVE ACTIVE MODEM NO
10232 045254 0             LDA LEND X      /PICK UP END-OF-LINE BIT FOR THIS M(
10233 011261 0             STA LENDT
10234 104324 0             LDA FREE I      /GET PKT FOR FREE LIST
10235 101040 0             DEFSTAT SNZ, MI3
00604 031217 0
32000 010235 0
32020 101040 0
10236 143604 0             JMP DIS XI      /FREE LIST EMPTY - INPUT LOST
10237 024563 0             IRS NFS
10240 026324 0             IMA FREE
10241 015631 0             ADD (ACKH 0 I) /SET UP DMC START INPUT PNTR
10242 143262 0             JMP DIP XI      /DISPATCH TO SEPARATE CODE FOR EACH

                      LEV VAR
10243         V    TA:     BSS 1           /SAVE A REG
10244         V    TX:     BSS 1           /SAVE X REG
10245         V    TK:     BSS 1           /SAVE KEYS
10246         V    TAR:    BSS 1           /SAVE ADDRET
10247 010053  V    M2IOK:  M1OK
10250 010077  V            M2OK
10251 010123  V            M3OK
10252 010147  V            M4OK
10253 010173  V            M5OK
10254         V    LEND:   BSS CH          /ENDBIT ON=HIGH NO IMP
                                           /SIGN BIT ON= DEAD LINE
10261         V    LENDT:  BSS 1           /TEMP BECAUSE OF ONLY ONE X REG
```

```
                    LEV CON
10262 010317 C      DIP:        DP1
10263 010311 C                  DP2
10264        C                  SATDEF DP3
02244 010264 C
02274 010303 C
02324 010303 C
10265 010275 C                  DP4
10266 010267 C                  DP5

                    LEV M2I
10267 072030 0      DP5:        LDX M5INBP
10270 010030 0                  STA M5INBP
10271 015625 0                  ADD (BUFE-ACKH)
10272 026031 0                  IMA M5INBP+1
10273 030475 0                  M5IN
10274 003324 0                  JMP DIPE

10275 072026 0      DP4:        LDX M4INBP
10276 010026 0                  STA M4INBP
10277 015625 0                  ADD (BUFE-ACKH)
10300 026027 0                  IMA M4INBP+1
10301 030474 0                  M4IN
10302 003324 0                  JMP DIPE

10303 072024 0      DP3:        LDX M3INBP
10304 010024 0                  STA M3INBP
10305 015625 0                  ADD (BUFE-ACKH)
10306 026025 0                  IMA M3INBP+1
10307 030473 0                  M3IN
10310 003324 0                  JMP DIPE

10311 072022 0      DP2:        LDX M2INBP
10312 010022 0                  STA M2INBP
10313 015625 0                  ADD (BUFE-ACKH)
10314 026023 0                  IMA M2INBP+1
10315 030472 0                  M2IN
10316 003324 0                  JMP DIPE

10317 072020 0      DP1:        LDX M1INBP      /PICK UP OUR DMC INPUT PNTR
10320 010020 0                  STA M1INBP      /STORE NEW DMC INPUT PNTR
10321 015625 0                  ADD (BUFE-ACKH)           /COMPUTE NEW DMC END PNTR
10322 026021 0                  IMA M1INBP+1    /SWAP FOR CURRENT END PNTR
10323 030471 0                  M1IN            /DO NEW INPUT OCP
```

```
10324 017627 0   DIPE:     SUB (BUFE 0 I) /GET OLD PKT PNTR + SAVE IN X
10325 011611 0              STA M2ISP      /SAVE FOR TASK-ING OR FLUSHING
10326 026000 0              IMA 0          /SWAP IT FOR END PNTR
10327 017630 0              SUB (1 0 I)    /ADJUST IT FOR ONE OFF
10330 050111 0              STA BUFE X 0"A"TWOQ     /SAVE IT IN PKT END PNTR
10331 140040 0              CRA
10332 050000 0              STA 0 X        /CLEAR CHAIN PNTR
10333 044005 0              LDA HEAD X
10334 100400 0              SPL 0"A"SNDCOR
10335 101100 0              SLN 0"A"LINETS
10336 100000 0              SKP            /ALLOW SNDCOR W/O CHKSUM
10337 103632 0              JMP (M2IRQC) I /SEND CORE REQUEST
10340 005633 0              LDA (M2IADR)
10341 026111 0              IMA ADDRET     /SET UP ADD CHAIN RETURN FOR M2I
10342 011246 0              STA TAR        /AND SAVE CURRENT OWNER OF ADDER
10343 004000 0              LDA 0
10344 056111 0              SUB BUFE X     /COMPUTE BUFFER LENGTH
10345 015634 0              ADD (ADDBOT+ACKH)       /ADD IN TABLE OFFSET
10346 011351 0              STA M2IADJ     /AND SAVE AS ADD DISPATCH
10347 017635 0              SUB (ADDBOT)   /GET -(NO OF WORDS) IN A
10350 103351 0              JMP M2IADJ I   /AND JMP INTO ADD CHAIN
10351        0   M2IADJ:    BSS 1
10352 100040 0   M2IADR:    SZE            /IS THE CHECKSUM GOOD?
                  DEFPLC [NOP HERE TO ACCEPT BAD CHECKSUM PACKETS]
10353 003402 0              JMP PKTCH1     /NO, REPORT AS AN ERROR
10354 005246 0              LDA TAR
10355 010111 0              STA ADDRET     /AND RESTORE PREVIOUS OWNER OF ADD
10356 131040 0              RDCLOK
10357 003356 0              JMP .-1
10360 050001 0              STA IT X       /SAVE INPUT TIME- 100 MS CLOCK
10361 004674 0              LDA MP 0"A"INPCHN"A"MSTMOD
10362 050003 0              STA INCH X     /SAVE INPUT MODEM NO
10363 044005 0              LDA HEAD X
10364 101100 0              SLN 0"A"LINETS /LT OR ROUTE?
10365 003420 0              JMP M2IPKT     /NO
10366 040677 0              ARR 1
10367 100100 0              SLZ 0"A"NULPKT /IS THIS A NULL PKT OF ACKS ONLY?
10370 003404 0              JMP M2INUL     /YES
10371 040677 0              ARR 1
10372 100100 0              SLZ 0"A"GETCOR /A RELOAD DEMAND?
10373 103636 0              JMP (M2IDMC) I /YES
10374 073611 0   M2T0:      LDX M2ISP
10375 132401 0   M2T:       STX ETQ I      /PUT ON TASK QUEUE
10376 032401 0              STX ETQ
10377 030041 0              TASK           /POKE TASK INTERRUPT
10400 072674 0              LDX MP
10401 143577 0              JMP DIPP XI    /DISMISS INTERRUPT

10402 072674 0   PKTCH1:    LDX MP
                  DEFHLT [SOFTWARE CHECKSUM ERROR IN PACKET]
10403 121637 0              JST (PKTCHK) I
```

```
10404 044005 0   M2INUL:   LDA HEAD X      /GOT A NULL PACKET OF ACKS
10405 141140 0             ICL             /PICK UP IMP NO
10406 012106 0             ERA MINE        /COMPARE WITH MINE
10407 101040 0             SNZ             /IS THIS LINE LOOPED?
10410 003375 0             JMP M2T         /YES, GIVE NULL TO TASK, IGNORE ACKS
10411 004420 0             LDA THD         /PICK UP CHAN TO HIGH NO IMP
10412 012674 0             ERA MP          /COMPARE WITH THIS LINE NO
10413 100040 0             SZE             /IS IT THIS LINE?
10414 003426 0             JMP M2IACK      /NO
10415 044006 0             LDA HEAD1 X     /YES, SO COPY IN HIS VALUE FOR SYNC
10416 010417 0             STA SYNC        /KEEPING GLOBAL TIME THROUGHOUT NET
10417 003426 0             JMP M2IACK      /NO, PROCESS ACKS, THEN GIVE TO T/

10420 044007 0   M2IPKT:   LDA HEAD2 X
10421 007640 0             ANA (ENDBIT)
10422 013261 0             ERA LENDT
10423 101400 0             SMI             /IS THIS LINE DOWN?
10424 101040 0             SNZ             /IS THIS PKT FROM US?
10425 103641 0             JMP (M2IFRE) I  /YES, THROW AWAY PKT
10426 044004 0   M2IACK:   LDA ACKM X
10427 140401 0             CMA
10430 141050 0             CAL 0"A"ACKTAB
10431 011612 0             STA ACKT        /ACKS FROM PACKET
10432 072674 0             LDX MP
10433 052641 0             ERA TSEX X
10434 046653 0             ANA CHFREE X    /SHOULD BE NO ACKS ON FREE SLOTS
10435 100040 0             SZE
                 DEFHLT [SPURIOUS ACK]
10436 121642 0             JST (PKTCH2) I
10437 005612 0             LDA ACKT
10440 066641 0             IMA TSEX X      /COMPARE WITH WHAT WE GOT
10441 052641 0             ERA TSEX X
10442 101040 0             SNZ
10443 003374 0             JMP M2T0        /NO ACKS, SO QUIT
10444 011612 0             STA ACKT        /SAVE ACKS TO PROCESS
10445 052653 0             ERA CHFREE X    /FREE UP ACKED CHANNELS
10446 050653 0             STA CHFREE X
10447 005612 0             LDA ACKT
```

```
10450 173643 0   ACKLOP:   LDX (I2MTAB 0 X) I
10451 140407 0              TCA
10452 007612 0              ANA ACKT        /GET LOWEST BIT THAT TRANSITIONED
10453 013612 0              ERA ACKT        /TURN IT OFF
10454 027612 0              IMA ACKT        /UPDATE SET OF ACKS TO PROCESS
10455 013612 0              ERA ACKT        /AND GO PROCESS THIS ONE
10456 023644 0              CAS (20)
10457 003547 0              JMP ACK567
10460 003563 0              JMP ACK4
10461 022117 0              CAS FOUR
10462 003566 0              JMP ACK3
10463 003571 0              JMP ACK2
10464 101100 0              SLN
10465 003574 0              JMP ACK1
10466 140040 0              CRA
10467 066000 0              IMA 0 X
10470 072674 0   ACKS:      LDX MP
10471 023645 0              CAS (1777)      /IS THIS A TRUE PKT PNTR?
10472 003475 0              JMP ACKGUD      /YES
10473 101000 0              NOP
                 DEFHLT [QUASI=IMPOSSIBLE SPURIOUS ACK]
10474 121642 0              JST (PKTCH2) I /DEBUG SPURIOUS ACK
10475 062634 0   ACKGUD:    CAS I2MNXT X    /IS THIS THE PKT CURRENTLY ON THE L
10476 100000 0              SKP             /NO
10477 003536 0              JMP ACKSYN      /YES, WE CANT FREE IT YET
10500 010000 0              STA 0
10501 044111 0              LDA BUFE X
10502 100400 0              SPL 0"A"TWOQ
10503 003511 0              JMP FREE1       /ON TWO QUEUES
10504 004324 0              LDA FREE        /ON ONE ONLY, SO FREE
10505 050000 0              STA 0 X
10506 032324 0              STX FREE
10507 024537 0              IRS NFA
10510 003513 0              JMP FREE2
10511 140100 0   FREE1:     SSP 0"A"TWOQ
10512 050111 0              STA BUFE X      /MARK AS ON ONE QUEUE NOW
10513 024564 0   FREE2:     IRS NSFS
```

```
10514 044002 0   ACKS1:   LDA PTRT X      /TRACING?
10515 100040 0            SZE
10516 003543 0            JMP ACTR2       /GO DO IT
10517 044111 0   ACTR1:   LDA BUFE X      /GET PACKET LENGTH
10520 140100 0            SSP 0"A"TWOQ
10521 016000 0            SUB 0
10522 016116 0            SUB THREE 0"A"[ACKH-1]
10523 072674 0            LDX MP
10524 055613 0            ADD THRUPW X
10525 100400 0            SPL
10526 004112 0            LDA SIGN        /MARK OFLO
10527 051613 0            STA THRUPW X
10530 065620 0            IRS THRUPT X
10531 101000 0            NOP
10532 005612 0            LDA ACKT
10533 101040 0            SNZ             /HAVE WE PROCESSED ALL THE ACKS?
10534 003374 0            JMP M2T0        /YES, SO QUIT
10535 003450 0            JMP ACKLOP
10536 140500 0   ACKSYN:  SSM
10537 050634 0            STA I2MNXT X
10540 140100 0            SSP
10541 010000 0            STA 0
10542 003514 0            JMP ACKS1       /MARK THE BUFFER AS ACKED

10543 121646 0   ACTR2:   JST (TRCDUN) I /TRACING PACKET
10544 072674 0            LDX MP          /NEEDED FOR TRCDUN
10545 073611 0            LDX M2ISP
10546 003517 0            JMP ACTR1

10547 022753 0   ACK567:  CAS C100
10550 003560 0            JMP ACK7
10551 003555 0            JMP ACK6
10552 140040 0   ACK5:    CRA
10553 066005 0            IMA 5 X
10554 003470 0            JMP ACKS
10555 140040 0   ACK6:    CRA
10556 066006 0            IMA 6 X
10557 003470 0            JMP ACKS
10560 140040 0   ACK7:    CRA
10561 066007 0            IMA 7 X
10562 003470 0            JMP ACKS
10563 140040 0   ACK4:    CRA
10564 066004 0            IMA 4 X
10565 003470 0            JMP ACKS
10566 140040 0   ACK3:    CRA
10567 066003 0            IMA 3 X
10570 003470 0            JMP ACKS
10571 140040 0   ACK2:    CRA
10572 066002 0            IMA 2 X
10573 003470 0            JMP ACKS
10574 140040 0   ACK1:    CRA
10575 066001 0            IMA 1 X
10576 003470 0            JMP ACKS
```

```
                        LEV CON
10577 010060 C    DIPP:       DPP1
10600 010104 C                DPP2
10601 010130 C                DPP3
10602 010154 C                DPP4
10603 010200 C                DPP5
10604 010054 C    DIS:        DIS1
10605 010100 C                DIS2
10606 010124 C                DIS3
10607 010150 C                DIS4
10610 010174 C                DIS5

                        LEV VAR
10611          V    M2ISP:      BSS 1           /SAVED PACKET POINTER
10612          V    ACKT:       BSS 1
10613          V    THRUPW:     BSS CH
10620          V    THRUPT:     BSS CH
```

```
10625 000105 C   LEV CON   CONSTANTS
10626 004000 C
10627 100111 C
10630 100001 C
10631 100004 C
10632 011116 C
10633 010352 C
10634 001562 C
10635 001556 C
10636 011170 C
10637 011101 C
10640 001000 C
10641 011124 C
10642 011127 C
10643 040622 C
10644 000020 C
10645 001777 C
10646 011144 C
02417 175655 C              PAGEND 10,UNCON,5
```

```
                        /MODEM TO IMP PACKET-ERROR STUFF

                        LEV M2I
11101 000000 0  PKTCHK:  0                  /ADDRESS OF PKT ERROR
11102 120745 0           JST HLTNCC I       /REPORT TRAP TO NCC
11103 105366 0  PKTCHC:  LDA (TAR) I
11104 010111 0           STA ADDRET         /RESTORE PREVIOUS OWNER OF ADDER
11105 004537 0           LDA NFA
11106 016563 0           SUB NFS
11107 016751 0           SUB TEN            /LEAVE MORE THAN MINF
11110 100400 0           SPL                /ROOM TO SEND PKT TO DIAG?
11111 003123 0           JMP NODIAG         /NO
11112 105367 0           LDA (M2ISP) I      /PICK UP PKT PNTR
11113 026342 0           IMA DIAGQ          /PUT ON DIAG QUEUE
11114 111370 0           STA (M2ISP 0 I) I      /AND SET UP CHAIN PNTR
11115 103371 0           JMP (DIPP 0 XI) I      /DISMISS

11116 072674 0  M2IRQC:  LDX MP
11117 004124 0           LDA MINUS4
11120 050265 0           STA SLT X
11121 004112 0           LDA SIGN 0"A"SNDCOR
11122 050421 0           STA SIHY X         /MARK TO SEND CORE
11123 173367 0  NODIAG:  LDX (M2ISP) I      /AND FREE BAD PKT
11124 120671 0  M2IFRE:  JST FLUSHI I
11125 072674 0           LDX MP
11126 103371 0           JMP (DIPP 0 XI) I

11127 000000 0  PKTCH2:  0
11130 120745 0           JST HLTNCC I
11131 021133 0           JST KILLIN         /KILL LINES FOR SPURIOUS ACKS
11132 003103 0           JMP PKTCHC         /CONTINUE
                KILTIM=10.                  /LINE HELD DEAD TIME

                        LEV [M2I,T,0,TSK,BCK]
11133 000000 0  KILLIN:  0                  /SUBR TO STOP INPUT AND OUTPUT ON
11134 005372 0           LDA (NOP)          /KILL THE LINE INSTANTLY
11135 111373 0           STA (M2IOK 0 XI) I
11136 005374 0           LDA (-KILTIM)      /OTHER IMP WILL SEE THE LINE GO D(
11137 050265 0           STA SLT X
11140 050433 0           STA LINE X         /FOR NCC AND RTGO
11141 140040 0  KILL2:   CRA
11142 050160 0  KILL3:   STA NEIGHB X
11143 103133 0  KILL4:   JMP KILLIN I
```

```
                        LEV [M2I,I2H]
11144 000000 0  TRCDUN: 0                   /FINISH TRACE BLOCK
11145 011167 0          STA TRCD
11146 044001 0          LDA ST X
11147 073167 0          LDX TRCD
11150 050003 0          STA TST X
11151 131040 0          RDCLOK
11152 003151 0          JMP .-1
11153 050004 0          STA TAT X
11154 004112 0          LDA SIGN
11155 052012 0          ERA TDONE X
11156 050012 0          STA TDONE X
11157 005167 0          LDA TRCD
11160 015375 0          ADD (TQUE)
11161 011167 0          STA TRCD
11162 105144 0          LDA TRCDUN I
11163 011164 0          STA .+1
11164        0          BSS 1               /LDX FROM PAGE 0
11165 133167 0          STX TRCD I
11166 103144 0          JMP TRCDUN I
                        LEV VAR
11167        V  TRCD:   BSS 1               /TRCDUN PTR

                        LEV M2I
11170 044007 0  M2IDMC: LDA HEAD2 X         /RELOAD DEMAND
11171 013205 0          ERA PASWRD          /CHECK PASSWORD
11172 100040 0          SZE                 /KOSHER?
11173 003203 0          JMP M2IDM1          /NO
11174 044004 0          LDA ACKH X          /LOOK AT DEMAND
11175 101400 0          SMI                 /PANIC DEMAND?
11176 103376 0          JMP (1004) I        /YES, INSTANT RELOAD, A=MODEM NUMBE
11177 004674 0          LDA MP              /NO, USE OUR MODEM NO.
11200 141206 0          AOA                 /(COUNTING 1=4)
11201 010137 0          STA SW3FG           /AND NICE=STOP/RELOAD
11202 003124 0          JMP M2IFRE

11203 072674 0  M2IDM1: LDX MP
                        DEFHLT [RELOAD DEMAND WITH BAD PASSWORD]
11204 021101 0          JST PKTCHK

                        DEFPLC [DEMAND RELOAD PASSWORD]
11205 175461 0  PASWRD: 175461              /KEEP NEXT LOCATIONS IN ORDER
11206 177777 0  DMNDCR: =1                  /ACKH, USED FOR RELOAD CODE
11207 000005 0          GETCOR 0 LINETS         /HEADER
11210 000000 0          0                   /SYNC
11211 000000 0          0                   /PASSWORD PUT HERE MANUALLY
11212        0          BSS 1               /CHECKSUM
```

```
                        /LINE SPEED COMPUTATIONS
                        LEV I2M    LCK ALL
11213 012114 2 0 I2MRM:     ERA ONE 0"A"RM /THIS IS RM CLEAR FLAG
11214 111377 2 0            STA (RMFLG 0 X) I        /NOW CHK TO SEE IF TIME IS
11215 100400 2 0            SPL                 /SIGN MINUS IF FIRST TIME THROUGH
11216 003323 2 0            JMP I2MRMI          /INITIALIZATION
11217 141140 2 0            ICL                 /SPD TYPE FROM L, HALF INTO RT,
11220 010000 2 0            STA 0               /USED AS INDEX INTO MARGIN TABLE
11221 045331 2 0            LDA DELSPD X        /GET PERMISSABLE VARIANCE
11222 011360 2 0            STA DELTA
11223 173400 2 0            LDX (OCHN) I        /RESTORE CHAN # IN X
11224 055346 2 0            ADD RMLAST X        /MAXIMUM ACCEPTABLE TIME FOR THIS MS
11225 123401 2 0            CAS (THIST) I       /COMP W/ACTUAL TIME FOR THIS MSG
11226 003240 2 0            JMP I2MRMA          /MAX>THIS, SO FAR SO GOOD
11227 003245 2 0            JMP I2MRMB          /MAX=THIS, ALL OK, IN SPEC
                        DEFHLT [LINE SPEED DECREASED]
11230 021231 2 0 I2MRMD:    JST I2MSCG
11231 000000 2 0 I2MSCG:    0
11232 120745 2 0            JST HLTNCC I        /SEND MSG TO NCC
11233 105377 2 0            LDA (RMFLG 0 X) I        /DO HOLD DOWN
11234 007402 2 0            ANA (0 0 177777"X"SHD)
11235 013403 2 0            ERA (SHD)           /(6) SPEED HOLD DOWN
11236 111377 2 0            STA (RMFLG 0 X) I        /STORED IN RMFLG
11237 003260 2 0            JMP I2MRMC          /PUT THIST INTO LAST AND QUIT

                        /TIME WAS <MAX ACCEPTABLE, WAS IT > MIN?
11240 017360 2 0 I2MRMA:    SUB DELTA
11241 017360 2 0            SUB DELTA           /MIN ACCEPTABLE TIME
11242 123401 2 0            CAS (THIST) I       /COMP W/ACTUAL TIME
                        DEFHLT [LINE SPEED INCREASED]
11243 021231 2 0            JST I2MSCG          /MIN>THIS, TOO SLOW
11244 101000 2 0            NOP                 /MIN=THIS, ALL OK
11245 105377 2 0 I2MRMB:    LDA (RMFLG 0 X) I        /MIN<THIS, TIME IS OK
11246 007403 2 0            ANA (SHD)           /GET HOLD-DOWN COUNTER
11247 100040 2 0            SZE                 /HOLDING?
11250 003263 2 0            JMP I2MRME          /YES, GO COUNT IT DOWN
11251 045341 2 0            LDA RMTACT X        /NO, AVG IN (1/4 WEIGHT)TO ACTUAL
11252 041477 2 0            LGL 1               /*2
11253 055341 2 0            ADD RMTACT X        /*3
11254 115401 2 0            ADD (THIST) I       /+THIS
11255 040476 2 0            LGR 2               /OVER 4
11256 141216 2 0            ACA                 /ROUND IT OFF
11257 051341 2 0 I2MRMF:    STA RMTACT X        /INTO ACTUAL TIME
11260 105401 2 0 I2MRMC:    LDA (THIST) I       /PUT THIS INTO LAST
11261 051346 2 0            STA RMLAST X
11262 103404 2 0            JMP (I2MS) I        /AND RETURN TO INTERRUPT HNDLR
```

```
                        /IN COUNTDOWN, THIS TIME WITHIN LIMITS
11263 105377 2 0 I2MRME:    LDA (RMFLG 0 X) I       /WORD WITH COUNTER
11264 017405 2 0            SUB (SHD1)      /BOTTOM BIT OF COUNTER
11265 111377 2 0            STA (RMFLG 0 X) I       /PUT IT BACK
11266 007403 2 0            ANA (SHD)       /GET THE COUNTER
11267 100040 2 0            SZE             /COUNTED TO ZERO YET?
11270 003260 2 0            JMP I2MRMC      /NO, JUST PUT THIS INTO LAST AND RE'
11271 073406 2 0            LDX (-NSPD+1)   /YES, BELIEVE 'THIST'
11272 045331 2 0 I2MRMG:    LDA TIMSPC+NSPD-1 X     /GET TYPE, MAY HAVE CHNGD
11273 123401 2 0            CAS (THIST) I   /CMPR W/SPEC MAX TIMES/TYPE
11274 003300 2 0            JMP I2MRMH      /THIS TYPE, (MAX TIME>THIS)
11275 003300 2 0            JMP I2MRMH      /  "    "     "    " = "
11276 024000 2 0            IRS 0           /NOPE, TRY NEXT SLOWER TYPE
11277 003272 2 0            JMP I2MRMG
11300 045340 2 0 I2MRMH:    LDA LINDTT+NSPD-1 X     /GET LINE DEAD TIME FOR TI
11301 011360 2 0            STA DELTA       /AND SAVE IN TEMP
11302 004000 2 0            LDA 0           /INDEX= -TYPE
11303 140407 2 0            TCA             /COMPLIMENT
11304 141340 2 0            ICA             /INTO LEFT HALF
11305 173400 2 0            LDX (OCHN) I    /RESTORE CHAN IN X
11306 111377 2 0            STA (RMFLG 0 X) I 0"A"SHD"A"RM      /BACK INTO RMFLI
11307 141340 2 0            ICA             /GET SPEED TYPE
11310 015407 2 0            ADD (RMCLKS)    /ADD TABLE ADDRESS
11311 051353 2 0            STA RMCLKP X    /SAVE FOR USE IN RSTOUT
11312 005360 2 0            LDA DELTA       /PICK UP TEMP
11313 051361 2 0            STA LINDT X     /AND SAVE AS THIS LINE'S DEAD TIMF
11314 044433 2 0            LDA LINE X
11315 100040 2 0            SZE             /IS LINE UP?
11316 021133 2 0            JST KILLIN      /NO, RESET TIME IN CASE JUST RELO/'I
11317 105401 2 0            LDA (THIST) I   /PUT (THIS+LAST)/2 INTO ACTUAL
11320 055346 2 0            ADD RMLAST X
11321 040477 2 0            LGR 1
11322 003257 2 0            JMP I2MRMF

11323 140100 2 0 I2MRMI:    SSP             /INITIALIZE FIRST TIME THROUGH
11324 111377 2 0            STA (RMFLG 0 X) I       /CLEAR INIT BIT TOO,
11325 003260 2 0            JMP I2MRMC      /PUT THIS INTO LAST AND QUIT
```

```
                    LEV CON
                    /NSPD=1 ENTRIES
11326 000161 C      TIMSPC:  161            /(125K)MAX TIME A RM TAKES IN TYPE 1
11327 001066 C               1066           /(25K) TYPE 2
11330 004202 C               4202           /(6.5K) TYPE 1 (ALL SLOWER TYPE 0)

                    /NSPD ENTRIES
11331 000377 C      DELSPD:  377            /00 10% OF EXPECTED TIME FOR RM (+8
11332 000177 C               177            /01
11333 000060 C               60             /10
11334 000060 C               60             /11
                    /NSPD ENTRIES
11335 177324 C      LINDTT:  0 0-PTCK"T"5   /FOR 250KBS
11336 177704 C               0 0-PTCK       /FOR 50KBS
11337 177764 C               0 0-PTCK"Q"5   /FOR 10KBS
11340 177771 C               0 0-PTCK"Q"10  /LINE DEAD TIME FOR 5KBS

                    LEV VAR
11341         V     RMTACT:  BSS CH         /ACTUAL TIME FOR RM (AVERAGED)
11346         V     RMLAST:  BSS CH         /TIME FOR LAST RM IN 100 MU SEC'S
11353         V     RMCLKP:  BSS CH         /PTR TO ENTRY IN RMCLKS
11360         V     DELTA:   BSS 1          /DELSPD ENTRY FOR THIS LINE
11361         V     LINDT:   BSS CH         /LINE HELD DEAD TIMES

11366 010246 C      LEV CON  CONSTANTS
11367 010611 C
11370 110611 C
11371 150577 C
11372 101000 C
11373 150247 C
11374 177766 C
11375 000011 C
11376 001004 C
11377 052620 C
11400 012654 C
11401 012644 C
11402 177771 C
11403 000006 C
11404 012156 C
11405 000002 C
11406 177775 C
11407 020274 C
02420 173433 C               PAGEND 11,UNCON,4
```

```
                    /IMP TO MODEM (I2M)

                    PAGI2M:
                    LEV I2M

00071 012127 2      M10TIL/   I2M1
00072 012123 2      M20TIL/   I2M2
00073 012117 2      M30TIL/   I2M3
00074 012113 2      M40TIL/   I2M4
00075 012107 2      M50TIL/   I2M5

                    PAGI2M/   LEV VAR

12103          V    TATA:     BSS 1          /I2M TEMPS
12104          V    TXTX:     BSS 1
12105          V    TCTC:     BSS 1
12106          V    IRET:     BSS 1

                    /IMP TO MODEM INTERRUPTS COME TO THIS PAGE.
12107 000000 2 0    I2M5:     INT I2M
12110 033104 2 0              STX TXTX
12111 072117 2 0              LDX FOUR
12112 003132 2 0              JMP I2M0
12113 000000 2 0    I2M4:     INT I2M
12114 033104 2 0              STX TXTX
12115 072116 2 0              LDX THREE
12116 003132 2 0              JMP I2M0
12117 000000 2 0    I2M3:     INT I2M
12120 033104 2 0              STX TXTX
12121 072115 2 0              LDX TWO
12122 003132 2 0              JMP I2M0
12123 000000 2 0    I2M2:     INT I2M
12124 033104 2 0              STX TXTX
12125 072114 2 0              LDX ONE
12126 003132 2 0              JMP I2M0
12127 000000 2 0    I2M1:     INT I2M
12130 033104 2 0              STX TXTX
12131 072113 2 0              LDX ZERO
```

```
12132 033654 2 0 I2M0:   STX OCHN        /SAVE MODEM NUMBER
12133 011103 2 0         STA TATA
12134 000011 2 0         DXA
12135 003136 2 0         JMP .+1
12136 000043 2 0         INK
12137 011105 2 0         STA TCTC
12140 004416 2 0         LDA TIMES       /CURRENT 640 MS CLOCK
12141 057632 2 0         SUB TIM640 X    /INITIAL READING FOR THIS MSG
12142 017712 2 0         SUB (10.)       /10.24 TICKS/WRAP OF 100 MUS CLK
12143 101400 2 0         SMI             /<10 TICKS?
12144 003516 2 0         JMP RAPT        /NO, MSG TOOK TOO LONG, CLOCK WRAPPE
12145 131040 2 0         RDCLOK          /100 MU SEC CLOCK
12146 003145 2 0         JMP .-1
12147 057637 2 0         SUB TIM100 X    /MINUS START TIMER
12150 011644 2 0         STA THIST       /TIME FOR THIS MESSAGE
12151 055625 2 0         ADD CUMTIM X    /ADD TO TOTAL
12152 051625 2 0         STA CUMTIM X    /AND SAVE
12153 045620 2 0         LDA RMFLG X     /ROUTING MSG FLAGS
12154 100100 2 0         SLZ             /WAS THIS A ROUTING MESSAGE?
12155 103713 2 0         JMP (I2MRM) I   /YES, GO DO LINE SPEED COMPUTNS
12156 004502 2 0 I2MS:   LDA MOM         /LOAD MODEM OUTPUT MASK
12157 170120 2 0         SMK INTM        /SET PRI INTERRUPT
12160 026134 2 0         IMA PRIM
12161 011652 2 0         STA TMTM
12162 140040 2 0         CRA
12163 066634 2 0         IMA I2MNXT X    /PKT PNTR FOR NEXT OUTPUT FOR CHL
12164 101400 2 0         SMI             /WAS THERE AN ACK FOR THE PKT WE
12165 003173 2 0         JMP I2MALL      /NO, DO NOT RELEASE PKT
12166 140100 2 0         SSP
12167 010000 2 0         STA 0
12170 120671 2 0         JST FLUSHI I    /YES, SO WE CAN FREE IT NOW
12171 024564 2 0         IRS NSFS
12172 073654 2 0         LDX OCHN
```

```
12173 000401 2 0 I2MALL:   ENB I2M
12174 044265 2             LDA SLT X
12175 100040 2             SZE                 /TIME TO SEND A ROUTING MESSAGE?
12176 003276 2             JMP I2MLT           /YES
12177 045660 2             LDA I2MLST X        /PICK UP RING PNTR
12200 141206 2             ADA                 /ADVANCE IT
12201 062627 2             CAS I2MEND X
12202 101000 2             NOP
12203 044622 2             LDA I2MTAB X        /WRAP AROUND
12204 051660 2             STA I2MLST X
12205 001001 2             INH M2I             /PREVENT M2I FROM ACKING
12206 145660 2 0           LDA I2MLST XI       /WHILE WE LOOK AT THIS SLOT
12207 023714 2 0           CAS (1777)          /IS THERE A PKT HERE?
12210 003550 2 0           JMP I2MRET          /YES, SEE IF IT IS TOO OLD
12211 073654 2 0 I2MNEW:   LDX OCHN            /NO, NOTHING TO RETRANSMIT
12212 000401 2 0           ENB I2M
12213 044317 2             LDA SMPQ X
12214 100040 2             SZE                 /A NEW PRIORITY PACKET TO SEND?
12215 003363 2             JMP I2MPRI          /YES
12216 044312 2             LDA SMQ X
12217 100040 2             SZE                 /A NEW REGULAR PACKET TO SEND?
12220 003375 2             JMP I2MREG          /YES
12221 044445 2             LDA SNULL X
12222 101040 2             SNZ                 /SHOULD WE SEND A NULL PKT?
12223 003500 2             JMP I2MQUT          /NO, SO QUIT
```

```
12224 140040 2   I2MNUL:   CRA             /SEND A NULL PKT WITH IMY
12225 066421 2             IMA SIMY X
12226 100400 2             SPL 0"A"SNDCOR /DID WE GET A REQUEST TO SEND CORE
12227 003262 2             JMP I2MCOR     /YES, SO SERVICE IT
12230 100040 2             SZE            /DID WE GET IN ANY ROUTING MESSAGES
12231 005715 2             LDA (IHERDU)   /YES, SEND AN I HEARD YOU
12232 013716 2             ERA (LINETS 0 NULPKT)    /IN A NULL PKT
12233 141340 2             ICA
12234 012106 2             ERA MINE
12235 141340 2             ICA
12236 151704 2             STA NULPTR XI  /SET UP HEADER OF NULL PKT
12237 045704 2             LDA NULPTR X   /PICK UP PNTR TO NULL AREA
12240 016114 2             SUB ONE
12241 151665 2             STA MOPX XI    /SET UP OUR OUTPUT AREA
12242 011655 2             STA ACKWRD
12243 014117 2             ADD FOUR 0"A"[MINPL-ACKH]          /MIN PACKET LEN
12244 151672 2             STA MOP1 XI
12245 044646 2             LDA RSEX X     /PUT IN ACKS
12246 073655 2             LDX ACKWRD
12247 050000 2             STA ACKH-ACKH X
12250 004417 2             LDA SYNC       /PUTTING SYNC TIME INTO NULLS
12251 050002 2             STA HEAD1-ACKH X
12252 004117 2   I2MNLC:   LDA FOUR 0"A"[MINPL-ACKH]
12253 056000 2             SUB ACKH-ACKH X          /BUILD CKSUM
12254 056001 2             SUB HEAD-ACKH X
12255 056002 2             SUB HEAD1-ACKH X
12256 056003 2             SUB HEAD2-ACKH X
12257 050004 2             STA HEAD3-ACKH X         /AND STORE IT
12260 073654 2             LDX OCHN
12261 003465 2             JMP I2MDN1

12262 005717 2   I2MCOR:   LDA (CORELO)
12263 151665 2             STA MOPX XI
12264 005720 2             LDA (COREHI-1)
12265 151672 2             STA MOP1 XI
12266 003467 2             JMP I2MDUN     /RETURN TO DO OUTPUT, NO ACKS

12267 005721 2   I2MDMC:   LDA (DMNDCR)   /SEND 'DEMAND CORE'
12270 151665 2             STA MOPX XI
12271 014117 2             ADD FOUR 0"A"[MINPL-ACKH]
12272 151672 2             STA MOP1 XI
12273 016117 2             SUB FOUR 0"A"[MINPL-ACKH]
12274 010000 2             STA 0
12275 003252 2             JMP I2MNLC     /GET CHECKSUM AND SEND IT

12276 100400 2   I2MLT:    SPL            /ARE WE HOLDING LINE DEAD?
12277 003500 2             JMP I2MQUT     /YES, GO NO FURTHER
12300 016114 2   I2ML2:    SUB ONE
12301 050265 2   I2ML3:    STA SLT X
12302 022114 2   I2ML4:    CAS ONE        /RELOAD DEMAND TO SEND?
12303 003267 2             JMP I2MDMC     /YES
12304 003224 2             JMP I2MNUL     /NULL TO SEND
                 /---FALL THROUGH TO SEND ROUTING
```

```
                        /THE WORDS FROM I2MCK1 TO I2MCK2 ARE CHECKSUMMED
                        CHK=0
12305 073361 2          I2MCK1:   K LDX I2MCKX    /PICK UP -[# OF WDS IN CODE TO CK
12306 055363 2                    K ADD I2MCK2+1 X          /ADD THEM (NOTE 0 IN AN I
12307 024000 2                    K IRS 0
12310 003306 2                    K JMP .-2
12311 100040 2                    K SZE           /DIFFERENT?
                                  RELOAD [I2M ROUTING CODE BROKEN]
12312 120061 2                    K JST SWDTIL I /SOFTWARE WDT, DO A RELOAD
12313 073654 2                    K LDX OCHN
12314 125353 2                    K IRS IMHSI I  /KEEP STAT COUNTER
12315 101000 2                    K NOP
12316 004660 2                    K LDA RST,O     /GET OUTPUT PTR
12317 015355 2                    K ADD I2MRC1
12320 151665 2                    K STA MOPX XI   /BEG POINTER
12321 017356 2                    K SUB I2MRC2
12322 151672 2                    K STA MOP1 XI
12323 015357 2                    K ADD I2MRC3
12324 010000 2                    K STA 0
12325 005354 2                    K LDA I2MRAP    /(RUTADR)
12326 026111 2                    K IMA ADDRET    /SAVE CURRENT OWNER OF ADDER
12327 011653 2                    K STA TARTAR
12330 005356 2                    K LDA I2MRC2    /(-NIMP - HEAD1 + ACKH)
12331 103332 2                    K JMP .+1 I     /JUMP INTO RIGHT PLACE IN ADD CHA
12332 001454 2                    K ADDBOT+0-NIMP-HEAD1+ACKH
12333 140407 2          RUTADR:   K TCA
12334 072113 2                    K LDX ZERO      /USE TO FIND CKSUM POST INDEXED
12335 112660 2                    K ERA RST,O I   /COMPARE CKSUM W/ THAT GENERATED BY
12336 027653 2                    K IMA TARTAR
12337 010111 2                    K STA ADDRET
12340 005653 2                    K LDA TARTAR
12341 073654 2                    K LDX OCHN
12342 001001 2                    K .INH          LCK ALL
12343 100040 2 0                  K SZE           /DIFFERENT?
                                DEFHLT [ROUTING MESSAGE CHECKSUM ERROR - INTRA IMP]
12344 021571 2 0                  K JST I2MHLT
12345 141206 2 0                  K AOA           /1
12346 053620 2 0                  K ERA RMFLG X   /SAYS ROUTING MSG GOING OUT
12347 051620 2 0                  K STA RMFLG X
12350 105360 2 0                  K LDA I2MRP I   /(RSTSN)
12351 051645 2 0                  K STA RSTSNO X /SAVE SER # OF LAST OUTPUT
12352 003467 2 0                  K JMP I2MDUN

                                LEV CON
12353 071615 C          IMHSI:    K IMHS 0 X
12354 012333 C          I2MRAP:   K RUTADR
12355 137675 C          I2MRC1:   K -X 0-NIMP-HEAD1+ACKH-1
12356 177675 C          I2MRC2:   K -NIMP-HEAD1+ACKH-1
12357 177671 C          I2MRC3:   K -NIMP-HEAD1-1
12360 026644 C          I2MRP:    K RSTSN
12361 177722 C          I2MCKX:   K I2MCK1-0-I2MCK2-1       /CHECKSUM COUNTER
12362 044107 C          I2MCK2:   -CHK            /CHECKSUM ON CODE GOES HERE
```

```
                    LEV I2M
12363 050634 2  I2MPRI:  STA I2MNXT X
12364 140040 2           CRA
12365 166634 2           IMA I2MNXT XI
12366 050317 2           STA SMPQ X
12367 100040 2           SZE
12370 003406 2           JMP I2MGNU
12371 005722 2           LDA (SMPQ)
12372 015654 2           ADD OCHN
12373 050370 2           STA EMPQ X
12374 003406 2           JMP I2MGNU

12375 050634 2  I2MREG:  STA I2MNXT X   /LOAD WITH TOP OF Q ADDR
12376 140040 2           CRA
12377 166634 2           IMA I2MNXT XI  /GET CHAIN PNTR OF NEW REQ
12400 050312 2           STA SMQ X      /LINK TO TOP OF Q
12401 100040 2           SZE            /WAS THIS LAST?
12402 003406 2           JMP I2MGNU     /NO
12403 005723 2           LDA (SMQ)      /YES, FIX UP Q PNTRS
12404 015654 2           ADD OCHN
12405 050363 2           STA EMQ X


12406 173724 2  I2MGNU:  LDX (I2MNXT 0 X) I       /GOT A NEW PKT
12407 133725 2           STX (INCH 0 XI) I       /SET UP SLOT PNTR
12410 005726 2           LDA (-200,)    /GIVE A PKT 200 TRIES
12411 050003 2           STA INCH X     /TO BE ACCEPTED
12412 011657 2           STA I2MREF     /MARK AS NEW PKT, DON'T CHECKSUM
12413 073654 2           LDX OCHN
12414 044634 2           LDA I2MNXT X
```

```
12415 140100 2   I2MGOT:   SSP
12416 015727 2             ADD (ACKH)
12417 151665 2             STA MOPX XI
12420 011655 2             DEFSTAT STA ACKWRD, IM1
00605 031160 2
32001 012420 2
32021 011655 2
12421 173724 2             LDX (I2MNXT 0 X) I
12422 131040 2             RDCLOK
12423 003422 2             JMP .-1
12424 050001 2             STA ST X
12425 044111 2             LDA BUFE X
12426 140100 2             SSP 0"A"TWOQ
12427 073654 2             LDX OCHN
12430 151672 2             STA MOP1 XI
12431 011656 2             STA ENDWRD
12432 005657 2             LDA I2MREF      /RETRANSMISSION OR NEW?
                   DEFPLC [NOP HERE TO STOP CHECKSUM VERIFY IN I2M]
12433 100040 2             SZE
12434 003456 2             JMP I2MCHF      /NO CKSUM
12435 005730 2             LDA (I2MADR)    /CAPTURE ADDER
12436 026111 2             IMA ADDRET
12437 011653 2             STA TARTAR
12440 005655 2             LDA ACKWRD
12441 016117 2             SUB FOUR 0"A"ACKH
12442 010000 2             STA 0           /PACKET POINTER
12443 017656 2             SUB ENDWRD      /LENGTH OF PACKET
12444 015731 2             ADD (ADDBOT+ACKH)
12445 011450 2             STA I2MADJ
12446 017732 2             SUB (ADDBOT)
12447 103450 2             JMP I2MADJ I
12450        2   I2MADJ:   BSS 1
12451 100040 2   I2MADR:   SZE
12452 003524 2             JMP I2MCHE      /CHECKSUM ERROR!
12453 005653 2             LDA TARTAR
12454 010111 2             STA ADDRET      /RESTORE ADDER OWNER
12455 073654 2             LDX OCHN
12456 105655 2   I2MCHF:   LDA ACKWRD I
12457 141044 2             CAR 0"A"ACKBTS /PUT IN ACKS
12460 052646 2             ERA RSEX X
12461 127655 2             IMA ACKWRD I    /AND CORRECT CHECKSUM
12462 117655 2             SUB ACKWRD I
12463 115656 2             ADD ENDWRD I
12464 111656 2             STA ENDWRD I
12465 140040 2   I2MDN1:   CRA
12466 050445 2             STA SNULL X     /ACKS MARKED AS SENT
```

```
12467 004416 2   I2MDUN:   LDA TIMES       /640 MS COUNTER
12470 051632 2             STA TIM640 X    /TABLE OF MODEM OUT START TIMES
12471 131040 2             RDCLOK          /100 MICRO SEC CLOCK
12472 003471 2             JMP .+1
12473 051637 2             STA TIM100 X    /SAVE THIS CLOCK TOO
12474 045677 2             LDA MXOUT X
12475 011476 2             STA . 1
12476        2             BSS 1
12477 005711 2             LDA M30SCF      /SET TO WAIT FOR HARDWARE COMPLETE
12500 050440 2   I2MQUT:   STA NONE X      /OR SET FLAG TO INDICATE IDLE
12501 001001 2             INH MSK
12502 005652 2 0           LDA TMTM
12503 010134 2 0           STA PRIM
12504 170120 2 0           SMK INTM
12505 144071 2 0           LDA M10TIL XI
12506 011106 2 0           STA IRET
12507 000013 2 0           EXA
12510 005105 2 0           LDA TCTC
12511 171020 2 0           OTK
12512 005103 2 0           LDA TATA
12513 073104 2 0           LDX TXTX
12514 000401 2 0           ENB I2M
12515 103106 2             JMP IRET I

                 LEV I2M   LCK ALL
12516 005733 2 0 RAPT:     LDA (14400)     /6400MS, 1 SLOW T,0 IN 100MUS UNITS
12517 051625 2 0           STA CUMTIM X    /RM TOOK TOO LONG, MAX_TIMER
12520 045620 2 0           LDA RMFLG X     /CLEAR RM FLAG BIT
12521 006122 2 0           ANA MINUS2 0"A"RM        /177776
12522 051620 2 0           STA RMFLG X
12523 003156 2 0           JMP I2MS        /AND RETURN

                 LEV I2M
12524 001001 2   I2MCHE:   INH ALL
                 DEFHLT (MODEM OUT DETECTED INTRA-IMP CHECKSUM ERROR)
12525 021526 2 0           JST .+1
12526 000000 2 0           0
12527 120745 2 0           JST HLTNCC I    /REPORT IT
12530 004000 2 0           LDA 0
12531 026342 2 0           IMA DIAGQ       /AND TO DIAG TTY
12532 050000 2 0           STA 0 X
12533 000401 2 0           ENB I2M
12534 005653 2             LDA TARTAR
12535 010111 2             STA ADDRET
12536 024564 2             IRS NSFS
12537 044004 2             LDA ACKH X      /FREE UP UN-ACKED CHANNEL
12540 007734 2             ANA (CHANUM)
12541 141140 2             ICL
12542 073654 2             LDX OCHN
12543 054622 2             ADD I2MTAB X    /GET SLOT POINTER
12544 011653 2             STA TARTAR      /(TEMP)
12545 140040 2             CRA
12546 111653 2             STA TARTAR I    /CLEAR SLOT PTR
12547 003500 2             JMP I2MQUT      /LEAVE MODEM OUTPUT IDLE FOR A BI"
```

```
                        LCK M2I
12550 010000 2 0 I2MRET:    STA 0           /SAVE PKT PNTR
12551 131040 2 0            RDCLOK
12552 003551 2 0            JMP .+1
12553 056001 2 0            SUB ST X        /COMPARE TIME NOW WITH SENT TIME
12554 100400 2 0            SPL
12555 140407 2 0            TCA             /MAKE DIFF A POSITIVE NUMBER
12556 017735 2 0            SUB (1250.)     /COMPARE WITH 125 MS
                        /THIS CONSTANT VARIES WITH LINE LENGTH AND SPEED
                        /IT SHOULD BE TABLED WHEN WE GET FAST LINES+SATELLITES
12557 100400 2 0            SPL             /TOO OLD?
12560 003211 2 0            JMP I2MNEW      /NOT YET
12561 064003 2 0            IRS INCH X      /COUNT ANOTHER RETRANSMIT
12562 003575 2 0            JMP I2MRTR      /NOT OVER THE LIMIT
12563 120671 2 0            JST FLUSHI I    /KILL PKT AFTER 200 TRIES
12564 024564 2 0            IRS NSFS        /AND COUNT IT OUT
12565 073654 2 0            LDX OCHN
12566 140040 2 0            CRA
12567 151660 2 0            STA I2MLST XI   /SO IT WON'T BE FLUSHED TWICE
                        DEFHLT [200 RETRANSMISSIONS = SERIOUS MALFUNCTION]
12570 021571 2 0            JST I2MHLT
12571 000000 2 0 I2MHLT:    0
12572 120745 2 0            JST HLTNCC I    /REPORT TROUBLE TO NCC
12573 121736 2 0            JST (KILLIN) I /KILL LINE INSTANTLY
12574 003500 2 0            JMP I2MQUT      /DISMISS INTERRUPT

12575 073654 2 0 I2MRTR:    LDX OCHN
12576 140040 2 0            CRA             /MARK PACKET AS A RETRANSMISSION
12577 011657 2 0            STA I2MREF      /SO CHECKSUM IS VERIFIED
12600 145660 2 0            LDA I2MLST XI   /PACKET SENT >125MS AGO
12601 050634 2 0            STA I2MNXT X    /SO RETRANSMIT IT
12602 000401 2 0            ENB I2M
12603 003415 2              JMP I2MGOT

                        LEV [T,0,TSK]           LCK SIN
12604 000000 5 0 I2MSB:     0               /SOFTWARE WAKEUP OF MODEM OUTPUT
12605 033104 5 0            STX TXTX        /ALWAYS CALLED FROM LOW CORE AND DX
12606 011103 5 0            STA TATA
12607 033654 5 0            STX OCHN
12610 005604 5 0            LDA I2MSB
12611 150071 5 0            STA M1OTIL XI
12612 143613 5 0            JMP I2MSBT XI   /CLEAR X BIT IN ADDR AND LEAP IN F

                        LEV VAR
12613 012156 V  I2MSBT:     I2MS
12614 012156 V              I2MS
12615        V              SATDEF I2MS
02245 012615 V
02275 012156 V
02325 012156 V
12616 012156 V              I2MS
12617 012156 V              I2MS
```

```
                    /BITS IN RMFLG
                    RMINIT=100000           /SET IF FIRST TIME THROUGH (IN INI
                    SPDTYP=77400            /TYPE 0 = 5KBS
                                            /TYPE 1 = 10KBS
                                            /TYPE 2 = 50KBS
                                            /TYPE 3 = 250 KBS
                    SHD=6       /SPEED HOLD-DOWN COUNTER
                    SHD1=2      /BOTTOM BIT OF SHD
                    RM=1        /IF SET, SAYS ROUTING MESSAGE PENDING

                    LEV VAR
12620          V    RMFLG:      BSS CH          /INIT TO 1006(HD ON 50KB LINE)
12625          V    CUMTIM:     BSS CH          /CUMULATIVE BUSY TIME OVER INTERVAL
12632          V    TIM640:     BSS CH          /'TIMES' AT START OF OUTPUT
12637          V    TIM100:     BSS CH          /100 MUS CLOCK AT START OF OUTPUT
12644          V    THIST:      BSS 1           /ELAPSED TIME FOR THIS TRANSMISSION
12645          V    RSTSNO:     BSS CH          /SERIAL NO, OF LAST RM OUTPUT
```

```
                    LEV VAR
12652          V    TMTM:      BSS 1           /TEMP M
12653          V    TARTAR:    BSS 1           /TEMP ADDER RETURN
12654          V    OCHN:      BSS 1           /ACTIVE MODEM NUMBER
12655          V    ACKWRD:    BSS 1           /PNTR TO WORD IN PKT WHERE ACKS GO
12656          V    ENDWRD:    BSS 1           /PNTR TO LAST WORD IN PKT
12657          V    I2MREF:    BSS 1           /RETRANSMIT FLAG: CHECKSUM IF FLAG
12660          V    I2MLST:    BSS CH          /PNTR TO LAST SLOT SENT
                    LEV CON
12665 000032   C    MOPX:      M1OTBP          /DMC OUTPUT PNTRS
12666 000034   C               M2OTBP
12667 000036   C               M3OTBP
12670 000040   C               M4OTBP
12671 000042   C               M5OTBP
12672 000033   C    MOP1:      M1OTBP+1        /DMC OUTPUT END PNTRS
12673 000035   C               M2OTBP+1
12674 000037   C               M3OTBP+1
12675 000041   C               M4OTBP+1
12676 000043   C               M5OTBP+1
12677 030071   C    MXOUT:     M1OUT           /OUTPUT INSTRUCTIONS
12700 030072   C               M2OUT
12701 030073   C               M3OUT
12702 030074   C               M4OUT
12703 030075   C               M5OUT
12704 032101   C    NULPTR:    NULS1+1         /PNTRS TO NULL PKT AREAS
12705 032106   C               NULS2+1
12706 032113   C               NULS3+1
12707 032120   C               NULS4+1
12710 032125   C               NULS5+1

12711 175551   C    M30SCF:    =[0 0 30SEC"T"25,]
```

```
12712 000012 C    LEV CON   CONSTANTS
12713 011213 C
12714 001777 C
12715 000020 C
12716 000003 C
12717 000060 C
12720 032777 C
12721 011206 C
12722 000317 C
12723 000312 C
12724 040634 C
12725 140003 C
12726 177470 C
12727 000004 C
12730 012451 C
12731 001562 C
12732 001556 C
12733 014400 C
12734 017400 C
12735 002342 C
12736 011133 C
02421 176744 C              PAGEND 12,UNCON,5
```

```
                    /HOST TO IMP (HI)

                    PAGH2I:
                    LEV H2I

00100 013100 4      H1INIL/   HI0E
00101        4      H2INIL/   TIPDEF HI1E, TINT
02246 000101 4
02276 013072 4
02326 025061 4
00075 013064 4      H3INIL/   HI2E
00074 013056 4      H4INIL/   HI3E

                    PAGH2I/
                    /HOST 3 INTERRUPT ROUTINE
13056 000000 4 0 HI3E:      INT H2I
13057 033135 4 0            STX HIX
13060 073056 4 0            LDX HI3E
13061 033106 4 0            STX HISB
13062 072116 4 0            LDX THREE
13063 003110 4 0            JMP HISB2
                    /HOST 2 INTERRUPT ROUTINE
13064 000000 4 0 HI2E:      INT H2I
13065 033135 4 0            STX HIX
13066 073064 4 0            LDX HI2E
13067 033106 4 0            STX HISB
13070 072115 4 0            LDX TWO
13071 003110 4 0            JMP HISB2
                    /HOST 1 INTERRUPT ROUTINE
13072 000000 4 0 HI1E:      INT H2I
13073 033135 4 0            STX HIX
13074 073072 4 0            LDX HI1E
13075 033106 4 0            STX HISB
13076 072114 4 0            LDX ONE
13077 003110 4 0            JMP HISB2
                    /HOST 0 INTERRUPT ROUTINE
13100 000000 4 0 HI0E:      INT H2I
13101 033135 4 0            STX HIX         /SAVE INDEX REGISTER
13102 073100 4 0            LDX HI0E
13103 033106 4 0            STX HISB        /SET UP RETURN ADDRESS
13104 072113 4 0            LDX ZERO        /INTERRUPT FROM HOST 0
13105 003110 4 0            JMP HISB2
```

```
                        / FROM HERE ON IS COMMON TO ALL HOST INTERRUPT ROUTINES

13106 000000 4 0 HISB:      0
13107 033135 4 0            STX HIX
13110 000011 4 0 HISB2:     DXA
13111 003112 4 0            JMP . 1
13112 032675 4 0            STX HIP         /SAVE CURRENT HOST
13113 011133 4 0            STA HIA         /SAVE AC
13114 000043 4 0            INK
13115 011134 4 0            STA HIK
13116 004501 4 0            LDA HIM         /SET UP NEW INTERRUPT MASK (177760)
13117 170120 4 0            SMK INTM        /OUTPUT IT
13120 026134 4 0            IMA PRIM        /SAVE IT IN PRIM
13121 011136 4 0            STA HIMS        /SAVE OLD PRIM
13122 000401 4 0            ENB H2I
13123 142453 4              JMP HILO XI     /RESTART WHERE LAST LEFT OFF

13124 000000 4    HIWM:     0               /DEBREAK AND WAKE UP 25MS LATER
13125 072675 4              LDX HIP
13126 005124 4              LDA HIWM
13127 050453 4    HIWM1:    STA HILO X
13130 004121 4              LDA MINUS1
13131 051137 4              STA HITT X      /SET TIMEOUT TO WAIT 1 PERIOD
13132 003516 4              JMP HIDONE

                        LEV VAR
13133         V     HIA:    BSS 1           /AC SAVE
13134         V     HIK:    BSS 1           /K SAVE
13135         V     HIX:    BSS 1           /IR SAVE
13136         V     HIMS:   BSS 1           /PRIM SAVE
13137         V     HITT:   BSS TH          /HOST-TO-IMP INTERFACE TIMER
```

```
                    LEV CON
13147 000050 C   HIB1:     H1INBP          /DMC INPUT PNTRS
13150        C             TIPDEF H2INBP,JUNK
02247 013150 C
02277 000052 C
02327 000001 C
13151        C             TIPDEF H3INBP,TIPLNK+2
02250 013151 C
02300 000056 C
02330 000772 C
13152 000042 C             H4INBP
13153 013323 C             HIBB
13154 013324 C             HIBB+1
13155 013325 C             HIBB+2
13156 013326 C             HIBB+3
13157 000051 C   HIB2:     H1INBP+1        /DMC INPUT END PNTRS
13160        C             TIPDEF H2INBP+1,JUNK
02251 013160 C
02301 000053 C
02331 000001 C
13161        C             TIPDEF H3INBP+1,TIPLNK+3
02252 013161 C
02302 000057 C
02332 000773 C
13162 000043 C             H4INBP+1
13163 013327 C             HIBC
13164 013330 C             HIBC+1
13165 013331 C             HIBC+2
13166 013332 C             HIBC+3
13167 003014 C   HER0:     JMP 0 1000 777"A"HITEST  /NEEDED FOR HOST TEST
                                        /MUST PRECEDE HER!
13170 070070 C   HER:      H1ERR           /SKIP ON ERROR FROM HOST
13171 070060 C             H2ERR
13172        C             TIPDEF H3ERR,NOP
02253 013172 C
02303 070050 C
02333 101000 C
13173 070051 C             H4ERR
13174 101000 C             NOP
13175 101000 C             NOP
13176 101000 C             NOP
13177 101000 C             NOP
13200 030170 C   HIN:      H1IN            /INPUT INSTRUCTIONS
13201 030160 C             H2IN
13202        C             TIPDEF H3IN,JMP+0+1000+HIFAKE"A"777
02254 013202 C
02304 030150 C
02334 003531 C
13203 030151 C             H4IN
13204 003531 C             JMP HIFAKE
13205 003531 C             JMP HIFAKE
13206 003531 C             JMP HIFAKE
13207 003531 C             JMP HIFAKE
```

```
                        /FAKE HOST TO IMP (JAM)
                        /SIMULATE HOST-TO-IMP INTERFACE HARDWARE FOR FAKE HOSTS:
                        /1- RECEIVE A WORD FROM HOST
                        /2- STORE THE WORD THROUGH THE DMC INPUT POINTER
                        /3- INCREMENT THE DMC INPUT POINTER
                        /4- IF LAST BIT INDICATOR IS SET, OR
                        /    IF THE DMC INPUT AND INPUT END POINTERS CROSS
                        /    GIVE INPUT COMPLETED INTERRUPT
                        /5- GO TO 1
                        /HIBB SERVES AS THE DMC INPUT POINTER
                        /HIBC SERVES AS THE DMC INPUT END POINTER
                        /CALLING SEQUENCE
                        /FAKE HOST NUMBER IN X REG - 0=TTY,1=DDT,2=TRACE,3=STATISTIC
                        /SIGN BIT OF X REG IS LAST BIT INDICATOR - BIT ON=LAST BIT
                        /THE WORD TO GIVE TO THE IMP IN A REG
                        /JST JAM - SEND THIS WORD TO IMP FROM THIS FAKE HOST
                        /        - IMPLICIT BACKGROUND WAIT UNTIL THIS WORD IS TAKEN
                        /        - AND ANOTHER WORD MAY BE SENT
                        LEV BCK
13210 000000 7    GAM:      0
13211 151323 7              STA HIBB XI     /STORE NEXT WORD THROUGH INPUT PNT
13212 065323 7              IRS HIBB X      /INCREMENT INPUT PNTR
13213 004000 7              LDA 0
13214 100400 7              SPL             /IS LAST BIT FLAG SET?
13215 003247 7              JMP GAM2        /YES
13216 045327 7              LDA HIBC X
13217 057323 7              SUB HIBB X
13220 101400 7              SMI             /HAVE PNTRS CROSSED?
13221 103210 7              JMP GAM I       /NO, RETURN
13222 005177 7              LDA HER+NH+3    /(NOP)
13223 051317 7    GAM1:     STA EMFH+NH X   /SET UP LAST BIT INSTRUCTION FOR HO
13224 005210 7              LDA GAM
13225 051251 7              STA GAMT X      /SAVE RETURN ADDRESS
13226 004000 7              LDA 0
13227 140100 7              SSP
13230 011255 7              STA GAMX
13231 014130 7              ADD PLNH
13232 010000 7              STA 0           /SET UP X REG FOR THIS FAKE HOST
13233 001001 7              INH SIN         /SOFTWARE INTERRUPT HOST-TO-IMP
13234 000013 7 0            EXA
13235 021106 7 0            JST HISB        RET BCK
13236 001001 7              INH ALL
13237 120672 7 0            JST DODXA I     RET BCK
13240 073255 7              LDX GAMX
13241 045143 7    GAM3:     LDA HITT+NH X   /TIMER HAS THREE POSSIBLE STATES
13242 140401 7              CMA             /0 - WAITING FOR LEADER INPUT
13243 100040 7              SZE             /-1 -  WAITING FOR SOFTWARE INTERRU
13244 143251 7              JMP GAMT XI     /IF NOT -1, INPUT CAN GO, SO RETUF
13245 120665 7              JST DOZE I      /-N - WAITING FOR DATA INPUT
                        DEFPLC [JAM CALL TO DOZE]
13246 003241 7              JMP GAM3        /WAIT UNTIL INPUT IS ALLOWED
13247 004112 7    GAM2:     LDA SIGN        /(SKP)
13250 003223 7              JMP GAM1
                        LEV VAR   DEFPLC [GAMT]
13251         V   GAMT:     BSS FH          /TABLE OF RETURN ADDRESSES
13255         V   GAMX:     BSS 1
```

```
                        LEV BCK    LCK INI
13256 000000 7 0 HIST:  0                  /RESTART HOST TO IMP
13257 140040 7 0        CRA
13260 051333 7 0        STA HISP X
13261 011106 7 0        STA HISB           /IN CASE NON-DXA IMP RELOADED FROM I
13262 111535 7 0        STA (HIDEST 0 X) I
13263 045273 7 0        LDA HISTAB X
13264 050453 7 0        STA HILO X         /SET UP INITIAL ADDRESS TO GO TO
13265 045303 7 0        LDA EMIT X
13266 051313 7 0        STA EMFH X         /SET UP EOM INSTRUCTION
13267 000013 7 0        EXA
13270 021106 7 0        JST HISB           /CALL HOST
13271 120672 7 0        JST DODXA I
13272 103256 7 0        JMP HIST I

                        LEV CON
13273 013353 C  HISTAB: HISTRH             /INITIAL COROUTINE ENTRANCES
13274 013353 C          HISTRH
13275        C          TIPDEF HISTRH, HISTFH
02255 013275 C
02305 013353 C
02335 013416 C
13276 013353 C          HISTRH
13277 013416 C          HISTFH
13300 013416 C          HISTFH
13301 013416 C          HISTFH
13302 013416 C          HISTFH

13303 070270 C  EMIT:   H1EOM              /SKIP ON LAST BIT INSTRUCTIONS
13304 070260 C          H2EOM
13305        C          TIPDEF H3EOM, SKP
02256 013305 C
02306 070250 C
02336 100000 C
13306 070251 C          H4EOM
13307 100000 C          SKP
13310 100000 C          SKP
13311 100000 C          SKP
13312 100000 C          SKP

                        LEV VAR
13313        V  EMFH:   BSS TH             /SKIP ON END OF MESSAGE FROM HOST
13323        V  HIBB:   BSS FH             /DMC INPUT PNTRS FOR FAKE HOSTS
13327        V  HIBC:   BSS FH             /DMC INPUT END PNTRS FOR FAKE HOSTS
13333        V  HISP:   BSS TH             /POINTER TO CURRENT BUFFER
13343        V  HINWAT: BSS TH             /HOLD UP HOST INPUT

                        LEV H2I
13353 005536 4  HISTRH: LDA (HIFRST)       /DISCARD FIRST INPUT OF REAL HOST
13354 003417 4          JMP HISTLO
```

```
13355 004114 4   HIDOWN:   LDA ONE 0"A"HSTGDN
13356 050504 4             STA HIHD X      /MARK HOST GOING DOWN
                 DEFPLC [HI = WAITING FOR A PKT TO THROW AWAY]
13357 140040 4   HIDISC:   CRA
13360 127535 4             IMA (HIDEST 0 X) I
13361 101400 4             SMI             /DID THIS GUY JUST TAKE TOO LONG?
13362 003367 4             JMP HIDSC1      /NO
13363 005537 4             LDA (HIDISC)
13364 050453 4             STA HILO X
13365 140040 4             CRA             /DON'T SET ALARM CLOCK AGAIN
13366 003470 4             JMP HINLO1
13367 045333 4   HIDSC1:   LDA HISP X      /FLUSH HISP
13370 101040 4             SNZ
13371 003400 4             JMP HIFRST
13372 010000 4             STA 0
13373 050111 4             STA BUFE X 0"A"TWOQ
13374 001001 4             INH FRE
13375 120671 4 0           JST FLUSHI I
13376 000401 4 0           ENB H2I
13377 072675 4             LDX HIP
                 DEFPLC [HI = WAITING FOR INITIAL INPUT]
13400 045313 4   HIFRST:   LDA EMFH X      /IS EOM SET?
13401 011403 4             STA .+2
13402 005537 4             LDA (HIDISC)
13403        4             BSS 1
13404 003466 4             JMP HINLO       /NO
13405 140040 4   HIDB:     CRA
13406 051333 4             STA HISP X
13407 045313 4             LDA EMFH X      /IS EOM SET?
13410 011411 4             STA .+1
13411        4             BSS 1
13412 003457 4             JMP HINBUF      /NO
13413 045343 4   HIWAIT:   LDA HINWAT X    /INPUT TO BE BLOCKED?
13414 100040 4             SZE
13415 003430 4             JMP HIBLKD      /YES
13416 005540 4   HISTFH:   LDA (HILEAD)
13417 050453 4   HISTLO:   STA HILO X
13420 140040 4             CRA
13421 051137 4             STA HITT X      /GIVE HIM FOREVER TO INPUT NEXT MF
13422 004000 4             LDA 0
13423 041577 4             ALS 1
13424 015541 4             ADD (I 0 HICWS)
13425 151147 4             STA HIB1 XI
13426 141206 4             AOA
13427 003511 4             JMP HINB2

13430 021124 4   HIBLKD:   JST HIWM
                 DEFPLC [HI = INPUT BEING BLOCKED BY OUTPUT]
13431 003413 4             JMP HIWAIT

                 LEV CON
                 DEFPLC [HI = 2 WORD INPUT AREA]
13432        C   HICWS:    BSS TH+TH
```

```
                    LEV H2I
13452 044453 4      HIWBUF:   LDA HILO X
13453 051333 4                STA HISP X      /SAVE RETURN ADDRESS
13454 021124 4                JST HIWM
                    DEFPLC [HI = NO FREE SPACE]
13455 045333 4                LDA HISP X
13456 003466 4                JMP HINLO       /RESTORE RETURN ADDRESS
13457 005542 4      HINBUF:   LDA (PKTN1)
13460 115543 4                ADD (HIH1 0 X) I
13461 111543 4                STA (HIH1 0 X) I
13462 007544 4                ANA (PKTNO)
13463 101040 4                SNZ             /WILL NEXT PKT BE NO 10?
13464 003357 4                JMP HIDISC      /YES
13465 005545 4                LDA (HI25)
13466 050453 4      HINLO:    STA HILO X
13467 005546 4                LDA (0 0 -15000,"Q"25,)
13470 051137 4      HINLO1:   STA HITT X      /GIVE HOST 15 SECS TO INPUT PKT
13471 001001 4                INH FRE
13472 004537 4 0              LDA NFA
13473 016563 4 0              SUB NFS
13474 016570 4 0              SUB MINF
13475 100400 4 0              SPL
13476 003452 4 0              JMP HIWBUF      /NOT ENOUGH BUFFERS FOR MODEM INPUT
13477 104324 4 0              LDA FREE I
13500 101040 4 0              SNZ
13501 003452 4 0              JMP HIWBUF
13502 026324 4 0              IMA FREE
13503 024563 4 0              IRS NFS
13504 000401 4 0              ENB H2I
13505 051333 4                STA HISP X      /SAVE POINTER TO BUFFER
13506 015547 4                ADD (I 0 DATA)
13507 151147 4                STA HIB1 XI
                    /THIS CONSTANT DETERMINES PACKET LENGTH FOR THE WHOLE IMPSY
13510 015550 4                ADD (BUFE-2-DATA)       /ALLOW FOR CHKSM
13511 140100 4      HINB2:    SSP             /FOR FAKE HOSTS
13512 151157 4                STA HIB2 XI
13513 045200 4                LDA HIN X
13514 011515 4                STA .+1
13515          4              BSS 1
13516 005136 4      HIDONE:   LDA HIMS        /RESTORE INTERRUPT MASK
13517 001001 4                INH MSK
13520 170120 4 0              SMK INTM
13521 010134 4 0              STA PRIM
13522 000013 4 0              EXA
13523 005134 4 0              LDA HIK
13524 171020 4 0              OTK
13525 073135 4 0              LDX HIX         /RESTORE IR
13526 005133 4 0              LDA HIA         /RESTORE AC
13527 000401 4 0              ENB H2I
13530 103106 4                JMP HISB I

13531 145147 4      HIFAKE:   LDA HIB1 XI
13532 140100 4                SSP
13533 151147 4                STA HIB1 XI
13534 003516 4                JMP HIDONE
```

```
13535 054177 C   LEV CON   CONSTANTS
13536 013400 C
13537 013357 C
13540 014053 C
13541 113432 C
13542 000400 C
13543 054147 C
13544 003400 C
13545 014544 C
13546 176650 C
13547 100011 C
13550 000076 C
02422 175557 C              PAGEND 13,UNCON,4
```

```
                        LEV VAR
14003 000000 V  HICW1:  0               /TEMP USED TO RETRIEVE CONTROL WORDS
                        LEV H2I
14004 000000 4  HILOOP: 0
14005 045042 4          LDA HBTS X
14006 012106 4          ERA MINE
14007 051147 4          STA HIH1 X
14010 004143 4          LDA HL2WD
14011 051167 4          STA HIH3 X
14012 103004 4          JMP HILOOP I

14013 021004 4  HIEXER: JST HILOOP
14014 045147 4  HITEST: LDA HIH1 X     /MSG A NOP?
14015 007627 4          ANA (HICODE)
14016 013630 4          ERA (CNOP)
14017 100040 4          SZE
14020 103631 4          JMP (HIDISC) I /NO, FLUSH MESSAGE
14021 045167 4          LDA HIH3 X     /DATA WORD MATCH?
14022 012143 4          ERA HL2WD
14023 101040 4          SNZ
14024 125632 4          IRS (HLRCVD) I /YES, COUNT A GOOD ONE
14025 103631 4          JMP (HIDISC) I /AND FLUSH MSG

                        /USE TO CLEAN UP UNTIL IMPDIE LOGIC TAKES OVER
14026 000000 4  HIWMD:  0               /HIWM WITH DEAD TEST
14027 072675 4          LDX HIP
14030 173633 4          LDX (HIDEST 0 X) I
14031 044165 4          LDA RUT X
14032 072675 4          LDX HIP
14033 100400 4          SPL 0"A"RUTDED /IS DEST IMP DEAD?
14034 003272 4          JMP HI19       /YES
14035 044504 4          LDA HIHD X 0"A"HSTUP
14036 100040 4          SZE            /IS SOURCE HOST DEAD?
14037 003232 4          JMP HIERR      /YES
14040 005026 4          LDA HIWMD
14041 103634 4          JMP (HIWM1) I  /NO, WAIT ONE TICK

                        LEV CON
14042 000000 C  HBTS:   0               /FROM IMP AND HOST BITS
14043 000100 C          100
14044 000200 C          200
14045 000300 C          300
14046 040000 C          40000
14047 040100 C          40100
14050 040200 C          40200
14051 040300 C          40300
```

```
                        LEV H2I
14052 121635 4          HIHDN:    JST (HIWM) I
                        DEFPLC [HI = WAITING FOR LEADER]
                        VD,1P:
14053 044504 4          HILEAD:   LDA HIHD X 0"A"HSTIDN
14054 022116 4                    CAS THREE
14055 003052 4                    JMP HIHDN 0"A"HSTIDN
14056 101000 4                    NOP
14057 004000 4                    LDA 0           /SET UP HIH1, HIH3 FROM CONTROL INPI
14060 041577 4                    ALS 1
14061 010000 4                    STA 0
14062 105636 4                    LDA (HICWS 0 X) I
14063 011003 4                    STA HICW1
14064 105637 4                    LDA (HICWS+1 X) I
14065 072675 4                    LDX HIP
14066 007640 4                    ANA (LINKNO)
14067 051167 4                    STA HIH3 X
14070 005003 4                    LDA HICW1 0"A"[PRIBIT 0 FORIMP TRACE FOROCT DESTHI
14071 051147 4                    STA HIH1 X 0"A"PKTNO
14072 007627 4                    ANA (HICODE)
14073 141140 4                    ICL
14074 015641 4                    ADD (HI2 0 I)
14075 051137 4                    STA HIH0 X
14076 017134 4                    SUB HIDE
14077 101400 4                    SMI
14100 103132 4                    JMP HI2+7 I     /ASSUMES NO TYPE 7 MESSAGE
14101 105642 4                    LDA (HER 0 X) I
14102 011103 4                    STA ,+1
14103        4                    BSS 1           /ERROR?, LOOP JST, OR EXER OR TEST
14104 100000 4                    SKP             /NO
14105 003232 4                    JMP HIERR       /ERROR BIT SET IN LEADER
14106 140040 4                    CRA 0"A"HSTUP
14107 066504 4                    IMA HIHD X
14110 100040 4                    SZE             /WAS HOST DOWN?
14111 104700 4                    LDA IHXX I      /YES, IS OUTPUT IN PROGRESS?
14112 101040 4                    SNZ
14113 003116 4                    JMP ,+3         /NOT BOTH
14114 004107 4                    LDA M30SEC      /WAS DOWN, GIVE OUTPUT FULL 30 SEC
14115 111643 4                    STA (IHTT 0 X) I
14116 105644 4                    LDA (EMFH 0 X) I          /YES
14117 011120 4                    STA ,+1
14120        4                    BSS 1           /EOM?
14121 143137 4                    DEFSTAT JMP HIH0 XI, HS2 /N0,DISPATCH ON TYPE
00606 031072 4
32002 014121 4
32022 143137 4
14122 003231 4                    JMP HISHRT      /YES, LESS THAN 32 BIT MESSAGE
```

```
                        LEV CON
14123 014243 C  HI2:    HI20            /0 = REG
14124 013357 C          HIDISC          /1 = IMP FORMAT ERROR
14125 013355 C          HIDOWN          /2 = HOST GOING DOWN
14126 014230 C          HIBADC          /3
14127 013357 C          HIDISC          /4 = NOP
14130 014230 C          HIBADC          /5
14131 014230 C          HIBADC          /6
14132 014230 C          HIBADC          /7 = USED IN CODE FOR HIBADC REFER
14133 013357 C          HIDISC          /8 = IMP FORMAT ERROR WITH ID
14134 114134 C  HIDE:   . 0 I

                        LEV VAR
                        /MORE OF HOST-TO-IMP, INCLUDING PACKET PROCESSING
14135         V  HIT1:  BSS 1           /TEMP
14136 177777  V  HITF:  -1
14137         V  HIH0:  BSS TH          /SAVED HEAD,HEAD1,HEAD2,HEAD3
14147         V  HIH1:  BSS TH
14157         V  HIH2:  BSS TH
14167         V  HIH3:  BSS TH
14177         V  HIDEST: BSS TH         /DESTINATION OF CURRENT MESS
                                        /SIGN BIT ON MEANS HOST TOOK TOO LO
14207         V  HILINK: BSS TH         /PNTR TO SAVED LINK+SUB-CODE WORD
14217         V  HIBLKT: BSS TH         /TIME TO WAIT FOR MESS NO
14227         V  HIAR:  BSS 1           /TEMP ADDER RETURN

                        LEV H2I
14230 065167  4 HIBADC: IRS HIH3 X 0"A"CILLGL
14231 065167  4 HISHRT: IRS HIH3 X 0"A"CSHORT
14232 140040  4 HIERR:  CRA 0"A"CERR32
14233 051147  4         STA HIH1 X
14234 005645  4         LDA (CERRLD)
14235 003273  4         JMP HI16

14236 005646  4 HIBLK:  LDA (CBLOCK)
14237 053167  4         ERA HIH3 X
14240 051167  4         STA HIH3 X
14241 005647  4         LDA (CINCTR)
14242 003273  4         JMP HI16
```

```
14243 004675 4   HI20:     LDA HIP          /FIGURE OUT HOW LONG TO WAIT FOR ME
14244 012130 4              ERA PLNH         /IS THIS FROM TTY?
14245 100040 4              SZE              /GIVE IT 150 MS OR 15 SECS IF NOT
14246 005650 4              LDA (0 0 -6"X"-450.)
14247 012126 4              ERA MINUS6       /15 SECS FOR ALL OTHER HOST
14250 051217 4              STA HIBLKT X
14251 045147 4              LDA HIH1 X
14252 007651 4              ANA (DESTI)
14253 051177 4              STA HIDEST X
14254 010000 4              STA 0
14255 044165 4              LDA RUT X
14256 072675 4              LDX HIP
14257 101400 4              SMI 0"A"CIMPD 0"A"RUTDED
14260 007652 4              ANA (RUTCMU)     /HOSTS AT DEAD IMPS ARE DEAD
14261 100040 4              SZE              /IS THERE A DELAY IN BRINGING THIS
14262 003272 4              JMP HI19         /YES, IMP IS STILL DEAD
14263 045147 4              LDA HIH1 X
14264 007653 4              ANA (FORIMP 0 DESTH)
14265 013654 4              ERA (FORIMP 0 200)
14266 101010 4              SS2              /ALL HOSTS ARE UP IF SS2 IS UP
14267 100040 4              SZE              /PARAM CHANGE IS DOWN IF IT'S NOT
14270 003311 4              JMP HI23         /HOST IS UP
14271 065167 4   HI18:      IRS HIH3 X 0"A"CHSTD
14272 005655 4   HI19:      LDA (CDESTD)
14273 051137 4   HI16:      STA HIH0 X
14274 001001 4   HI17:      INH FRE
14275 045167 4 0            LDA HIH3 X
14276 010515 4 0            STA TWDP
14277 045147 4 0            LDA HIH1 X
14300 053137 4 0            ERA HIH0 X
14301 120670 4 0            JST OWP I
14302 103631 4 0            JMP (HIDISC) I
14303 121635 4 0            JST (HIWM) I   RET H2I
                    DEFPLC [HI = WAITING FOR TWO-WORD STORE]
14304 003274 4              JMP HI17
```

```
14305 065217 4   HI22:     IRS HIBLKT X   /HAVE WE WAITED TOO LONG?
14306 100000 4              SKP            /NO
14307 003236 4              JMP HIBLK      /YES, SEND BACK BLOCKED
14310 021026 4              JST HIWMD
                  DEFPLC [HI = WAITING FOR MESS NO]
14311 045147 4   HI23:      LDA HIH1 X
14312 007656 4              ANA (PRIBIT 0 DESTI)
14313 121657 4              JST (MESGET) I
14314 003305 4              JMP HI22       /MESSNO IN USE, WAIT
14315 051137 4              STA HIH0 X     /SET UP HIH0, HIH2
14316 045147 4              LDA HIH1 X
14317 007660 4              ANA (FOROCT) 0"A"LSTPKT
14320 012106 4              ERA MINE       /CONSTRUCT SOURCE
14321 053042 4              ERA HBTS X 0"A"SRCEH
14322 051157 4              STA HIH2 X
14323 004675 4              LDA HIP
14324 013661 4              ERA (NH+2)
14325 100040 4              SZE            /DO NOT AUTO-TRACE TRACE
14326 105662 4              LDA (TF) I
14327 100040 4              SZE            /IS AUTO TRACE ON?
14330 025136 4              IRS HITF       /YES, IS IT TIME TO TRACE?
14331 003341 4              JMP HI24       /NO
14332 045147 4              LDA HIH1 X     /YES
14333 007663 4              ANA (0 0 177777"X"TRACE)
14334 013664 4              ERA (TRACE)    /TURN ON TRACE BIT
14335 051147 4              STA HIH1 X
14336 105662 4              LDA (TF) I
14337 140407 4              TCA
14340 011136 4              STA HITF       /RESET AUTO TRACE INTERVAL
14341 005665 4   HI24:      LDA (HIPKT1)
14342 103666 4              JMP (HINLO) I
                  DEFPLC [HI = WAITING FOR FIRST PKT]
14343 105667 4   HIPKT1:    LDA (HITT 0 X) I
14344 101040 4              SNZ            /DID ALARM CLOCK GO OFF?
14345 003353 4              JMP HIPK1S     /YES
14346 105644 4              LDA (EMFH 0 X) I
14347 011350 4              STA .+1
14350        4              BSS 1
14351 003400 4              JMP HIPLT      /MULTI-PACKET INPUT
14352 003361 4              JMP HIPK1A

14353 140500 4   HIPK1S:    SSM
14354 051177 4              STA HIDEST X   /MARK AS TOO SLOW
14355 045147 4              LDA HIH1 X
14356 007670 4              ANA (0 0 177777"X"PKTNO)
14357 013655 4              ERA (PKTNO)    /MARK AS LAST PKT - FOR HIDISC
14360 051147 4              STA HIH1 X
14361 005671 4   HIPK1A:    LDA (ONEOR8 0 REQALL)    /MARK AS REQ FOR 1
14362 053137 4              ERA HIH0 X
14363 051137 4              STA HIH0 X
14364 021464 4              JST HIPKT
14365 003370 4              JMP HIPPT
```

```
14366 021026 4    HIPPT0:   JST HIWMD
                  DEFPLC [HI = WAITING FOR PPT SLOT FOR REQ1]
14367 172677 4              LDX HIXX I
14370 121672 4    HIPPT:    JST (PPTPUT) I
14371 003366 4              JMP HIPPT0      /NO ROOM IN PPT, WAIT
14372 051207 4    HIMESS:   STA HILINK X    /SAVE PNTR INTO PPT OR PLT
14373 045177 4              LDA HIDEST X
14374 100400 4              SPL             /DID THIS GUY TAKE TOO LONG
14375 003610 4              JMP HIPSLO      /YES, GO TO TASK
14376 121673 4              JST (HTPMT) I   /COUNT A MESSAGE OF THROUGHPUT
14377 003551 4              JMP HI26

14400 045177 4    HIPLT:    LDA HIDEST X
14401 121674 4              JST (TALLYG) I /ANY ALLOC FROM OUR DEST?
14402 003412 4              JMP HIPLT2      /NO
14403 021464 4    HIPLTA:   JST HIPKT
14404 072675 4              LDX HIP
14405 003407 4              JMP HIPLT1
14406 021026 4              JST HIWMD
                  DEFPLC [HI = WAITING FOR PLT SLOT FOR MESS8]
14407 121675 4    HIPLT1:   JST (PLTPUT) I
14410 003406 4              JMP .-2         /NO PLT ROOM, WAIT
14411 003372 4              JMP HIMESS

14412 005676 4    HIPLT2:   LDA (REQALL)    /MARK AS REQUEST FOR 8
14413 053137 4              ERA HIH0 X
14414 051137 4              STA HIH0 X
14415 021464 4              JST HIPKT       /COPY HEADER
14416 004000 4              LDA 0
14417 015677 4              ADD (TWOQ MINPL)          /MARK AS ON TWO QUEUES,
14420 050111 4              STA BUFE X      /FROM SAME BUFFER
14421 072675 4              LDX HIP
14422 100000 4              SKP
14423 021026 4              JST HIWMD
                  DEFPLC [HI = WAITING FOR PLT SLOT FOR REQ8]
14424 121675 4              JST (PLTPUT) I
14425 003423 4              JMP .-2         /NO PLT ROOM, WAIT
14426 051207 4              STA HILINK X    /SAVE PNTR INTO PLT
14427 172677 4    HIPLT3:   LDX HIXX I
14430 021520 4              JST HICKSM      /MAKE A CHECKSUM
14431 001001 4              INH M2I
14432 132401 4 0            STX ETQ I
14433 032401 4 0            STX ETQ
14434 030041 4 0            TASK
14435 121635 4 0 HIPLT4:    JST (HIWM) I    RET H2I
                  DEFPLC [HI = WAITING FOR TASK TO TAKE A REQ8]
14436 003435 4              JMP HIPLT4
14437 003427 4              JMP HIPLT3      /TASK REFUSED IT
```

```
14440 045177 4   HIPLT5:   LDA HIDEST X
14441 121674 4             JST (TALLYG) I /ANY ALLOC FROM OUR DEST?
14442 003444 4             JMP HIPLT6     /NO
14443 003447 4             JMP HIPLT8
14444 021026 4   HIPLT6:   JST HIWMD
                           DEFPLC [HI = WAITING FOR ALL8]
14445 003440 4   HIALL:    JMP HIPLT5

14446 121635 4   HIPLT7:   JST (HIWM) I
14447 172677 4   HIPLT8:   LDX HIXX I
14450 044111 4             LDA BUFE X
14451 100400 4             SPL 0"A"TWOQ   /HAS THE ACK FOR THIS PKT BEEN PRC
14452 003446 4             JMP HIPLT7     /NOT YET, PKT STILL ON LINE, SO WAI
14453 072675 4             LDX HIP
14454 003456 4             JMP HIPLT0

14455 021026 4   HIPLT9:   JST HIWMD
                           DEFPLC [HI = WAITING FOR MESS NO FOR MESS8]
14456 045177 4   HIPLT0:   LDA HIDEST X   /KEEP SAME ORDNO AS REQ8
14457 121657 4             JST (MESGET) I /GET NEW MESS NO FOR MESS8
14460 003455 4             JMP HIPLT9     /MESS NO IN USE, WAIT
14461 051137 4             STA HIH0 X 0"A"REQALL    /SAVE IN HEADER
14462 111667 4             STA (HITT 0 X) I         /DEFEAT INC TRN LOGIC
14463 003403 4             JMP HIPLTA
```

```
14464 000000 4   HIPKT:    0
14465 104677 4             LDA HIXX I      /COPY HEADER
14466 015700 4             ADD (HEAD)
14467 011135 4             STA HIT1
14470 045137 4             LDA HIH0 X
14471 111135 4             STA HIT1 I
14472 025135 4             IRS HIT1
14473 045147 4             LDA HIH1 X
14474 111135 4             STA HIT1 I
14475 025135 4             IRS HIT1
14476 045157 4             LDA HIH2 X
14477 111135 4             STA HIT1 I
14500 025135 4             IRS HIT1
14501 045167 4             LDA HIH3 X
14502 111135 4             STA HIT1 I
14503 105701 4             LDA (HIB1 0 XI) I        /SAVE LENGTH
14504 140100 4             SSP 0"A"TWOQ
14505 172677 4             LDX HIXX I      /LEAVE ROOM FOR CKSUM WRD
14506 050111 4             STA BUFE X      /SET UP TWOQ BIT AFTER CALL TO HIPK'
14507 131040 4             RDCLOK          /SAVE TIME
14510 003507 4             JMP .+1
14511 050001 4             STA IT X
14512 004675 4             LDA HIP 0"A"INPCHN
14513 140500 4             SSM 0"A"HSTMOD
14514 050003 4             STA INCH X
14515 140040 4             CRA
14516 050000 4             STA 0 X         /CLEAR CHAIN POINTER
14517 103464 4             JMP HIPKT I

14520 000000 4   HICKSM:   0
14521 005702 4             LDA (HICKAD)    /GRAB ADDER
14522 026111 4             IMA ADDRET      /AND SAVE OLD OWNER
14523 011227 4             STA HIAR
14524 044111 4             LDA BUFE X
14525 140100 4             SSP 0"A"TWOQ
14526 011543 4             STA HICKT
14527 140407 4             TCA
14530 014000 4             ADD 0
14531 015703 4             ADD (ADDBOT+ACKH+1)
14532 011535 4             STA HICKAJ
14533 017704 4             SUB (ADDBOT+1) /-NO OF WORDS
14534 103535 4             JMP HICKAJ I
14535        4   HICKAJ:   BSS 1
14536 140407 4   HICKAD:   TCA
                 DEFPLC [NOP HERE TO TURN OFF H2I CHECKSUM GENERATION]
14537 111543 4             STA HICKT I     /STORE CHECKSUM
14540 005227 4             LDA HIAR        /PUT BACK OLD OWNER
14541 010111 4             STA ADDRET
14542 103520 4             JMP HICKSM I
                 LEV VAR
14543        V   HICKT:    BSS 1           /TEMP BUFE PTR
```

```
                    /TOP OF PACKET LOOP
                    LEV H2I
                    DEFPLC [HI = WAITING FOR MIDDLE PACKET]
14544 021464 4      HI25:     JST HIPKT       /SET UP HEADER AND BUFFER CONTROL W(
14545 072675 4               LDX HIP
14546 105667 4               LDA (HITT 0 X) I
14547 101040 4               SNZ             /DID ALARM CLOCK GO OFF?
14550 003610 4               JMP HIPSLO      /YES
14551 105642 4      HI26:     LDA (HER 0 X) I
14552 011553 4               STA .+1
14553          4             BSS 1           /ERROR?
14554 003570 4               JMP HI84        /NO
14555 005646 4               LDA (CERROR)    /YES, MARK MESS AS ERROR IN DATA
14556 153207 4      HISUBC:   ERA HILINK XI   /PUT IN NEW SUB CODE
14557 006120 4               ANA SEVEN 0"A"SUBCOD
14560 153207 4               ERA HILINK XI   /INTO PNTR TO LINK AND SUB CODE WORI
14561 151207 4               STA HILINK XI
14562 172677 4               LDX HIXX I
14563 044005 4               LDA HEAD X
14564 007705 4               ANA (0 0 177777"X"INCTRN)
14565 013706 4               ERA (INCTRN)    /SET INC TRN BIT
14566 050005 4               STA HEAD X
14567 003616 4               JMP H2TASK

14570 045177 4      HI84:     LDA HIDEST X    /COUNT A PACKET OF THROUGHPUT
14571 121707 4               JST (HTPPT) I
14572 105644 4               LDA (EMFH 0 X) I
14573 011574 4               STA HIEM1
14574          4    HIEM1:    BSS 1           /IS EOM SET?
14575 003577 4               JMP .+2         /NO
14576 003612 4               JMP HI87        /YES
14577 045147 4               LDA HIM1 X      /GET PACKET #
14600 007655 4               ANA (PKTNO)
14601 013655 4               ERA (PKTNO)
14602 101040 4               SNZ             /IS PKT NO=7 ?
14603 003606 4               JMP HIPLNG      /YES
14604 172677 4      HI85:     LDX HIXX I
14605 003616 4               JMP H2TASK      /NO

14606 004114 4      HIPLNG:   LDA ONE 0"A"CLONG
14607 003556 4               JMP HISUBC      /MARK MESS AS TOO LONG

14610 004115 4      HIPSLO:   LDA TWO 0"A"CSLOWS
14611 003556 4               JMP HISUBC      /MARK MESS AS TOO SLOW
```

```
14612 172677 4    HI87:     LDX HIXX I
14613 044007 4              DEFSTAT LDA HEAD2 X, HS0
00607 031055 4
32003 014613 4
32023 044007 4
14614 140500 4              SSM 0"A"LSTPKT
14615 050007 4              STA HEAD2 X
14616 021520 4    H2TASK:   JST HICKSM      /CHECKSUM PACKET
14617 001001 4              INH M2I
14620 132401 4 0            STX ETQ I       /PUT PACKET ON MIDDLE TASK QUEUE
14621 032401 4 0            STX ETQ
14622 030041 4 0            TASK            /POKE TASK INTERRUPT
14623 121635 4 0 H2TSKS:    JST (HIWM) I    RET H2I
                  DEFPLC [HI = WAITING FOR TASK TO TAKE A PKT]
14624 003623 4              JMP H2TSKS      /NO ACTION YET
14625 003604 4              JMP HI85        /TASK REFUSED IT
14626 103710 4              JMP (HIDB) I    /TASK TOOK IT
```

```
14627 007400 C   LEV CON   CONSTANTS
14630 002000 C
14631 013357 C
14632 021431 C
14633 054177 C
14634 013127 C
14635 013124 C
14636 053432 C
14637 053433 C
14640 177760 C
14641 114123 C
14642 053170 C
14643 056306 C
14644 053313 C
14645 000400 C
14646 000004 C
14647 004400 C
14650 000704 C
14651 000077 C
14652 000340 C
14653 040300 C
14654 040200 C
14655 003400 C
14656 100077 C
14657 015161 C
14660 010000 C
14661 000006 C
14662 030457 C
14663 157777 C
14664 020000 C
14665 014343 C
14666 013466 C
14667 053137 C
14670 174377 C
14671 000300 C
14672 015064 C
14673 022415 C
14674 015114 C
14675 015233 C
14676 000100 C
14677 100010 C
14700 000005 C
14701 153147 C
14702 014536 C
14703 001563 C
14704 001557 C
14705 177767 C
14706 000010 C
14707 022426 C
14710 013405 C
02423 176721 C              PAGEND 14,UNCON,4
```

```
                    LEV [T,0,TSK,BCK]          LCK H2I
                    /PENDING PACKET TABLE SUBROUTINES - LOCK INTERRUPTS
15033 000000 5 4 PPTGET:  0                    /GET AN ENTRY FROM PPT
15034 011160 5 4          STA PPWANT           /MATCH ON MESSNO AND IMPNO IN A
15035 005521 5 4          LDA (-PPTL)
15036 011157 5 4          STA PPTRY
15037 005522 5 4          LDA (PPT)
15040 011156 5 4          STA PPSLT
15041 105156 5 4 PPTL1:   LDA PPSLT I          /LOOK AT NEXT SLOT
15042 101040 5 4          SNZ                  /IS THIS SLOT OCCUPIED?
15043 003060 5 4          JMP PPTN1            /NO
15044 010000 5 4          STA 0                /YES, SO LOOK FOR MATCH
15045 044005 5 4          LDA HEAD X
15046 141044 5 4          CAR 0"A"MESSNO
15047 052006 5 4          ERA HEAD1 X
15050 007523 5 4          ANA (0 0 177777"X"DESTI)
15051 052006 5 4          ERA HEAD1 X
15052 013160 5 4          ERA PPWANT
15053 100040 5 4          SZE                  /MATCH ON MESSNO+IMPNO?
15054 003060 5 4          JMP PPTN1            /NO
15055 005156 5 4          LDA PPSLT            /RETURN PNTR TO PPT PNTR IN AC
15056 025033 5 4          IRS PPTGET           /SKIP=SUCCESS
15057 103033 5 4          JMP PPTGET I
15060 025156 5 4 PPTN1:   IRS PPSLT            /GET NEXT SLOT
15061 025157 5 4          IRS PPTRY
15062 003041 5 4          JMP PPTL1            /LOOP BACK
15063 103033 5 4          JMP PPTGET I         /NO MATCH, NO SKIP

                    LEV H2I
15064 000000 4    PPTPUT: 0                    /PUT AN ENTRY INTO PPT - PNTR IN X
15065 004675 4            LDA HIP              /TABLE IS PPTL DEEP FOR FAKE HOSTS
15066 040576 4            ARS 2
15067 140407 4            TCA 0"A"NH           /AND PPTL-1 DEEP FOR REAL HOSTS
15070 015524 4            ADD (0 1-PPTL)
15071 011157 4            STA PPTRY
15072 005522 4            LDA (PPT)
15073 011156 4            STA PPSLT
15074 105156 4    PPTL2:  LDA PPSLT I
15075 100040 4            SZE                  /IS THIS SLOT FREE?
15076 003110 4            JMP PPTN2            /NO
15077 133156 4            STX PPSLT I          /YES, SO PUT IN OUR PNTR
15100 044111 4            LDA BUFE X
15101 140500 4            SSM 0"A"TWOQ         /MARK PACKET AS ON 2 QUEUES
15102 050111 4            DEFSTAT STA BUFE X, HS4
00610 031266 4
32004 015102 4
32024 050111 4
15103 004000 4            LDA 0
15104 015525 4            ADD (HEAD3)
15105 072675 4            LDX HIP
15106 025064 4            IRS PPTPUT           /SKIP=SUCCESS
15107 103064 4            JMP PPTPUT I
15110 025156 4    PPTN2:  IRS PPSLT            /GET NEXT SLOT
15111 025157 4            IRS PPTRY
15112 003074 4            JMP PPTL2            /LOOP BACK
15113 103064 4            JMP PPTPUT I         /NO ROOM, NO SKIP
```

```
                    LEV [M2I,T,0,BCK]
                    /TALLY TABLE SUBROUTINES - LOCK INTERRUPTS
                    /ARG PASSED IN A, AND X PRESERVED
15114 000000 4      TALLYG: 0               /GET AN ENTRY FROM TALLY
15115 011153 4              STA TALLYT      /IMPNO TO MATCH IN A
15116 033154 4              STX TALLYX
15117 073526 4              LDX (TALLY-1)
15120 024000 4      TALLYK: ISZ 0
15121 004000 4              LDA 0
15122 023155 4              CAS TALLYI      /COMPARE WITH IN PNTR
15123 003150 4              JMP TALLYR
15124 003150 4              JMP TALLYR      /NO MATCH, NO SKIP
15125 044000 4              LDA 0 X
15126 013153 4              ERA TALLYT
15127 100040 4              SZE             /IS THIS ENTRY ONE WE WANT?
15130 003120 4              JMP TALLYK      /NO, LOOP BACK
15131 004000 4              LDA 0
15132 013527 4              ERA (TALLY)
15133 101040 4              SNZ             /DID WE JUST GRAB THE OLDEST ALLOCA
15134 111530 4              STA (TALLYC) I  /YES, SO RESET TALLY CLOCK
15135 044001 4      TALLYM: LDA 1 X
15136 050000 4              STA 0 X         /MOVE REST OF TABLE UP BY ONE SLOT
15137 024000 4              ISZ 0
15140 004000 4              LDA 0
15141 013155 4              ERA TALLYI
15142 100040 4              SZE             /DONE YET?
15143 003135 4              JMP TALLYM      /NO, LOOP BACK
15144 005155 4              LDA TALLYI      /YES, NOW ADJUST IN PNTR
15145 016114 4              SUB ONE
15146 011155 4              STA TALLYI
15147 025114 4              ISZ TALLYG      /SKIP=SUCCESS
15150 073154 4      TALLYR: LDX TALLYX      /RESTORE X
15151 005153 4              LDA TALLYT      /RESTORE A
15152 103114 4              JMP TALLYG I

                    LEV VAR
15153         V     TALLYT: BSS 1           /TEMP A
15154         V     TALLYX: BSS 1           /TEMP X
15155         V     TALLYI: BSS 1           /IN PNTR

15156         V     PPSLT:  BSS 1           /PNTR TO PPT ENTRY
15157         V     PPTRY:  BSS 1           /NO OF TIMES TO LOOK
15160         V     PPWANT: BSS 1           /MESSNO + IMPNO WE WANT
```

```
                    LEV [H2I,BCK]
15161 000000 4   MESGET:  0                /GET MESSNO, DEST IMP IN A
15162 033204 4            STX MESGX
15163 011203 4            STA MESGT
15164 140100 4            SSP 0"A"PRIBIT
15165 015531 4            ADD (TMESS)
15166 010000 4            STA 0
15167 044000 4            LDA 0 X
15170 101100 4            SLN 0"A"MESBTS
15171 003201 4            JMP MESGND      /MESS NO IN USE
15172 005203 4            LDA MESGT
15173 100400 4            SPL 0"A"PRIBIT /NEED A NEW ORD NO?
15174 021361 4            JST UPORD       /YES
15175 021347 4            JST UPMESS
15176 007532 4            ANA (MESSNO 0 ORDNO)
15177 013533 4            ERA (TRNREP)    /MARK AS TRANSMISSION
15200 025161 4            IRS MESGET      /SKIP=SUCCESS
15201 073204 4   MESGND:  LDX MESGX
15202 103161 4            JMP MESGET I
                    LEV VAR
15203         V   MESGT:   BSS 1
15204         V   MESGX:   BSS 1

                    LEV [T,0,TSK,BCK]          LCK H2I
                    /PENDING LEADER TABLE SUBROUTINES - LOCK INTERRUPTS
15205 000000 5 4 PLTGET:  0                /GET AN ENTRY FROM PLT
15206 011274 5 4          STA PLWANT       /MATCH ON MESSNO AND IMPNO IN A
15207 005534 5 4          LDA (-PLTL)
15210 011273 5 4          STA PLTRY
15211 073535 5 4          LDX (PLT)
15212 044000 5 4 PLTL1:   LDA PLT0 X
15213 101040 5 4          SNZ              /IS THIS ENTRY EMPTY?
15214 003226 5 4          JMP PLTN1        /YES
15215 141044 5 4          CAR 0"A"MESSNO
15216 052014 5 4          ERA PLT1 X
15217 007523 5 4          ANA (0 0 177777"X"DESTI)
15220 052014 5 4          ERA PLT1 X
15221 013274 5 4          ERA PLWANT
15222 100040 5 4          SZE              /MATCH ON MESSNO+IMPNO?
15223 003226 5 4          JMP PLTN1        /NO
15224 025205 5 4          IRS PLTGET       /SKIP=SUCCESS
15225 103205 5 4          JMP PLTGET I     /RETURN PNTR TO PLT ENTRY IN X
15226 024000 5 4 PLTN1:   IRS 0            /GET NEXT ENTRY
15227 025273 5 4          IRS PLTRY
15230 003212 5 4          JMP PLTL1        /LOOP BACK
15231 005274 5 4          LDA PLWANT       /RESTORE A
15232 103205 5 4          JMP PLTGET I     /NO MATCH, NO SKIP
```

```
                        LEV H2I
15233 000000 4  PLTPUT:  0                /PUT AN ENTRY INTO PLT
15234 004000 4           LDA 0            /HOST NO IN A
15235 113536 4           ERA (HIH0 0 X) I
15236 007537 4           ANA (0 0 177777"X"MESSNO"X"REQALL)
15237 113536 4           ERA (HIH0 0 X) I
15240 013540 4           ERA (PLTUSE)     /MARK PLT0 ENTRY IN USE
15241 011275 4           STA PLTH         /SAVE PLT0 ENTRY
15242 105541 4           LDA (HIH1 0 X) I
15243 011276 4           STA PLTH1        /SAVE PLT1 ENTRY
15244 105542 4           LDA (HIH3 0 X) I
15245 011277 4           STA PLTH3        /SAVE PLT2 ENTRY
15246 005534 4           LDA (=PLTL)
15247 011273 4           STA PLTRY
15250 073535 4           LDX (PLT)
15251 044000 4  PLTL2:   LDA PLT0 X
15252 100040 4           SZE              /IS THIS ENTRY FREE?
15253 003267 4           JMP PLTN2        /NO
15254 005275 4           LDA PLTH         /YES, SO PLANT PLT0,1,2
15255 050000 4           STA PLT0 X
15256 005276 4           LDA PLTH1
15257 050014 4           STA PLT1 X
15260 005277 4           LDA PLTH3
15261 050030 4           DEFSTAT STA PLT2 X, HS5
00611 031276 4
32005 015261 4
32025 050030 4
15262 025233 4           IRS PLTPUT       /SKIP=SUCCESS
15263 004000 4  PLTPX:   LDA 0
15264 015543 4           ADD (PLT2)
15265 072675 4           LDX HIP
15266 103233 4           JMP PLTPUT I
15267 024000 4  PLTN2:   IRS 0            /GET NEXT ENTRY
15270 025273 4           IRS PLTRY
15271 003251 4           JMP PLTL2        /LOOP BACK
15272 003263 4           JMP PLTPX        /NO ROOM, NO SKIP

                        LEV VAR
15273         V  PLTRY:  BSS 1
15274         V  PLWANT: BSS 1
15275         V  PLTH:   BSS 1
15276         V  PLTH1:  BSS 1
15277         V  PLTH3:  BSS 1

15300         V  RALLYA: BSS 1
15301         V  RALLYI: BSS 1
15302         V  RALMRK: BSS 1
```

```
                        /RALLY TABLE SUBROUTINES
                        LEV [I2H,TSK]
15303 000000 3   RALLYP: 0                /PUT AN ENTRY IN RALLY TABLE
15304 011300 3           STA RALLYA       /A = MESSNO, ONEOR8, RFNM, SRCEI
15305 007544 3           ANA (SRCEI)
15306 015545 3           ADD (RALLY)
15307 011301 3           STA RALLYI       /SET UP INPUT PNTR
15310 004121 3           LDA MINUS1
15311 022000 3           CAS 0            /X = REGULAR, INCOMPLETE, OR DEAD
15312 141206 3           AOA              /X=SIGN, DEAD
15313 141206 3           AOA              /X=MINUS1, INCOMPLETE
15314 141206 3           AOA              /X=0 OR X>0, REGULAR
15315 141206 3           AOA              /MAKE INTO 11, 10, OR 01
15316 041576 3           ALS 2            /SHIFT INTO POSITION
15317 011302 3           STA RALMRK       /AND SAVE AS MARK BITS
15320 005300 3           LDA RALLYA
15321 141140 3           ICL 0"A"MESSNO
15322 006116 3           ANA THREE
15323 041576 3           ALS 2
15324 140407 3           TCA
15325 015546 3           ADD (ALR 0
15326 011331 3           STA RALPS1       /SET UP SHIFT
15327 011341 3           STA RALPS2
15330 005547 3           LDA (17)
15331        3   RALPS1: BSS 1
15332 107301 3           ANA RALLYI I
15333 100040 3           SZE              /SOMETHING ALREADY THERE?
15334 003346 3           JMP RALPX        /YES, A BUG
15335 005300 3           LDA RALLYA
15336 040672 3           ARR 6 0"A"[ONEOR8 0 RFNM]
15337 006116 3           ANA THREE        /GET BITS
15340 013302 3           ERA RALMRK       /MARK GOT-IT BIT
15341        3   RALPS2: BSS 1            /SHIFT THEM OVER
15342 113301 3           ERA RALLYI I     /OR THE BITS IN
15343 111301 3           STA RALLYI I
15344 010477 3           STA RALLCF       /COUNT AN ALLOCATE PENDING
15345 025303 3           IRS RALLYP       /SKIP=SUCCESS
15346 103303 3   RALPX:  JMP RALLYP I

                        /FORMAT OF EACH RALLY WORD IS 4 4-BIT BYTES: A,B,C,D
                        /THIS TABLE RUNS IN PARALLEL WITH AMESS, THE NEXT MESSAGE
                        /NUMBER FOR WHICH A REPLY SHOULD BE RETURNED
                        /BYTE A IS FOR AMESS=3 MOD 4, B FOR AMESS=2 MOD 4
                        /C= 1 MOD 4, D= 0 MOD 4
                        /FORMAT OF EACH 4 -BIT BYTE IS TTMM:
                        /TT=00 NO ENTRY
                        /TT=01 RFNM OR RFNM/ALLOCATE
                        /TT=10 INCOMPLETE TRANSMISSION
                        /TT=11 DESTINATION DEAD
                        /FOR TT=10 OR TT=01:
                        /MM=00 8 PKT ALLOCATE
                        /MM=01 8 PKT RFNM/ALLOCATE
                        /MM=10 1 PKT ALLOCATE
                        /MM=11 1 PKT RFNM
```

```
                    LEV [H2I,T,O,TSK,BCK]
15347 000000 4   UPMESS:  0              /ADD ONE TO MESS NO
15350 044000 4             LDA 0 X       /PNTR TO MESS TAB IN X
15351 007547 4             ANA (MESBTS)
15352 040477 4             LGR 1         /SHIFT BITS
15353 052000 4             ERA 0 X
15354 007547 4             ANA (MESBTS)
15355 052000 4             ERA 0 X
15356 015550 4             ADD (MESS1) 0"A"MESSNO
15357 050000 4             STA 0 X       /INCREMENT MESS NO
15360 103347 4             JMP UPMESS I

15361 000000 4   UPORD:    0             /ADD ONE TO ORDER NO
15362 044000 4             LDA 0 X       /PNTR TO MESS TAB IN X
15363 015551 4             ADD (20) 0"A"ORDNO
15364 052000 4             ERA 0 X       /INCREMENT ORDER NO
15365 007552 4             ANA (ORDNO)
15366 052000 4             ERA 0 X
15367 050000 4             STA 0 X
15370 103361 4             JMP UPORD I
```

```
                        LEV FRE
                        /PUT A TWO-WORD MESSAGE - LOCK INTERRUPTS
                        /CALLED BY I2H,H2I,T.O,TSK,BCK
15371 000000 0    OWPE: 0
15372 033501 0          STX HNUM
15373 011502 0          STA ONEW
15374 005501 0          LDA HNUM
15375 022130 0          CAS PLNH        /REAL HOST?
15376 003442 0          JMP OWPF        /NO
15377 101000 0          NOP             /TTY LIKE REAL HOST
15400 073553 0          LDX (SHBQ)
15401 004124 0          LDA MINUS4
15402 011500 0          STA TPEE
15403 003411 0          JMP OWP4
15404 010000 0    OWP0: STA 0
15405 064003 0          IRS 3 X
15406 003462 0          JMP OWP3
15407 004121 0          LDA MINUS1
15410 050003 0          STA 3 X
15411 025500 0    OWP4: IRS TPEE        /ALLOWED TO HAVE ANOTHER BUFFER?
15412 003415 0          JMP OWP8        /YES
15413 025371 0    OWP7: IRS OWPE        /NO
15414 003476 0          JMP OWP5
15415 044000 0    OWP8: LDA 0 X
15416 100040 0          SZE
15417 003404 0          JMP OWP0
15420 104324 0          LDA FREE I
15421 101040 0          SNZ
15422 003413 0          JMP OWP7
15423 026324 0          IMA FREE
15424 024563 0          IRS NFS
15425 050000 0          STA 0 X
15426 011500 0          STA TPEE
15427 026000 0          IMA 0
15430 050001 0          STA 1 X
15431 005554 0          LDA (-17.)      /(DECIMAL)
15432 011503 0          STA OWT3
15433 050003 0          STA 3 X
15434 140040 0          CRA
15435 050000 0          STA 0 X
15436 005500 0          LDA TPEE
15437 014117 0          ADD FOUR
15440 050002 0          STA 2 X
15441 003452 0          JMP OWP1

15442 012120 0    OWPF: ERA SEVEN       /DISCARD?
15443 100040 0          SZE
15444 103371 0          JMP OWPE I      /NO,
15445 005555 0          LDA (-300.)     /YES, RESET SOFTWARE WDT. TO 3 MIN.
15446 010503 0          STA WDTIME
15447 030026 0          WDT             /AND POKE THE HARDWARE
15450 103371 0          JMP OWPE I
```

```
15451 044000 0    OWP2:     LDA 0 X
15452 010000 0    OWP1:     STA 0
15453 014117 0              ADD FOUR
15454 050000 0              STA 0 X
15455 005500 0              LDA TPEE
15456 050003 0              STA 3 X
15457 025503 0              IRS OWT3
15460 003451 0              JMP OWP2
15461 073500 0              LDX TPEE

15462 144002 0    OWP3:     LDA 2 XI
15463 066002 0              IMA 2 X
15464 073501 0              LDX HNUM
15465 150403 0              STA EHWQ XI
15466 050403 0              STA EHWQ X
15467 010000 0              STA 0
15470 140040 0              CRA
15471 050000 0              STA 0 X
15472 005502 0              LDA ONEW
15473 050001 0              STA 1 X
15474 004515 0              LDA TWOP
15475 050002 0              STA 2 X
15476 073501 0    OWP5:     LDX HNUM
15477 103371 0              JMP OWPE I

                  LEV VAR
15500          V  TPEE:     BSS 1
15501          V  HNUM:     BSS 1
15502          V  ONEW:     BSS 1
15503          V  OWT3:     BSS 1
```

```
                        /SUBROUTINE TO GET FROM A QUEUE - LOCK INTERRUPTS
                        LEV [I2H,T,O,BCK]
15504 000000 3  GETQ:   0
15505 044000 3          LDA 0 X
15506 101040 3          SNZ
15507 103504 3          JMP GETQ I      /NOTHING ON QUEUE
15510 144000 3          LDA 0 XI
15511 101040 3          SNZ             /IS THIS THE ONLY THING ON QUEUE?
15512 133556 3          STX (QUEUEE-QUEUEB X) I  /YES, MAKE END POINT TO
15513 066000 3          IMA 0 X         /REMOVE FROM QUEUE
15514 010000 3          STA 0
15515 140040 3          CRA
15516 050000 3          STA 0 X         /CLEAR CHAIN POINTER
15517 025504 3          IRS GETQ
15520 103504 3          JMP GETQ I

15521 177770 C  LEV CON CONSTANTS
15522 033457 C
15523 177700 C
15524 177771 C
15525 000010 C
15526 032260 C
15527 032261 C
15530 020210 C
15531 032271 C
15532 177460 C
15533 000004 C
15534 177764 C
15535 033477 C
15536 054137 C
15537 000277 C
15540 000200 C
15541 054147 C
15542 054167 C
15543 000030 C
15544 000077 C
15545 032571 C
15546 041700 C
15547 000017 C
15550 000400 C
15551 000020 C
15552 000060 C
15553 000337 C
15554 177757 C
15555 177324 C
15556 040051 C
02424 175566 C           PAGEND 15,UNCON,4
```

```
                    /IMP TO HOST (IH)

                    PAGI2H:
                    LEV I2H

00076 016034 3      H1OTIL/   IH0E
00077        3      H2OTIL/   TIPDEF IH1E,TINT
02257 000077 3
02307 016026 3
02337 025061 3
00070 016020 3      H3OTIL/   IH2E
00067 016012 3      H4OTIL/   IH3E

                    PAGI2H/
                    /HOST 3 INTERRUPT ROUTINE
16012 000000 3 0    IH3E:     INT I2H
16013 033121 3 0              STX IHX
16014 073012 3 0              LDX IH3E
16015 033042 3 0              STX IHSB
16016 072116 3 0              LDX THREE
16017 003044 3 0              JMP IHSB2
                    /HOST 2 INTERRUPT ROUTINE
16020 000000 3 0    IH2E:     INT I2H
16021 033121 3 0              STX IHX
16022 073020 3 0              LDX IH2E
16023 033042 3 0              STX IHSB
16024 072115 3 0              LDX TWO
16025 003044 3 0              JMP IHSB2
                    /HOST 1 INTERRUPT ROUTINE
16026 000000 3 0    IH1E:     INT I2H
16027 033121 3 0              STX IHX
16030 073026 3 0              LDX IH1E
16031 033042 3 0              STX IHSB
16032 072114 3 0              LDX ONE
16033 003044 3 0              JMP IHSB2
                    /HOST 0 INTERRUPT ROUTINE
16034 000000 3 0    IH0E:     INT I2H
16035 033121 3 0              STX IHX         /SAVE INDEX REGISTER
16036 073034 3 0              LDX IH0E
16037 033042 3 0              STX IHSB
16040 072113 3 0              LDX ZERO        /NOTE HOST WHICH CAUSED INTERRUPT
16041 003044 3 0              JMP IHSB2
```

```
                        /FROM HERE ON IS COMMON TO ALL IMP-HOST INTERRUPT ROUTINES
16042 000000 3 0 IHSB:  0
16043 033121 3 0        STX IHX
16044 000011 3 0 IHSB2: DXA
16045 003046 3 0        JMP .+1
16046 011117 3 0        STA IHA         /SAVE AC
16047 000043 3 0        INK
16050 011120 3 0        STA IHK         /SAVE EX-MODE
16051 032676 3 0        STX IHP         /SAVE CURRENT HOST
16052 004500 3 0        LDA IHM         /SET UP NEW INTERRUPT MASK (177700)
16053 170120 3 0        SMK INTM        /OUTPUT IT
16054 026134 3 0        IMA PRIM        /SAVE IT IN PRIM
16055 011122 3 0        STA IHMS        /SAVE OLD PRIM
16056 000401 3 0        ENB I2H
16057 143107 3          JMP IHLO,XI     /RESTART WHERE LAST LEFT OFF

16060 000000 3    IHDB: 0               /DEBREAK
16061 004000 3          LDA 0
16062 016130 3          SUB PLNH
16063 100400 3          SPL
16064 003071 3          JMP IHDO        /REAL HOST - DO THE OCP
16065 004107 3          LDA M30SEC      /FAKE HOSTS ALWAYS GET 2 MINUTES
16066 041576 3          ALS 2
16067 051306 3          STA IHTT,X
16070 100000 3          SKP             /DON'T DO OCP FOR FAKE GUYS
16071        3    IHDO: BSS 1
16072 005060 3          LDA IHDB
16073 051107 3    IHDONE:STA IHLO,X
16074 005122 3          LDA IHMS        /RESTORE INTERRUPT MASK
16075 001001 3          INH MSK
16076 170120 3 0        SMK INTM
16077 010134 3 0        STA PRIM
16100 000013 3 0        EXA
16101 005120 3 0        LDA IHK
16102 171020 3 0        OTK             /RESTORE EX-MODE
16103 073121 3 0        LDX IHX         /RESTORE IR
16104 005117 3 0        LDA IHA         /RESTORE AC
16105 000401 3 0        ENB I2H
16106 103042 3          JMP IHSB,I

                        LEV VAR
                        / IHLO INDICATES WHAT ROUTINES DID LAST
                        DEFPLC [IHLO]
16107        V  IHLO:   BSS TH          /RETURN ADDRESSES WHERE IH LEFT OFF
16117        V  IHA:    BSS 1           /AC SAVE
16120        V  IHK:    BSS 1           /K SAVE
16121        V  IHX:    BSS 1           /IR SAVE
16122        V  IHMS:   BSS 1           /OLD PRIM SAVE
16123        V  IHAR:   BSS 1           /ADD RET SAVE
```

```
                    /IMP-TO-HOST ROUTINES LOCAL STORAGE
                    LEV CON
16124 030270 C      IHED:     H1FOUT          /FINAL OUTPUT INSTRUCTIONS
16125 030260 C                H2FOUT
16126        C                TIPDEF H3FOUT, NOP
02260 016126 C
02310 030250 C
02340 101000 C
16127 030251 C                H4FOUT
16130 016205 C      OWOP:     OWO             /PNTRS TO TWO WORD OUTPUT AREAS
16131 016207 C                OWO+2
16132 016211 C                OWO+4
16133 016213 C                OWO+6
16134 016215 C                OWO+10
16135 000044 C      IHB1:     H1OTBP          /DMC OUTPUT PNTRS
16136 000046 C                H2OTBP
16137        C                TIPDEF H3OTBP, TIPLNK
02261 016137 C
02311 000054 C
02341 000770 C
16140 000030 C                H4OTBP
16141 017407 C                IHBB
16142 017410 C                IHBB+1
16143 017411 C                IHBB+2
16144 017412 C                IHBB+3
16145 000045 C      IHB2:     H1OTBP+1        /DMC OUTPUT END PNTRS
16146 000047 C                H2OTBP+1
16147        C                TIPDEF H3OTBP+1, TIPLNK+1
02262 016147 C
02312 000055 C
02342 000771 C
16150 000031 C                H4OTBP+1
16151 017413 C                IHBC
16152 017414 C                IHBC+1
16153 017415 C                IHBC+2
16154 017416 C                IHBC+3
                    LEV VAR
                    /IN IHSP:
                    /0 ==> NOTHING IS GOING OUT
                    /100000 ==> LEADER ONLY (2-WRD MSG) GOING
                    /2000-37777 ==> PACKET IS GOING OUT
                    /102000-137777 ==> PACKET WITH BAD CKSUM IS GOING OUT
16155        V      IHSP:     BSS TH          /SAVED BUFFER POINTERS
16165        V      IHWQ:     BSS TH          /SAVED QUEUE POINTERS
16175        V      IHLSTP:   BSS TH          /MINUS IF LAST PKT
                    DEFPLC [IH = 2 WORD OUTPUT AREA]
16205        V      OWO:      BSS [[NH+1]"T"2]        /TWO WORD OUTPUT AREA
```

```
                    LEV BCK     LCK INI          /INITIALIZATION ROUTINE
16217 000000 7 0    IHIN:       0
16220 140040 7 0                CRA
16221 051155 7 0                STA IHSP X
16222 151135 7 0                STA IHB1 XI      /FOR FAKE HOSTS
16223 011042 7 0                STA IHSB         /IN CASE NON-DXA IMP RELOADS FROM )
16224 140500 7 0                SSM              /BLOCK INPUT!
16225 111575 7 0                STA (IHINWAT 0 X) I
16226 005576 7 0                LDA (IHBEG)
16227 021273 7 0                JST IHST
16230 103217 7 0                JMP IHIN I

                    LEV I2H
16231 000000 3      IHS1:       0                /DISCARD BUFFERS FROM QUEUE
16232 014676 3                  ADD IHP
16233 011303 3                  STA IHT2
16234 015577 3                  ADD (NHS+0-SHQ)
16235 011304 3                  STA IHT3
16236 004676 3                  LDA IHP
16237 012120 3                  ERA SEVEN
16240 101040 3                  SNZ              /DISCARD?
16241 103231 3                  JMP IHS1 I       /YES, DO NOT DISCARD DISCARD
16242 105303 3      IHS1A:      LDA IHT2 I
16243 101040 3                  SNZ              /ANYTHING ON THIS QUEUE?
16244 103231 3                  JMP IHS1 I       /NO, QUIT
16245 010000 3                  STA 0
16246 005305 3                  LDA IHS1F        /=0, FLUSH ALL, ELSE, FLUSH TIMEO(
16247 101040 3                  SNZ              /DISCARD ALL?
16250 003261 3                  JMP IHS1B        /YES
16251 004416 3                  LDA TIMES        /GET TIME IN SLOW TICKS
16252 056003 3                  SUB INCH X       /NO, CHECK TIME
16253 100400 3                  SPL              /TOO OLD?
16254 003267 3                  JMP IHS1C        /NO, SO SAVE TIME LEFT
16255 004676 3                  LDA IHP
16256 016130 3                  SUB PLNH
16257 101400 3                  SMI              /FAKE HOST?
16260 103231 3                  JMP IHS1 I       /YES, HAVE MERCY
16261 073303 3      IHS1B:      LDX IHT2
16262 121600 3                  JST (GETQ) I
16263 103231 3                  JMP IHS1 I       /SHOULDNT HAPPEN
16264 121601 3                  JST (IHS5) I
16265 125304 3                  IRS IHT3 I
16266 003242 3                  JMP IHS1A

16267 023305 3      IHS1C:      CAS IHS1F        /PICK MIN TIME LEFT
16270 011305 3                  STA IHS1F        /FOR OLDEST PKT ON PRI OR REG QUEUE
16271 101000 3                  NOP              /IF NOTHING THERE, USE 30 SECS
16272 103231 3                  JMP IHS1 I
```

```
                        LEV T.O                         /RESTART ROUTINE
16273 000000 5    IHST: 0                               /HERE AT INIT AND WHEN HOST READY DI
16274 051107 5          STA IHLO X                      /THROW AWAY ALL MESSAGES
16275 001001 5          INH SIN
16276 000013 5 0        EXA                             /BUT DO NOT FLAP IMP'S READY LINE
16277 021042 5 0        JST IHSB                        RET T.O
16300 001001 5          INH ALL
16301 120672 5 0        JST DODXA I                     RET T.O
16302 103273 5          JMP IHST I

                        LEV VAR
16303         V   IHT2: BSS 1                           /TEMP
16304         V   IHT3: BSS 1                           /TEMP
16305         V   IHS1F: BSS 1                          /0=FLUSH ALL, ELSE=FLUSH TIMEOUTS
                                                        /ALSO KEEPS ALARM CLOCK TIME FOR [
16306         V   IHTT: BSS TH                          /TIME OUT CHECK FLAGS

                        LEV CON
16316 030570 C  HENABT: H1ENAB
16317 030560 C          H2ENAB
16320 030550 C          H3ENAB
16321 030551 C          H4ENAB

                        LEV I2H
16322 000000 3  IHW640: 0                               /SUBR TO WAIT 640 MS
16323 011324 3          STA .+1                         /SET UP READY LINE OCP
16324        3          BSS 1                           /DO IT
16325 004121 3          LDA MINUS1                      /AND WAIT 640 MS FOR RELAY TO SETTLI
16326 051306 3          STA IHTT X
16327 005322 3          LDA IHW640
16330 003073 3          JMP IHDONE

16331 004110 3  IHBEG:  LDA PTICKS                      /A LITTLE MORE THAN TWICE PTICKS
16332 016120 3          SUB SEVEN
16333 041577 3          ALS 1                           /WAIT FOR LINES TO COME UP AND ROUT
16334 051306 3          STA IHTT X
16335 005602 3          LDA (IHWAIT)
16336 003073 3          JMP IHDONE
16337 005603 3  IHWT1:  LDA (NOP)
16340 021322 3          JST IHW640
                        DEFPLC [IH - WAITING FOR INITIALIZATION DELAY]
16341 004172 3  IHWAIT: LDA RUT+BBNIMP
16342 100400 3          SPL 0"A"RUTDED                  /IS NCC UP YET?
16343 003347 3          JMP IHWT2                       /NEVER COMING UP...GO AHEAD
16344 007604 3          ANA (RUTCMU)                    /COMING UP?
16345 100040 3          SZE
16346 003337 3          JMP IHWT1                       /YES, WAIT SOME MORE
16347 004116 3  IHWT2:  LDA THREE 0"A"HSTOFF             /OK, START UP HOSTS
16350 003357 3          JMP IHR11                       /HOLD DOWN RDY FOR 60 SECS AT INIT
```

```
16351 004000 3   IHR2:     LDA 0           /HERE TO FLUSH ALL/FLAP READY LINE
16352 016120 3              SUB SEVEN       /DON'T FLUSH STUFF ON DISCARD QUEUE
16353 101040 3              SNZ
16354 103605 3              JMP (IH62) I
16355 111575 3              STA (HINWAT 0 X) I      /DISCARD STUFF ON OTHER QI
16356 004115 3              LDA TWO 0"A"HSTTRD
16357 050504 3   IHR11:     STA HIHD X      /MARK HOST AS TARDY (DEAD)
16360 121606 3   IHR1:      JST (OWGE) I    /HERE TO FLUSH ALL/NO READY LINE FL
16361 100000 3              SKP             /THROW AWAY ALL 2 WORD MESSAGES
16362 003360 3              JMP IHR1
16363 140040 3              CRA             /FLUSH BUFFER CURRENTLY IN INTERFACI
16364 151145 3              STA IHB2 XI
16365 151135 3              STA IHB1 XI
16366 067155 3              IMA IHSP X
16367 140100 3              SSP             /IF 0, NOTHING GOING
16370 101040 3              SNZ             /IF SIGN BIT ONLY, TWO WORD GOING
16371 003400 3              JMP IS40        /IN EITHER CASE, NOTHING TO FLUSH
16372 024541 3              IRS NREA
16373 011305 3              STA IHS1F       /SAVE PKT PNTR IN TEMP
16374 045175 3              LDA IHLSTP X    /PICK UP LST PKT BIT
16375 073305 3              LDX IHS1F       /GET PKT PNTR
16376 050007 3              STA HEAD2 X     /AND RESTORE LST PKT BIT TO PKT
16377 121601 3              JST (IHS5) I
16400 140040 3   IS40:      CRA             /SET TO DISCARD ALL BUFFERS ON QU[
16401 011305 3              STA IHS1F
16402 005607 3              LDA (SHQ)       /GET REGULAR QUEUE
16403 021231 3              JST IHS1
16404 005610 3              LDA (SHPQ)      /GET PRIORITY QUEUE
16405 021231 3              JST IHS1
16406 072676 3              LDX IHP
16407 004000 3              LDA 0
16410 016130 3              SUB PLNH
16411 101400 3              SMI             /FAKE HOST?
16412 003422 3              JMP IS30        /YES, DO NOT DROP READY LINE
16413 105575 3              LDA (HINWAT 0 X) I      /WE BLOCKING INPUT?
16414 101040 3              SNZ
16415 003422 3              JMP IS30        /NO, DON'T DROP READY LINE
16416 105611 3              LDA (HUNXPT 0 X) I
16417 021322 3              JST IHW640      /WAIT FOR 640 MS
                 DEFPLC [IH = WAITING FOR READY LINE TO DROP]
16420 045316 3              LDA HENABT X
16421 021322 3              JST IHW640      /WAIT FOR 640 MS
                 DEFPLC [IH = WAITING FOR READY LINE TO GO UP]
16422 004123 3   IS30:      LDA MINUS3
16423 011303 3              STA IHT2
16424 000401 3   IS10:      ENB I2H
16425 005612 3              LDA (CNOP)
16426 001001 3              INH FRE
16427 120670 3 0            JST OWP I       /PUT 3 NOPS ON HOST TWO WORD QUEUE
16430 101000 3 0            NOP
16431 025303 3 0            IRS IHT2
16432 003424 3 0            JMP IS10
16433 005613 3 0            LDA (CRESET)
16434 120670 3 0            JST OWP I       /PUT AN IMP-TO-HOST RESET MESS ON
16435 101000 3 0            NOP
16436 000401 3 0            ENB I2H
```

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16437 140040 3              CRA             /RELEASE INPUT
16440 111575 3              STA (HINWAT 0 X) I
16441 005603 3   IH00:      LDA (NOP)
16442 021322 3              JST IHW640      RET I2H
                 DEFPLC [IH = NOTHING TO DO]
16443 004107 3   IH1:       LDA M30SEC      /SET TO DISCARD TIMED-OUT BUFFERS
16444 011305 3              STA IHS1F       /AND SAVE TIME LEFT ON OLDEST
16445 005607 3              LDA (SHQ)
16446 021231 3              JST IHS1        /CHECK REG QUEUE FOR OLD MESS
16447 005610 3              LDA (SHPQ)
16450 021231 3              JST IHS1        /AND PRI QUEUE ALSO
16451 072676 3              LDX IHP
16452 121606 3              JST (OWGE) I    /IS THERE ENTRY ON ONE WORD QUEUE
16453 003503 3              JMP IH2         /NO
16454 151130 3              STA OWOP XI     /(OWO+2*IR) PUT WORD IN OUTPUT ARE
16455 045130 3              LDA OWOP X      /GET POINTER TO FRONT OF AREA
16456 151135 3              STA IHB1 XI     /BUILD FIRST BUFFER CONTROL WORD
16457 141206 3              DEFSTAT AOA,HS3
00612 031113 3
32006 016457 3
32026 141206 3
16460 151145 3              STA IHB2 XI     /BUILD SECOND BUFFER CONTROL WORD
16461 051155 3              STA IHSP X
16462 004516 3              LDA TWDG
16463 151155 3              STA IHSP XI     /PUT OUT SECOND WORD
16464 045124 3              LDA IHED X
16465 011071 3              STA IHDO        /DO OUTPUT + END
16466 004112 3              LDA SIGN
16467 051155 3              STA IHSP X
16470 051175 3              STA IHLSTP X    /SO SUCK AND TIP WILL WORK PROPERL
16471 005305 3              LDA IHS1F       /USE MIN TIME LEFT FOR PKTS ON QUEU
16472 051306 3              STA IHTT X      /OR 30 SECS IF BOTH QUEUES EMPTY
16473 021060 3              JST IHDB
                 / WAITING FOR INTERRUPT AFTER OUTPUT OF 2 WORD MESSAGE
                 DEFPLC [IH = SENDING 2 WORD MSG]
16474 140040 3              CRA
16475 151135 3              STA IHB1 XI
16476 051155 3              STA IHSP X
16477 045306 3              LDA IHTT X
16500 101040 3              SNZ             /DID HARDWARE INTERRUPT?
16501 003351 3              JMP IHR2        /NO, ALARM CLOCK WENT OFF- HOST TAR
16502 003443 3              JMP IH1         /YES, NORMAL OUTPUT COMPLETE

16503 044302 3   IH2:       LDA SHPQ X      /IS THERE SOMETHING IN THE PRIORITY
16504 101040 3              SNZ
16505 003510 3              JMP .+3         /NO
16506 005610 3              LDA (SHPQ)
16507 003514 3              JMP IH19
16510 044272 3              LDA SHQ X       /IS THERE SOMETHING IN THE REGULAR
16511 101040 3              SNZ
16512 003441 3              JMP IH00
16513 005607 3              LDA (SHQ)
16514 014000 3   IH19:      ADD 0
16515 051165 3              STA IHWQ X      /SAVE POINTER TO QUEUE
```

```
16516 004115 3                LDA TWO 0"A"[DATA-HEAD2]
16517 111614 3                STA (FPSW 0 X) I
16520 145165 3    IH21:       LDA IHWQ XI
16521 051155 3                STA IHSP X      /SAVE POINTER TO BUFFER
16522 045165 3                LDA IHWQ X
16523 010000 3                STA 0
16524 144000 3                LDA 0 XI        /UPDATE QUEUE START POINTER
16525 050000 3                STA 0 X
16526 101040 3                SNZ             /IS THIS LAST ENTRY ON QUEUE
16527 133615 3                STX (EHQ-SHQ X) I         /MAKE START PTR POINTED T
16530 064251 3                IRS NHS-SHQ X
16531 072676 3                LDX IHP
16532 172700 3                LDX IHXX I
16533 005616 3                LDA (IHCKAD)
16534 026111 3                IMA ADDRET
16535 011123 3                STA IHAR
16536 004000 3                LDA 0
16537 056111 3                SUB BUFE X
16540 015617 3                ADD (ADDBOT+ACKH)
16541 140100 3                SSP 0"A"TWOQ
16542 011545 3                STA IHCKAJ
16543 017620 3                SUB (ADDBOT)    /-NO OF WORDS
16544 103545 3                JMP IHCKAJ I
16545         3    IHCKAJ:    BSS 1
16546 100040 3    IHCKAD:    SZE
16547 003553 3                JMP IHBAD
16550 005123 3                LDA IHAR
16551 010111 3                STA ADDRET
16552 103621 3                JMP (IHNOCK) I

16553 027123 3    IHBAD:      IMA IHAR        /TEMP FOR CKSUM ERROR
16554 010111 3                STA ADDRET      /AND RESTORE OWNER
16555 004676 3                LDA IHP
16556 012120 3                ERA SEVEN
                  DEFPLC [NOP HERE TO TURN OFF I2H CHECKSUM CHECK]
16557 101040 3                SNZ
16560 103621 3                JMP (IHNOCK) I /DON"T REPORT DISCARD ERRORS
16561 005123 3                LDA IHAR
16562 001001 3                INH ALL
                  DEFHLT [HOST OUTPUT DETECTED INTRA-IMP CKSUM ERROR]
16563 021564 3 0              JST .+1         /NOW TRAP TO NCC
16564 000000 3 0              0
16565 120745 3 0              JST HLTNCC I
16566 000401 3 0              ENB I2H
16567 072676 3                LDX IHP
16570 045155 3                LDA IHSP X
16571 140500 3                SSM             /FLAG PACKET TO GO TO DIAGTT
16572 051155 3                STA IHSP X
16573 140100 3                SSP
16574 103622 3                JMP (IHNOC2) I /AND CONTINUE ANYWAY
```

```
16575 053343 C   LEV CON   CONSTANTS
16576 016331 C
16577 000251 C
16600 015504 C
16601 017237 C
16602 016341 C
16603 101000 C
16604 000340 C
16605 017143 C
16606 017250 C
16607 000272 C
16610 000302 C
16611 041170 C
16612 002000 C
16613 005000 C
16614 057203 C
16615 040051 C
16616 016546 C
16617 001562 C
16620 001556 C
16621 017062 C
16622 017064 C
02425 175632 C             PAGEND 16,UNCON,4
```

```
                        LEV CON
17056 030070 C  IHOT:   H1ROUT          /REGULAR OUTPUT INSTRUCTIONS
17057 030060 C          H2ROUT
17060        C          TIPDEF H3ROUT, NOP
02263 017060 C
02313 030050 C
02343 101000 C
17061 030051 C          H4ROUT

                        LEV I2H   /MORE IMP-TO-HOST CODE
17062 072676 3  IHNOCK: LDX IHP
17063 105424 3          LDA (IHSP 0 X) I
17064 015425 3  IHNOC2: ADD (DATA)
17065 057203 3          SUB FPSW X      /BUILD FIRST BUFFER CONTROL WORD
17066 111426 3          STA (IHB1 0 XI) I
17067 172700 3          LDX IHXX I
17070 131040 3          RDCLOK
17071 003070 3          JMP .-1
17072 050001 3          STA ST X
17073 140040 3          CRA
17074 050000 3          STA 0 X         /CLEAR CHAIN PNTR
17075 044111 3          LDA BUFE X
17076 140100 3          SSP 0"A"TWOQ
17077 016114 3          SUB ONE         /STRIP CHECKSUM/DUMMY WRD
17100 072676 3          LDX IHP
17101 111427 3          STA (IHB2 0 XI) I       /MAKE SECOND BUFFER CONTR
17102 024565 3          IRS NRES        /UPDATE REASSEMBLY COUNT
17103 172700 3          LDX IHXX I
17104 044007 3          LDA HEAD2 X     /TURN OFF BITS FOR HOSTS
17105 007430 3          ANA (FRMIMP 0 FRMOCT SRCEHI)
17106 066007 3          IMA HEAD2 X 0"A"[LSTPKT 0 ENDBIT]
17107 072676 3          LDX IHP
17110 111431 3          STA (IHLSTP 0 X) I      /SAVE LAST PKT FLAG
17111 100400 3          SPL 0"A"LSTPKT          /IS THIS LAST PACKET OF M
17112 003115 3          JMP IH4         /YES
17113 045056 3          LDA IHOT X
17114 100000 3          SKP
17115 105432 3  IH4:    DEFSTAT LDA (IHED 0 X) I, HS1
00613 031076 3
32007 017115 3
32027 105432 3
17116 111433 3          STA (IHDO) I    /DO OUTPUT
17117 021127 3          JST IH6
17120 105431 3          LDA (IHLSTP 0 X) I
17121 121434 3          JST (HTPPF) I   /COUNT A PACKET OF THROUGHPUT
17122 105431 3          LDA (IHLSTP 0 X) I
17123 101400 3          SMI             /DID WE JUST PUT OUT LAST PKT?
17124 103435 3          JMP (IH21) I    /NO
17125 121436 3          JST (HTPMF) I   /COUNT A MESSAGE OF THROUGHPUT
17126 103437 3          JMP (IH1) I     /YES
```

```
                        LEV I2H    /MORE OF IMP-TO-HOST
17127 000000 3          IH6:       0                /SEND OUT A PKT
17130 172700 3                     LDX IHXX I
17131 004416 3                     LDA TIMES        /GET TIME IN SLOW TICKS
17132 056003 3                     SUB INCH X
17133 072676 3                     LDX IHP
17134 111440 3                     STA (IHTT 0 X) I
17135 100400 3                     SPL
17136 003143 3                     JMP IH62         /SOME TIME LEFT - GO USE IT
17137 004000 3                     LDA 0            /RUN OUT - FAKE HOST?
17140 016130 3                     SUB PLNH
17141 100400 3                     SPL
17142 103441 3                     JMP (IHR2) I     /NO - HAVE NO MERCY
17143 121442 3          IH62:      JST (IHDB) I
                        DEFPLC [IH - SENDING OUT A PKT]
17144 140040 3                     CRA
17145 111426 3                     STA (IHB1 0 XI) I
17146 105440 3                     LDA (IHTT 0 X) I
17147 101040 3                     SNZ              /DID HARDWARE INTERRUPT?
17150 103441 3                     JMP (IHR2) I     /NO, ALARM CLOCK WENT OFF - HOST TA
17151 172700 3                     LDX IHXX I       /YES, NORMAL OUTPUT COMPLETE
17152 044002 3                     LDA PTRT X
17153 001001 3                     INH M2I
17154 100040 3 0                   SZE              /MUST WE TRACE HIM?
17155 121443 3 0                   JST (TRCDUN) I   /YES
17156 072676 3 0                   LDX IHP          /MUST FOLLOW TRCDUN CALL
17157 000401 3 0                   ENB I2H
17160 140040 3                     CRA
17161 067203 3                     IMA FPSW X       /RESET FIRST PKT SWITCH
17162 172700 3                     LDX IHXX I
17163 100040 3                     SZE              /IS THIS THE FIRST PKT?
17164 003214 3                     JMP IH63         /YES
17165 072676 3          IH6F:      LDX IHP
17166 140040 3                     CRA
17167 126700 3                     IMA IHXX I       /CLEAR OUT IHSP
17170 010000 3                     STA 0
17171 001001 3                     INH FRE
17172 100400 3 0                   SPL
17173 003177 3 0                   JMP IH6B         /WAS BAD PACKET, PUT ON DIAG Q
17174 120671 3 0                   JST FLUSHI I     /FLUSH PACKET
17175 072676 3 0 IH6F1:    LDX IHP
17176 103127 3 0                   JMP IH6 I

17177 140100 3 0 IH6B:     SSP
17200 026342 3 0                   IMA DIAGQ        /PUT ON DIAG Q
17201 050000 3 0                   STA 0 X
17202 003175 3 0                   JMP IH6F1

                        LEV VAR
17203         V         FPSW:      BSS TH           /FIRST PACKET SWITCH
17213         V         IH6INC:    BSS 1            /MINUS IF RFNM IS FOR INC TRN
```

```
                    LEV I2M
17214 044006 3  IH63:    LDA HEAD1 X     /THIS CODE IS FOR MULTI-PKT MESS FOR
17215 007444 3           ANA (PKTNO)     /THAT WAS ON IH Q TOO LONG IN MID: '
17216 100040 3           SZE             /IS THIS FIRST PACKET?
17217 003165 3           JMP IH6F        /NO, THE RFNM HAS BEEN SENT ALREADY
17220 044005 3           LDA HEAD X      /NORMAL CASE, SEND BACK RFNM-ALLOC
17221 007445 3           ANA (INCTRN)
17222 100040 3           SZE
17223 004121 3           LDA MINUS1
17224 011213 3           STA IH6INC
17225 044005 3           LDA HEAD X
17226 007446 3           ANA (MESSNO 0 ONEOR8)
17227 013447 3           ERA (RFNM)
17230 052007 3           ERA HEAD2 X
17231 007450 3           ANA (0 0 177777"X"SRCEI)
17232 052007 3           ERA HEAD2 X
17233 073213 3           LDX IH6INC      /SET UP AS INCTRN OR NOT
17234 121451 3           JST (RALLYP) I /PUT IN RALLY TABLE
17235 101000 3           NOP             /ENTRY ALREADY THERE - BAD
17236 003165 3           JMP IH6F


                    LEV I2M
17237 000000 3  IHS5:    0
17240 044005 3           LDA HEAD X
17241 007452 3           ANA (0 0 177777"X"INCTRN)
17242 013445 3           ERA (INCTRN)
17243 050005 3           STA HEAD X
17244 132352 3           STX EHQ+NH+3 I
17245 032352 3           STX EHQ+NH+3
17246 024526 3           IRS NHA+NH+3
17247 103237 3           JMP IHS5 I
```

```
                    /ROUTINE TO GET WORD OFF ONE WORD MESSAGE QUEUE TO HOST
                    /CALLING SEQUENCE

                    /INDEX REGISTER CONTAINS HOST NUMBER
                    / JST   OWG I
                    / <RETURN IF NOTHING ON QUEUE>
                    / <RETURN IF SOMETHING ON QUEUE -- VALUE IN AC>

                    LEV I2H
17250 000000 3  OWGE:   0
17251 033337 3          STX OWGY
17252 044332 3          LDA SHWQ X      /GET START OF HOST ONE WORD QUEUE
17253 100040 3          SZE
17254 003260 3          JMP OWGL        /RETURN IF NOTHING ON QUEUE
17255 073337 3  OWGX:   LDX OWGY
17256 005340 3          LDA OWGA        /GET DATA IN AC
17257 103250 3          JMP OWGE I      /RETURN
17260 011341 3  OWGL:   STA OWGS        /SAVE START OF QUEUE FOR LATER USE
17261 004000 3          LDA 0
17262 022130 3          CAS PLNM        /REAL HOST?
17263 003255 3          JMP OWGX        /NO
17264 101000 3          NOP             /TTY LIKE REAL HOST
17265 025250 3          IRS OWGE        /PREPARE TO TAKE SECOND RETURN
17266 073341 3          LDX OWGS        /PUT START OF QUEUE IN INDEX REGIS
17267 044001 3          LDA 1 X
17270 011340 3          STA OWGA
17271 044002 3          LDA 2 X
17272 010516 3          STA TWDG
17273 044003 3          LDA 3 X         /GET POINTER TO POINTER TO HEAD OF
17274 011342 3          STA OWGT        /SAVE FOR LATER USE
17275 073337 3          LDX OWGY        /GET HOST NUMBER
17276 144332 3          LDA SHWQ XI
17277 050332 3          STA SHWQ X      /UPDATE QUEUE POINTER
17300 100040 3          SZE
17301 003305 3          JMP OWG1
17302 005453 3          LDA (SHWQ)
17303 014000 3          ADD 0
17304 050403 3          STA EHWQ X      /IF QUEUE NOW EMPTY FIX THINGS
```

```
17305 073342 3    OWG1:     LDX OWGT        /GET POINTER TO HEAD OF BUFFER
17306 044002 3              LDA 2 X         /GET FREE STORAGE POINTER FOR THIS F
17307 111341 3              STA OWGS I
17310 005341 3              LDA OWGS        /PUT THREE WORD BLOCK ON FREE STORAG
17311 050002 3              STA 2 X
17312 044003 3              LDA 3 X         /GET FREE BLOCK COUNT
17313 016114 3              SUB ONE
17314 050003 3              STA 3 X         /UPDATE FREE BLOCK COUNT
17315 023454 3              CAS (-18.)      /IS BUFFER EMPTY
17316 003255 3              JMP OWGX        /IF NO, RETURN
17317 044001 3              LDA 1 X         /IF YES, PUT IT ON FREE LIST
17320 054000 3              ADD 0 X
17321 017455 3              SUB (SHBQ)      /CHECK FOR LAST BUFFER ON QUEUE
17322 101040 3              SNZ
17323 003255 3              JMP OWGX        /IF YES, RETURN
17324 044000 3              LDA 0 X         /TAKE BUFFER OUT OF USE FOR ONE WORD
17325 150001 3              STA 1 XI
17326 044001 3              LDA 1 X
17327 064000 3              IRS 0 X
17330 150000 3              STA 0 XI
17331 140040 3              CRA 0"A"TWOQ
17332 050111 3              STA BUFE X
17333 001001 3              INH FRE
17334 120671 3 0            JST FLUSHI I
17335 000401 3 0            ENB I2H
17336 003255 3              JMP OWGX

                  LEV VAR
17337         V   OWGY:     BSS 1
17340         V   OWGA:     BSS 1
17341         V   OWGS:     BSS 1
17342         V   OWGT:     BSS 1

                  LEV ALL
                  /CALLED BY VDI,T,O,TSK,BCK
17343 000000 0    .DODXA:   0               /DISABLE EXTENDED ADDRESSING
17344 000011 0              DXA             /CALLED WITH INTERRUPTS LOCKED
17345 000401 0              ENB ALL         /RETURNS WITH INTERRUPTS ENABLED
17346 103343 0              JMP .DODXA I
```

```
                    /IMP TO FAKE HOST (SUCK)
                    /SIMULATE IMP-TO-HOST INTERFACE HARDWARE FOR FAKE HOSTS:
                    /1- IF THE DMC OUTPUT AND OUTPUT END POINTERS CROSS,
                    /   GIVE OUTPUT COMPLETED INTERRUPT
                    /2- FETCH NEXT WORD THROUGH THE DMC OUTPUT POINTER
                    /3- INCREMENT THE DMC OUTPUT POINTER, AND IF THE POINTERS C
                    /   AND IF THIS IS A FINAL OUTPUT, SET THE LAST BIT INDICATO
                    /4- SEND THE WORD TO THE HOST
                    /5- GO TO 1
                    /IHBB SERVES AS THE DMC OUTPUT POINTER
                    /IHBC SERVES AS THE DMC OUTPUT END POINTER
                    /CALLING SEQUENCE
                    /FAKE HOST NUMBER IN X REG - 0=TTY,1=DDT,2=PARAM CHANGE,3=DI
                    /JST SUCK - GET NEXT WORD FROM IMP FOR THIS FAKE HOST
                    /         - IMPLICIT BACKGROUND WAIT UNTIL WORD IS READY
                    /R1       - WORD IN A REG
                    /R2       - WORD IN A REG IS LAST WORD OF CURRENT MESSAGE
                    LEV BCK
17347 000000 7      SUC:      0
17350 045407 7      SUC1:     LDA IHBB X      /IS THERE ANY OUTPUT TO GO?
17351 101040 7                SNZ
17352 003366 7                JMP SUC2        /NO, WAIT ONE BACKGROUND LOOP
17353 057413 7                SUB IHBC X
17354 022113 7                CAS ZERO        /HAVE PNTRS CROSSED?
17355 003374 7                JMP SUC4        /YES
17356 003362 7                JMP SUC3        /ALMOST, THIS IS LAST WORD IN BUFFE
17357 145407 7      SUC5:     LDA IHBB XI     /FETCH NEXT WORD FROM OUTPUT PNTR
17360 065407 7                IRS IHBB X      /INCREMENT OUTPUT PNTR
17361 103347 7                JMP SUC I       /NOW RETURN WITH DATA

17362 105456 7      SUC3:     LDA (IHLSTP+NH X) I       /YES
17363 100400 7                SPL 0"A"LSTPKT /IS THIS THE LAST PKT?
17364 025347 7                IRS SUC         /YES, SO GIVE SKIP RETURN=LAST BIT
17365 003357 7                JMP SUC5

17366 005347 7      SUC2:     LDA SUC
17367 051420 7                STA SUCT X      /SAVE RETURN ADDRESS
17370 120667 7                JST WAIT I      /COROUTINE RETURN TO BACKGROUND
                    DEFPLC [SUCK CALL TO WAIT]
17371 045420 7                LDA SUCT X
17372 011347 7                STA SUC         /RESTORE RETURN ADDRESS
17373 003350 7                JMP SUC1

17374 033417 7      SUC4:     STX SUCX        /YES, SO INTERRUPT ON OUTPUT COMPLE
17375 004000 7                LDA 0
17376 014130 7                ADD PLNH
17377 010000 7                STA 0           /SET UP X REG FOR THIS FAKE HOST
17400 001001 7                INH SIN         /SOFTWARE INTERRUPT IMP-TO-HOST
17401 000013 7 0              EXA
17402 121457 7 0              JST (IHSB) I    RET BCK
17403 001001 7                INH ALL
17404 120672 7 0              JST DODXA I     RET BCK
17405 073417 7                LDX SUCX
17406 003350 7                JMP SUC1        /NOW GO BACK FOR MORE OUTPUT
```

```
                LEV VAR
17407            V   IHBB:     BSS FH          /DMC OUTPUT PNTRS FOR FAKE HOSTS
17413            V   IHBC:     BSS FH          /DMC OUTPUT END PNTRS FOR FAKE HOSTS
17417            V   SUCX:     BSS 1
                     DEFPLC [SUCT]
17420            V   SUCT:     BSS FH          /TABLE OF RETURN ADDRESSES
```

```
17424 056155 C   LEV CON   CONSTANTS
17425 000011 C
17426 156135 C
17427 156145 C
17430 050377 C
17431 056175 C
17432 056124 C
17433 016071 C
17434 022462 C
17435 016520 C
17436 022451 C
17437 016443 C
17440 056306 C
17441 016351 C
17442 016060 C
17443 011144 C
17444 003400 C
17445 000010 C
17446 177600 C
17447 000100 C
17450 177700 C
17451 015303 C
17452 177767 C
17453 000332 C
17454 177756 C
17455 000337 C
17456 056201 C
17457 016042 C
02426 174464 C             PAGEND 17,UNCON,4
```

```
                    TO:         LEV T,0
00102 020022 5      CLOKIL/     TO
20022 000000 5 0    TO/         INT T,0          /TIMEOUT INTERRUPT ENTRANCE
20023 000011 5 0                DXA
20024 003025 5 0                JMP .+1
20025 033145 5 0                STX TOT
20026 025143 5 0                IRS TOSLOW       /IS THIS REALLY A SLOW TICK?
20027 003034 5 0                JMP TO1          /NO
20030 073574 5 0                LDX (-25.)       /YES, RESET CLOCK
20031 033143 5 0                STX TOSLOW       /EVERY 25TH TICK
20032 072114 5 0                LDX ONE
20033 100000 5 0                SKP
20034 072113 5 0    TO1:        LDX ZERO         /CHOOSE APPROPRIATE X
20035 051146 5 0                STA TOA,X        /SAVE AC
20036 045160 5 0                LDA TOM,X
20037 170120 5 0                SMK INTM
20040 026134 5 0                IMA PRIM
20041 051156 5 0                STA TOMK,X
20042 000043 5 0                INK
20043 051150 5 0                STA TOCK,X
20044 005145 5 0                LDA TOT
20045 051152 5 0                STA TOX,X
20046 005022 5 0                LDA TO           /SAVE RETURN
20047 051154 5 0                STA TOC,X
20050 024415 5 0                IRS TIME         /COUNT LOCAL TIME
20051 101000 5 0                NOP
20052 024417 5 0                IRS SYNC         /COUNT GLOBAL TIME
20053 101000 5 0                NOP
20054 030026 5 0                WDT              /** TAKE THIS AWAY WHEN ALGORITHM
20055 143162 5 0                JMP TOS,XI

                    LEV T,0
20056 001001 5      TOR:        INH MSK
20057 045154 5 0                LDA TOC,X
20060 011022 5 0                STA TO
20061 045152 5 0                LDA TOX,X
20062 011145 5 0                STA TOT
20063 045156 5 0                LDA TOMK,X
20064 170120 5 0                SMK INTM
20065 010134 5 0                STA PRIM
20066 000013 5 0                EXA
20067 045150 5 0                LDA TOCK,X
20070 171020 5 0                OTK
20071 045146 5 0                LDA TOA,X
20072 073145 5 0                LDX TOT
20073 000401 5 0                ENB T,0
20074 103022 5                  JMP TO,I
```

```
                        LEV BCK    LCK INI
20075 000000 7 0 TOI:   0                  /TIMEOUT INITIALIZATION
20076 004127 7 0        LDA MICH
20077 010141 7 0        STA HTPAR
20100 072113 7 0        LDX ZERO
20101 140040 7 0 TOIL:  CRA
20102 111575 7 0        STA (E123 0 X) I       /CLEAR LINE ERROR
20103 004115 7 0        LDA TWO
20104 051300 7 0        STA RMBIT X    /TIMER BIT FOR VAR FRQ RM'S
20105 005576 7 0        LDA (1000 SHD RMINIT)    /101006, 50 KB LINE FULL I
20106 111577 7 0        STA (RMFLG 0 X) I        /AND INIT FLAG IN EACH RMI
20107 005600 7 0        LDA (RMCLKS+2) /POINT ALL LINES AT 50KB TIME
20110 111601 7 0        STA (RMCLKP 0 X) I
20111 004110 7 0        LDA PTICKS
20112 111602 7 0        STA (LINDT 0 X) I
20113 004121 7 0        LDA MINUS1
20114 051452 7 0        STA LTR X
20115 021354 7 0 TOIL2: JST DEDL       /SET SLT MINUS, KILL LINE
20116 024000 7 0        IRS 0
20117 024141 7 0        IRS HTPAR      /ENDS UP BY SETTING HTPAR TO 0
20120 003101 7 0        JMP TOIL
20121 004121 7 0        LDA MINUS1
20122 011143 7 0        STA TOSLOW     /START WITH SLOW TICK
20123 010142 7 0        STA HLNM       /CLEAR HOST INTERFACE TEST
20124 111603 7 0        STA (HLNMS) I
20125 111604 7 0        STA (RTSSNT) I
20126 011210 7 0        STA TALLYC     /DO THIS OR BACK2 WONT WORK RIGHT
20127 111605 7 0        STA (RALTRY) I
20130 111606 7 0        STA (GODWNC) I
20131 111607 7 0        STA (COMUPC) I
20132 111610 7 0        STA (MESST) I
                        /THIS CODE IS TO START ALL LINES W/ROUTING MSG SYNC=ED W/SLO
20133 011277 7 0        STA RMCLKS+NSPD=1
20134 004122 7 0        LDA MINUS2
20135 073611 7 0        LDX (=NSPD+1)
20136 051277 7 0 TOIL1: STA RMCLKS+NSPD=1 X
20137 024000 7 0        IRS 0
20140 003136 7 0        JMP TOIL1
20141 030040 7 0        CLKON
20142 103075 7 0        JMP TOI I

                        LEV VAR
20143         V  TOSLOW: BSS 1
20144         V  TOK:    BSS 1
20145         V  TOT:    BSS 1
20146         V  TOA:    BSS 2
20150         V  TOCK:   BSS 2
20152         V  TOX:    BSS 2
20154         V  TOC:    BSS 2
20156         V  TOMK:   BSS 2
                        LEV CON
20160 177774 C  TOM:    =4             /LOCK OUT T.O IN JOBF
20161 177774 C          =4             /ENB T.O IN JOBS **TEMP NOT**
20162 020170 C  TOS:    JOBF
20163 021075 C          JOBS
```

```
                    LEV T.0
20164 005160 5   JOBF1:    LDA TOM          /DONE WITH SLOW TICK
20165 170120 5              SMK INTM
20166 010134 5              STA PRIM         /LOCK OUT T.0
20167 072114 5              LDX ONE          /REMEMBER IT IS A SLOW TICK
                    /FAST TIMEOUT JOBS = RESTART EVERYBODY
20170 033144 5   JOBF:     STX TOK          /SAVE TYPE OF TICK
20171 021211 5              JST RSTOUT       /MUST PRECEDE IMTC
20172 021305 5              JST IMTC         RET T.0   /ATTEMPT TO RESTART MODE
20173 021327 5              JST HITC         /ATTEMPT TO RESTART HOST INS
20174 121612 5              JST (SWCH) I     /MONITOR THINGS
20175 021200 5              JST TALLYB       /TIME OUT OLDEST ALLOCATE WE HAVE
20176 073144 5              LDX TOK
20177 003056 5              JMP TOR

20200 000000 5   TALLYB:   0                /BUMP TALLY CLOCK EVERY 25 MS
20201 005613 5              LDA (TALLY)
20202 113614 5              ERA (TALLYI) I
20203 101040 5              SNZ              /IS THE TALLY TABLE EMPTY?
20204 011210 5              STA TALLYC       /YES, HOLD TALLYC AT 1 WHILE QUIESC
20205 025210 5              IRS TALLYC       /BUMP TALLY CLOCK
20206 101000 5              NOP              /IN CASE BACK ISNT GOING
20207 103200 5              JMP TALLYB I

                    LEV VAR
20210        V   TALLYC:   BSS 1            /TALLY CLOCK = COUNTS FROM 0 TO 5

                    LEV T.0
20211 000000 5   RSTOUT:   0
20212 025274 5              IRS RMCLKS       /CHECK TO SEND ROUTING MSGS
20213 100000 5              SKP              /...RUN CLKS FOR EACH POSS LINE SPD
20214 003255 5              JMP RSTR50       /2 SLOW TICKS
20215 025275 5              IRS RMCLKS+1
20216 100000 5              SKP
20217 003257 5              JMP RSTR25       /RESET  (1 SLOW TICK)
20220 025276 5              IRS RMCLKS+2
20221 100000 5              SKP
20222 003261 5              JMP RSTR5        /5 FAST TICKS [RMCLKS+3 IS FAST T.0
```

```
20223 072127 5    RSTR0:    LDX MICH
20224 004121 5              LDA MINUS1
20225 123615 5    RSTO2:    CAS (RMCLKP+CH XI) I     /TIME UP TEST
20226 100000 5              SKP
20227 003233 5              JMP RSTO4         /YES, DO ROUTING CHECK
20230 024000 5    RSTO3:    IRS 0             /NO, GO TO NEXT LINE
20231 003225 5              JMP RSTO2
20232 103211 5              JMP RSTOUT I      /DONE

20233 045305 5    RSTO4:    LDA RMBIT+CH X /ADVANCE BIT POINTER
20234 040677 5              ARR 1
20235 100400 5              SPL               /TIME TO WRAP?
20236 005616 5              LDA (20)          /YES, RESET TO 5TH BIT
20237 051305 5              STA RMBIT+CH X
20240 107617 5              ANA (RUTFRQ+CH XI) I     /GET RIGHT BIT OUT OF R
20241 101040 5              SNZ               /TIME TO SEND ROUTING?
20242 003253 5              JMP RSTO5         /NO, GO TO NEXT LINE
20243 100100 5              SLZ
20244 003264 5              JMP RSTDL
20245 001001 5    RSTO6:    INH I2M           /SEND ROUTING
20246 044272 5 2            LDA SLT+CH X
20247 101040 5 2            SNZ               /NO ROUTING IF HELD DEAD OR BUSY
20250 004115 5 2            LDA TWO           /ALWAYS SEND NULL W/ROUTING
20251 050272 5 2            STA SLT+CH X
20252 000401 5 2            ENB T,O
20253 004121 5    RSTO5:    LDA MINUS1        /ON TO NEXT LINE
20254 003230 5              JMP RSTO3


20255 005620 5    RSTR50:   LDA (-50.)
20256 011274 5              STA RMCLKS
20257 005574 5    RSTR25:   LDA (-25.)
20260 011275 5              STA RMCLKS+1
20261 004125 5    RSTR5:    LDA MINUS5
20262 011276 5              STA RMCLKS+2
20263 003223 5              JMP RSTR0

20264 033273 5    RSTDL:    STX RSTDT         /SAVE X
20265 004000 5              LDA 0
20266 016127 5              SUB MICH          /CONVERT NEG X TO POS X
20267 010000 5              STA 0
20270 021354 5              JST DEDL          /CALL DEDL FOR HELLO-IHY AT BASIC
20271 073273 5              LDX RSTDT         /RESTORE X
20272 003245 5              JMP RSTO6

                  LEV VAR
20273          V  RSTDT:    BSS 1             /TEMP X
20274          V  RMCLKS:   BSS NSPD          /1 CLOCK/SPD
20300          V  RMBIT:    BSS CH            /5 BIT ROTATE BIT 1/LINE
```

```
                        LEV T.0
20305 000000 5          IMTC:   0               /WAKE UP IDLE MODEMS
20306 072113 5                  LDX ZERO
20307 004127 5                  LDA MICH        /DO FOR ALL MODEMS
20310 011353 5                  STA IMTK
20311 001001 5          IMTCL:  INH SIN
20312 044440 5 0                LDA NONE X      /CHECK STATUS OF MODEM
20313 100040 5 0                SZE             /WAITING FOR HARDWARE INTERRUPT?
20314 003324 5 0                JMP I2MTC2
20315 121621 5 0 I2MTC0:        JST (I2MSB) I   RET T.0   /NO, SO GIVE SOFTWARE INTI
20316 001001 5                  INH ALL
20317 120672 5 0                JST DODXA I     RET T.0
20320 024000 5          I2MTC1: IRS 0
20321 025353 5                  IRS IMTK
20322 003311 5                  JMP IMTCL
20323 103305 5                  JMP IMTC I

                        LEV T.0 LCK SIN
20324 064440 5 0 I2MTC2:        IRS NONE X
20325 003320 5 0                JMP I2MTC1
20326 003315 5 0                JMP I2MTC0

                        LEV T.0
20327 000000 5          HITC:   0               /TIMEOUT CHECK ROUTINE
20330 004131 5                  LDA MITH
20331 011352 5                  STA HITK        /ATTEMPT TO WAKE UP ALL HOST-TO-IMP
20332 005352 5          HITZ:   LDA HITK
20333 012415 5                  ERA TIME        /USE A RANDOM WAKEUP ORDER
20334 006120 5                  ANA SEVEN       /TO FACILITATE RESOURCE SHARING
20335 010000 5                  STA 0
20336 001001 5                  INH [SIN,H2I,TPC]
20337 105622 5 0                LDA (HITT 0 X) I
20340 100040 5 0                SZE             /IS THIS HOST WAITING TO WAKE UP?
20341 125622 5 0                IRS (HITT 0 X) I        /YES, TIME TO WAKE HIM YE
20342 003346 5 0                JMP HITZL       /NO
20343 000013 5 0                EXA             /YES, SOFTWARE INTERRUPT HOST-TO-I
20344 121623 5 0                JST (HISB) I    RET T.0
20345 001001 5                  INH ALL
20346 120672 5 0 HITZL:         JST DODXA I     RET T.0
20347 025352 5                  IRS HITK
20350 003332 5                  JMP HITZ
20351 103327 5                  JMP HITC I

                        LEV VAR
20352           V       HITK:   BSS 1
20353           V       IMTK:   BSS 1           /TEMP COUNTER
```

```
                    LEV T,0
20354 000000 5   DEDL:    0                  /INVESTIGATE FOR LINE STATUS
20355 044265 5            LDA SLT X
20356 100400 5            SPL                /IS THIS LINE IN DEAD STATE?
20357 003445 5            JMP HEL4           /YES, GO NO FURTHER
20360 140040 5            CRA
20361 127575 5            IMA (E123 0 X) I
20362 101040 5            SNZ                /DID WE GET ANY ROUTING MSGS?
20363 003367 5            JMP DED1           /NO
20364 064421 5            IRS SIHY X         /YES, COUNT ONE AS AN HELLO
20365 065457 5            IRS RTRCVD X       /AND RETURN AN I-HEARD-YOU
20366 101000 5            NOP
20367 125624 5   DED1:    IRS (RTSSNT 0 X) I       /COUNT HELLO SENT
20370 101000 5            NOP
20371 044426 5            LDA LAC X          /CHECK LINE ALIVE COUNT
20372 101040 5            SNZ                /DID WE GET AN I-HEARD-YOU?
20373 003416 5            JMP NOC            /NO INPUT ON THIS CHANNEL
20374 016114 5            SUB ONE            /YES, CAN ONLY GET ONE (TWO IN CAS
20375 100040 5            SZE                /PER BASIC INTERVAL
20376 004114 5            LDA ONE
20377 050426 5            STA LAC X
20400 044433 5            LDA LINE X
20401 101040 5            SNZ
20402 003414 5            JMP DED3           /LINE WAS ALREADY ALIVE
20403 065452 5            IRS LTR X
20404 103354 5            JMP DEDL I         /NOT TIME TO BRING LINE UP YET
20405 140040 5            CRA
20406 050433 5            STA LINE X
20407 044160 5            LDA NEIGHB X       /FOR DETECTING PACKETS ON LOOPED LI
20410 016106 5            SUB MINE
20411 006112 5            ANA SIGN           /1=I AM THE HIGHER NUMBER IMP
20412 040672 5            ARR 6 0"A"ENDBIT
20413 111625 5            STA (LEND 0 X) I         /SAVE FOR USE IN PACKET
20414 004125 5   DED3:    LDA MINUS5
20415 003431 5            JMP HEL1
```

```
20416 044433 5    NOC:      LDA LINE X
20417 100040 5              SZE                 /WAS LINE ALIVE?
20420 003433 5              JMP DED4            /LINE STILL IS DEAD
20421 065452 5              IRS LTR X           /CURRENTLY UP, SHOULD IT BE?
20422 003440 5              JMP HEL3            /NOT TIME TO KILL LINE YET
20423 001001 5              INH M2I
20424 121626 5 0            JST (KILLIN) I
20425 000401 5 0            ENB T,O
20426 105602 5    HELD:     LDA (LINDT 0 X) I
20427 111625 5              STA (LEND 0 X) I          /MARK LINE DOWN
20430 050433 5    HEL0:     STA LINE X
20431 051452 5    HEL1:     STA LTR X
20432 103354 5              JMP DEDL I

20433 045452 5    DED4:     LDA LTR X           /LINE IS DEAD
20434 123602 5              CAS (LINDT 0 X) I         /IS IT AT MAX DEAD COUNT?
20435 016114 5              SUB ONE             /NOT YET, COUNT DOWN
20436 003430 5              JMP HEL0            /AND RETURN
20437 003426 5              JMP HELD            /PAST MAX!? RESET

20440 045452 5    HEL3:     LDA LTR X           /LINE IS DYING
20441 022123 5              CAS MINUS3          /IS IT TIME TO GIVE FAKE ROUTING?
20442 100000 5              SKP                 /NO
20443 121627 5              JST (RSTINP) I /YES,CALL ROUTING INPUT W/ DUMMY M
20444 103354 5              JMP DEDL I

20445 023630 5    HEL4:     CAS (-KILTIM+1)           /LINE HAS BEEN KILLED
20446 100000 5              SKP                 /IS IT TIME TO GIVE FAKE ROUTING?
20447 121627 5              JST (RSTINP) I /YES, CALL ROUT INPUT W/ DUMMY MSG
20450 021464 5              JST JSRT
20451 003426 5              JMP HELD

                  LEV VAR
20452         V   LTR:      BSS CH
20457         V   RTRCVD:   BSS CH              /COUNT OF HELLO'S RCVD
```

```
                        LEV T.0
20464 000000 5    JSRT:     0
20465 004112 5              LDA SIGN          /TURN OFF I2MTC CLOCK WAKEUP
20466 050440 5              STA NONE X        /FOR DEAD OR NON-EXISTENT LINES
20467 004000 5              LDA 0
20470 014127 5              ADD MICH
20471 023544 5              CAS VDHNO
20472 100000 5              SKP               /IS THIS MODEM STOLEN BY VDH?
20473 103464 5              JMP JSRT I        /YES
20474 023545 5              CAS MODNO
20475 103464 5              JMP JSRT I        /IS THIS MODEM STOLEN BY HOST?
20476 103464 5              JMP JSRT I
20477 115631 5              ADD (SATNO) I
20500 101040 5              SNZ
20501 103543 5              JMP SATGCI I
20502 064265 5              IRS SLT X         /YES, TIME TO START BRINGING IT UP?
20503 103464 5              JMP JSRT I        /NO
20504 001001 5              INH I2M
20505 033546 5 2            STX SENR
20506 005632 5 2 JSRT2:     LDA (SMPQ)
20507 021547 5 2 JSRT3:     JST JSRTS
20510 005633 5 2 JSRT4:     LDA (SMQ)
20511 021547 5 2            JST JSRTS
20512 073546 5 2            LDX SENR
20513 005634 5 2            LDA (ACKTAB)
20514 050646 5 2            STA RSEX X
20515 050653 5 2            STA CHFREE X
20516 044622 5 2            LDA I2MTAB X
20517 111635 5 2            STA (I2MLST 0 X) I
20520 050627 5 2            STA I2MEND X
20521 005636 5 2            LDA (=NACH)
20522 050634 5 2            STA I2MNXT X
20523 140040 5 2 NACKL:     CRA
20524 050641 5 2            STA TSEX X        /ZERO THIS = LOOP UNNECESSARY
20525 050440 5 2            STA NONE X        /ZERO THIS = LOOP UNNECESSARY
20526 166627 5 2            IMA I2MEND XI
20527 010000 5 2            STA 0
20530 023637 5 2            CAS (1777)
20531 021557 5 2            JST RQSUB
20532 101000 5 2            NOP               /NOTHING THERE OR JUST A DUMMY
20533 073546 5 2            LDX SENR
20534 064627 5 2            IRS I2MEND X
20535 064634 5 2            IRS I2MNXT X
20536 003523 5 2            JMP NACKL
20537 005640 5 2            LDA (JMP+0+1000+M2I0"A"777)
20540 111641 5 2            STA (M2IOK 0 XI) I
20541 000401 5 2            ENB T.0
20542 103464 5              JMP JSRT I

                        LEV VAR
20543         V     SATGCI:   SATDEF [0 0 JSRT I]
02264 020543 V
02314 120464 V
02344 120464 V
20544         V     VDHNO:    BSS 1           /0 FOR NO VDH, ELSE M,N=5
20545         V     MODNO:    BSS 1           /0=5 MODS, -1=4 MODS, -2=3 MODS
20546         V     SENR:     BSS 1
```

```
                        LEV T,0    LCK I2M
20547 000000 5 2 JSRTS:    0
20550 015546 5 2           ADD SENR
20551 011573 5 2           STA JSRTQ
20552 073573 5 2 JSRTS1:   LDX JSRTQ
20553 121642 5 2           JST (GETQ) I
20554 103547 5 2           JMP JSRTS I
20555 021557 5 2           JST RQSUB
20556 003552 5 2           JMP JSRTS1

20557 000000 5 2 RQSUB:    0
20560 132402 5 2           STX ERQ I
20561 032402 5 2           STX ERQ
20562 024564 5 2           IRS NSFS        /TASK WILL FLUSH IF DEST WENT DEAD
20563 044002 5 2           LDA PTRT X
20564 101040 5 2           SNZ
20565 103557 5 2           JMP RQSUB I
20566 010000 5 2           STA 0
20567 005643 5 2           LDA (140000)
20570 052012 5 2           ERA TDONE X
20571 050012 5 2           STA TDONE X
20572 103557 5 2           JMP RQSUB I
                        LEV VAR
20573         V    JSRTQ:  BSS 1
```

```
20574 177747 C   LEV CON   CONSTANTS
20575 045565 C
20576 101006 C
20577 052620 C
20600 020276 C
20601 051353 C
20602 051361 C
20603 022273 C
20604 022303 C
20605 004601 C
20606 027263 C
20607 027264 C
20610 021561 C
20611 177775 C
20612 022320 C
20613 032261 C
20614 015155 C
20615 151360 C
20616 000020 C
20617 167274 C
20620 177716 C
20621 012604 C
20622 053137 C
20623 013106 C
20624 062303 C
20625 050254 C
20626 011133 C
20627 026120 C
20630 177767 C
20631 005153 C
20632 000317 C
20633 000312 C
20634 000377 C
20635 052660 C
20636 177770 C
20637 001777 C
20640 003231 C
20641 150247 C
20642 015504 C
20643 140000 C
02427 175651 C             PAGEND 20,UNCON,4
```

```
                    LEV T.O   LCK ALL
                    /SLOW TIMEOUT JOBS
21075 021460 5 0 JOBS:      JST IHTC        RET T.O   /ATTEMPT TO RESTART HOST (
21076 021362 5              JST DEDH        /ESTABLISH HOST UP/DOWN STATUS
21077 021432 5              JST JED         /COMPUTE EFFECTIVE DELAY
21100 121672 5              JST (RUTCLK) I
                    /THESE FIRST FOUR SHOULD PRECEDE THE ROUTING COMPUTATION
21101 121673 5              JST (RUTOUT) I /COMPUTE ROUTING
21102 021564 5              JST HTEST       /OCP INTERFACES IF NECESSARY
21103 021640 5              JST HPOKE       /TEST HOST INTERFACE
21104 021134 5              JST DEDI        /DEAD IMP CLEANUP - AFTER ROUTING C
21105 021500 5              JST JUQC        /ADJUST QUEUE COUNTERS
21106 000401 5              ENB T.O
21107 021526 5              JST MESSTO      /TIMEOUT INCOMPLETE MESSAGE NUMBERS
21110 073674 5              LDX (0 0 -ADDBOT-1+ADDTOP)          /CHECK ADD CH/
21111 005675 5              LDA (ADD BUFE+4 X)        /BASIC INSTRUCTION
21112 123676 5   ADDCH1:     CAS (ADDBOT+1 X) I
21113 100000 5              SKP             /BAD
21114 100000 5              SKP             /GOOD
                            RELOAD [ADD CHAIN BROKEN]
21115 120061 5              JST SWDTIL I    /BAD, GO RELOAD
21116 016114 5              SUB ONE         /MODIFY INSTR IN A
21117 024000 5              IRS 0
21120 003112 5              JMP ADDCH1
21121 005677 5              LDA (JMP ADDRET I)        /CHECK RETURN INSTR
21122 113676 5              ERA (ADDBOT+1 X) I
21123 100040 5              SZE
                            RELOAD [ADD CHAIN RETURN BROKEN]
21124 120061 5              JST SWDTIL I    /BAD, GO RELOAD
21125 010452 5              STA LUUP        /BLINK LOOPED LIGHT
21126 101000 5   VDH3:      NOP             /VDH TIMEOUT CALL
21127 001001 5              INH ALL
21130 024416 5 0            IRS TIMES       /COUNT TIME IN SLOW TICKS
21131 024503 5 0            IRS WDTIME      /CHECK SOFTWARE W.D.T.
21132 103700 5 0            JMP (JOBF1) I   /NOW DO FAST STUFF.
                    RELOAD [SOFTWARE WDT FIRED]
21133 120061 5 0            JST SWDTIL I
```

```
                             LEV T.0
21134 000000 5    DEDI:      0               /TIMEOUT COMES HERE TO CLEAN UP
21135 005701 5               LDA (TMESS)
21136 011356 5               STA DMSTAB
21137 072113 5               LDX ZERO
21140 033355 5    IMPD:      STX DEDIMP      /NO OF IMP WHICH DIED
21141 044165 5               LDA RUT X
21142 101400 5               SMI 0"A"RUTDED  /IS THIS IMP DEAD?
21143 003274 5               JMP IMPD7       /NO, GO ON TO NEXT ONE
21144 073356 5               LDX DMSTAB      /FIRST CLEAN UP TRANSMIT SIDE
21145 001001 5               INH ALL
21146 044000 5 0             LDA 0 X
21147 007702 5 0             ANA (MESBTS)
21150 013702 5 0             ERA (MESBTS)
21151 101040 5 0             SNZ             /ARE THERE ANY OUTSTANDING MESSAGE
21152 003232 5 0             JMP IMPD2A      /NO, GO ON TO CLEAN UP OTHER THINGS
21153 004124 5 0             LDA MINUS4
21154 011357 5 0             STA DEDTRY      /LOOK AT 4 POSSIBLE MESS FOR DEAD
21155 044000 5 0             LDA 0 X
21156 017703 5 0             SUB (0 0 3"T"400) 0"A"MESSNO
21157 050000 5 0             STA 0 X         /ROLL BACK 4 MESS NOS
21160 100100 5 0 IMPD0:      SLZ             /IS THIS MESS NO WAITING FOR REPLY?
21161 003226 5 0             JMP IMPD2       /NO
21162 141044 5 0             CAR 0"A"MESSNO  /YES, SO LOOK FOR IT
21163 013355 5 0             ERA DEDIMP
21164 121704 5 0             JST (PPTGET) I
21165 003203 5 0             JMP IMPD1       /NOT IN PPT
21166 010000 5 0             STA 0           /GOT IT IN PPT
21167 140040 5 0             CRA
21170 066000 5 0             IMA PPT0 X
21171 140100 5 0             SSP 0"A"RETRAN
21172 010000 5 0             STA 0
21173 120671 5 0             JST FLUSHI I    /IF ON 2 QUEUES, RQSUB WILL FLUSH
21174 044010 5 0             LDA HEAD3 X
21175 141044 5 0             CAR 0"A"CIMPD
21176 010515 5 0             STA TWDP
21177 044007 5 0             LDA HEAD2 X
21200 121705 5 0             JST (HOSTNO) I
21201 044006 5 0             LDA HEAD1 X
21202 003221 5 0             JMP IMPDP
21203 105356 5 0 IMPD1:      LDA DMSTAB I
21204 141044 5 0             CAR 0"A"MESSNO
21205 013355 5 0             ERA DEDIMP
21206 121706 5 0             JST (PLTGET) I
21207 003226 5 0             JMP IMPD2       /MUST HAVE BEEN A GIVE BACK
21210 010000 5 0             STA 0
21211 140040 5 0             CRA
21212 066000 5 0             IMA PLT0 X      /CLEAR PLT ENTRY
21213 006120 5 0             ANA SEVEN
21214 011361 5 0             STA IMPDLH
21215 044030 5 0             LDA PLT2 X
21216 141044 5 0             CAR 0"A"CIMPD
21217 010515 5 0             STA TWDP
21220 044014 5 0             LDA PLT1 X
```

```
21221 007707 5 0 IMPDP:   ANA (0 0 177777"X"LSTPKT"X"HICODE)
21222 013710 5 0          ERA (CDESTD)    /RETURN A DEST IMP DEAD
21223 073361 5 0          LDX IMPDLH
21224 120670 5 0          JST OWP I
21225 101000 5 0          NOP
21226 073356 5 0 IMPD2:   LDX DMSTAB
21227 121711 5 0          JST (UPMESS) I
21230 025357 5 0          IRS DEDTRY
21231 003160 5 0          JMP IMPD0
21232 005355 5 0 IMPD2A:  LDA DEDIMP
21233 121712 5 0          JST (TALLYG) I /FLUSH ALL ALLOCATES FROM HIM
21234 100000 5 0          SKP
21235 003232 5 0          JMP IMPD2A
21236 073713 5 0          LDX (SHRQ)      /NOW CLEAN UP RECEIVE SIDE
21237 044000 5 0 IMPD3:   LDA 0 X         /GET ALL REAS BLOCKS BACK
21240 101040 5 0          SNZ
21241 003244 5 0          JMP IMPD3A
21242 021303 5 0          JST DREAS
21243 003237 5 0          JMP IMPD3
21244 073714 5 0 IMPD3A:  LDX (MESSTK)    /GET ALL MESSTK ENTRIES BACK
21245 044000 5 0 IMPD4:   LDA 0 X
21246 101040 5 0          SNZ
21247 003271 5 0          JMP IMPD6       /END OF MESSTK
21250 100400 5 0          SPL             /REAS BLOCK?
21251 003267 5 0          JMP IMPD5       /YES
21252 033360 5 0          STX DTEND
21253 010000 5 0          STA 0
21254 044007 5 0          LDA HEAD2 X
21255 013355 5 0          ERA DEDIMP
21256 007715 5 0          ANA (SRCEI)
21257 100040 5 0          SZE             /FROM DEAD IMP?
21260 003245 5 0          JMP IMPD4       /NO
21261 044000 5 0          LDA 0 X         /YES, REMOVE FROM MESSTK
21262 111360 5 0          STA DTEND I
21263 120671 5 0          JST FLUSHI I    /AND FREE BUFFER
21264 024565 5 0          IRS NRES        /ADJUST REAS COUNT
21265 073360 5 0          LDX DTEND
21266 003245 5 0          JMP IMPD4
21267 021303 5 0 IMPD5:   JST DREAS
21270 003245 5 0          JMP IMPD4
21271 073355 5 0 IMPD6:   LDX DEDIMP
21272 121716 5 0          JST (MESINI) I
21273 000401 5 0          ENB T,0
21274 024000 5    IMPD7:  IRS 0
21275 025356 5            IRS DMSTAB
21276 004000 5            LDA 0
21277 014132 5            ADD MINIMP
21300 100400 5            SPL             /HAVE WE DONE ALL IMPS YET?
21301 003140 5            JMP IMPD        /NOT YET, CYCLE BACK
21302 103134 5            JMP DEDI I
```

```
                        LCK ALL
21303 000000 5 0 DREAS:     0                   /TRY TO FREE A REAS BLOCK
21304 140100 5 0            SSP
21305 033360 5 0            STX DTEND
21306 010000 5 0            STA 0
21307 044001 5 0            LDA RID X
21310 013355 5 0            ERA DEDIMP
21311 007715 5 0            ANA (SRCEI)
21312 100040 5 0            SZE                 /FROM DEAD IMP?
21313 103303 5 0            JMP DREAS I         /NO
21314 044000 5 0            LDA 0 X             /YES, REMOVE FROM MESSTK OR SMRQ
21315 111360 5 0            STA DTEND I
21316 021321 5 0            JST REASF           /FREE REAS BLOCK AND PKTS
21317 073360 5 0            LDX DTEND
21320 103303 5 0            JMP DREAS I

21321 000000 5 0 REASF:     0                   /FREE REAS BLOCK AND ANY PKTS
21322 004000 5 0            LDA 0
21323 026326 5 0            IMA RASF
21324 110326 5 0            STA RASF I          /RETURN REAS BLOCK TO REAS FREE LIS'
21325 005717 5 0            LDA (-8) 0"A"8PKTS
21326 011353 5 0            STA INCN
21327 140040 5 0            CRA
21330 050013 5 0            STA RSF X
21331 044002 5 0            LDA RMAX X
21332 100400 5 0            SPL                 /DID WE GET LAST PKT?
21333 004120 5 0            LDA SEVEN 0"A"8PKTS     /NO
21334 141206 5 0            AOA
21335 014565 5 0            ADD NRES
21336 010565 5 0            STA NRES            /ADJUST REAS COUNT
21337 140040 5 0 INCFRE:    CRA
21340 066003 5 0            IMA REAS X
21341 101040 5 0            SNZ                 /DID WE GET THIS PKT?
21342 003347 5 0            JMP INCNXT          /NO
21343 033354 5 0            STX INCX
21344 010000 5 0            STA 0               /YES, SO FREE IT
21345 120671 5 0            JST FLUSHI I
21346 073354 5 0            LDX INCX
21347 024000 5 0 INCNXT:    IRS 0
21350 025353 5 0            IRS INCN
21351 003337 5 0            JMP INCFRE
21352 103321 5 0            JMP REASF I

                        LEV VAR
21353         V     INCN:     BSS 1
21354         V     INCX:     BSS 1
21355         V     DEDIMP:   BSS 1               /NO OF A DEAD IMP
21356         V     DMSTAB:   BSS 1               /PNTR TO HIS TMESS TABLE
21357         V     DEDTRY:   BSS 1
21360         V     DTEND:    BSS 1               /TEMP Q PNTR
21361         V     IMPDLH:   BSS 1
```

```
                      LEV T.O
21362 000000 5    DEDH:        0                   /TEST FOR DEAD HOSTS
21363 004131 5                 LDA MITH
21364 011430 5                 STA DHC
21365 072113 5                 LDX ZERO
21366 045662 5    TDH1:        LDA SKST X
21367 011372 5                 STA TDH4
21370 001001 5                 INH [I2H,H2I]
21371 044504 5 3               LDA HIHD X
21372        5 3  TDH4:        BSS 1
21373 015720 5 3               ADD (TDHDN-0-TDHUP)       /READY LINE DOWN
21374 015721 5 3               ADD (JMP TDHUP 0 I)       /READY LINE DOWN
21375 011376 5 3               STA .+1
21376        5 3               BSS 1

21377 021423 5 3  TDHUP:       TDH5                /STEADY-STATE UP
21400 021423 5 3               TDH5                /READY LINE UP, HOST GOING DOWN
21401 021423 5 3               TDH5                /READY LINE UP, HOST TARDY
21402 021411 5 3               TDH3                /READY LINE JUST WENT UP, WAS DOWN
21403 021423 5 3               TDH5                /IGNORE HOST IF IMP NOT UP

21404 021421 5 3  TDHDN:       TDH2                /READY LINE JUST WENT DOWN, WAS UP
21405 021423 5 3               TDH5                /READY LINE DOWN, HOST GOING DOWN
21406 021421 5 3               TDH2                /READY LINE JUST WENT DOWN, WAS TA
21407 021423 5 3               TDH5                /STEADY-STATE DOWN
21410 021423 5 3               TDH5                /IGNORE HOST IF IMP NOT UP

21411 140040 5 3  TDH3:        CRA
21412 050504 5 3               STA HIHD X
21413 104700 5 3               LDA IHXX I       /NOW TRULY UP
21414 101040 5 3               SNZ              /IS THERE AN OUTPUT IN PROGESS?
21415 003423 5 3               JMP TDH5         /NO
21416 004107 5 3               LDA M30SEC       /YES - MOST LIKELY A NOP
21417 111722 5 3               STA (IHTT 0 X) I          /GIVE FULL 30 SECS
21420 003423 5 3               JMP TDH5

21421 005723 5 3  TDH2:        LDA (IHWAIT)     /HOST WENT DOWN, DO NOT DROP IMP RE
21422 121724 5 3               JST (IHST) I     RET T.O    / CLEAR OUT HIS QUEUES
21423 000401 5    TDH5:        ENB T.O
21424 024000 5                 IRS 0
21425 025430 5                 IRS DHC
21426 003366 5                 JMP TDH1
21427 103362 5                 JMP DEDH I

                  LEV VAR
21430        V    DHC:         BSS 1
```

```
                        LEV VAR
21431 000000 V          HLRCVD:  0              /# OF CORRECT RESPONSES

                        /* COMPUTE OUR EFFECTIVE CHANNEL DELAY
                        / S= 20L + (100+S) E/T   WHERE T=20
                        /S' = [(L+5)(256/(20-E))-64]
                        LEV T.0
21432 000000 5          JED:     0
21433 072127 5                   LDX MICH
21434 001001 5          ED1:     INH I2M
21435 004116 5 2                 LDA THREE
21436 111455 5 2                 STA PCED I
21437 005717 5 2                 LDA (-NACH)
21440 011457 5 2                 STA JEDC
21441 044627 5 2                 LDA I2MTAB+CH X
21442 011456 5 2                 STA JEDP
21443 105456 5 2 JEDL:           LDA JEDP I
21444 100040 5 2                 SZE
21445 125455 5 2                 IRS PCED I
21446 025456 5 2                 IRS JEDP
21447 025457 5 2                 IRS JEDC
21450 003443 5 2                 JMP JEDL
21451 000401 5 2                 ENB T.0
21452 024000 5                   IRS 0
21453 003434 5                   JMP ED1
21454 103432 5                   JMP JED I
                        LEV CON
21455 066505 C          PCED:    CED+CH X
                        LEV VAR
21456         V         JEDP:    BSS 1
21457         V         JEDC:    BSS 1

                        LEV T.0
21460 000000 5          IHTC:    0               /TIME OUT CHECK ROUTINE
21461 004131 5                   LDA MITH
21462 011477 5                   STA IHTK
21463 072113 5                   LDX ZERO        /ATTEMPT TO WAKE UP ALL IMP-TO-HOST
21464 125722 5          IHTY:    IRS (IHTT 0 X) I        /TIME TO WAKE HIM YET?
21465 003473 5                   JMP IHTZ        /NO
21466 001001 5                   INH SIN         /YES, SOFTWARE INTERRUPT IMP-TO-HOS
21467 000013 5 0                 EXA
21470 121725 5 0                 JST (IHSB) I    RET T.0
21471 001001 5                   INH ALL
21472 120672 5 0                 JST DODXA I     RET T.0
21473 024000 5          IHTZ:    IRS 0
21474 025477 5                   IRS IHTK
21475 003464 5                   JMP IHTY
21476 103460 5                   JMP IHTC I
                        LEV VAR
21477         V         IHTK:    BSS 1
```

```
                    LEV T.O
21500 000000 5   JUQC:     0
21501 073726 5              LDX (-COUNTL)
21502 001001 5   QC1:      INH ALL
21503 044543 5 0            LDA COUNTA+COUNTL X
21504 056567 5 0            SUB COUNTS+COUNTL X
21505 101400 5 0            SMI             /NEGATIVE
21506 003513 5 0            JMP QC2         /NO
                    DEFHLT [QUEUE COUNTER WENT NEGATIVE]
21507 021510 5 0            JST CNTHLT
21510 000000 5 0 CNTHLT:    0
21511 120745 5 0            JST HLTNCC I
21512 140040 5 0            CRA             /RESET COUNT TOT ZERO
21513 050543 5 0 QC2:       STA COUNTA+COUNTL X
21514 140040 5 0            CRA
21515 050567 5 0            STA COUNTS+COUNTL X
21516 000401 5 0            ENB T.O
21517 024000 5              IRS 0
21520 003502 5              JMP QC1
21521 001001 5              INH ALL
21522 125727 5 0            IRS (SNTALL) I /ARE WE ALLOCATE=IDLE?
21523 103500 5 0            JMP JUQC I     /NO
21524 010542 5 0            STA NALA       /YES, FREE UP ALLOCATE STORE
21525 103500 5 0            JMP JUQC I
```

```
                     LEV T.O
21526 000000 5       MESSTO:    0                /TIMEOUT MESS NO IN 34-51 SECS
21527 025561 5                  IRS MESST        /TIME TO LOOK YET?
21530 103526 5                  JMP MESSTO I     /NO
21531 072132 5                  LDX MINIMP
21532 001001 5       MESST1:    INH H2I
21533 105730 5 4                LDA (TMESS+NIMP 0 X) I
21534 007702 5 4                ANA (MESBTS)
21535 013702 5 4                ERA (MESBTS)
21536 101040 5 4                SNZ              /ANY MESSAGES OUTSTANDING?
21537 003550 5 4                JMP MESST2       /NOTHING TO TIME OUT
21540 105730 5 4                LDA (TMESS+NIMP 0 X) I
21541 007731 5 4                ANA (MSTO1 0 MSTO2)
21542 013731 5 4                ERA (MSTO1 0 MSTO2)
21543 101040 5 4                SNZ
21544 003550 5 4                JMP MESST2       /ALREADY TIMED OUT
21545 005732 5 4                LDA (MSTO1)
21546 115730 5 4                ADD (TMESS+NIMP 0 X) I
21547 111730 5 4                STA (TMESS+NIMP 0 X) I
21550 000401 5 4     MESST2:    ENB T.O
21551 024000 5                  IRS 0
21552 003532 5                  JMP MESST1
21553 004107 5                  LDA M30SEC       /17 SECS
21554 040575 5                  ARS 3
21555 014107 5                  ADD M30SEC
21556 040577 5                  ARS 1
21557 011561 5                  STA MESST        /BETWEEN LOOKS
21560 103526 5                  JMP MESSTO I

                     LEV VAR
21561          V     MESST:     BSS 1
21562          V     HTOLD:     BSS 1
21563          V     HTINTF:    BSS 1
```

```
                        LEV T.O
21564 000000 5  HTEST:  0
21565 101000 5  HTMIN:  NOP
21566 005733 5          LDA (NOP)       /RESET MXIN/NOP INSTRUCTION
21567 011565 5          STA HTMIN
21570 004141 5          LDA HTPAR
21571 013562 5          ERA HTOLD
21572 101040 5          SNZ
21573 103564 5          JMP HTEST I     /NO CHANGE, NOTHING TO DO
21574 004141 5          LDA HTPAR
21575 006120 5          ANA SEVEN       /GET FUNCTION
21576 101040 5          SNZ
21577 003626 5          JMP HTX         /FUNCTION ZERO?!
21600 010000 5          STA 0
21601 004141 5          LDA HTPAR
21602 040575 5          ARS 3           /GET INTERFACE
21603 006752 5          ANA C77
21604 011563 5          STA HTINTF
21605 055630 5          ADD HTTAB-1 X
21606 011624 5          STA HT5         /CORRECT OCP
21607 004000 5          LDA 0
21610 022116 5          CAS THREE
21611 003624 5          JMP HT5         /HOST FUNCTION...DO IT
21612 100000 5          SKP             /MODEM UNPATCH...MORE TO DO
21613 003621 5          JMP HT1         /MODEM OTHER...SET UP IN
21614 073563 5          LDX HTINTF
21615 001001 5          INH I2M
21616 044437 5 2        LDA NONE-1 X    /MODEM BUSY?
21617 100040 5 2        SZE
21620 103564 5 2        JMP HTEST I     /YES, COME AGAIN
21621 005563 5 2 HT1:   LDA HTINTF      /SET UP IN FOR NEXT T.O. TO DO
21622 015734 5 2        ADD (M1IN-1)
21623 011565 5 2        STA HTMIN
21624        5 2 HT5:   BSS 1
21625 000401 5 2        ENB T.O
21626 004141 5  HTX:    LDA HTPAR       /RESET HTOLD
21627 011562 5          STA HTOLD
21630 103564 5          JMP HTEST I

                        LEV CON
                        /HTPAR HAS VALUE DDF - DEVICE IS DD AND FUNCTION IS F
                        /D=1,2,3,4,5 FOR MODEMS 1,2,3,4,5 (F=1,2,OR 3)
                        /D=70,60,50,51 FOR HOSTS 1,2,3,4 (F=4,5,OR 6)
21631 030270 C  HTTAB:  M1LXP-1         /1 - LINE CROSSPATCH
21632 030370 C          M1IXP-1         /2 - INTERFACE CROSSPATCH
21633 030170 C          M1UNXP-1        /3 - UNPATCH (RESTORE)
21634 030300 C          H1XP-70         /4 - CROSSPATCH HOST INTERFACE
21635 030500 C          H1ENAB-70       /5 - ENABLE NORMAL HOST TRAFFIC
21636 030400 C          H1UNXP-70       /6 - UNPATCH (CLEAR) HOST INTERFACE
21637 101000 C          NOP             /7
```

```
                        LEV T.O
21640 000000 5    HPOKE:    0                 /TEST HOST INTERFACE
21641 001001 5              INH FRE
21642 004142 5 0            LDA HLNM          /TESTER TURNED ON?
21643 100400 5 0            SPL
21644 003656 5 0            JMP HPOKE2        /OFF
21645 010000 5 0            STA 0
21646 044332 5 0            LDA SHWQ X        /ROOM FOR ANOTHER TEST PROD?
21647 100040 5 0            SZE
21650 003656 5 0            JMP HPOKE2        /NO
21651 004143 5 0            LDA HL2WD
21652 010515 5 0            STA TWDP
21653 005735 5 0            LDA (CNOP)
21654 120670 5 0            JST OWP I
21655 025660 5 0            IRS HLSNT         /COUNT ANOTHER POKE
21656 000401 5 0 HPOKE2:    ENB T.O
21657 103640 5              JMP HPOKE I
                        LEV VAR
21660        V      HLSNT:  BSS 1
                        LEV CON
21661 037454 C      VDH3.:  VD.TO

21662 070170 C      SKST:   H1RDY
21663 070160 C              H2RDY
21664        C      TIPSKP: TIPDEF H3RDY, NOP
02265 021664 C
02315 070150 C
02345 101000 C
21665 070151 C              H4RDY
21666 100000 C              SKP
21667 100000 C              SKP
21670 100000 C              SKP
21671 100000 C              SKP
```

```
21672 027112 C    LEV CON   CONSTANTS
21673 026512 C
21674 177666 C
21675 054115 C
21676 041557 C
21677 102111 C
21700 020164 C
21701 032271 C
21702 000017 C
21703 001400 C
21704 015033 C
21705 007244 C
21706 015205 C
21707 070377 C
21710 003400 C
21711 015347 C
21712 015114 C
21713 000340 C
21714 000327 C
21715 000077 C
21716 002374 C
21717 177770 C
21720 000005 C
21721 103377 C
21722 056306 C
21723 016341 C
21724 016273 C
21725 016042 C
21726 177754 C
21727 004161 C
21730 072371 C
21731 000300 C
21732 000100 C
21733 101000 C
21734 030470 C
21735 002000 C
02430 176745 C              PAGEND 21,UNCON,4
```

```
                    LEV BCK
                    /TROUBLE REPORTS TO NCC AT HOST 0 AT BBN
22057 005524 7   TRBL:    LDA (301)        /*SEND TRBL REPT CODE
22060 011301 7             STA NTRCKS       /INIT THE CHECKSUM COUNTER
22061 121525 7             JST (GIVE) I
22062 073526 7             LDX (-NH)
22063 001001 7             INH ALL          /USING B REG = MUST LOCK INTERRUPT
22064 044510 7 0 NTR6:     LDA HIHD+NH X
22065 100040 7 0           SZE
22066 004112 7 0           LDA SIGN
22067 140024 7 0           CHS
22070 041277 7 0           LLR 1
22071 024000 7 0           IRS 0
22072 003064 7 0           JMP NTR6
22073 040274 7 0           LRR NH
22074 013272 7 0           ERA SWS          /*SEND ANOMALY WORD = HOSTS + SWIT
22075 021310 7 0           JST NTGIVE       RET BCK
22076 127527 7             IMA (RSFNCC) I /*SEND RESTART-RELOAD INDICATOR
22077 021310 7             JST NTGIVE
22100 026746 7             IMA HLTLOC       /*SEND HALT PC REG
22101 021310 7             JST NTGIVE
22102 004747 7             LDA HLTA         /*SEND HALT A  REG
22103 021310 7             JST NTGIVE
22104 004750 7             LDA HLTX         /*SEND HALT X  REG
22105 021310 7             JST NTGIVE
22106 072124 7             LDX MINUS4       /*SEND COUNTS FOR
22107 001001 7   NTR7:     INH ALL          /FREE, REAS, S+F, AND ALLOCATE
22110 044543 7 0           LDA NFA+4 X
22111 056567 7 0           SUB NFS+4 X
22112 021310 7 0           JST NTGIVE       RET BCK
22113 024000 7             IRS 0
22114 003107 7             JMP NTR7
22115 004105 7             LDA VERS         /*SEND IMP VERSION NO
22116 021310 7             JST NTGIVE
22117 105530 7             LDA (HOST34) I /*SEND HOST34 CONFIGURATOR WORD
22120 021310 7             JST NTGIVE
22121 000013 7             EXA
22122 105531 7             LDA (TIPVER) I /*SEND TIP VERSION NO
22123 001001 7             INH [ALL]
22124 120672 7 0           JST DODXA I      RET BCK
22125 021310 7             JST NTGIVE
22126 004142 7             LDA HLNM         /*SEND NO OF HOST INTERFACE BEING T
22127 021310 7             JST NTGIVE
22130 127532 7             IMA (HLSNT) I  /*SEND TEST MESS SENT COUNT
22131 021310 7             JST NTGIVE
22132 127533 7             IMA (HLRCVD) I /*SEND TEST MESS RECVD COUNT
22133 021310 7             JST NTGIVE
22134 011277 7             STA NTRTM1       /ZERO LINE-SPEEDS WORD
22135 072127 7             LDX MICH         /TAKE A SNAPSHOT OF LINE ERRORS
22136 001001 7   NTR1:     INH [T,0,TSK]    /A=0 NOW
```

```
22137 140040 7 5          CRA
22140 127534 7 5          IMA (RTRCVD+CH 0 X) I
22141 057310 7 5          SUB RTSSNT+CH X          /SUBTRACT ROUTING MESS S
22142 140407 7 5          TCA             /COMPUTE NO OF ROUTING MESS MISSED
22143 100400 7 5          SPL
22144 140040 7 5          CRA             /MUST BE A POSITIVE NUMBER
22145 023535 7 5          CAS (377)
22146 005535 7 5          LDA (377)
22147 101000 7 5          NOP
22150 011302 7 5          STA E321        /SAVE AS ERROR COUNT FOR THIS LINE
22151 004121 7 5          LDA MINUS1
22152 067310 7 5          IMA RTSSNT+CH X          /*SEND NO OF ROUTING ME(
22153 023535 7 5          CAS (377)
22154 005535 7 5          LDA (377)
22155 101000 7 5          NOP
22156 021310 7 5          JST NTGIVE      RET BCK
22157 044440 7            LDA LINE+CH X   /NOW ERROR+THROUGHPUT COUNTS FOR EA
22160 100040 7            SZE
22161 005536 7            LDA (200)
22162 052165 7            ERA NEIGHB+CH X          /PICK UP NEIGHBOR IMP NUM
22163 022106 7            CAS MINE        /IS LINE LOOPED?
22164 100000 7            SKP             /NO
22165 012753 7            ERA C100        /YES, PUT IN LOOPED BIT
22166 141340 7            ICA
22167 013302 7            ERA E321        /*SEND NO OF ROUTING MESS MISSED
22170 021310 7            JST NTGIVE
22171 105537 7            LDA (RMFLG+CH X) I       /GET LINE SPEED BITS
22172 141340 7            ICA
22173 006116 7            ANA THREE 0"A"SPDTYP
22174 013277 7            ERA NTRTM1
22175 041676 7            ALR 2
22176 011277 7            STA NTRTM1
22177 024000 7            IRS 0
22200 003136 7            JMP NTR1
22201 041674 7            ALR 4           /LEFT ADJUST
22202 021310 7            JST NTGIVE      /*SEND LINE SPEEDS
22203 072123 7            LDX MINUS3
22204 105540 7            LDA (37777 0 X) I        /*SEND TRAP INFO (P, A, X
22205 021310 7            JST NTGIVE
22206 024000 7            IRS 0
22207 003204 7            JMP .+3
```

```
22210 027301 7              IMA NTRCKS      /A=0 NOW
22211 140407 7              TCA
22212 121525 7              JST (GIVE) I    /*SEND CHECKSUM
22213 140040 7              CRA
22214 027276 7              IMA TRBSTF      /FIRED BY SYNC OR SWCH?
22215 100040 7              SZE
22216 103541 7              JMP (GIVLST) I /*SEND PADDING--FIRED BY SWCH
22217 073542 7              LDX (100003)    /END OUR OWN MESSAGE
22220 004112 7              LDA SIGN
22221 120664 7              JST JAM I       /*PADDING AND END OF MESSAGE
22222 105543 7              LDA (TRBD) I    /*NCC DEST
22223 121525 7              JST (GIVE) I
22224 105544 7              LDA (TRBD+0+TLNK-TDST) I /*NCC LINK
22225 121525 7              JST (GIVE) I
22226 005545 7              LDA (302)       /*STAT MESSAGE CODE
22227 021310 7              JST NTGIVE
22230 072127 7              LDX MICH        /SEND LINE STATS
22231 127546 7   NTR8:      IMA (THRUPT+CH X) I
22232 021310 7              JST NTGIVE      /*PACKET THRUPUT
22233 127547 7              IMA (THRUPW+CH X) I
22234 021310 7              JST NTGIVE      /*WORD THRUPUT
22235 024000 7              IRS 0
22236 003231 7              JMP NTR8
22237 073526 7              LDX (-NH)       /NOW HOST THROUGHPUTS FOR EACH HOS
22240 005550 7   NTR5:      LDA (-10.)      /AND FOR EACH OF 10 FLAVORS
22241 011277 7              STA NTRTM1
22242 005551 7              LDA (NTRTAB 0 I)
22243 011300 7              STA NTRTM2
22244 140040 7   NTR4:      CRA
22245 127300 7              IMA NTRTM2 I    /*SEND HOST THROUGHPUT COUNT
22246 021310 7              JST NTGIVE
22247 025300 7              IRS NTRTM2
22250 025277 7              IRS NTRTM1
22251 003244 7              JMP NTR4
22252 024000 7              IRS 0
22253 003240 7              JMP NTR5
22254 027301 7              IMA NTRCKS      /A=0 NOW
22255 140407 7              TCA
22256 121525 7              JST (GIVE) I    /*SEND CKSUM
22257 103541 7              JMP (GIVLST) I /*SEND PADDING
```

```
                        LEV CON

22260 073563 C    NTRTAB:   HTPMTN+NH X
22261 073567 C              HTPMFN+NH X
22262 073573 C              HTPPTN+NH X
22263 073577 C              HTPPFN+NH X
22264 073603 C    NTRT1:    HTPMTL+NH X
22265 073607 C    NTRT3:    HTPMFL+NH X
22266 073613 C    NTRT2:    HTPPTL+NH X
22267 073617 C    NTRT4:    HTPPFL+NH X
22270 073623 C              HTPWTI+NH X
22271 073627 C              HTPWFI+NH X

                        LEV VAR
22272         V   SWS:      BSS 1           /ANOMALIES
22273         V   HLNMS:    BSS 1
22274         V   SWCHTM:   BSS 1
22275 003014  V   HERSAV:   JMP 0 1000 777"A"HITEST
22276         V   TRBSTF:   BSS 1
22277         V   NTRTM1:   BSS 1
22300         V   NTRTM2:   BSS 1
22301         V   NTRCKS:   BSS 1           /CHECKSUM FOR TROUBLE REPT
22302         V   E321:     BSS 1           /NO OF ERRORS ON EACH LINE
22303         V   RTSSNT:   BSS CH          /NO OF HELLO'S SENT

                        LEV BCK
22310 000000 7    NTGIVE:   0               /BUILD CHECKSUM
22311 000401 7              ENB BCK
22312 027301 7              IMA NTRCKS
22313 015301 7              ADD NTRCKS
22314 027301 7              IMA NTRCKS
22315 121525 7              JST (GIVE) I    /AND GIVE A WORD TO IMP VIA JAM
22316 140040 7              CRA
22317 103310 7              JMP NTGIVE I
```

```
                /BITS IN SWS (TROUBLE REPORT ANOMALIES):
                / 100000 = HOST 0 UP (NOT KEPT IN SWS)
                /  40000 = HOST 1 UP (NOT KEPT IN SWS)
                /  20000 = HOST 2 UP (NOT KEPT IN SWS)
                /  10000 = HOST 3 UP (NOT KEPT IN SWS)
                /   4000 = VDH SOFTWARE IS UP
                /   2000 = M.GENERATOR IS ON
                /   1000 = STATISTICS IS ON
                /    400 = SNAPSHOT IS ON
                /    200 = TRACE IS ON
                /    100 = MEM PROTECT IS OFF
                /     40 = SPARE
                /     20 = OVERRIDE IS ON
                /     10 = SS 1 IS ON
                /      4 = SS 2 IS ON
                /      2 = SS 3 IS ON
                /      1 = SS 4 IS ON
```

```
                    LEV T.O
22320 000000 5   SWCH:    0                /SET UP SWITCH SETTINGS FOR TROUBLE
22321 005552 5             LDA (4000)       /SET UP FREQ FOR NCC TRBL REPTS
22322 111553 5             STA (TRBF) I     /DEST IS SET IN BACK
22323 072121 5             LDX MINUS1
22324 105527 5             LDA (RSFNCC) I
22325 101040 5             SNZ
22326 105554 5             LDA (HLTLOC) I
22327 100040 5             SZE              /IF RSFLAG OR HLTLOC NON-ZERO
22330 033272 5             STX SWS          /FIRE OFF A TRBL REPT NOW
22331 004142 5             LDA HLNM
22332 027273 5             IMA HLNMS
22333 023273 5             CAS HLNMS
22334 100000 5             SKP              /CHANGE IN HOST TEST STATUS?
22335 003345 5             JMP SWCH0        /NO
22336 033272 5             STX SWS
22337 010000 5             STA 0            /PICK HOST NO GOING OFF
22340 005275 5             LDA HERSAV
22341 127555 5             IMA (HER 0 X) I            /INTERCHANGE PATCH REGIST
22342 072142 5             LDX HLNM         /PICK HOST NO COMING ON
22343 127555 5             IMA (HER 0 X) I
22344 011275 5             STA HERSAV 0"A"HER0
22345 004753 5   SWCH0:    LDA C100
22346 111556 5             STA (1777) I     /ATTEMPT TO CHANGE WORD ON PROT P/
22347 140040 5             CRA
22350 127556 5             IMA (1777) I     /IF SUCCESSFUL, PUT IN MP OFF BIT
22351 012473 5             ERA OVRDF        /OVRDF=20 IF ON, =0 IF OFF
22352 100020 5             SR1
22353 012751 5             ERA TEN
22354 100010 5             SR2
22355 012117 5             ERA FOUR
22356 100004 5             SR3
22357 012115 5             ERA TWO
22360 100002 5             SR4
22361 012114 5             ERA ONE
22362 072124 5             LDX MINUS4
22363 011274 5   SWCH4:    STA SWCHTM
22364 105557 5             LDA (PARAMT+4 X) I
22365 100040 5             SZE
22366 105560 5             LDA (SWCHB+4 X) I          /SET THE BIT
22367 013274 5             ERA SWCHTM
22370 024000 5             IRS 0
22371 003363 5             JMP SWCH4
22372 012567 5             ERA VDHUPF       /=4000 IF VDH IS UP
22373 027272 5             IMA SWS
22374 013272 5             ERA SWS
22375 101040 5             SNZ
22376 103320 5             JMP SWCH I
22377 011276 5             STA TRBSTF       /TELL TRBL RPTS THAT SWS FIRED IT
22400 004417 5             LDA SYNC
22401 117553 5             SUB (TRBF) I
22402 111561 5             STA (TRBOLD) I
22403 103320 5             JMP SWCH I
```

```
                        LEV [M2I,VDI,I2H,T,0,TSK]
22404 000000 0    HLTWRD: 0
22405 010747 0            STA HLTA
22406 032750 0            STX HLTX
22407 004122 0            LDA MINUS2
22410 015404 0            ADD HLTWRD
22411 010746 0            STA HLTLOC
22412 104746 0            LDA HLTLOC I
22413 010746 0            STA HLTLOC      /SAVE LOC OF HLT
22414 103404 0            JMP HLTWRD I

                        LEV H2I   /8-WAY BREAKDOWN OF HOST THROUGHPUT
22415 000000 4    HTPMT:  0                 /COUNT MESSAGES TO NET
22416 012106 4            ERA MINE
22417 100040 4            SZE               /INTER- OR INTRA-NODE?
22420 005562 4            LDA (HTPMTN+0-HTPMTL)
22421 015264 4            ADD NTRT1
22422 001001 4            INH I2H
22423 021505 4 3          JST HTPIRS      RET H2I
22424 101000 4            NOP
22425 103415 4            JMP HTPMT I

22426 000000 4    HTPPT:  0                 /COUNT PACKETS TO NET
22427 012106 4            ERA MINE
22430 100040 4            SZE               /INTER- OR INTRA-NODE?
22431 005562 4            LDA (HTPPTN+0-HTPPTL)
22432 015266 4            ADD NTRT2
22433 001001 4            INH I2H
22434 021505 4 3          JST HTPIRS      RET H2I
22435 103426 4            JMP HTPPT I     /R1==>FH - DON'T GET LENGTH
22436 172677 4            LDX HIXX I
22437 044111 4            LDA BUFE X
22440 016000 4            SUB 0
22441 140100 4            SSP 0"A"TWOQ
22442 017563 4            SUB (DATA)      /GOT PACKET LENGTH, NOT COUNTING LE
22443 072675 4            LDX HIP
22444 115564 4            ADD (HTPWTI 0 X) I
22445 100400 4            SPL
22446 004112 4            LDA SIGN        /MARK OFLO
22447 111564 4            STA (HTPWTI 0 X) I
22450 103426 4            JMP HTPPT I

                        LEV I2H
22451 000000 3    HTPMF:  0                 /COUNT MESSAGES FROM NET
22452 012106 3            ERA MINE
22453 007565 3            ANA (SRCEI)
22454 100040 3            SZE               /INTER- OR INTRA-NODE?
22455 005562 3            LDA (HTPMFN+0-HTPMFL)
22456 015265 3            ADD NTRT3
22457 021505 3            JST HTPIRS
22460 101000 3            NOP
22461 103451 3            JMP HTPMF I
```

```
22462 000000 3   HTPPF:   0                /COUNT PACKETS FROM NET
22463 012106 3            ERA MINE
22464 007565 3            ANA (SRCEI)
22465 100040 3            SZE              /INTER= OR INTRA=NODE?
22466 005562 3            LDA (HTPPFN+0=HTPPFL)
22467 015267 3            ADD NTRT4
22470 021505 3            JST HTPIRS
22471 103462 3            JMP HTPPF I      /R1==>FH
22472 172700 3            LDX IHXX I
22473 044111 3            LDA BUFE X
22474 016000 3            SUB 0
22475 140100 3            SSP 0"A"TWOQ
22476 017563 3            SUB (DATA)       /GOT PKT LENGTH
22477 072676 3            LDX IHP
22500 115566 3            ADD (HTPWFI 0 X) I
22501 100400 3            SPL
22502 004112 3            LDA SIGN         /MARKING OVERFLOW
22503 111566 3            STA (HTPWFI 0 X) I
22504 103462 3            JMP HTPPF I

                  /HOST THROUGHPUT TABLES AND COUNT ROUTINE
22505 000000 3   HTPIRS:  0                /TBL IN A, HOST NUM IN X
22506 016130 3            SUB PLNH
22507 011523 3            STA HTPIR1
22510 004000 3            LDA 0
22511 016130 3            SUB PLNH
22512 101400 3            SMI              /FAKE HOST?
22513 003521 3            JMP HTPIR2       /YES, DO NOT COUNT TRAFFIC TO OR FR
22514 105523 3            LDA HTPIR1 I
22515 101400 3            SMI              /OVERFLOWED--LEAVE AT 100000
22516 141206 3            AOA              /ADD ONE TO COUNTER
22517 111523 3            STA HTPIR1 I
22520 025505 3            IRS HTPIRS       /R2==>REAL (NOT FAKE) HOST
22521 000401 3   HTPIR2:  ENB I2H
22522 103505 3            JMP HTPIRS I
                  LEV VAR
22523        V   HTPIR1:  BSS 1            /PNTR INTO HTPTBL
```

```
22524 000301 C   LEV CON   CONSTANTS
22525 030403 C
22526 177774 C
22527 003560 C
22530 001005 C
22531 040000 C
22532 021660 C
22533 021431 C
22534 060464 C
22535 000377 C
22536 000200 C
22537 052625 C
22540 077777 C
22541 030165 C
22542 100003 C
22543 030456 C
22544 030450 C
22545 000302 C
22546 050625 C
22547 050620 C
22550 177766 C
22551 122260 C
22552 004000 C
22553 030464 C
22554 000746 C
22555 053170 C
22556 001777 C
22557 070440 C
22560 041246 C
22561 030210 C
22562 177760 C
22563 000011 C
22564 073617 C
22565 000077 C
22566 073623 C
02431 175607 C             PAGEND 22,UNCON,4
```

```
                /DDT CONTROL LANGUAGE INFORMATION
                /
                /************CURRENTLY IMPLEMENTED COMMANDS*****************
                /
                /SHIFT-CONTROL-P (OR THE BREAK KEY) HAS THE FOLLOWING EFFEC
                /1- ANY DDT OUTPUT IS STOPPED
                /2- THE CURRENTLY OPENED REGISTER IS CLOSED WITH NO NEW CONT
                /3- DDT FORGETS WHATEVER NUMBER WAS BEING TYPED IN
                /4- DDT TYPES A CARRAIGE RETURN-LINE FEED
                /5- DDT IS UN-CROSSPATCHED - THAT IS YOU ARE NOW TYPING
                /   TO THE LOCAL DDT IF YOU WERE CROSSPATCHED BEFORE
                /
                /<RUBOUT> HAS THE FOLLOWING EFFECTS:
                /1- DDT FORGETS WHATEVER NUMBER WAS BEING TYPED IN
                /2- DDT TYPES "#    "
                /
                /. HAS THE VALUE OF THE CURRENT REGISTER'S ADDRESS (14-BIT)
                /
                /<BACKARROW> HAS THE VALUE OF THE LAST THING TYPED BY DDT
                /
                /* HAS THE VALUE OF THE CONTENTS OF THE REGISTER ADDRESSED B
                /HAS BEEN ASSEMBLED AS THE CURRENT SYLLABLE.  IT ALWAYS USES
                /THE CURRENT SYLLABLE AS A 14 BIT ADDRESS AND CAN BE APPLI
                /ITSELF OR TO ANY SYLLABLE
                /
                /T HAS THE VALUE OF THE IMP NUMBER OF THE LAST FOREIGN IMP
                /TO SEND A TTY MESSAGE TO THIS IMP, USED IN T- OR TC.
                /
                /, SEPARATES ARGUMENTS TO MULTIPLE ARGUMENT COMMANDS
                /
                /A1/   OPENS REGISTER AT LOCATION A1 (14-BIT ADDRESS)
                /
                /A1<BACKSLASH>   OPEN REGISTER AT LOCATION A1 (USED AS
                /A 9 BIT RELATIVE ADDRESS TO THE PAGE . IS ON.
                /
                /A1<LINEFEED>   CLOSES THE CURRENTLY OPEN REGISTER (IF ANY)
                /INSERTS A1 AS ITS NEW CONTENTS (IF SUPPLIED)
                /
                /A1^   CLOSES THE CURRENTLY OPEN REGISTER (AS LINEFEED) AND
                /THE PREVIOUS REGISTER
                /
                /A1<CARRET>   CLOSES THE CURRENTLY OPEN REGISTER (AS LINEFEE
                /OPENS THE NEXT REGISTER
                /
                /<SPACE> AND + BOTH MEAN ADDITION
                /
                /- MEANS SUBTRACTION
                /
                /D MEANS THE NUMBER FOLLOWING IS DECIMAL
                /
                /" MEANS THAT THE TWO CHARACTERS FOLLOWING ARE TO BE TAKEN
                /AS LITERAL ASCII VALUES AND PACKED INTO A WORD LEFT HALF, R
                /
```

```
/= TYPES OUT THE OCTAL VALUE OF THE LAST INPUT
/EG: 3=3, 3+6=11, D11=13, "AB=40502, "AB+D10=40514, .=3033
/
/> TYPES OUT THE ASCII VALUE OF THE LAST OUTPUT (IE <BACKARR
/EG: 34567/   40502   >   AB
/
/
/A1,A2,A3Z   CLEARS ["ZEROES"] CORE BETWEEN LIMITS = A1 IS TI
/CONSTANT CORE WILL BE CLEARED TO, A2 AND A3 ARE THE (INCLI
/LOWER AND UPPER LIMITS, REPECTIVELY.
/
/A1,A2W   DUMPS OUT ["WRITES"] CORE BETWEEN LIMITS = A1 ANI
/ARE THE (INCLUSIVE) LOWER AND UPPER LIMITS, RESPECTIVELY.
/
/A1,A2,A3S   STARTS UP A PROGRAM (I.E. CAUSE A TRANSFER TO
/LOCATION), A3 IS THE (14 BIT) ADDRESS AT WHICH THE PROGRAM
/IS TO BE STARTED, A2 SPECIFIES THE CONTENTS OF THE A REGISTI
/WHEN THE PROGRAM IS STARTED UP, A1 SPECIFIES THE
/X REGISTER WHEN THE PROGRAM IS STARTED UP.
/
/A1C   CROSSPATCHES DDT TO IMP A1.
/MESSAGES ARE THEN TRANSMITTED TO IMP A1
/FOR EVERY CHARACTER THAT IS TYPED IN
/
/A1,A2H   SETS UP THE HEADER FOR MESSAGE
/TRANSMISSION - MESSAGES ARE TRANSMITTED BY
/TYPING A SEMICOLON, THEN ALL THE CHARACTERS UP TO THE
/NEXT SEMICOLON ARE SENT OFF AS A MESSAGE TO
/DESTINATION AS DETERMINED BY THIS HEADER.
/A1 GIVES LEADER WORD 1 (DESTINATION)
/A2 GIVES LEADER WORD 2 (LINK #).
/
/A1$    SENDS AN IMP GOING DOWN MESSAGE TO ALL THE HOSTS
/AT THE SITE TO WHICH DDT IS CROSSPATCHED.
/A1 IS THE LINK OR SUB-CODE WORD AND MUST BE SUPPLIED
/
/Q   TURNS DDT OUTPUT OFF AND ON - REVERSES THE CURRENT STAT
/IF DDT TYPES NOTHING BACK IT IS OFF ["QUIET"]
/OTHERWISE DDT WILL TYPE A CARRIAGE RETURN-LINE FEED
/
/I   PRODUCES AN INTERRUPT PRINT
/A DUMP OF SOME INTERESTING INTERRUPT LOCATIONS
/
/!   PRODUCES A QUEUE PRINT
/A DUMP OF SOME INTERESTING QUEUE AND TABLE LOCATIONS
/
/A1,A2,A3,A4[E N]   WORD SEARCHES:  UNDER A MASK OF A1, DDT
/SEARCH FOR WORDS EQUAL (NOTEQUAL) TO A2 BETWEEN THE
/LIMITS A3 TO A4.
/
```

```
                /
                /******************SENSE SWITCH FOUR**********************
                /
                /  HAVING SENSE SWITCH 4 DOWN INHIBITS ALL OF
                /DDT'S COMMANDS WHICH COULD DESTROY THE PROGRAM BEING
                /LSOKED AT,  IF YOU ATTEMPT TO CHANGE CORE WITH SS4 DOWN, D
                /WILL TYPE "#    " AT YOU AND COMPLETELY IGNORE THE COMMAND,
                /THE COMMANDS AFFECTED ARE:  S, Q, Z,$, AND LINEFEED, UPARRO
                /CARRIAGE RETURN IF TRYING TO SUPPLY NEW CONTENTS,

                /******************NULL ARGUMENT CONVENTIONS*****************
                /
                /FOR =,CR,LF,", AND <BACKSLASH> IF
                /THE ARGUMENT A1 IS LEFT OUT, THE LAST NUMBER TYPED BY DDT W
                /BE USED AS THE ARGUMENT,
                /
                /FOR E, N, Z AND W, IF EITHER (OR BOTH) OF THE LIMITS ARE LE
                /DDT WILL USE THE LAST LIMITS SPECIFIED FOR EITHER A Z OR /
                /OR AN E OR AN N,
                /IF THE VALUE IS LEFT OUT IN AN E, N OR Z COMMAND, THE LAST
                /SPECIFIED IN ANY E, N, OR Z COMMAND WILL BE USED,  IF THE
                /IS LEFT OUT OF AN E OR N COMMAND IT WILL BE SUPPLIED FROM
                /THE LAST E OR N DONE, OR -1 IF NO MASK HAS EVER
                /BEEN SPECIFIED,
                /
                /FOR S, ANY ARGUMENTS LEFT OUT WILL BE SUPPLIED FROM THE LAS
                /THOSE ARGUMENTS WERE SPECIFIED,
                /
                /*************************************************************
```

```
                        LEV BCK
                        /DDT - STAND ALONE AND BACKGROUND
                        /THE SAME PROGRAM IS USED FOR STAND ALONE USE
                        /AND AS A BACKGROUND PROGRAM RUNNING WITH THE IMP SYSTEM
                        /THE ONLY DIFFERENCE IS IN THE INPUT AND OUTPUT PORTS
                        /CALLS TO INPUT A CHARACTER AND TO OUTPUT A CHARACTER
                        /ARE MADE INDIRECT THROUGH LDIN AND LDOT RESPECTIVELY
                        /STAND ALONE THESE POINT TO SIMPLE TTY I/O HANDLERS
                        /UNDER IMPSYS THESE POINT TO COMPLEX COROUTINES IN BACKGRO
23033 005633 7  DDSA:   LDA (DDA3)      /ENTRY TO STAND ALONE DDT
23034 011163 7          STA LDIN        /SET UP STAND ALONE INPUT
23035 005634 7          LDA (DDA4)
23036 011164 7          STA LDOT        /SET UP STAND ALONE OUTPUT
23037 005635 7          LDA (QNUL)
23040 011632 7          STA QPTR        /TURN OFF QUIET MODE
23041 011162 7          STA BBNF        /SET DEST TO NON-BBN
23042 140040 7          CRA
23043 010473 7          STA OVRDF       /TURN OFF SOFTWARE SS4
23044 000013 7          EXA
23045 003076 7          JMP DCLR        /GO TO RESTART ENTRY

23046 000000 7  DDA3:   0               /STAND ALONE DDT INPUT
23047 131004 7          TTINAC          /GET INPUT CHAR
23050 003047 7          JMP .-1
23051 007636 7          ANA (177)
23052 013637 7          ERA (200)       /ALWAYS PUT IN PARITY BIT
23053 103046 7          JMP DDA3 I

23054 000000 7  DDA4:   0               /STAND ALONE DDT OUTPUT
23055 070104 7          TTSNBZ
23056 003075 7          JMP DDA5        /BUSY, SO GET THE INPUT CHAR
23057 030104 7          TTSOM           /GO INTO OUTPUT MODE
23060 170004 7          TTOTA           /DO OUTPUT
23061 003060 7          JMP .-1
23062 070004 7          TTSRDY
23063 003062 7          JMP .-1
23064 030004 7          TTSIM           /GO BACK TO INPUT MODE
23065 103054 7          JMP DDA4 I

                        /START BACKGROUND DDT OUTPUT
23066 005640 7  DDTI:   LDA (DOUT)
23067 011164 7          STA LDOT
23070 005641 7          LDA (DIN)
23071 011163 7          STA LDIN
23072 005635 7          LDA (QNUL)
23073 011632 7          STA QPTR
23074 103642 7          JMP (DDTI1) I
```

```
                    /DDT
                    /NOTE THAT DDT RUNS WITH INTERRUPTS LOCKED - PI OFF
                    /IT ALSO RUNS WITH EXTENDED ADDRESSING ENABLED - EA ON
                    /MAIN LISTEN LOOP

23075 021046 7      DDA5:     JST DDA3
                              LCK ALL
23076 021165 7 0    DCLR:     JST CRLF        /RESTART ENTRY
23077 140040 7 0              CRA
23100 011145 7 0              STA PRS
23101 021261 7 0    LF:       JST CLS
23102 005643 7 0              LDA (215)       /TYPE A CR
23103 121164 7 0              JST LDOT I
23104 021215 7 0    CLSE:     JST CSL
23105 140040 7 0              CRA
23106 011145 7 0              STA PRS
23107 011144 7 0              STA PAR1
23110 121163 7 0    LSE:      JST LDIN I
23111 006752 7 0              ANA C77
23112 011161 7 0              STA CHARIN
23113 015644 7 0              ADD (DTAB)      /DISPATCH TABLE
23114 010000 7 0              STA 0
23115 044000 7 0              LDA 0 X
23116 100400 7 0              SPL
23117 003122 7 0              JMP DDTDIS      /SIGN BIT MEANS ALWAYS DO IT
23120 005162 7 0              LDA BBNF        /ELSE ONLY IF OVERRIDDEN OR BBN
23121 021126 7 0              JST SS4ON
23122 044000 7 0 DDTDIS:      LDA 0 X
23123 010000 7 0              STA 0
23124 005161 7 0              LDA CHARIN
23125 042000 7 0              JMP 0 X
```

```
23126 000000 7 0 SS4ON:   0
23127 101040 7 0          SNZ              /A IS 0 IF OK (E.G. BBNF)
23130 103126 7 0          JMP SS4ON I
23131 004473 7 0          LDA OVRDF        /ELSE REQUIRE OVERRIDE ON
23132 101040 7 0          SNZ
23133 100002 7 0          SR4              /OR SS4 ON
23134 103126 7 0          JMP SS4ON I      /ELSE FALL INTO RUB
23135 005645 7 0 RUB:     LDA (243)        /TYPE A #
23136 121164 7 0 RUB1:    JST LDOT I
23137 021173 7 0 RUB2:    JST TAB          /AND THREE SPACES
23140 003104 7 0          JMP CLSE

                  LEV VAR
23141         V           BSS 1            /PARAMETERS STORAGE BLOCK
23142         V           BSS 1
23143         V           BSS 1
23144         V   PAR1:   BSS 1
23145         V   PRS:    BSS 1            /PARAMETER SUPPLIED - 1=> YES (R T
23146         V   SYL:    BSS 1            /LAST SYLLABLE TYPED IN
23147 000000  V   LAST:   0                /LAST WORD TYPED (CURRENT VALUE OF
23150 000000  V   PT:     0                /CURRENT VALUE OF .
23151 000000  V   OPEN:   0                /ADDRESS OF OPEN REG (<0 IF NONE)
23152 000000  V   DLO:    0                /LOW LIMIT
23153 000000  V   DHI:    0                /HI LIMIT
23154 000000  V   VAL:    0                /VALUE FOR CLEAR AND SEARCHES
23155 000000  V   CNT:    0                /COUNT FOR LOOPING
23156 177777  V   SMSK:   -1               /MASK FOR SEARCHES
23157 000000  V   SP:     0                /LAST DDT START ADDRESS
23160 000000  V   SX:     0                /LAST DDT START X REG
23161         V   CHARIN:  BSS 1            /TEMP INPUT CHARACTER
23162         V   BBNF:    BSS 1            /0 IF DDT MESS FROM BBN

                  LEV CON
23163 024052  C   LDIN:   DIN              /DDT  INPUT CHAR ROUTINE
23164 024163  C   LDOT:   DOUT             /DDT OUTPUT CHAR ROUTINE
```

```
                    /UTILITY SUBROUTINES AND STUFF

                    LEV BCK    LCK ALL
23165 000000 7 0 CRLF:      0
23166 005643 7 0            LDA (215)       /TYPE A CARRIAGE RETURN
23167 121164 7 0            JST LDOT I
23170 005646 7 0            LDA (212)       /AND A LINE FEED
23171 121164 7 0            JST LDOT I
23172 103165 7 0            JMP CRLF I

23173 000000 7 0 TAB:       0
23174 005647 7 0            LDA (240)       /TYPE THREE SPACES
23175 121164 7 0            JST LDOT I
23176 121164 7 0            JST LDOT I
23177 121164 7 0            JST LDOT I
23200 103173 7 0            JMP TAB I

23201 000000 7 0 GP:        0               /GET A PARAMETER
23202 007145 7 0            ANA PRS
23203 101040 7 0 DSNZ:      SNZ             /WAS PARAM SUPPLIED?
23204 025201 7 0            IRS GP          /NO, SKIP
23205 045144 7 0            LDA PAR1 X      /YES, RETURN VALUE
23206 103201 7 0            JMP GP I

23207 000000 7 0 GP1:       0               /GET PARAMETER 1
23210 072113 7 0            LDX ZERO
23211 004114 7 0            LDA ONE
23212 021201 7 0            JST GP
23213 025207 7 0            IRS GP1         /GOT VALUE, GIVE SKIP RETURN
23214 103207 7 0            JMP GP1 I

23215 000000 7 0 CSL:       0               /COMBINE IN A SYLLABLE
23216 140040 7 0            CRA
23217 027146 7 0            IMA SYL
23220 100000 7 0 CSLX:      SKP             /SKP (DEFAULT) MEANS DO ADDITION
23221 140407 7 0            TCA             /ELSE DO SUBTRACTION
23222 015144 7 0            ADD PAR1        /COMBINE WITH PARAM 1
23223 011144 7 0            STA PAR1        /ACCUMULATE IN PARAM 1
23224 004112 7 0            LDA SIGN
23225 011220 7 0            STA CSLX        /RESET +/- FLAG
23226 103215 7 0            JMP CSL I
```

```
23227 000000 7 0 PAC:    0                  /PRINT ADDRESS AND CONTENTS
23230 140100 7 0         SSP
23231 011244 7 0         STA OPN            /SAVE ADDRESS OF REG TO BE PRINTED
23232 021165 7 0         JST CRLF           /TYPE A CR = LF
23233 005244 7 0         LDA OPN
23234 021302 7 0         JST OPT            /TYPE THE ADDRESS IN OCTAL
23235 005650 7 0         LDA (257)          /TYPE A /
23236 121164 7 0         JST LDOT I
23237 021207 7 0         JST GP1
23240 025145 7 0         IRS PRS
23241 005244 7 0         LDA OPN
23242 021244 7 0         JST OPN            /OPEN REG AND TYPE CONTENTS
23243 103227 7 0         JMP PAC I

23244 000000 7 0 OPN:    0                  /OPEN A REGISTER AND TYPE ITS CONT
23245 140100 7 0         SSP
23246 011151 7 0         STA OPEN
23247 021207 7 0         JST GP1
23250 003253 7 0         JMP OPN1           /NO ARG, DON'T RESET .
23251 005151 7 0         LDA OPEN
23252 011150 7 0         STA PT
23253 021173 7 0 OPN1:   JST TAB
23254 073151 7 0         LDX OPEN
23255 044000 7 0         LDA 0 X
23256 021302 7 0         JST OPT
23257 021173 7 0         JST TAB
23260 103244 7 0         JMP OPN I

23261 000000 7 0 CLS:    0                  /CLOSE A REGISTER
23262 005651 7 0         LDA (JMP DIG1)
23263 011355 7 0         STA DIG
23264 021215 7 0         JST CSL
23265 005151 7 0         LDA OPEN
23266 101400 7 0         SMI
23267 021207 7 0         JST GP1
23270 003277 7 0         JMP CLS1           /NO NEW CONTENTS FOR THE REG
23271 011147 7 0         STA LAST
23272 004114 7 0         LDA ONE            /REAL OVERRIDE NEEDED
23273 021126 7 0         JST SS4ON
23274 005147 7 0         LDA LAST
23275 073151 7 0         LDX OPEN
23276 050000 7 0         STA 0 X
23277 140500 7 0 CLS1:   SSM
23300 011151 7 0         STA OPEN
23301 103261 7 0         JMP CLS I
```

```
23302 000000 7 0 OPT:    0
23303 011147 7 0         STA LAST
23304 000201 7 0         IAB
23305 072125 7 0         LDX MINUS5
23306 004121 7 0         LDA MINUS1
23307 011333 7 0         STA OPTT
23310 005652 7 0         LDA (130)
23311 041077 7 0         LLL 1
23312 023653 7 0 OPT1:   CAS (260)      /ZERO?
23313 100000 7 0         SKP
23314 003326 7 0         JMP OPT4       /SEE IF WE SHOULD SUPRESS IT
23315 025333 7 0         IRS OPTT
23316 101000 7 0 DNOP:   NOP
23317 121164 7 0 OPT3:   JST LDOT I
23320 005654 7 0 OPT2:   LDA (26)
23321 041075 7 0         LLL 3
23322 024000 7 0         IRS 0
23323 003312 7 0         JMP OPT1
23324 121164 7 0         JST LDOT I     /ALWAYS PRINT LOWEST ORDER DIGIT
23325 103302 7 0         JMP OPT I
23326 025333 7 0 OPT4:   IRS OPTT
23327 003317 7 0         JMP OPT3
23330 004121 7 0         LDA MINUS1     /SUPRESS A ZERO
23331 011333 7 0         STA OPTT
23332 003320 7 0         JMP OPT2
23333        7 0 OPTT:   BSS 1

23334 021173 7 0 ASCOUT: JST TAB
23335 005147 7 0         LDA LAST
23336 141140 7 0         ICL
23337 121164 7 0         JST LDOT I
23340 005147 7 0         LDA LAST
23341 141050 7 0         CAL
23342 003136 7 0         JMP RUB1

23343 021215 7 0 COM:    JST CSL        /, DISPATCH
23344 140040 7 0         CRA
23345 027144 7 0         IMA PAR1
23346 027143 7 0         IMA PAR1-1
23347 027142 7 0         IMA PAR1-2
23350 027141 7 0         IMA PAR1-3
23351 005145 7 0         LDA PRS
23352 041477 7 0         LGL 1
23353 011145 7 0         STA PRS
23354 003110 7 0         JMP LSE
```

```
                        /DISPATCHER ROUTINES
23355          7 0 DIG:     BSS 1          /JMP DIG1  OR  NOP
23356 015146 7 0            ADD SYL
23357 015146 7 0            ADD SYL
23360 040175 7 0 DIG1:      LRS 3          /DIGITS DISPATCH
23361 015146 7 0            ADD SYL
23362 041175 7 0            LLS 3
23363 017655 7 0            SUB (60)
23364 011146 7 0 DIG2:      STA SYL
23365 021207 7 0            JST GP1
23366 025145 7 0            IRS PRS
23367 003110 7 0            JMP LSE

23370 005316 7 0 DECIN:     LDA DNOP
23371 011355 7 0            STA DIG
23372 003110 7 0            JMP LSE

23373 021215 7 0 EQS:       JST CSL        /EQUALS DISPATCH
23374 005144 7 0            LDA PAR1
23375 021302 7 0            JST OPT
23376 003137 7 0            JMP RUB2

23377 021215 7 0 PLUS:      JST CSL        /ADDITION DISPATCH
23400 003110 7 0            JMP LSE

23401 021215 7 0 MIN:       JST CSL        /MINUS DISPATCH
23402 005316 7 0            LDA DNOP
23403 011220 7 0            STA CSLX
23404 003110 7 0            JMP LSE

23405 005150 7 0 PTOP:      LDA PT         /. DISPATCH
23406 003364 7 0            JMP DIG2

23407 073146 7 0 STAR:      LDX SYL        /* DISPATCH
23410 044000 7 0            LDA 0 X
23411 003364 7 0            JMP DIG2

23412 005147 7 0 BARR:      LDA LAST       /<BACKARROW> DISPATCH
23413 003364 7 0            JMP DIG2

23414 005656 7 0 BOP:       LDA (IHTT)     /HOST OUTPUT TIMER
23415 003364 7 0            JMP DIG2       /FOR WBB = HOST INTERFACE DEBUG

23416 105657 7 0 TOP:       LDA (WHOTTY) I /TTY OUTPUT SOURCE
23417 003364 7 0            JMP DIG2       /FOR NCC OPS= WHO IS TYPING ON TTY
```

```
23420 021215 7 0 SLH:     JST CSL          // DISPATCH
23421 021207 7 0          JST GP1
23422 005147 7 0          LDA LAST
23423 021244 7 0 SLH2:    JST OPN
23424 003104 7 0          JMP CLSE

23425 021215 7 0 BS:      JST CSL          /BACKSLASH DISPATCH
23426 021207 7 0          JST GP1
23427 005147 7 0          LDA LAST
23430 011147 7 0          STA LAST
23431 007660 7 0          ANA (1000)       /GET PAGE BIT
23432 100040 7 0          SZE              /PAGE 0?
23433 005150 7 0          LDA PT           /NO, THIS PAGE
23434 013147 7 0          ERA LAST
23435 007661 7 0          ANA (77000)
23436 013147 7 0          ERA LAST
23437 003423 7 0          JMP SLH2

23440 021261 7 0 UA:      JST CLS          /^ DISPATCH
23441 004121 7 0          LDA MINUS1
23442 003445 7 0          JMP CR1

23443 021261 7 0 CR:      JST CLS          /CARRIAGE RETURN DISPATCH
23444 004114 7 0          LDA ONE
23445 015150 7 0 CR1:     ADD PT
23446 011150 7 0          STA PT
23447 021227 7 0          JST PAC
23450 003104 7 0          JMP CLSE

23451 121163 7 0 ASCIN:   JST LDIN I
23452 141240 7 0          ICR
23453 011147 7 0          STA LAST
23454 121163 7 0          JST LDIN I
23455 013147 7 0          ERA LAST
23456 011147 7 0          STA LAST
23457 003364 7 0          JMP DIG2

23460 021215 7 0 S:       JST CSL          /S DISPATCH
23461 021207 7 0          JST GP1
23462 100000 7 0          SKP
23463 011157 7 0          STA SP
23464 004114 7 0          LDA ONE          /REAL OVERRIDE, NOT JUST BBNF
23465 021126 7 0          JST SS4ON
23466 072122 7 0          LDX MINUS2
23467 004117 7 0          LDA FOUR
23470 021201 7 0          JST GP
23471 011160 7 0          STA SX
23472 072121 7 0          LDX MINUS1
23473 004115 7 0          LDA TWO
23474 021201 7 0          JST GP
23475 101000 7 0          NOP
23476 073160 7 0          LDX SX
23477 103157 7 0          JMP SP I
```

```
23500 021126 7 0 Z:       JST SS4ON      /A NOT ZERO = REAL OVERRIDE
23501 005662 7 0          LDA (JMP Z1)
23502 003513 7 0          JMP SCH1
23503 005154 7 0 Z1:      LDA VAL
23504 050000 7 0          STA 0 X
23505 003553 7 0          JMP SCH2

23506 005526 7 0 W:       LDA DSKP
23507 003513 7 0          JMP SCH1       /W DISPATCH
23510 005570 7 0 EQ:      LDA DSZE
23511 003513 7 0          JMP SCH1       /E DISPATCH
23512 005203 7 0 NEQ:     LDA DSNZ       /N DISPATCH
23513 011546 7 0 SCH1:    STA SXEC       /SET UP TEST
23514 072123 7 0          LDX MINUS3
23515 004751 7 0          LDA TEN
23516 021201 7 0          JST GP
23517 011156 7 0          STA SMSK       /FIRST PARAM = MASK
23520 072122 7 0          LDX MINUS2
23521 004117 7 0          LDA FOUR
23522 021201 7 0          JST GP
23523 011154 7 0          STA VAL        /SECOND PARAM = VALUE
23524 021215 7 0          JST CSL
23525 021207 7 0          JST GP1
23526 100000 7 0 DSKP:    SKP
23527 011153 7 0          STA DHI        /FOURTH PARAM = HI BOUND
23530 072121 7 0          LDX MINUS1
23531 004115 7 0          LDA TWO
23532 021201 7 0          JST GP
23533 011152 7 0          STA DLO        /THIRD PARAM = LO BOUND
23534 005152 7 0          LDA DLO
23535 017153 7 0          SUB DHI
23536 016114 7 0          SUB ONE
23537 011155 7 0          STA CNT        /LEAVE COUNT IN CNT
23540 101400 7 0          SMI
23541 003135 7 0          JMP RUB        /INVERTED BLOCK
23542 073152 7 0          LDX DLO
23543 044000 7 0 SCH3:    LDA 0 X
23544 013154 7 0          ERA VAL        /COMPARE
23545 007156 7 0          ANA SMSK       /MASK OFF BITS TO BE IGNORED
23546        7 0 SXEC:    BSS 1          /TEST = SET UP BY CALLS
23547 003553 7 0          JMP SCH2       /FAILURE
23550 004000 7 0          LDA 0
23551 021227 7 0          JST PAC
23552 073151 7 0          LDX OPEN
23553 024000 7 0 SCH2:    IRS 0
23554 025155 7 0          IRS CNT
23555 003543 7 0          JMP SCH3
23556 003076 7 0          JMP DCLR
```

```
23557 021126 7 0 DOWNM:   JST SS4ON       /A NOT ZERO
23560 021215 7 0          JST CSL         /$ DISPATCH
23561 021207 7 0          JST GP1
23562 003135 7 0          JMP RUB         /MUST HAVE SS4 ON AND GIVE A PARAM
23563 120672 7 0          JST DODXA I     RET BCK
23564 121663 7            JST (IHDOWN) I /TELL ALL HOSTS IMP GOING DOWN
23565 000013 7            EXA
23566 003076 7            JMP DCLR

                     LCK ALL
23567 004473 7 0 OVRD:    LDA OVRDF       /0 DISPATCH
23570 100040 7 0 DSZE:    SZE
23571 003575 7 0          JMP OVRD1       /LEAVING OVERRIDE MODE
23572 005162 7 0          LDA BBNF        /FROM BBN
23573 021126 7 0          JST SS4ON
23574 140040 7 0          CRA             /THEN YOU CAN ENTER OVERRIDE
23575 013664 7 0 OVRD1:   ERA (20)
23576 010473 7 0          STA OVRDF
23577 040677 7 0          ARR 1
23600 013665 7 0          ERA (306)       /MAKE AN N OR AN F
23601 121164 7 0          JST LDOT I      /TYPE ON OR OFF
23602 003076 7 0          JMP DCLR

23603 021215 7 0 C:       JST CSL
23604 021207 7 0          JST GP1         /CROSSPATCH
23605 003135 7 0          JMP RUB
23606 007666 7 0          ANA (0 0 177777"X"HICODE)
23607 013667 7 0          ERA (PRIBIT 0 FORIMP)
23610 111670 7 0          STA (MED0) I    /SET "FOR IMP" BIT
23611 003076 7 0          JMP DCLR

23612 021215 7 0 H:       JST CSL         /SET UP A HEADER
23613 072121 7 0          LDX MINUS1
23614 004115 7 0          LDA TWO
23615 021201 7 0          JST GP
23616 111671 7 0          STA (MHD0) I
23617 021207 7 0          JST GP1
23620 100000 7 0          SKP
23621 111672 7 0          STA (MHD1) I
23622 003076 7 0          JMP DCLR

23623 021126 7 0 QDSP:    JST SS4ON
23624 005632 7 0          LDA QPTR        /QUIET MODE CONTROL
23625 027164 7 0          IMA LDOT
23626 011632 7 0          STA QPTR
23627 003076 7 0          JMP DCLR

23630 000000 7 0 QNUL:    0               /NULL SUBROUTINE
23631 103630 7 0          JMP .-1 I
                     LEV VAR
23632        V    QPTR:   BSS 1
```

```
23633 023046 C   LEV CON   CONSTANTS
23634 023054 C
23635 023630 C
23636 000177 C
23637 000200 C
23640 024163 C
23641 024052 C
23642 024157 C
23643 000215 C
23644 024400 C
23645 000243 C
23646 000212 C
23647 000240 C
23650 000257 C
23651 003360 C
23652 000130 C
23653 000260 C
23654 000026 C
23655 000060 C
23656 016306 C
23657 025506 C
23660 001000 C
23661 077000 C
23662 003503 C
23663 003525 C
23664 000020 C
23665 000306 C
23666 170377 C
23667 140000 C
23670 025165 C
23671 025166 C
23672 025167 C
02432 176700 C              PAGEND 23,UNCON,4
```

```
                    LEV BCK
24012 120666 7      DIN4:     JST SUCK I
24013 140500 7                SSM @"A"PRIBIT
24014 011050 7                STA DSRC
24015 007500 7                ANA (FRMIMP @ SRCEHI)
24016 013501 7                ERA (FRMIMP @ BBNIMP)
24017 100040 7                SZE               /SET FLAG IF MESS FROM BBN IMP TTY
24020 013502 7                ERA (@ @ BBNIMP"X"BBNTIP)
24021 100040 7                SZE               /SET FLAG IF MESS FROM BBN TIP TTY
24022 013503 7                ERA (FRMIMP @ BBNTIP"X"PDP1D)
24023 111504 7                STA (BBNF) I      /SET FLAG IF MESS FROM BBN IMP HOST
24024 120666 7                JST SUCK I
24025 011051 7                STA DSRC+1
24026 120666 7      DIN1:     JST SUCK I
24027 003040 7                JMP DIN2
24030 011047 7                STA DINW
24031 141050 7                CAL
24032 101040 7                SNZ
24033 003036 7                JMP DIN3          /NOTHING AT ALL IN THIS WORD
24034 005047 7                LDA DINW
24035 021076 7                JST DINR
24036 025067 7      DIN3:     IRS DEND          /HAVE OUTPUT CLOSE OFF THEIR MESSAGI
24037 003012 7                JMP DIN4          /GO BACK FOR NEXT MESSAGE

24040 011047 7      DIN2:     STA DINW          /FEED DDT A WORD
24041 021076 7                JST DINR
24042 005047 7                LDA DINW
24043 141340 7                ICA
24044 021076 7                JST DINR
24045 003026 7                JMP DIN1

                    LEV VAR
24046         V     DINC:     BSS 1
24047         V     DINW:     BSS 1
24050         V     DSRC:     BSS 2             /DDT DEST/SOURCE
```

```
                        LEV BCK
24052 000000 7  DIN:    0                   /DDT CALLS HERE TO GET A CHARACTER
24053 072114 7  DIN7:   LDX ONE
24054 001001 7          INH ALL
24055 120672 7 0        JST DODXA I         RET BCK
24056 100000 7          SKP
24057 120665 7  DIN8:   JST DOZE I
24060 140040 7          CRA
24061 027067 7          IMA DEND            /TIME TO END A MESSAGE?
24062 101040 7          SNZ
24063 003070 7          JMP DIN9            /NO
24064 005505 7          LDA (DIN7)          /CLOSE A MESSAGE
24065 011163 7          STA DOUT
24066 003116 7          JMP DOT2
24067        7  DEND:   BSS 1

24070 027046 7  DIN9:   IMA DINC            /INPUT CHAR READY?
24071 101040 7          SNZ
24072 003057 7          JMP DIN8
24073 001001 7          INH ALL
24074 000013 7 0        EXA
24075 103052 7 0        JMP DIN I

                        LEV BCK
24076 000000 7  DINR:   0                   /ROUTINE CALLS HERE TO FEED A CHAR
24077 101400 7          SMI
24100 103076 7          JMP DINR I
24101 140100 7          SSP
24102 141140 7          ICL
24103 100040 7          SZE
24104 003110 7          JMP DINA
24105 010472 7          STA DDTI            /WE ARE GIVING DDT A "BREAK"
24106 005335 7          LDA LRET
24107 011052 7          STA DIN
24110 011046 7  DINA:   STA DINC
24111 120667 7          JST WAIT I          /LET DDT GRAB THE CHAR
24112 005046 7          LDA DINC
24113 100040 7          SZE
24114 003111 7          JMP .+3
24115 103076 7          JMP DINR I
```

```
24116 005207 7   DOT2:    LDA DOTW        /START HERE TO CLOSE OFF LAST MESSAG
24117 073506 7   DOT5:    LDX (100001)
24120 120664 7             JST JAM I
24121 004112 7   DOT6:    LDA SIGN        /START HERE WITH EMPTY WORLD
24122 021176 7             JST DOTR
24123 072114 7             LDX ONE
24124 005050 7             LDA DSRC        /*SEND DEST HOST
24125 120664 7             JST JAM I       /(=SOURCE OF LAST MESS RECVD)
24126 005051 7             LDA DSRC+1      /*SEND DEST LINK
24127 120664 7             JST JAM I       /(=LINK OF LAST MESS RECVD)
24130 005507 7             LDA (-500.)     /NUMBER OF WORDS PER MESSAGE
24131 011213 7             STA DCNT
24132 005210 7             LDA DOTA
24133 007510 7             ANA (177)
24134 000201 7             IAB
24135 041050 7   DOT3:     LLL 24.
24136 013511 7             ERA (100200)
24137 021176 7             JST DOTR
24140 004472 7             LDA DDTI        /DDT BEING INTERRUPTED?
24141 100040 7             SZE
24142 003152 7             JMP DOT4        /YES, SUPRESS OUTPUT
24143 000201 7             IAB
24144 072114 7             LDX ONE
24145 120664 7             JST JAM I       /*SEND TWO CHARS PER WORD
24146 025213 7             IRS DCNT
24147 003154 7             JMP DOT7
24150 004112 7             LDA SIGN
24151 003117 7             JMP DOT5

24152 005512 7   DOT4:     LDA (LSE)
24153 011163 7             STA DOUT
24154 004112 7   DOT7:     LDA SIGN
24155 021176 7             JST DOTR
24156 003135 7             JMP DOT3

24157 005335 7   DOTI1:    LDA LRET
24160 011163 7             STA DOUT
24161 011067 7             STA DEND
24162 003121 7             JMP DOT6
```

```
24163 000000 7    DOUT:     0                 /DDT CALLS HERE WITH A CHAR TO TYPE
24164 011210 7              STA DOTA
24165 007510 7              ANA (177)
24166 013207 7              ERA DOTW
24167 000201 7              IAB
24170 011211 7              STA DOTB
24171 033212 7              STX DOTX
24172 001001 7              INH ALL
24173 120672 7 0            JST DODXA I       RET BCK
24174 072114 7              LDX ONE
24175 103176 7              JMP DOTR I

24176 000000 7    DOTR:     0                 /ROUTINES CALL HERE TO RETURN TO DD
24177 011207 7              STA DOTW
24200 005211 7              LDA DOTB
24201 000201 7              IAB
24202 005210 7              LDA DOTA
24203 073212 7              LDX DOTX
24204 001001 7              INH ALL
24205 000013 7 0            EXA
24206 103163 7 0            JMP DOUT I

                  LEV VAR
24207          V  DOTW:     BSS 1
24210          V  DOTA:     BSS 1
24211          V  DOTB:     BSS 1
24212          V  DOTX:     BSS 1
24213          V  DCNT:     BSS 1             /NUMBER OF WORDS LEFT IN OUTPUT PAC
```

```
                    LEV BCK    LCK ALL
24214 005337 7 0 QP:           LDA QPC1        /QUEUE PRINT
24215 011360 7 0               STA QT1
24216 005340 7 0 QPQ1:         LDA QPC2
24217 015360 7 0               ADD QT1
24220 011361 7 0               STA QT2
24221 010000 7 0               STA 0
24222 044000 7 0               LDA 0 X
24223 101040 7 0               SNZ
24224 003244 7 0               JMP QPQ3
24225 121332 7 0               JST QPCR I
24226 004000 7 0               LDA 0
24227 121333 7 0               JST QPOP I
24230 121334 7 0               JST QPTB I
24231 005513 7 0               LDA (-10)
24232 011362 7 0               STA QT3
24233 073361 7 0 QPQ2:         LDX QT2
24234 044000 7 0               LDA 0 X
24235 101040 7 0               SNZ
24236 003244 7 0               JMP QPQ3
24237 011361 7 0               STA QT2
24240 121333 7 0               JST QPOP I
24241 121334 7 0               JST QPTB I
24242 025362 7 0               IRS QT3
24243 003233 7 0               JMP QPQ2
24244 025360 7 0 QPQ3:         IRS QT1
24245 003216 7 0               JMP QPQ1
24246 005357 7 0               LDA QTB3
24247 011360 7 0               STA QT1
```

```
24250 073360 7 0 QPB1:    LDX QT1
24251 045350 7 0          LDA QTB1+QTBL X
24252 011361 7 0          STA QT2
24253 045357 7 0          LDA QTB2+QTBL X
24254 011362 7 0          STA QT3
24255 073362 7 0 QPB2:    LDX QT3
24256 044000 7 0          LDA 0 X
24257 101040 7 0          SNZ
24260 003305 7 0          JMP QPB4
24261 011363 7 0          STA QT4
24262 005362 7 0          LDA QT3
24263 010000 7 0          STA 0
24264 101400 7 0          SMI
24265 003275 7 0          JMP QPB3
24266 025362 7 0          IRS QT3
24267 044001 7 0          LDA 1 X
24270 023506 7 0          CAS (100001)
24271 100000 7 0          SKP
24272 003305 7 0          JMP QPB4
24273 017514 7 0          SUB (BUFE 0 I)
24274 011363 7 0          STA QT4
24275 121332 7 0 QPB3:    JST QPCR I
24276 005362 7 0          LDA QT3
24277 140100 7 0          SSP
24300 121333 7 0          JST QPOP I
24301 121334 7 0          JST QPTB I
24302 005363 7 0          LDA QT4
24303 121333 7 0          JST QPOP I
24304 121334 7 0          JST QPTB I
24305 025362 7 0 QPB4:    IRS QT3
24306 025361 7 0          IRS QT2
24307 003255 7 0          JMP QPB2
24310 025360 7 0          IRS QT1
24311 003250 7 0          JMP QPB1
24312 103335 7 0          JMP QPND I

24313 073515 7 0 IP:      LDX (-IPL)      /INTERRUPT PRINT
24314 045400 7 0 IP1:     LDA IPT+IPL X
24315 033360 7 0          STX QT1
24316 121336 7 0          JST QPAC I      /PRINT SOME KEY PARAMETERS
24317 073360 7 0          LDX QT1
24320 024000 7 0          IRS 0
24321 003314 7 0          JMP IP1
24322 073516 7 0          LDX (STDIL-0-TASKIL)
24323 044104 7 0 IP2:     LDA TASKIL+1 X
24324 033360 7 0          STX QT1
24325 121336 7 0          JST QPAC I      /PRINT ALL INTERRUPT ENTRANCES
24326 073360 7 0          LDX QT1
24327 024000 7 0          IRS 0
24330 003323 7 0          JMP IP2
24331 103335 7 0          JMP QPND I
```

```
24332 023165 7 0 QPCR:    CRLF            /QUEUE PRINT CONSTANTS AND VARIABLES
24333 023302 7 0 QPOP:    OPT
24334 023173 7 0 QPTB:    TAB
                  LRET:                   /SAME AS QPND
24335 023076 7 0 QPND:    DCLR
24336 023227 7 0 QPAC:    PAC
24337 177727 7 0 QPC1:    -QUEUEL
24340 000343 7 0 QPC2:    QUEUEB+QUEUEL

24341 177770 7 0 QTB1:    -PPTL
24342 177770 7 0          -TH
24343 177770 7 0          -TH
24344 177730 7 0          -[CH"T"NACH]
24345 177774 7 0          -CH+0+1
24346 177730 7 0          0 0 -2"T"COUNTL
24347 177720 7 0          -PLTNUM
24350 033457 7 0 QTB2:    PPT
24351 013333 7 0          HISP
24352 016155 7 0          IHSP
24353 032030 7 0          I2MB0
24354 100020 7 0          100020
24355 000517 7 0          COUNTA
24356 033477 7 0          PLT
                  QTBL=QTB2-0-QTB1
24357 177771 7 0 QTB3:    -QTBL

                  LEV VAR
24360         V   QT1:     BSS 1
24361         V   QT2:     BSS 1
24362         V   QT3:     BSS 1
24363         V   QT4:     BSS 1

                  LEV CON
24364 000134  C   IPT:     PRIM            /INTERRUPT PRINT LOCS
24365 000674  C            MP
24366 012654  C            OCHN
24367 012604  C            I2MSB
24370 000675  C            HIP
24371 013106  C            HISB
24372 000676  C            IMP
24373 016042  C            IHSB
24374 020144  C            TOK
24375 003412  C            FAKENO
24376 004420  C            BACKNO
24377 000111  C            ADDRET
                  IPL=.-0-IPT
```

```
                    DDOK=100000
                    /SIGNBIT ON (DDOK) ==> NON-PRIVELEGED DISPATCH

                    LEV CON
24400 123076 C      DTAB:       DCLR+0+DDOK     /@
24401 123110 C                  LSE+0+DDOK      /A
24402 023414 C                  BOP             /B
24403 123603 C                  C+0+DDOK        /C
24404 023370 C                  DECIN           /D
24405 023510 C                  EQ              /E
24406 123110 C                  LSE+0+DDOK      /F
24407 123110 C                  LSE+0+DDOK      /G
24410 123612 C                  H+0+DDOK        /H
24411 024313 C                  IP              /I
24412 023101 C                  LF              /J - 12 - LINEFEED
24413 123110 C                  LSE+0+DDOK      /K
24414 123612 C                  H+0+DDOK        /L
24415 023443 C                  CR              /M - 15 - CR
24416 023512 C                  NEQ             /N
24417 123567 C                  OVRD+0+DDOK     /O
24420 123110 C                  LSE+0+DDOK      /P
24421 023623 C                  QDSP            /Q
24422 123110 C                  LSE+0+DDOK      /R
24423 023460 C                  S               /S
24424 123416 C                  TOP+0+DDOK      /T
24425 123110 C                  LSE+0+DDOK      /U
24426 123110 C                  LSE+0+DDOK      /V
24427 023506 C                  W               /W
24430 123110 C                  LSE+0+DDOK      /X
24431 123110 C                  LSE+0+DDOK      /Y
24432 023500 C                  Z               /Z
24433 123110 C                  LSE+0+DDOK      /[
24434 023425 C                  BS              /<BACKSLASH>
24435 123110 C                  LSE+0+DDOK      /]
24436 023440 C                  UA              /^
24437 023412 C                  BARR            /<BACKARROW>
```

```
24440 123377 C              PLUS+0+DDOK     /<SPACE>
24441 024214 C              QP              /!
24442 023451 C              ASCIN           /"
24443 123110 C              LSE+0+DDOK      /#
24444 023557 C              DOWNM           /$
24445 123110 C              LSE+0+DDOK      /%
24446 123110 C              LSE+0+DDOK      /&
24447 123110 C              LSE+0+DDOK      /'
24450 123110 C              LSE+0+DDOK      /(
24451 123110 C              LSE+0+DDOK      /)
24452 023407 C              STAR            /*
24453 123377 C              PLUS+0+DDOK     /+
24454 123343 C              COM+0+DDOK      /,
24455 123401 C              MIN+0+DDOK      /-
24456 023405 C              PTOP            /.
24457 023420 C              SLH             //
24460 123355 C              DIG+0+DDOK      /0
24461 123355 C              DIG+0+DDOK      /1
24462 123355 C              DIG+0+DDOK      /2
24463 123355 C              DIG+0+DDOK      /3
24464 123355 C              DIG+0+DDOK      /4
24465 123355 C              DIG+0+DDOK      /5
24466 123355 C              DIG+0+DDOK      /6
24467 123355 C              DIG+0+DDOK      /7
24470 123355 C              DIG+0+DDOK      /8
24471 123355 C              DIG+0+DDOK      /9
24472 123110 C              LSE+0+DDOK      /:
24473 123110 C              LSE+0+DDOK      /;
24474 123110 C              LSE+0+DDOK      /<
24475 123373 C              EQS+0+DDOK      /=
24476 023334 C              ASCOUT          />
24477 023135 C              RUB             /? = 177 = RUBOUT
```

```
24500 040377 C    LEV CON   CONSTANTS
24501 040005 C
24502 000033 C
24503 040333 C
24504 023162 C
24505 024053 C
24506 100001 C
24507 177014 C
24510 000177 C
24511 100200 C
24512 023110 C
24513 177770 C
24514 100111 C
24515 177764 C
24516 177760 C
02433 174523 C              PAGEND 24,UNCON,4
```

```
                        TINT:   LEV TTY         /TTY INTERRUPT
00063 025061  0         STDIL/  TINT
25061 000000  0         TINT/   INT TTY
25062 011115  0                 STA TINA        /SAVE A REG
25063 070004  0                 TTSRDY
25064 003077  0                 JMP TTRT        /NOT REALLY A TTY INTERRUPT
25065 140040  0                 CRA
25066 022474  0                 CAS TTFG        /IS TTFG = -1,0,1?
25067 003112  0                 JMP TIN1        /-1 WE JUST TYPED A BACKSLASH
25070 003104  0                 JMP TIN2        / 0 NORMAL INTERRUPT
25071 030104  0                 TTSOM           / 1 WE MUST TYPE A BACKSLASH
25072 005511  0                 LDA (334)
25073 170004  0                 TTOTA
25074 003112  0                 JMP TIN1
25075 004121  0                 LDA MINUS1      /SET TTFG TO -1
25076 010474  0         TIN3:   STA TTFG
25077 000043  0         TTRT:   INK
25100 171020  0                 OTK
25101 005115  0                 LDA TINA        /RESTORE A REG
25102 000401  0                 ENB TTY
25103 103061  0                 JMP TINT I

25104 005503  0         TIN2:   LDA OTGO        /CHECK HALF-DUPLEX FLAG
25105 100040  0                 SZE             /ARE WE IN INPUT MODE?
25106 003112  0                 JMP TIN1        /NO, THIS IS AN OUTPUT INTERRUPT
25107 131004  0                 TTINAC          /YES, GET INPUT CHAR
25110 003107  0                 JMP .-1
25111 011116  0                 STA TTCR        /SAVE IT
25112 030004  0         TIN1:   TTSIM
25113 004114  0                 LDA ONE         /SET TTFG TO 1
25114 003076  0                 JMP TIN3
                        LEV VAR
25115         V         TINA:   BSS 1           /TTY INT SAVED A REG
25116         V         TTCR:   BSS 1           /RAW TTY INPUT CHAR

                        /OTGO IS THE STATE OF THE HALF-DUPLEX INTERFACE
                        /0=EXPECTING INPUT, 1=HAVE DONE OUTPUT

                        /TTFG IS THE COMMUNICATION FLAG BETWEEN
                        /THE TTY INTERRUPT HANDLER AND THE BACKGROUND TTY PROCESSING
                        /AT INTERRUPT TIME:
                        /-1= LAST ACTION WAS TO TYPE A BACKSLASH, NOW 1=>TTFG
                        / 0= NORMAL - BACKGROUND IS READY FOR TTY INT, NOW 1=>TTFG
                        / 1= A SECOND TTY INT CAME IN BEFORE BACKGROUND CAUGHT UP
                        /    SO TYPE A BACKSLASH, NOW -1=>TTFG
                        /AT BACKGROUND LEVEL:
                        /USE A CRA, IMA TTFG SEQUENCE TO INTERROGATE TTY
                        /0=>TTFG, USE CHAR IF TTFG WAS = 1
```

```
                        LEV BCK
25117 140040 7          TTYI:   CRA             /TELETYPE INPUT STARTS HERE
25120 011503 7                  STA OTGO
25121 010673 7                  STA HSFG
25122 011504 7                  STA HSGO
25123 011163 7                  STA TTCH
25124 111512 7                  STA (DINC) I
25125 004106 7                  LDA MINE
25126 013513 7                  ERA (PRIBIT 0 FORIMP)
25127 111514 7                  STA (DSRC) I
25130 012753 7                  ERA C100
25131 011165 7                  STA HED0
25132 005515 7                  LDA (40)
25133 170020 7                  SMK 20          /ENABLE TTY INTERRUPTS ONLY
25134 003174 7                  JMP TTI3        /GO FIRE OFF A DUMMY MSG TO DDT

25135 005170 7          IND1:   LDA TTI2
25136 011160 7                  STA INDB
25137 000401 7          TTI1:   ENB BCK
25140 072113 7                  LDX ZERO
25141 120665 7                  JST DOZE I      /WAIT FOR NEXT INPUT CHAR
25142 005503 7                  LDA OTGO        /OUTPUT ACTIVE?
25143 100040 7                  SZE
25144 003137 7                  JMP TTI1        /YES
25145 001001 7                  INH TTY
25146 026474 7 0                IMA TTFG        /TTY HAVE SOMETHING FOR US??
25147 101400 7 0                SMI             /IF TTFG= -1, NO
25150 101040 7 0                SNZ             /IF TTFG=  0, NO
25151 003137 7 0                JMP TTI1        /NO
25152 005116 7 0                LDA TTCR        /IF TTFG=  1, YES
25153 007516 7 0                ANA (177)       /PUT IN PARITY BIT
25154 013517 7 0                ERA (200)
25155 011163 7 0                STA TTCH
25156 000401 7 0                ENB BCK
25157 103160 7                  JMP INDB I      /GO PROCESS THE CHAR

25160 000000 7          INDB:   0               /COME HERE TO GET NEXT CHAR FROM TT
25161 011164 7                  STA TTIW        /SAVE THE INPUT WORD SO FAR
25162 003137 7                  JMP TTI1

                        LEV VAR
25163           V       TTCH:   BSS 1           /RAW TTY INPUT CHAR+PARITY BIT
25164           V       TTIW:   BSS 1
25165           V       HED0:   BSS 1           /CROSSPATCH HEADER
25166           V       MHD0:   BSS 1           /MESSAGE HEADER
25167           V       MHD1:   BSS 1
```

```
                    MSGT=273  /SEMI
                    NUMB=272  /COLON
                    LEV BCK
25170 025171 7      TTI2:     .+1             /PLACE TO START BUILDING NEW MESSAGE
25171 023520 7                CAS (MSGT)      /IS IT A MESSAGE INITIATOR?
25172 100000 7                SKP
25173 003221 7                JMP MSG         /YES

                    /SEND A SINGLE CHAR MESSAGE
25174 005165 7      TTI3:     LDA HED0        /*SEND CROSSPATCH HEADER
25175 120664 7                JST JAM I
25176 140040 7                CRA             /*SEND ON LINK ZERO
25177 120664 7                JST JAM I
25200 005163 7                LDA TTCH
25201 013517 7                ERA (200)
25202 100040 7                SZE             /IS THE CHAR TO SEND A BREAK?
25203 003207 7                JMP TTI5        /NO
25204 004106 7                LDA MINE        /YES, RESET CROSSPATCH HEADER TO [ ]
25205 013521 7                ERA (PRIBIT 0 FORIMP 100)
25206 011165 7                STA HED0        /DDT AT SELF = PRIORITY
25207 005163 7      TTI5:     LDA TTCH
25210 140500 7                SSM
25211 141340 7                ICA
25212 011164 7                STA TTIW
25213 140040 7                CRA
25214 011504 7                STA HSGO
25215 005164 7      MSG2:     LDA TTIW        /*SEND 1 CHAR MESSAGE
25216 072112 7                LDX SIGN        /CLOSE OFF THE MESSAGE
25217 120664 7                JST JAM I
25220 003135 7                JMP IND1

                    /SEND A SEMICOLON MESSAGE = MULTI-CHARACTER
25221 004673 7      MSG:      LDA HSFG        /SEND A MESSAGE
25222 011504 7                STA HSGO
25223 005166 7                LDA MHD0        /*SEND MESSAGE HOST
25224 120664 7                JST JAM I
25225 005167 7                LDA MHD1        /*SEND MESSAGE LINK
25226 120664 7                JST JAM I
25227 004112 7      MSG0:     LDA SIGN
25230 021277 7                JST MSG1        /GET ONE CHAR
25231 140500 7                SSM             /PUT IN PARITY
25232 141340 7                ICA             /SAVE
25233 021277 7                JST MSG1        /GET OTHER CHAR
25234 013517 7                ERA (200)       /PUT IN PARITY
25235 013164 7                ERA TTIW
25236 120664 7                JST JAM I       /*SEND NEXT TWO CHARS
25237 003227 7                JMP MSG0        /GO BACK FOR MORE
```

```
25240 140040 7   MSG3:    CRA             /BUILD A NUMBER
25241 021277 7   MSG4:    JST MSG1        /GET NEXT CHAR
25242 023522 7            CAS (215)       /CR?
25243 100000 7            SKP             /NO
25244 003253 7            JMP MSG5        /YES, END OF THE NUMBER
25245 001001 7            INH ALL         /USING B REG = MUST LOCK INTS
25246 040075 7 0          LRL 3
25247 005164 7 0          LDA TTIW
25250 041075 7 0          LLL 3
25251 000401 7 0          ENB BCK
25252 003241 7            JMP MSG4

25253 070104 7   MSG5:    TTSNBZ          /ECHO CR WITH A LF
25254 003274 7            JMP MSG6        /FORGET IT
25255 030104 7            TTSOM
25256 005523 7            LDA (212)
25257 170004 7            TTOTA
25260 003257 7            JMP .-1
25261 025503 7            IRS OTGO
25262 120665 7   MSG7:    JST DOZE I      /WAIT FOR CHAR TO TYPE OUT
25263 140040 7            CRA
25264 026474 7            IMA TTFG
25265 101040 7            SNZ             /HAS TTY INTERRUPTED?
25266 003262 7            JMP MSG7        /NOT YET, WAIT
25267 005503 7            LDA OTGO        /NOW UNSTEP OUTPUT FLAG
25270 016114 7            SUB ONE
25271 100400 7            SPL
25272 140040 7            CRA
25273 011503 7            STA OTGO
25274 005164 7   MSG6:    LDA TTIW        /ADD NUMBER TO MESSAGE
25275 120664 7            JST JAM I
25276 003227 7            JMP MSG0

25277 000000 7   MSG1:    0               /SUBR TO GET NEXT CHAR FOR MESSAGE
25300 021160 7            JST INDB        /GET THE CHAR
25301 023520 7            CAS (MSGT)      /IS IT MESSAGE TERMINATOR?
25302 100000 7            SKP             /NO
25303 003215 7            JMP MSG2        /YES, DONE = LEAP INTO INDB CODE
25304 023524 7            CAS (NUMB)      /IS IT NUMBER INDICATOR?
25305 103277 7            JMP MSG1 I      /NO, RETURN WITH CHAR
25306 003240 7            JMP MSG3        /YES, PUT AN OCTAL NUMBER IN THE ME
25307 103277 7            JMP MSG1 I      /NO, RETURN WITH CHAR
```

```
25310 072113 7   TTO0:    LDX ZERO        /TELETYPE OUTPUT ROUTINES
25311 033505 7            STX TTNM        /CLEAR FLAG
25312 120666 7            JST SUCK I      /WAIT FOR SOME OUTPUT TO HAPPEN
25313 025503 7            IRS OTGO        /GRAB THE TTY
25314 011501 7            STA TTOW
25315 007525 7            ANA (SRCEHI)
25316 022106 7            CAS MINE        /NOT IF FROM US
25317 022752 7            CAS C77         /NOT IF NON-TTY
25320 003323 7            JMP TTO01
25321 101000 7            NOP
25322 011506 7            STA WHOTTY      /LAST FOREIGN IMP TTY TO SEND TO TT
25323 120667 7   TTO01:   JST WAIT I
25324 005501 7            LDA TTOW
25325 041475 7            LGL 3 0"A"FOROCT
25326 011502 7            STA OCTL
25327 101400 7            SMI
25330 005504 7            LDA HSGO
                 /MAKE A SKP TO SEE ALL I2H MESSAGES = RFNMS FOR SINGLE CHAR
25331 101040 7            SNZ
25332 003353 7            JMP TTO2
25333 005522 7            LDA (215)
25334 021450 7            JST SEND
25335 005523 7            LDA (212)
25336 021450 7            JST SEND
25337 005523 7            LDA (212)
25340 021450 7            JST SEND
25341 005501 7            LDA TTOW
25342 021412 7            JST OCTO
25343 120666 7            JST SUCK I
25344 100000 7            SKP
25345 003350 7            JMP TTO7
25346 021412 7            JST OCTO
25347 003356 7            JMP TTO3

25350 025505 7   TTO7:    IRS TTNM        /SET END FLAG
25351 021412 7            JST OCTO
25352 003370 7            JMP TTO5

25353 120666 7   TTO2:    JST SUCK I      /FROM DDT: SKIP OVER REST OF LEAD
25354 100000 7            SKP
25355 003437 7            JMP TTO8
25356 120666 7   TTO3:    JST SUCK I
25357 003374 7            JMP TTO4        /MORE MESSAGE
25360 025505 7            IRS TTNM
25361 011501 7            STA TTOW        /DONE
25362 141050 7            CAL
25363 101040 7            SNZ
25364 003370 7            JMP TTO5
25365 005501 7            LDA TTOW        /GET LAST CHAR
25366 141140 7            ICL
25367 021450 7            JST SEND
25370 140040 7   TTO5:    CRA
25371 011503 7            STA OTGO
25372 011502 7            STA OCTL
25373 003310 7            JMP TTO0
```

```
                    LEV BCK
25374 011501 7   TT04:     STA TTOW        /SEND ANOTHER WORD OF THE MESSAGE
25375 005502 7              LDA OCTL
25376 100400 7              SPL
25377 003407 7              JMP TT06
25400 005501 7              LDA TTOW
25401 141140 7              ICL
25402 021450 7              JST SEND
25403 005501 7              LDA TTOW
25404 141050 7              CAL
25405 021450 7              JST SEND
25406 003356 7              JMP TT03

25407 005501 7   TT06:     LDA TTOW
25410 021412 7              JST OCTO
25411 003356 7              JMP TT03

25412 000000 7   OCTO:     0               /OCTAL OUTPUT
25413 000201 7              IAB
25414 004126 7              LDA MINUS6
25415 011507 7              STA OCO1
25416 005526 7              LDA (130)
25417 041077 7              LLL 1
25420 000201 7   OCO2:     IAB
25421 011510 7              STA OCO3
25422 000201 7              IAB
25423 021450 7              JST SEND
25424 005510 7              LDA OCO3
25425 000201 7              IAB
25426 005527 7              LDA (26)
25427 041075 7              LLL 3
25430 025507 7              IRS OCO1
25431 003420 7              JMP OCO2
25432 005522 7              LDA (215)
25433 021450 7              JST SEND
25434 005523 7              LDA (212)
25435 021450 7              JST SEND
25436 103412 7              JMP OCTO I

25437 025505 7   TT08:     IRS TTNM
25440 005501 7              LDA TTOW
25441 007530 7              ANA (IMCODE)
25442 013531 7              ERA (CINCTR)
25443 100040 7              SZE             /BLOCKED OR LOST?
25444 003370 7              JMP TT05        /NO
25445 005511 7              LDA (334)       /YES, TYPE A BACKSLASH SINCE OUR ME
25446 021450 7              JST SEND
25447 003370 7              JMP TT05
```

```
25450 000000 7   SEND:     0               /SUBR TO TYPE OUT A CHAR
25451 023517 7              CAS (200)       /*200 BIT SET?
25452 101000 7              NOP
25453 100000 7              SKP
25454 103450 7              JMP SEND I      /NO, IGNORE THE CALL
25455 072113 7              LDX ZERO
25456 070104 7              TTSNBZ
25457 003472 7              JMP SND2        /INTERRUPTING OUTPUT!
25460 030104 7              TTSOM
25461 170004 7              TTOTA
25462 003472 7              JMP SND2
25463 120667 7   SND3:      JST WAIT I      /WAIT FOR CHAR TO GO OUT
25464 140040 7              CRA
25465 026474 7              IMA TTFG
25466 101400 7              SMI
25467 101040 7              SNZ
25470 003463 7              JMP SND3
25471 103450 7              JMP SEND I

25472 005505 7   SND2:      LDA TTNM        /AT END OF MSG?
25473 100040 7              SZE
25474 003370 7              JMP TTO5        /YES, NO MSG TO SKIP
25475 120666 7              JST SUCK I      /SKIP REST OF MESSAGE
25476 003472 7              JMP SND2
25477 010472 7              STA DDTI
25500 003370 7              JMP TTO5        /AND CONTINUE LOOKING FOR A NEW MES

                 LEV VAR
25501         V  TTOW:      BSS 1
25502         V  OCTL:      BSS 1
25503         V  OTGO:      BSS 1
25504         V  HSGO:      BSS 1
25505         V  TTNM:      BSS 1           /END OF MSG IF NON ZERO
25506 000000  V  WHOTTY:    0               /LAST FOREIGN TYPIST ON THIS TTY
25507         V  OCO1:      BSS 1
25510         V  OCO3:      BSS 1
```

```
25511 000334 C   LEV CON   CONSTANTS
25512 024046 C
25513 140000 C
25514 024050 C
25515 000040 C
25516 000177 C
25517 000200 C
25520 000273 C
25521 140100 C
25522 000215 C
25523 000212 C
25524 000272 C
25525 000377 C
25526 000130 C
25527 000026 C
25530 007400 C
25531 004400 C
02434 174532 C              PAGEND 25,UNCON
```

```
                /NEW ROUTING
                /THESE ROUTINES BUILD TWO MAIN TABLES


                /RUT = ROUTE USE TABLE, THE BEST LINE DIRECTORY
                /RST = ROUTE SEND TABLE, THE HOPS/DELAY INFORMATION UPDATE MI
                /THE NEW VALUE OF HOPS AND DELAY ON THE BEST LINES FOR EACH
                /RSTN = THE RST NEW TABLE
                /       THE IDENTITY OF THE BEST LINE FOR EACH IS KEPT IN
                /RUTW = THE RUT WORKING TABLE

                /A NAMING CONVENTION -- TAGS LIKE RST,N AND RST,W ARE INDIRE
                /POINTERS [FOR ',' READ "POINT"], POST-INDEXED BY NEGATIVE
                /RST,N  IS THUS THE RST POINTER TO THE NEW TABLE

                /BITS IN RUT
                RUTDED=100000           /THIS IMP IS DOWN,UNREACHABLE OR NO
                RUTGOD=60000            /GOING-DOWN DELAY CNTR = EVERY 4TH
                RUTGD1=20000            /LOW ORDER BIT OF RUTGOD
                RUTHPC=17400            /LINE # +1 OF SHORTEST HOP PATH
                RUTCMU=340              /COMING-UP DELAY COUNTER = EVERY 8T
                RUTCM1=40 /LOW ORDER BIT OF RUTCMU
                RUTDLC=37 /LINE # +1 OF BEST DELAY PATH
                RUTUS=0

                /BITS IN RUTW
                RUTHPH=60000            /HOLD-DOWN TIMER FOR MIN HOP PATH
                RTHPH1=20000            /LOW ORDER BIT OF RUTHPH
                RUTDLH=140              /HOLD-DOWN TIMER FOR MIN DELAY PATH
                RTDLH1=40 /LOW ORDER BIT OF RUTDLH

                /BITS IN RST, RSTN
                HOPS=174000             /5 BITS OF HOP COUNT
                HOPS1=4000              /LOW ORDER BIT OF HOPS
                DELS=3777 /11 BITS OF DELAY COUNT

                /BITS IN ROUTING MSG
                /IN HEAD1
                RMSN=177400             /RM SERIAL #
                RMSN1=400 /LOW-ORDER BIT IF SER #
```

```
                    /RUTINI IS AN INITIALIZATION ROUTINE TO SET UP
                    /THE ROUTING TABLES
                    LEV BCK   LCK INI
26070 000000 7 0 RUTINI:  0
26071 005645 7 0          LDA (RST 0 NIMP X)
26072 010660 7 0          STA RST,0
26073 005646 7 0          LDA (RST1 0 NIMP X)
26074 010661 7 0          STA RST,F
26075 005647 7 0          LDA (RST2 0 NIMP X)
26076 010662 7 0          STA RST,N
26077 073346 7 0          LDX NEGIMP      /LOOP OVER ALL IMPS
26100 005637 7 0 RUTINL:  LDA CDEAD       /(100000)
26101 050265 7 0          STA RUT+NIMP X 0"A"RUTDED
26102 140040 7 0          CRA
26103 051500 7 0          STA RUTW+NIMP X
26104 005640 7 0          LDA CMAXMD      /(177777)
26105 110660 7 0          STA RST,0 I
26106 110661 7 0          STA RST,F I
26107 110662 7 0          STA RST,N I
26110 024000 7 0          IRS 0
26111 003100 7 0          JMP RUTINL
26112 072106 7 0          LDX MINE
26113 140040 7 0          CRA 0"A"RUTUS
26114 011644 7 0          STA RSTSN       /START SER # AT 0
26115 050165 7 0          STA RUT X       /CLEAR RUT
26116 111650 7 0          STA (RST2 0 X) I          /AND RSTN
26117 103070 7 0          JMP RUTINI I
```

```
                    /RSTINP IS A ROUTINE TO COPY A RECIEVED ROUTING MESSAGE INTO
                    /RSTN, RSTW AND RUTW TABLES.
                    CHK=0
                    LEV T,0
26120 000000 5      RSTINP:   0
26121 033365 5      RSTCK1:   K STX LINEX     /SAVE LINE#
26122 011372 5                K STA RST,I     /SAVE AC FLAG
26123 073342 5                K LDX RSTCKX    /(RSTCK1=0=RSTCK2=1)
26124 140040 5                K CRA           /CALCULATE CHECKSUM FOR THIS CODE
26125 055365 5                K ADD RSTCK2+1 X
26126 024000 5                K IRS 0
26127 003125 5                K JMP .-2
26130 100040 5                K SZE           /DIFFERENT?
                              RELOAD [RUTINP CODE BROKEN]
26131 120061 5                K JST SWDTIL I /YES, RELOAD
26132 073365 5                K LDX LINEX     /RESTORE LINE # IN X
26133 045500 5                K LDA CED X     /PICK UP COMPUTED EFFECTIVE DELAY
26134 141206 5                K AOA
26135 011366 5                K STA DELOUR    /AND SAVE IT
26136 004000 5                K LDA 0
26137 141206 5                K AOA
26140 011367 5                K STA CHANR     /SAVE CHAN#+1 IN RT HALF
26141 141340 5                K ICA
26142 011370 5                K STA CHANL     /ALSO IN LEFT HALF
26143 013367 5                K ERA CHANR
26144 011371 5                K STA CHANB     /SAVE CHAN#+1 IN BOTH HALVES
26145 005372 5                K LDA RST,I     /PICK UP FLAG
26146 101040 5                K SNZ           /WERE WE CALLED BY TASK?
26147 003152 5                K JMP RSTI1     /YES, TRUE INPUT
26150 005344 5                K LDA DUMYIN    /NO, MAKE UP DUMMY INPUT OF ALL 1
26151 003167 5                K JMP RSTI2
26152 044433 5      RSTI1:    K LDA LINE X
26153 100040 5                K SZE           /IS LINE DOWN?
26154 103120 5                K JMP RSTINP I /YES, IGNORE ROUTING
26155 072514 5                K LDX THIS      /GET PKT PTR
26156 044006 5                K LDA HEAD1 X   /TO RM
26157 141044 5                K CAR 0"A"RMSN /EXTRACT SERIAL #
26160 073365 5                K LDX LINEX
26161 067505 5                K IMA RSTSNI X /SAVE AS LATEST INPUT #
26162 053505 5                K ERA RSTSNI X /COMPARE W/ PREV #
26163 101040 5                K SNZ           /NEW?
26164 103120 5                K JMP RSTINP I /NO, WE SAW IT BEFORE***NOP ON REI
26165 004514 5                K LDA THIS      /BUILD POST INDEXED PTR TO PKT
26166 015343 5                K ADD RSTCP1    /(HEAD2 0 NIMP X)
26167 011372 5      RSTI2:    K STA RST,I
26170 073346 5                K LDX NEGIMP    /LOOP OVER ALL IMPS
```

```
26171 105372 5   COPYL:    K LDA RST,I I  /GET ENTRY FROM RECEIVED ROUTING
26172 007347 5              K ANA HOPM     /(174000)
26173 015353 5              K ADD HOPM1    /(4000) ADD IN OUR HOP
26174 101040 5              K SNZ          /MAX VALUE?
26175 005347 5              K LDA HOPM     /YES
26176 011373 5              K STA HOPIN    /SAVE RECEIVED HOP COUNT
26177 141340 5              K ICA
26200 011374 5              K STA HOPINS
26201 105372 5              K LDA RST,I I  /EXTRACT RECEIVED DELAY
26202 007350 5              K ANA DELM
26203 015366 5              K ADD DELOUR   /ADD IN LOCAL DELAY
26204 023350 5              K CAS DELM     /(3777)
26205 005350 5              K LDA DELM     /TRUNCATE AT MAX DELAY
26206 101000 5              K NOP
26207 011375 5              K STA DELIN    /SAVE TOTAL DELAY
26210 005371 5              K LDA CHANB    /COMPARE THIS LINE #
26211 052265 5              K ERA RUT+NIMP X        /,,,WITH PREVIOUS BEST FOI
26212 007363 5              K ANA CHANM    /(17437)EXTRACT LINE FIELDS ONLY
26213 023352 5              K CAS BSTDEL   /(37)THIS MIN HOP LINE?
26214 003262 5              K JMP COPY11   /NO, SEE IF IT HAS GOOD DATA
26215 101000 5              K NOP
26216 011376 5              K STA CHANS    /SAVE
                  /THIS LINE IS PREVIOUS BEST FOR HOPS
26217 104662 5   COPY1:     K LDA RST,N I
26220 007350 5              K ANA DELM     /EXTRACT OLD DELAY
26221 013373 5              K ERA HOPIN    /PUT IN NEW HOPS
26222 126662 5              K IMA RST,N I  /SAVE IN RSTN
26223 007347 5              K ANA HOPM
26224 141340 5              K ICA
26225 017374 5              K SUB HOPINS   /COMPARE
26226 100400 5              K SPL          /CHANGED?
26227 003252 5              K JMP HOLD1    /YES, IF HOPS WORSE DO HOLD-DOWN
26230 005376 5   COPY2:     K LDA CHANS    /LOOK AT OUR CHAN
26231 100040 5              K SZE          /IS IT THE BEST DELAY?
26232 003320 5              K JMP COPY21   /NO
                  /THIS LINE PREVIOUS BEST FOR DELAY
26233 104662 5              K LDA RST,N I  /YES
26234 007347 5              K ANA HOPM     /EXTRACT OLD HOPS
26235 013375 5              K ERA DELIN    /PUT IN NEW DELAY
26236 126662 5              K IMA RST,N I  /SAVE IN RSTN
26237 007350 5              K ANA DELM
26240 017375 5              K SUB DELIN    /COMPARE
26241 015351 5              K ADD DELCLP   /ALLOW FOR SMALL CHANGE W/O HLDDWN
26242 100400 5              K SPL          /DELAY GET MUCH WORSE?
26243 003310 5              K JMP HOLD2    /Y, DO HOLD-DOWN
26244 024000 5   COPYI:     K IRS 0        /LOOP OVER ALL IMPS
26245 003171 5              K JMP COPYL
26246 025377 5              K IRS RSTINC   /COUNT ANOTHER INPUT COPY COMPLETE
26247 101000 5              K NOP
26250 073365 5              K LDX LINEX    /RESTORE X
26251 103120 5              K JMP RSTINP I /RETURN TO TASK
```

```
                        /THIS LINE WAS PREVIOUS BEST FOR HOPS, HOPS CHANGED
26252 045500 5   HOLD1:    K LDA RUTW+NIMP X        /HOPS GOT WORSE
26253 007356 5             K ANA HLDH      /GET HOLD-DOWN TIMER
26254 100040 5             K SZE           /ON?
26255 003230 5             K JMP COPY2     /Y, GO ON TO DELAY
26256 005356 5             K LDA HLDH      /N, TURN IT ON
26257 053500 5             K ERA RUTW+NIMP X        /...AND SAVE IN RUTW
26260 051500 5             K STA RUTW+NIMP X
26261 003230 5             K JMP COPY2

                        /THIS LINE WAS NOT PREVIOUS BEST FOR HOPS
26262 007352 5   COPY11:   K ANA BSTDEL    /TURN OFF HOP CHAN BITS
26263 011376 5             K STA CHANS     /SAVE IN CHANS
26264 045500 5             K LDA RUTW+NIMP X
26265 007356 5             K ANA HLDH      /GET HOLD-DOWN TIMER FOR HOPS
26266 100040 5             K SZE
26267 003230 5             K JMP COPY2     /NOT 0, GO DO DELAY NEXT
                        /NOT PREVIOUS BEST HOPS, NOT HOLDING
26270 104662 5             K LDA RST,N I
26271 007347 5             K ANA HOPM      /EXTRACT CURRENT HOPS ON BEST
26272 141340 5             K ICA
26273 023374 5             K CAS HOPINS    /COMPARE W/ RCVD HOPS
26274 003277 5             K JMP COPY13    /RCVD HOPS BETTER
26275 003230 5             K JMP COPY2     /NO BETTER, DO DELAY NEXT
26276 003230 5             K JMP COPY2     /DITTO

                        /NOT PREVIOUS BEST HOPS, NOT HOLDING, BETTER THAN PREVIOUS
26277 141340 5   COPY13:   K ICA
26300 112662 5             K ERA RST,N I   /EXTRACT OLD BEST DELAY
26301 013373 5             K ERA HOPIN     /PUT IN NEW HOPS
26302 110662 5             K STA RST,N I   /SAVE IN RSTN
26303 044265 5             K LDA RUT+NIMP X
26304 007361 5             K ANA CHANML    /(160377)EXTRACT CHAN OF MIN DELA
26305 013370 5             K ERA CHANL     /UPDATE CHAN OF MIN HOPS
26306 050265 5             K STA RUT+NIMP X         /SAVE IN RUT
26307 003230 5             K JMP COPY2
```

```
                        /THIS LINE WAS PREVIOUS BEST FOR DELAY, DELAY GOT WORSE
26310 045500 5   HOLD2:    K LDA RUTW+NIMP X        /DELAY GOT WORSE
26311 007357 5             K ANA HLDD      /GET DELAY HOLD-DOWN TIMER
26312 100040 5             K SZE           /IS IT ON?
26313 003244 5             K JMP COPYI     /YES, GO ON TO NEXT IMP
26314 005357 5             K LDA HLDD      /NO, TURN IT ON
26315 053500 5             K ERA RUTW+NIMP X        /SAVE IN RUTW
26316 051500 5             K STA RUTW+NIMP X
26317 003244 5             K JMP COPYI

                        /THIS LINE WAS NOT PREVIOUS BEST FOR DELAY
26320 045500 5   COPY21:   K LDA RUTW+NIMP X
26321 007357 5             K ANA HLDD      /GET DELAY HOLD-DOWN TIMER
26322 100040 5             K SZE
26323 003244 5             K JMP COPYI     /NOT 0, GO TO NEXT IMP
                        /NOT PREVIOUS BEST DELAY, NOT HOLDING
26324 104662 5             K LDA RST,N I
26325 007350 5             K ANA DELM      /EXTRACT CURRENT DELAY ON BEST
26326 023375 5             K CAS DELIN     /COMP W/ RCVD DELAY
26327 003332 5             K JMP COPY23    /RCVD DELAY BETTER
26330 003244 5             K JMP COPYI     /NO BETTER, GO ON TO NEXT IMP
26331 003244 5             K JMP COPYI     /DITTO

                        /NOT PREV BEST DELAY, NOT HOLDING, BETTER THAN PREVIOUS
26332 112662 5   COPY23:   K ERA RST,N I   /EXTRACT OLD BEST HOP COUNT
26333 013375 5             K ERA DELIN     /PUT IN NEW DELAY
26334 110662 5             K STA RST,N I   /SAVE IN RSTN
26335 044265 5             K LDA RUT+NIMP X
26336 007360 5             K ANA CHANMR    /(177740)EXTRACT CHAN OF MIN HOP
26337 013367 5             K ERA CHANR     /UPDATE CHAN OF BEST DELAY
26340 050265 5             K STA RUT+NIMP X         /SAVE IN RUT
26341 003244 5             K JMP COPYI     /GO ON TO NEXT IMP
```

```
                        LEV CON
26342 177534 C  RSTCKX:  K RSTCK1-0-RSTCK2-1
26343 040107 C  RSTCP1:  K HEAD2 0 NIMP X
26344 026345 C  DUMYIN:  K .+1              /PTR TO DUMMY MAX INPUT
26345 177777 C           K HOPS+0+DELS
26346 177700 C  NEGIMP:  K -NIMP
26347 174000 C  HOPM:    K HOPS
26350 003777 C  DELM:    K DELS
26351 000010 C  DELCLP:  K 10               /SMALL CHANGE TO DELAY IS OK
26352 000037 C  BSTDEL:  K RUTDLC
26353 004000 C  HOPM1:   K HOPS1            /4000
26354 020000 C  HLDH1:   K RTHPH1           /20000
26355 000040 C  HLDD1:   K RTDLH1           /40
26356 060000 C  HLDH:    K RUTHPH           /60000
26357 000140 C  HLDD:    K RUTDLH           /140
26360 177740 C  CHANMR:  K 0 0 177777"X"RUTDLC
26361 160377 C  CHANML:  K 0 0 177777"X"RUTHPC
26362 160340 C  CHANMB:  K 0 0 177777"X"RUTDLC"X"RUTHPC
26363 017437 C  CHANM:   K 0 0 RUTDLC"X"RUTHPC
26364 104676 C  RSTCK2:  -CHK

                        LEV VAR
26365        V  LINEX:   BSS 1              /INPUT LINE# (0 TO CH-1)
26366        V  DELOUR:  BSS 1              /OUR LOCAL DELAY OUT OF THIS LINE
26367        V  CHANR:   BSS 1              /THIS LINE # +1, IN RIGHT HALF
26370        V  CHANL:   BSS 1              /                LEFT
26371        V  CHANB:   BSS 1              /                BOTH HALVES
26372        V  RST.I:   BSS 1              /RST POINTER TO INPUT MESSAGE
26373        V  HOPIN:   BSS 1              /RCVD HOP COUNT TO THIS IMP
26374        V  HOPINS:  BSS 1              /HOPIN WITH HALVES SWAPPED
26375        V  DELIN:   BSS 1              /RCVD DELAY TO THIS IMP PLUS LOCAL
26376        V  CHANS:   BSS 1              /TEMP = XOR(INPUT LINE, RUT ENTRY)
26377        V  RSTINC:  BSS 1              /COUNTER OF CALLS OF RSTIN FOR ALI
26400        V  RUTW:    BSS NIMP
26500        V  CED:     BSS CH             /COMPUTED EFFECTIVE DELAY
26505        V  RSTSNI:  BSS CH             /SERIAL # OF LAST RM INPUT
```

```
                    CHK=0
                    LEV T.O
26512 000000 5      RUTOUT:   0
26513 073627 5      RUTCK1:   K LDX RUTCKX    /(RUTCK1=0=RUTCK2=1)
26514 140040 5                K CRA
26515 055642 5                K ADD RUTCK2+1 X
26516 024000 5                K IRS 0         /CHECKSUM THIS CODE
26517 003515 5                K JMP .-2
26520 100040 5                K SZE           /DIFFERENT?
                              RELOAD [RUTOUT CODE BROKEN]
26521 120061 5                K JST SWDTIL I /YES, RELOAD
26522 073630 5                K LDX CRSTC     /(=NIMP=HEAD2=ACKH)
26523 033642 5                K STX RSTC      /INIT CKSUM==# OF WORDS
26524 110660 5                K STA RST,O I   /INIT ACK HEADER AT ZERO
26525 024000 5                K IRS 0
26526 015642 5                K ADD RSTC      /ADD INTO MSG CKSUM
26527 011642 5                K STA RSTC
26530 004106 5                K LDA MINE      /THIS IMP #
26531 141340 5                K ICA
26532 141206 5                K AOA 0"A"LINETS          /PUT IN ROUTING MSG BIT
26533 110660 5                K STA RST,O I   /INIT HEADER
26534 024000 5                K IRS 0
26535 015642 5                K ADD RSTC      /ADD INTO MSG CKSUM
26536 011642 5                K STA RSTC
26537 005644 5                K LDA RSTSN
26540 015631 5                K ADD CRMSN1    /INCREMENT SER #
26541 011644 5                K STA RSTSN
26542 110660 5                K STA RST,O I
26543 024000 5                K IRS 0
26544 015642 5                K ADD RSTC      /ADD INTO MSG CKSUM
26545 011642 5                K STA RSTC
```

```
26546 044265 5   COMPL:    K LDA RUT+NIMP X
26547 100400 5             K SPL 0"A"RUTDED          /THIS IMP DEAD?
26550 003602 5             K JMP RTDEAD    /YES
26551 104662 5             K LDA RST.N I
26552 007347 5             K ANA HOPM      /GET HOP COUNT
26553 141340 5             K ICA
26554 023633 5             K CAS CMAXH     /COMPARE W/ MAX VALUE
26555 003614 5             K JMP RTDIED    /TOO BIG, THIS IMP HAS DIED
26556 003614 5             K JMP RTDIED    /DITTO
26557 044265 5             K LDA RUT+NIMP X
26560 007636 5             K ANA NOGODN    /THIS IMP UP, CLEAR GOING DOWN
26561 050265 5             K STA RUT+NIMP X
26562 033643 5             K STX THDTMP    /THIS IMP UP, SAVE AS HIGHEST # SO I
26563 104662 5   NWRST1:   K LDA RST.N I
26564 110660 5   NEWRST:   K STA RST.O I   /SAVE IN RST
26565 015642 5             K ADD RSTC      /ADD IN ROUTING MSG CKSUM
26566 011642 5             K STA RSTC      /AND PUT IT BACK
26567 024000 5             K IRS 0         /LOOP OVER ALL IMPS
26570 003546 5             K JMP COMPL
26571 140407 5             K TCA           /PICK UP FINAL CKSUM ANDCOMPLEMENT
26572 110660 5             K STA RST,O I   /STORE AS LAST WRD OF MSG
26573 073643 5             K LDX THDTMP    /PICK UP HIGHEST # IMP
26574 044265 5             K LDA RUT+NIMP X
26575 007632 5             K ANA HOPCHM    /EXTRACT OUR MIN HOP PATH TO IT
26576 141340 5             K ICA
26577 016114 5             K SUB ONE
26600 010420 5             K STA THD       /SAVE IN THD, FOR SYNC ACQUISITIOI
26601 103512 5             K JMP RUTOUT I  /AND RETURN
```

```
26602 104662 5   RTDEAD:   K LDA RST.N I  /THIS IMP WAS DEAD
26603 007347 5              K ANA HOPM     /EXTRACT BEST HOPS THIS TIME
26604 141340 5              K ICA
26605 023633 5              K CAS CMAXH    /COMPARE WITH MAX
26606 003624 5              K JMP RTDOWN   /STILL TOO MANY, DEAD
26607 003624 5              K JMP RTDOWN   /DITTO
26610 044265 5   RTNOTD:    K LDA RUT+NIMP X          /GET BEST LINES
26611 007363 5              K ANA CHANM @"A"RUTDED    /TURN OFF RUTDED BIT
26612 013634 5              K ERA COMUPM   /PUT IN INITIAL COME-UP DELAY
26613 003622 5              K JMP NWRST2   /PUT IN RUT, THEN SET UP RST

26614 044265 5   RTDIED:    K LDA RUT+NIMP X
26615 007635 5              K ANA GODWNM   /IMP WAS UP
26616 100040 5              K SZE          /IS IT MARKED AS GOING DOWN?
26617 003563 5              K JMP NWRST1   /YES
26620 005635 5              K LDA GODWNM   /NO, MARK IT NOW
26621 052265 5              K ERA RUT+NIMP X
26622 050265 5   NWRST2:    K STA RUT+NIMP X
26623 003563 5              K JMP NWRST1

26624 005640 5   RTDOWN:    K LDA CMAXHD   /REPORT AS DOWN TO NEIGHBORS
26625 110662 5              K STA RST.N I  /AND KEEP MAX VAL FOR US
26626 003564 5              K JMP NEWRST   /...BY SETTING RST TO MAX VALUE

                 LEV CON
26627 177651 C   RUTCKX:    K RUTCK1-0-RUTCK2-1
26630 177675 C   CRSTC:     K -NIMP-HEAD2+ACKH
26631 000400 C   CRMSN1:    K RMSN1        /400
26632 017400 C   HOPCHM:    K RUTHPC       /17400
26633 000260 C   CMAXH:     K 0 0 MAXH"T"8,          /260
26634 000340 C   COMUPM:    K RUTCMU       /340
26635 060000 C   GODWNM:    K RUTGOD       /60000
26636 117777 C   NOGODN:    K 0 0 177777"X"RUTGOD    /117777
26637 100000 C   CDEAD:     K RUTDED       /100000
26640 177777 C   CMAXHD:    K 0 0 HOPS"X"DELS        /177777
26641 125362 C   RUTCK2:    -CHK

                 LEV VAR
26642        V   RSTC:      BSS 1          /ROUTING MESSAGE CHECKSUM
26643        V   THDTMP:    BSS 1          /TEMP FOR THD

26644        V   RSTSN:     BSS 1          /SERIAL # OF LAST RM COMPUTATION
```

```
26645 073106 C   LEV CON   CONSTANTS
26646 073212 C
26647 073316 C
26650 073216 C
02435 175666 C   PAGEND 26,UNCON,15
```

```
                    LEV T.O
                    CHK=0
27112 000000 5  RUTCLK:   0
27113 073261 5  RTCLK1:   K LDX RTCLKX
27114 140040 5            K CRA
27115 055263 5            K ADD RTCLK2+1 X
27116 024000 5            K IRS 0
27117 003115 5            K JMP .-2
27120 100040 5            K SZE
                          RELOAD [RUTCLK CODE BROKEN]
27121 120061 5            K JST SWDTIL I
27122 073230 5            K LDX NIMPMI    /LOOP OVER ALL IMPS FOR HOLD-DOWN
27123 105241 5  HLDC1:    K LDA RUT,W I
27124 007243 5            K ANA HOLDH
27125 101040 5            K SNZ           /ARE WE HOLDING DOWN MIN HOP PATH?
27126 003132 5            K JMP HLDC2     /NO
27127 105241 5            K LDA RUT,W I
27130 017251 5            K SUB HOLDH1    /DECREMENT TIMER
27131 111241 5            K STA RUT,W I
27132 105241 5  HLDC2:    K LDA RUT,W I   /NO
27133 007244 5            K ANA HOLDD
27134 101040 5            K SNZ           /HOLDING DOWN MIN DELAY PATH?
27135 003141 5            K JMP HLDC3     /NO
27136 105241 5            K LDA RUT,W I
27137 017252 5            K SUB HOLDD1    /DECREMENT TIMER
27140 111241 5            K STA RUT,W I
27141 024000 5  HLDC3:    K IRS 0
27142 003123 5            K JMP HLDC1     /NEXT
27143 025263 5            K IRS GODWNC    /IS IT TIME TO DO GOING DOWN DELA
27144 003170 5            K JMP CMUC0     /NO
27145 005237 5            K LDA GODWNK    /YES, EVERY 4TH TICK
27146 011263 5            K STA GODWNC
27147 073230 5            K LDX NIMPMI    /LOOP OVER ALL IMPS FOR GOING DOWNS
27150 044265 5  GODC1:    K LDA RUT+NIMP X
27151 007245 5            K ANA MGODWN
27152 101040 5            K SNZ           /THIS IMP GOING DOWN?
27153 003166 5            K JMP GODC2     /NO
27154 044265 5            K LDA RUT+NIMP X        /YES
27155 017246 5            K SUB MGODW1    /DECREMENT TIMER
27156 050265 5            K STA RUT+NIMP X
27157 007245 5            K ANA MGODWN
27160 100040 5            K SZE           /IS IT COMPLETELY DOWN?
27161 003166 5            K JMP GODC2     /NO
27162 005235 5            K LDA MAXRST    /YES, HE IS REALLY DEAD
27163 111242 5            K STA RST,N2 I /SET UP RSTN
27164 005236 5            K LDA MAXRUT
27165 050265 5            K STA RUT+NIMP X        /AND RUT
27166 024000 5  GODC2:    K IRS 0
27167 003150 5            K JMP GODC1
```

```
27170 025264 5   CMUC0:    K IRS COMUPC    /IS IT TIME TO DO COMING-UP DELAYS
27171 003206 5              K JMP RMVFRQ    /NO, DO VBL FRQ CMPTNS
27172 005240 5              K LDA COMUPK    /YES, EVERY TENTH TICK
27173 011264 5              K STA COMUPC
27174 073230 5              K LDX NIMPMI    /LOOP OVER ALL IMPS FOR COMING UP
27175 044265 5   CMUC1:     K LDA RUT+NIMP X
27176 007247 5              K ANA MCOMUP
27177 101040 5              K SNZ           /IS THIS IMP COMING UP?
27200 003204 5              K JMP CMUC2     /NO
27201 044265 5              K LDA RUT+NIMP X          /YES
27202 017250 5              K SUB MCOMU1    /DECREMENT TIMER
27203 050265 5              K STA RUT+NIMP X          /SAVE IN RUT(IF HE CAME
27204 024000 5   CMUC2:     K IRS 0
27205 003175 5              K JMP CMUC1
27206 073231 5   RMVFRQ:    K LDX RMMICH    /=CH
27207 140040 5   RMVFRC:    K CRA
27210 011266 5              K STA RMVT
27211 127232 5              K IMA CTIMK I   /CLEAR CUMTIM AND COMPUTE EXTRAS
27212 017234 5   RMVFRA:    K SUB MS132K
27213 100400 5              K SPL
27214 003217 5              K JMP RMVFRB
27215 025266 5              K IRS RMVT
27216 003212 5              K JMP RMVFRA
27217 005233 5   RMVFRB:    K LDA RMFOUR
27220 017266 5              K SUB RMVT
27221 100400 5              K SPL
27222 140040 5              K CRA
27223 015260 5              K ADD CRMVTB
27224 051274 5              K STA RUTFRQ+CH X
27225 024000 5              K IRS 0
27226 003207 5              K JMP RMVFRC    /LOOP OVER ALL LINES
27227 103112 5              K JMP RUTCLK I
```

```
                    LEV CON
27230 177700 C      NIMPMI:   K -NIMP
27231 177773 C      RMMICH:   K -CH
27232 052632 C      CTIMK:    K CUMTIM CH X
27233 000004 C      RMFOUR:   K 4
27234 002450 C      MS132K:   K 2450
27235 177777 C      MAXRST:   K HOPS+0+DELS
27236 100000 C      MAXRUT:   K RUTDED
27237 177772 C      GODWNK:   K -6
27240 177767 C      COMUPK:   K -9.
27241 066500 C      RUT.W:    K RUTW+NIMP X
27242 073316 C      RST.N2:   K RST2+NIMP X
27243 060000 C      HOLDH:    K RUTHPH
27244 000140 C      HOLDD:    K RUTDLH
27245 060000 C      MGODWN:   K RUTGOD
27246 020000 C      MGODW1:   K RUTGD1
27247 000340 C      MCOMUP:   K RUTCMU
27250 000040 C      MCOMU1:   K RUTCM1
27251 020000 C      HOLDH1:   K RTHPH1
27252 000040 C      HOLDD1:   K RTDLH1
                    /RMVTAB USED BY RSTOUT
27253 000001 C      RMVTAB:   K 1             /1BIT IN 5 (# OF EXTRA +1 RM'S TO SI
27254 000005 C                K 5             /2 IN 5 (I.E. 1 EXTRA)
27255 000015 C                K 15
27256 000033 C                K 33
27257 000037 C                K 37
27260 027253 C      CRMVTB:   K RMVTAB
27261 177630 C      RTCLKX:   K RTCLK1-0-RTCLK2-1
27262 147750 C      RTCLK2:   -CHK

                    LEV VAR
27263         V     GODWNC:   BSS 1           /COUNTER - EVERY 4TH TICK
27264         V     COMUPC:   BSS 1           /COUNTER - EVERY 10TH TICK
27265         V     HOLDT:    BSS 1           /TEMP
27266         V     RMVT:     BSS 1           /TEMP
27267         V     RUTFRQ:   BSS CH          /# OF EXTRA RM'S PERMITTED AS PER

                    LEV CON   CONSTANTS
02436 172274 C      PAGEND 27,UNCON
```

```
                        LEV BCK
                        /STATISTICS PROGRAMS
                        /ALL CALLS TO DEFSTAT MUST PRECEDE THIS PAGE
30056 004114 7  STTI:   LDA ONE
30057 011213 7          STA SOFO        /BEGIN BY SAVING COPY OF SON
30060 005436 7  BKST:   LDA SON         /PICK UP 10-SEC STAT ON-OFF FLAG
30061 027213 7          IMA SOFO        /KEEP A COPY
30062 023436 7          CAS SON         /ANY CHANGE IN STATUS?
30063 100000 7          SKP             /YES, MUST CHANGE STATISTICS LOCATI
30064 003104 7          JMP SP2         /NO
30065 101040 7          SNZ             /WAS 10-SEC STAT JUST TURNED ON?
30066 003075 7          JMP SP1         /YES
30067 073575 7          LDX (-NSTATS)   /NO, JUST TURNED OFF
30070 105576 7          LDA (SC1+NSTATS 0 X) I   /PICK UP STANDARD CONTE
30071 111577 7          STA (SB1+NSTATS 0 XI) I  /AND PLANT IN DESIGNATED
30072 024000 7          IRS 0           /THIS RESTORES PROGRAM TO ITS DEFAU
30073 003070 7          JMP .-3
30074 003104 7          JMP SP2
30075 021256 7  SP1:    JST CLST        /CLEAR OUT 10-SEC STAT TABLES
30076 073575 7          LDX (-NSTATS)
30077 005600 7          LDA (JST SW1 I)          /PLANT JST'S TO STATISTIC
30100 111577 7          STA (SB1+NSTATS 0 XI) I
30101 141206 7          ADA             /THIS PUTS BREAKPOINT-LIKE CODE
30102 024000 7          IRS 0           /IN KEY PLACES THROUGHOUT THE PROGR
30103 003100 7          JMP .-3
30104 005601 7  SP2:    LDA (50000+0+DIAGTT)
30105 011455 7          STA DIAGD
30106 005602 7          LDA (DIAGQ 0 I)
30107 011440 7          STA DIAGON      /DIAG IS ALWAYS ON
30110 005603 7          LDA (TRON 0 I)
30111 011212 7          STA SP81        /INDIRECT POINTER FOR ON FLAGS
30112 072125 7          LDX MINUS5      /SO THAT NCC TRBL REPTS ALWAYS GO
30113 033441 7          STX TPON        /TURN ON NCC TRBL REPTS
30114 033211 7  SP3:    STX SP8         /LOOP HERE FOR EACH STAT PROGRAM
30115 105212 7          LDA SP81 I
30116 101040 7          SNZ             /IS THIS STAT PROGRAM TURNED ON?
30117 003170 7          JMP SP91        /NO
30120 004417 7          LDA SYNC        /PICK UP CURRENT TIME
30121 057211 7          SUB OLDS+5 X    /COMPARE WITH THE LAST TIME THIS PR
30122 100400 7          SPL             /CORRECT FOR TIMER OVERFLOW
30123 140407 7          TCA             /EVERY 30 MINUTES
30124 057465 7          SUB STATF+5 X   /LOOK AT INTERVAL BETWEEN PROGRAM R
30125 100400 7          SPL             /IS IT TIME TO ACTIVATE THIS PROG?
30126 003170 7          JMP SP91        /NO
30127 140040 7          CRA             /YES
30130 011214 7          STA SKEWT       /INIT A TIME-SKEWING TEMP
30131 004000 7          LDA 0
30132 012124 7          ERA MINUS4
30133 100040 7          SZE             /ARE WE DOING 10-SEC STAT?
30134 003153 7          JMP STAT6       /NO
```

```
30135 045465 7            LDA STATF+5 X  /YES, SKEW REPORTS BY IMP NUMBER
30136 040572 7            ARS 6 0"A"NIMP /DIV BY 100 = IMPNO
30137 101040 7            SNZ
30140 003153 7            JMP STAT6      /TOO SMALL AN INTERVAL TO SKEW
30141 140407 7            TCA
30142 011215 7            STA COUNT1     /BUILD MULTIPLY LOOP
30143 004106 7  STAT4:    LDA MINE
30144 140407 7            TCA
30145 011216 7            STA COUNT2
30146 025214 7  STAT5:    IRS SKEWT      /COMPUTE SKEWT=(MINE/100)*STATF
30147 025216 7            IRS COUNT2
30150 003146 7            JMP STAT5
30151 025215 7            IRS COUNT1
30152 003143 7            JMP STAT4
30153 045465 7  STAT6:    LDA STATF+5 X
30154 140407 7            TCA
30155 006417 7            ANA SYNC
30156 015214 7            ADD SKEWT
30157 051211 7            STA OLDS+5 X
30160 045457 7            LDA STATD+5 X  /*SEND STAT DEST
30161 021403 7            JST GIVE
30162 045451 7            LDA STATL+5 X  /*SEND STAT LINK
30163 021403 7            JST GIVE
30164 143204 7            JMP CAWL+5 XI  /CALL STAT PROGRAM

30165 073604 7  GIVLST:   LDX (100003)   /TERMINATE STAT MESSAGE
30166 004112 7            LDA SIGN       /*SEND PADDING
30167 120664 7            JST JAM I
30170 073211 7  SP91:     LDX SP8        /LOOP BACK OVER EACH STAT PROG
30171 025212 7            IRS SP81
30172 024000 7            IRS 0
30173 003114 7            JMP SP3
30174 072116 7            LDX THREE
30175 120665 7            JST DOZE I
30176 003060 7            JMP BKST

                LEV CON
30177 030217 C  CAWL:     SNAP           /SNAPSHOT STATISTICS PROGRAM
30200 030243 C            SEST           /CUMULATIVE STATISTICS PROGRAM
30201 030267 C            GENM           /MESSAGE GENERATOR
30202 030347 C            DIAG           /DIAGNOSTIC SENDER
30203 022057 C            TRBL           /NCC TROUBLE REPORT PROGRAM
                LEV VAR
30204 000000 V  OLDS:     0
30205 000000 V            0
30206 000000 V            0
30207 000000 V            0
30210 000000 V  TRBOLD:   0

30211         V  SP8:     BSS 1          /COUNTER FOR WHICH STAT PROG TO RUN
30212         V  SP81:    BSS 1          /STAT FLAGS INDIRECT PTR
30213         V  SOFO:    BSS 1          /SAVED COPY OF SON
30214         V  SKEWT:   BSS 1          /AMOUNT OF TIME TO SKEW STAT REPTS
30215         V  COUNT1:  BSS 1
30216         V  COUNT2:  BSS 1
```

```
                    /SEND SNAPSHOT STATISTICS
                    LEV BCK
30217 005605 7      SNAP:   LDA (5)          /*SEND SNAPSHOT CODE
30220 021403 7              JST GIVE
30221 004415 7              LDA TIME         /*SEND LOCAL TIME
30222 021403 7              JST GIVE
30223 073606 7              LDX (-COUNTL)
30224 001001 7      SNP2:   INH ALL
30225 044543 7 0            LDA COUNTA+COUNTL X      /*SEND QUEUE LENGTHS
30226 056567 7 0            SUB COUNTS+COUNTL X
30227 000401 7 0            ENB BCK
30230 021403 7              JST GIVE
30231 024000 7              IRS 0
30232 003224 7              JMP SNP2
30233 072132 7              LDX MINIMP
30234 044265 7      SNP3:   LDA RUT+NIMP X /*SEND ROUTE USE TABLE
30235 021403 7              JST GIVE
30236 105607 7              LDA (RST+NIMP 0 X) I     /*SEND ROUTE SEND TABLE
30237 021403 7              JST GIVE
30240 024000 7              IRS 0
30241 003234 7              JMP SNP3
30242 003165 7              JMP GIVLST       /*SEND PADDING AND END MESSAGE

                    /SEND 10 SECOND (CUMULATIVE) STATISTICS
30243 004115 7      SEST:   LDA TWO          /*SEND 10-SEC STAT CODE
30244 021403 7              JST GIVE
30245 004417 7              LDA SYNC         /*SEND NETWORK-WIDE TIME
30246 021403 7              JST GIVE
30247 073610 7              LDX (-NST)
30250 105611 7              LDA (STTB+NST X) I       /*SEND 10-SEC STAT TABLE
30251 021403 7              JST GIVE
30252 024000 7              IRS 0
30253 003250 7              JMP .-3
30254 021256 7              JST CLST         /CLEAR THE 10-SEC STAT TABLES
30255 003165 7              JMP GIVLST       /*SEND PADDING AND END MESSAGE

                    LEV BCK
                    /CLEAR ALL ENTRIES IN 10-SEC STAT TABLES
30256 000000 7      CLST:   0
30257 073610 7              LDX (-NST)
30260 140040 7              CRA
30261 001001 7              INH ALL
30262 111611 7 0            STA (STTB+NST X) I
30263 024000 7 0            IRS 0
30264 003262 7 0            JMP .-2
30265 000401 7 0            ENB BCK
30266 103256 7              JMP CLST I
```

```
                        /MESSAGE GENERATOR
30267 072116 7    GENM:     LDX THREE       /FAKE HOST 3 = STATISTICS
30270 005465 7              LDA MGNL        /PICK UP LENGTH OF MESSAGE
30271 007612 7              ANA (777)
30272 101040 7              SNZ
30273 003301 7              JMP GENM1
30274 140407 7              TCA             /GIVES RIGHT NUMBER, EXCLUDING PADD
30275 011346 7              STA MGCNT
30276 120664 7              JST JAM I       /*SEND MGNL WORDS
30277 025346 7              IRS MGCNT
30300 003276 7              JMP .-2
30301 131040 7    GENM1:    RDCLOK
30302 003301 7              JMP .-1
                        /CRA FOR ALL REG, LDA ONE FOR ALL PRI, ANA ONE FOR RANDOM MI
30303 140040 7              CRA
30304 100040 7              SZE
30305 004112 7              LDA SIGN
30306 013454 7              ERA MGD
30307 011454 7              STA MGD
30310 005446 7              LDA MGLK
30311 101000 7              NOP             /"SKP" TO RUN LINK CYCLER
30312 003165 7              JMP GIVLST      /*SEND PADDING AND END MESSAGE
30313 101040 7              SNZ
30314 003333 7              JMP LC1
30315 015613 7    LC3:      ADD (400)
30316 011446 7              STA MGLK
30317 100040 7              SZE
30320 003165 7              JMP GIVLST      /*SEND PADDING AND END MESSAGE
30321 004415 7              LDA TIME
30322 017345 7              SUB OTIM
30323 111343 7              STA PLAC I
30324 025343 7              IRS PLAC
30325 005465 7              LDA MGNL
30326 015342 7              ADD IGTH
30327 011465 7              STA MGNL
30330 017344 7              SUB LIMT
30331 101400 7              SMI
30332 003337 7              JMP LC44
30333 004415 7    LC1:      LDA TIME
30334 011345 7              STA OTIM
30335 005446 7              LDA MGLK
30336 003315 7              JMP LC3

30337 140040 7    LC44:     CRA             /WHEN DONE, SHUT MGEN OFF
30340 011437 7              STA MGON
30341 003165 7              JMP GIVLST      /*SEND PADDING AND END MESSAGE

                        LEV VAR
30342 000010 V    IGTH:     10              /LENGTH INCREMENT
30343 030000 V    PLAC:     30000           /CORE POINTER FOR TABLE BUILDING
30344 000760 V    LIMT:     760             /LONGEST MESSAGE TO SEND
30345        V    OTIM:     BSS 1           /TEMP TO SAVE STARTING TIME OF BLOC
30346        V    MGCNT:    BSS 1           /TEMP COUNTER FOR MESS LENGTH
```

```
                        LEV BCK
30347 001001 7          DIAG:   INH ALL         /SEND BROKEN PACKETS TO NCC FOR DIA(
30350 104342 7 0                LDA DIAGQ I
30351 026342 7 0                IMA DIAGQ       /GET PKT OFF DIAG QUEUE
30352 000401 7 0                ENB BCK
30353 011401 7                  STA DIAGP       /SAVE PNTR
30354 004746 7                  LDA HLTLOC      /*SEND HLT PC
30355 021403 7                  JST GIVE
30356 004747 7                  LDA HLTA        /*SEND HLT A REG
30357 021403 7                  JST GIVE
30360 004750 7                  LDA HLTX        /*SEND HLT X REG
30361 021403 7                  JST GIVE
30362 005401 7                  LDA DIAGP       /*SEND PKT PNTR
30363 010000 7                  STA 0
30364 021403 7                  JST GIVE
30365 005614 7                  LDA (-BUFL)
30366 011402 7                  STA DIAGC       /SET UP SEND COUNTER
30367 044000 7          DIAG1:  LDA 0 X         /*SEND CONTENTS OF BAD PACKET
30370 021403 7                  JST GIVE
30371 024000 7                  IRS 0
30372 025402 7                  IRS DIAGC
30373 003367 7                  JMP DIAG1
30374 001001 7                  INH ALL
30375 073401 7 0                LDX DIAGP
30376 120671 7 0                JST FLUSHI I
30377 000401 7 0                ENB BCK
30400 003165 7                  JMP GIVLST

                        LEV VAR
30401         V         DIAGP:  BSS 1           /PKT PNTR
30402         V         DIAGC:  BSS 1           /LOOP COUNTER

                        LEV BCK
30403 000000 7          GIVE:   0               /STAT CALLS TO JAM
30404 033411 7                  STX STT8        /SAVE X-REG
30405 072116 7                  LDX THREE
30406 120664 7                  JST JAM I
30407 073411 7                  LDX STT8
30410 103403 7                  JMP GIVE I
                        LEV VAR
30411         V         STT8:   BSS 1
```

```
                    LEV BCK     /FAKE IMP-TO-HOST 2 - PARAMETER CHANGE
30412 120666 7      BTR1:       JST SUCK I      /SKIP OVER REST OF MESSAGE
30413 003412 7                  JMP BTR1
30414 120666 7      BEST:       JST SUCK I      /BEGIN TO ACCEPT MESSAGE HERE
30415 120666 7                  JST SUCK I      /IGNORE LEADER
30416 120666 7      BTR4:       JST SUCK I      /GET NUMBER OF PARAM TO CHANGE
30417 100000 7                  SKP             /END OF MESSAGE?
30420 003414 7                  JMP BEST        /YES, GO BACK
30421 100400 7                  SPL             /IS NO OF PARAM POSTIVE?
30422 003412 7                  JMP BTR1        /NO, IGNORE REST OF MESSAGE
30423 007615 7                  ANA (37)        /YES, MASK DOWN TO 5 BITS
30424 015616 7                  ADD (PARAMT)    /BUILD PNTR TO PARAM TABLE
30425 011433 7                  STA BTR2
30426 120666 7                  JST SUCK I      /GET NEW VALUE FOR PARAMETER
30427 100000 7                  SKP             /END OF MESSAGE?
30430 003414 7                  JMP BEST        /YES, NO CHANGE TO THIS PARAM
30431 111433 7                  STA BTR2 I      /NO, PUT NEW VALUE IN PARAM
30432 003416 7                  JMP BTR4        /AND GO BACK FOR MORE
                    LEV VAR
30433 000000 V      BTR2:       0

                    DEFPLC [PARAMETERS TABLE]
                    PARAMT:
                    PARAML=32.
30434          V    TRON:       BSS 1           /0-TRACE ON
30435          V    SNON:       BSS 1           /1-SNAP ON
30436          V    SON:        BSS 1           /2-10-SEC STAT ON
30437          V    MGON:       BSS 1           /3-MESS GEN ON
30440          V    DIAGON:     BSS 1           /4-DIAG ON
30441          V    TPON:       BSS 1           /5-TRBL REPT ON
30442          V                BSS 1           /6

30443          V    TLNK:       BSS 1           /7-TRACE LINK
30444          V    STATL:      BSS 1           /10-SNAP LINK
30445          V                BSS 1           /11-10-SEC LINK
30446          V    MGLK:       BSS 1           /12-MESS GEN LINK
30447          V                BSS 1           /13-DIAG LINK
30450          V                BSS 1           /14-TRBL REPT LINK

30451          V    TDST:       BSS 1           /15-TRACE DEST
30452          V    STATD:      BSS 1           /16-SNAP DEST
30453          V                BSS 1           /17-10-SEC DEST
30454          V    MGD:        BSS 1           /20-MESS GEN DEST
30455          V    DIAGD:      BSS 1           /21-DIAG DEST
30456          V    TRBD:       BSS 1           /22-TRBL REPT DEST

30457          V    TF:         BSS 1           /23-AUTO TRACE FREQ
30460          V    STATF:      BSS 1           /24-SNAP FREQ
30461          V                BSS 1           /25-10-SEC FREQ
30462          V                BSS 1           /26-MESS GEN FREQ
30463          V                BSS 1           /27-DIAG FREQ
30464          V    TRBF:       BSS 1           /30-TRBL REPT FREQ

30465          V    MGNL:       BSS 1           /31-MESS GEN LENGTH
30466          V                BSS PARAMT+1+PARAML-.
```

```
                        LEV BCK    /FAKE IMP-TO-HOST 3 = DISCARD
30474 120666 7          STXY:      JST SUCK I      /GET EACH WORD AS IT IS READY
30475 003474 7                     JMP .-1         /AND RETURN IMMEDIATELY FOR MORE
30476 003474 7                     JMP .-2         /EVEN ON END OF MESSAGE

                                   /FAKE HOST-TO-IMP 2 = TRACE
30477 140500 7          BTRE:      SSM             /START HERE
30500 003515 7                     JMP BTRF

                        LCK TSK
30501 000401 7 6        BTD:       ENB BCK
30502 005572 7                     LDA T3BX
30503 101040 7                     SNZ
30504 003527 7                     JMP BTRD
30505 004112 7                     LDA SIGN
30506 073617 7                     LDX (100002)
30507 120664 7                     JST JAM I
30510 120665 7          BTRC:      JST DOZE I      /WAIT ONE BACKGROUND LOOP
30511 004341 7                     LDA STRQ        /START HERE
30512 101040 7                     SNZ             /ANYTHING TO SEND?
30513 003510 7                     JMP BTRC        /QUIT IF TRACE QUEUE EMPTY
30514 140040 7                     CRA
30515 011572 7          BTRF:      STA T3BX
30516 005451 7                     LDA TDST        /*SEND TRACE DEST
30517 120664 7                     JST JAM I
30520 005443 7                     LDA TLNK        /*SEND TRACE LINK
30521 120664 7                     JST JAM I
30522 004114 7                     LDA ONE         /*SEND TRACE CODE
30523 120664 7                     JST JAM I
30524 140040 7                     CRA             /RESET OVERFLOW FLAG
30525 026414 7                     IMA TTO         /*SEND STATE OF OVERFLOW FLAG
30526 120664 7                     JST JAM I
30527 072115 7          BTRD:      LDX TWO
30530 120665 7                     JST DOZE I
30531 005621 7          BRL2:      LDA ((STRQ))
30532 011573 7                     STA OLD2
30533 001001 7                     INH TSK
```

```
30534 105573 7 6 BTRL:    LDA OLD2 I      /SEARCH TRACE QUEUE
30535 011573 7 6          STA OLD2
30536 105573 7 6          LDA OLD2 I
30537 011574 7 6          STA OLD1
30540 101040 7 6          SNZ
30541 003501 7 6          JMP BTD         /JUMP IF DONE WITH TRACE QUEUE
30542 010000 7 6          STA 0
30543 044012 7 6          LDA TDONE X
30544 101400 7 6          SMI             /IS THIS TRACE BLOCK COMPLETE?
30545 003534 7 6          JMP BTRL        /NO
30546 044000 7 6          LDA 0 X         /YES, PICK UP ITS CHAIN PNTR
30547 111573 7 6          STA OLD2 I      /REMOVE FROM TRACE QUEUE
30550 000401 7 6          ENB BCK
30551 025572 7            IRS T3BX
30552 005622 7            LDA (=TDONE)
30553 011571 7            STA T2BX
30554 072115 7            LDX TWO
30555 025574 7            IRS OLD1
30556 105574 7            LDA OLD1 I
30557 120664 7            JST JAM I       /*SEND TRACE BLOCK
30560 025571 7            IRS T2BX
30561 003555 7            JMP .-4
30562 005574 7            LDA OLD1
30563 015622 7            ADD (=TDONE)
30564 001001 7            INH TSK
30565 026325 7 6          IMA TTF         /PUT ON FREE TRACE QUEUE
30566 110325 7 6          STA TTF I
30567 000401 7 6          ENB BCK
30570 003531 7            JMP BRL2        /LOOP SEARCHING TRACE QUEUE

                    LEV VAR
30571          V    T2BX:     BSS 1       /COPY LOOP COUNTER
30572          V    T3BX:     BSS 1       /COUNT OF NUMBER OF BLOCKS COPIED
30573          V    OLD2:     BSS 1       /QUEUE PNTR - USED IN SEARCH
30574          V    OLD1:     BSS 1       /PACKET PNTR - USED IN COPY
```

```
30575 177760 C   LEV CON   CONSTANTS
30576 072030 C
30577 172010 C
30600 120574 C
30601 050057 C
30602 100342 C
30603 130434 C
30604 100003 C
30605 000005 C
30606 177754 C
30607 073106 C
30610 177423 C
30611 071716 C
30612 000777 C
30613 000400 C
30614 177666 C
30615 000037 C
30616 030434 C
30617 100002 C
30620 000341 C
30621 030620 C
30622 177766 C
02437 175631 C             PAGEND 30,UNCON,3
```

```
                        LEV H2I
                        /HOST TO IMP STATISTICS
31055 000000 4    HS0:      0
31056 005753 4              LDA (STTB)
31057 001001 4              INH [I2M,I2H]
31060 011121 4 2            STA WHER
31061 004675 4 2            LDA HIP
31062 021123 4 2            JST SUB1
31063 015356 4 2            ADD TOT1
31064 011356 4 2            STA TOT1
31065 000401 4 2            ENB H2I
31066 072675 4              LDX HIP
31067 172677 4              LDX HIXX I
31070 044007 4              LDA HEAD2 X
31071 103055 4              JMP HS0 I

                        / HOST TO IMP ALL MESSAGES
31072 000000 4    HS2:      0
31073 065375 4              IRS CNT2 X
31074 101000 4              NOP
31075 103754 4              JMP (HIH0 0 XI) I

                        LEV I2H
                        / IMP TO HOST STATISTICS
31076 000000 3    HS1:      0
31077 005755 3              LDA (XGP)
31100 001001 3              INH I2M
31101 011121 3 2            STA WHER
31102 004676 3 2            LDA IHP
31103 172700 3 2            LDX IHXX I
31104 021123 3 2            JST SUB1
31105 015374 3 2            ADD TOT2
31106 011374 3 2            STA TOT2
31107 000401 3 2            ENB I2H
31110 072676 3              LDX IHP
31111 105756 3              LDA (IHED 0 X) I
31112 103076 3              JMP HS1 I

                        / IMP TO HOST CONTROL MESSAGES
31113 000000 3    HS3:      0
31114 141206 3              AOA
31115 065405 3              IRS CNT3 X
31116 101000 3              NOP
31117 103113 3              JMP HS3 I
```

```
                    LEV VAR
31120          V    WHERL:     BSS 1
31121          V    WHER:      BSS 1
31122          V    SUBL:      BSS 1

                    LEV I2M
31123 000000 2      SUB1:      0
31124 016130 2                 SUB PLNH
31125 101400 2                 SMI
31126 003156 2                 JMP SP6
31127 044111 2                 LDA BUFE X
31130 016000 2                 SUB 0
31131 017757 2                 SUB (DATA)
31132 140100 2                 SSP 0"A"TWOQ
31133 011122 2                 STA SUBL
31134 021717 2                 JST LOG
31135 014120 2                 ADD SEVEN       /POINTS TO LAST-PACKET LENGTH COUNTI
31136 015121 2                 ADD WHER        /...IN CORRECT TABLE
31137 011120 2                 STA WHERL
31140 125120 2                 IRS WHERL I     /AND GOOSE COUNTER
31141 101000 2                 NOP
31142 044006 2                 LDA HEAD1 X
31143 141340 2                 ICA 0"A"PKTNO
31144 006120 2                 ANA SEVEN
31145 101040 2                 SNZ
31146 003154 2                 JMP SP4         /NO SEPARATE COUNTER FOR 1PKT MSGS
31147 016114 2                 SUB ONE         /BACK OFF  1
31150 015121 2                 ADD WHER
31151 011121 2                 STA WHER
31152 125121 2                 IRS WHER I
31153 101000 2                 NOP
31154 005122 2      SP4:       LDA SUBL
31155 103123 2                 JMP SUB1 I

31156 073123 2      SP6:       LDX SUB1
31157 042002 2                 JMP 2 X
```

```
                        / IMP TO MODEM MESSAGES
31160 000000 2    IM1:      0
31161 111760 2              STA (ACKWRD) I
31162 010000 2              STA 0
31163 044105 2              LDA BUFE-ACKH X
31164 016000 2              SUB 0
31165 016116 2              SUB THREE 0"A"[HEAD2-ACKH]
31166 140100 2              SSP 0"A"TWOQ
31167 011337 2              STA IMT1
31170 021717 2              JST LOG
31171 173761 2              LDX (OCHN) I
31172 055331 2              ADD TUB1 X
31173 011340 2              STA IMT2
31174 125340 2              IRS IMT2 I
31175 101000 2              NOP
31176 005337 2              LDA IMT1
31177 055622 2              ADD ANS4 X
31200 051622 2              STA ANS4 X
31201 103160 2              JMP IM1 I

                        LEV M2I
                        / MODEM TO IMP DISCARD
31202 000000 0    MI1:      0
31203 025627 0              IRS MTOT
31204 070471 0              M1ERR
31205 103202 0              JMP MI1 I
31206 025634 0              IRS CKSM
31207 025202 0              IRS MI1
31210 101000 0              NOP
31211 103202 0              JMP MI1 I

                        /TASK I HEARD YOU MESSAGES RECEIVED
31212 000000 0    TSKIH:    0
31213 064426 0              IRS LAC X
31214 065641 0              IRS TSKIHY X
31215 101000 0              NOP
31216 103212 0              JMP TSKIH I
```

```
                        / MODEM TO IMP BUFFER TROUBLE
31217 000000 0    MI3:      0
31220 100040 0              SZE
31221 025217 0              IRS MI3
31222 101040 0              SNZ
31223 065646 0              IRS BUFT X
31224 101000 0              NOP
31225 103217 0              JMP MI3 I

                        /MORE OF MODEM TO IMP DISCARD

31226 000000 0    MI1A:     0
31227 025630 0              IRS MTOT+1
31230 070472 0              M2ERR
31231 103226 0              JMP MI1A I
31232 025635 0              IRS CKSM+1
31233 025226 0              IRS MI1A
31234 101000 0              NOP
31235 103226 0              JMP MI1A I

31236 000000 0    MI1B:     0
31237 025631 0              IRS MTOT+2
31240 070473 0              M3ERR
31241 103236 0              JMP MI1B I
31242 025636 0              IRS CKSM+2
31243 025236 0              IRS MI1B
31244 101000 0              NOP
31245 103236 0              JMP MI1B I

31246 000000 0    MI1C:     0
31247 025632 0              IRS MTOT+3
31250 070474 0              M4ERR
31251 103246 0              JMP MI1C I
31252 025637 0              IRS CKSM+3
31253 025246 0              IRS MI1C
31254 101000 0              NOP
31255 103246 0              JMP MI1C I

31256 000000 0    MI1D:     0
31257 025633 0              IRS MTOT+4
31260 070475 0              M5ERR
31261 103256 0              JMP MI1D I
31262 025640 0              IRS CKSM+4
31263 025256 0              IRS MI1D
31264 101000 0              NOP
31265 103256 0              JMP MI1D I
```

```
                    LEV H2I
31266 000000 4      HS4:        0
31267 050111 4                  STA BUFE X
31270 173762 4                  LDX (PPSLT) I
31271 131040 4                  RDCLOK
31272 003271 4                  JMP .-1
31273 050010 4                  STA PPT1 X      /SAVE SENT TIME FOR 1 PKT MESS
31274 173763 4                  LDX (PPSLT 0 I) I
31275 103266 4                  JMP HS4 I

31276 000000 4      HS5:        0               /SHOULD ONLY DO THIS ONCE, NEED A C
31277 050030 4                  STA PLT2 X
31300 131040 4                  RDCLOK
31301 003300 4                  JMP .-1
31302 050044 4                  STA PLT3 X      /SAVE SENT TIME FOR 8 PKT MESS
31303 103276 4                  JMP HS5 I

                    LEV TSK     LCK FRE
31304 000000 6 0    HS6:        0
31305 131040 6 0                RDCLOK
31306 003305 6 0                JMP .-1
31307 173764 6 0                LDX (PPTASK) I
31310 056010 6 0                SUB PPT1 X
31311 021322 6 0                JST HSTIME      /GET ROUND-TRIP TIME FOR 1 PKT ME
31312 103765 6 0                JMP (PPTFRE) I

31313 000000 6 0    HS7:        0
31314 131040 6 0                RDCLOK
31315 003314 6 0                JMP .-1
31316 173764 6 0                LDX (PPTASK) I
31317 056044 6 0                SUB PLT3 X
31320 021322 6 0                JST HSTIME      /GET ROUND-TRIP TIME FOR 8 PKT MESS
31321 103766 6 0                JMP (GUDRP0) I

31322 000000 6 0    HSTIME:     0
31323 040475 6 0                LGR 3
31324 173767 6 0                LDX (SOURCE) I
31325 055415 6 0                ADD HS4R X
31326 051415 6 0                STA HS4R X
31327 065515 6 0                IRS HS4S X
31330 103322 6 0                JMP HSTIME I
```

```
                    LEV CON
31331 031660 C      TUB1:     XGP1+0
31332 031666 C                XGP1+6
31333 031674 C                XGP1+12.
31334 031702 C                XGP1+18.
31335 031710 C                XGP1+24.
31336 031716 C                XGP1+30.
                    LEV VAR
31337          V    IMT1:     BSS 1
31340          V    IMT2:     BSS 1


                    /CUMULATIVE STATS SENT IN THIS ORDER
                    /STATISTICS GATHERED BY H2I
31341          V    STTB:     BSS 13.          /HISTOGRAM OF H2I MESS LENGTH = A
31356          V    TOT1:     BSS 1            /TOTAL # OF H2I WORDS
                    /STATISTICS GATHERED BY I2H
31357          V    XGP:      BSS 13.          /HISTOGRAM OF I2H MESS LENGTH = A
31374          V    TOT2:     BSS 1            /TOTAL # OF I2H WORDS
                    /STATISTICS GATHERED BY H2I
31375          V    CNT2:     BSS TH           /# OF H2I ALL MESSAGES PER HOST
                    /STATISTICS GATHERED BY I2H
31405          V    CNT3:     BSS TH           /# OF I2H CONTROL MESSAGES PER HOST
                    /STATISTICS GATHERED BY TSK
31415          V    HS4R:     BSS NIMP         /TOTAL ROUND TRIP TIME IN 800 MS PE
31515          V    HS4S:     BSS NIMP         /# OF ROUND TRIPS MEASURED ABOVE
                    /STATISTICS GATHERED BY I2M
31615          V    IMHS:     BSS CH           /# OF HELLOS SENT PER LINE
31622          V    ANS4:     BSS CH           /# OF DATA WOSDS SENT PER LINE
                    /STATISTICS GATHERED BY M2I
31627          V    MTOT:     BSS CH           /# OF INPUTS RECVD PER LINE
31634          V    CKSM:     BSS CH           /# OF CHECKSUM ERRORS PER LINE
                    /STATISTICS GATHERED BY TSK
31641          V    TSKIHY:   BSS CH           /# OF I HEARD YOUS RECVD PER LINE
                    /STATISTICS GATHERED BY M2I
31646          V    BUFT:     BSS CH           /# OF INPUTS LOST DUE TO LACK OF
31653          V    SLOW:     BSS CH           /UNUSED
                    /STATISTICS GATHERED BY I2M
31660          V    XGP1:     BSS CH+CH+CH+CH+CH+CH    /HISTOGRAM OF I2M MESSA
31716          V    EP20:     BSS 1            /BEGINNING OF PATCH AREA
                    NST=0+0+EP20-STTB
```

```
                        LEV I2M
                        / LOG SUBROUTINE
31717 000000 2    LOG:      0
31720 033742 2              STX LOGX
31721 022120 2              CAS SEVEN
31722 003731 2              JMP LOG1
31723 101000 2              NOP
31724 100400 2              SPL
31725 003733 2              JMP LOG3
31726 010000 2              STA 0
31727 045743 2              LDA LOGT X
31730 003740 2              JMP LOG2
31731 040575 2    LOG1:     ARS 3
31732 022120 2              CAS SEVEN
31733 004120 2    LOG3:     LDA SEVEN
31734 101000 2              NOP
31735 010000 2              STA 0
31736 045743 2              LDA LOGT X
31737 014116 2              ADD THREE
31740 073742 2    LOG2:     LDX LOGX
31741 103717 2              JMP LOG I

                        LEV VAR
31742         V     LOGX:     BSS 1
                        LEV CON
31743 000000 C    LOGT:     0
31744 000000 C              0
31745 000001 C              1
31746 000001 C              1
31747 000002 C              2
31750 000002 C              2
31751 000002 C              2
31752 000002 C              2
```

```
31753 031341 C   LEV CON   CONSTANTS
31754 154137 C
31755 031357 C
31756 056124 C
31757 000011 C
31760 012655 C
31761 012654 C
31762 015156 C
31763 115156 C
31764 007131 C
31765 007213 C
31766 007215 C
31767 006673 C
31770        C   SB1:      BSS NSTATS      /ADDRESSES FOR STAT INSTR
32010        C   SC1:      BSS NSTATS      /NOMINAL CONTENTS

02440 177030 C             PAGEND 31,SC1+NSTATS
```

```
                    LEV VAR
                    TABZB:    /THIS ENTIRE PAGE IS ZEROED AT INIT
                    /TABLES OF BUFFER PNTRS, NACH FOR EACH LINE
32030          V    I2MB0:    BSS NACH
32040          V    I2MB1:    BSS NACH
32050          V    I2MB2:    BSS NACH
32060          V    I2MB3:    BSS NACH
32070          V    I2MB4:    BSS NACH
                    /NULL AREAS
32100          V    NULS1:    BSS HEAD3-ACKH+1          /ACKS GO HERE
32105          V    NULS2:    BSS HEAD3-ACKH+1          /ACKS GO HERE
32112          V    NULS3:    BSS HEAD3-ACKH+1          /ACKS GO HERE
32117          V    NULS4:    BSS HEAD3-ACKH+1          /ACKS GO HERE
32124          V    NULS5:    BSS HEAD3-ACKH+1          /ACKS GO HERE
                    NTRCB=8
                    TRACEL=TDONE+1
32131          V    TRACEQ:   BSS NTRCB"T"TRACEL        /TRACE STORE
                    TALLYL=8.
32261          V    TALLY:    BSS TALLYL     /STACK OF TRANSMIT ALLOCATES WE HAVI

                    DEFPLC [TRANSMIT, RECEIVE, AND ALLOCATE MESSAGE TABLES]
32271          V    TMESS:    BSS NIMP
32371          V    RMESS:    BSS NIMP
32471          V    AMESS:    BSS NIMP
                    DEFPLC [RALLY TABLE = ALLOCATES TO SEND]
32571          V    RALLY:    BSS NIMP
                    LEV CON
02441 176671   C              PAGEND 32,-0

                    LEV VAR
                    /ROUTE SEND TABLES
                    /SEND ROUTING MESSAGE FROM HERE
33003          V    RSTX:     BSS 1          /ACKS
33004          V              BSS 1          /HEADER
33005          V              BSS 1          /SERIAL NO. (LH)
33006          V    RST:      BSS NIMP       /ROUTE SEND TABLE
33106          V    RSTCKS:   BSS 1          /CHECKSUM
                    /END OF ROUTING MESSAGE

                    /ALTERNATE ROUTING MESSAGE BUFFER 1
33107          V    RSTX1:    BSS 1          /ACKS
33110          V              BSS 1          /HEADER
33111          V              BSS 1          /SERAIL NO. (LH)
33112          V    RST1:     BSS NIMP       /ROUTE SEND TABLE
33212          V              BSS 1          /CHECKSUM

                    /ALTERNATE ROUTING MESSAGE BUFFER 2
33213          V    RSTX2:    BSS 1          /ACKS
33214          V              BSS 1          /HEADER
33215          V              BSS 1          /SERIAL NO. (LH)
33216          V    RST2:     BSS NIMP       /ROUTE SEND TABLE
33316          V              BSS 1          /CHECKSUM
```

```
                LEV VAR
                NREAB=8                         /8 = NEED MANY FOR <8 PKT MESSAGES
                REASL=RSF+1
33317       V   REASQ:    BSS NREAB"T"REASL       /REASSEMBLY STORE
                PPTL=8.                         /NUMBER OF ENTRIES IN PPT
                PPTN=2                          /NUMBER OF WORDS PER ENTRY IN PPT
                PPTNUM=PPTL"T"PPTN
                DEFPLC [PPT = PENDING PACKET TABLE]
33457       V   PPT:     BSS PPTNUM             /TABLE OF PNTRS TO PENDING PACKETS
                PLTL=12.                        /NUMBER OF ENTRIES IN PLT
                PLTN=4                          /NUMBER OF WORDS PER ENTRY IN PLT
                PLTNUM=PLTL"T"PLTN
                DEFPLC [PLT = PENDING LEADER TABLE]
33477       V   PLT:     BSS PLTNUM             /TABLE OF COPIED PENDING LEADERS
                HTPTBL:                         /TABLE OF HOST THROUGHPUTS
33557       V   HTPMTN:   BSS NH                /MESSAGES FROM HOST TO   NET
33563       V   HTPMFN:   BSS NH                /MESSAGES TO   HOST FROM NET
33567       V   HTPPTN:   BSS NH                /PACKETS  FROM HOST TO   NET
33573       V   HTPPFN:   BSS NH                /PACKETS  TO   HOST FROM NET
33577       V   HTPMTL:   BSS NH                /MESSAGES FROM HOST TO   LOCAL HOST
33603       V   HTPMFL:   BSS NH                /MESSAGES TO   HOST FROM LOCAL HOST
33607       V   HTPPTL:   BSS NH                /PACKETS  FROM HOST TO   LOCAL HOST
33613       V   HTPPFL:   BSS NH                /PACKETS  TO   HOST FROM LOCAL HOST
33617       V   HTPWTI:   BSS NH                /WORDS    FROM HOST TO   IMP
33623       V   HTPWFI:   BSS NH                /WORDS    TO   HOST FROM IMP
                TABZE:
                TABZL=TABZE+0-TABZB
```

```
                LEV CON
                IRP [PAGEN,,33,34,35,36]
                        PAGEND PAGEN,=0

02442 175627 C  ENDIRP
02443 170053 C
02444 170061 C
02445 170067 C

                P36FB=FB
                P36NB=NB
02446 170075 C          PAGEND 37,=0
                P37NB=NB=1              /ALLOW FOR SAT CODE
                P37FB=FB


                100003/ =0              VDHSTART  VDHEND
                        ,ASCII /  VDH

                "Z"/
                NMAXS=4"T"CH

                100001/ NBUFS=2
                        ,ASCII / TOTAL BUFFERS"Z"/

                100001/ P37NB
                        ,ASCII / FEWER BUFFERS IF VDH PRESENT"Z"/


                100001/ NMAXS
                        ,ASCII / STORE AND FORWARD LIMIT"Z"/

                100001/ 0 0 [0 0 [NBUFS=NMAXS+10]"Q"10]"T"10+2
                        ,ASCII / REASSEMBLY LIMIT"Z"/

                100001/ NITB
                        ,ASCII / IMP=TIP CONVERSION REGISTERS"Z"/

                100001/ NSTATS
                        ,ASCII / STATISTICS GATHERING PLACES"Z"/

                START
```

```
                    /VERY DISTANT HOST
                    37000/    VDHSTART:
                    ITBVP=0
                    /FILL IN THE VDH/IMP INITIALIZATION TABLE

                    LEV CON
03366          C    VDHD VDH2,JST VDH2, I,NOP
37717 121407   C
02346 101000   C
02361 003366   C
21126          C    VDHD VDH3,JST VDH3, I,NOP
37720 121661   C
02347 101000   C
02362 021126   C


                    /BUILD INSTRUCTIONS DEPENDENT ON M,N & H,N AND FINISH TABLE

                    IRPC [L,,1234]
                    REPEAT 1IF VZ L-1-H,N,[

                    VD,HOI=H'L'OTIL
                    VD,HII=H'L'INIL
                    VD,HIB=H'L'INBP
                    VD,IHB=H'L'OTBP
                    VDHD SKST H,N,NOP,H'L'RDY
                    VDHD IHED H,N,IRS VD,OT,H'L'FOUT
                    VDHD IHOT H,N,NOP,H'L'ROUT
                    VDHD HER H,N,NOP,H'L'ERR
                    VDHD HIN H,N,JMP HIFAKE,H'L'IN
                    VDHD EMIT H,N,SKP,H'L'EOM
                    VDHD HENABT H,N, IRS VD,RDY, H'L'ENAB
                    ]
```

```
                        /END THE REPEAT
21663           C       ENDIRP
37721 101000    C
02350 070160    C
02363 021663    C
16125           C
37722 024475    C
02351 030260    C
02364 016125    C
17057           C
37723 101000    C
02352 030060    C
02365 017057    C
13171           C
37724 101000    C
02353 070060    C
02366 013171    C
13201           C
37725 003531    C
02354 030160    C
02367 013201    C
13304           C
37726 100000    C
02355 070260    C
02370 013304    C
16317           C
37727 024476    C
02356 030560    C
02371 016317    C

                        /HOST34=0
                        V.1=74000
                        V.2=134000
                        V.3=154000
                        V.4=164000
                        V.5=170000
                        /HOST34>0
                        V..1=70000
                        V..2=130000
                        V..3=150000
                        V..4=160000
                        V..5=170000
                        /HOST34<0
                        V...1=60000
                        V...2=120000
                        V...3=140000
                        V...4=160000
                        V...5=160000

                        IRPC [L,,12345]

                        REPEAT 1IF VZ L-1-M,N,[

                        VD.IIM=V.'L
                        VD..IM=V..'L
                        VD...M=V...'L
                        VD.OIP=M'L'OTBP
                        VDHD 64 M,N,VD.II,M2I'L
```

```
                        VDHD 71 M,N,VD.OI,I2M*L

                        ] /END OF REPEAT
00066           C       ENDIRP
37730 037124    C
02357 010113    C
02372 000066    C
00073           C
37731 037331    C
02360 012117    C
02373 000073    C
```

```
/PACKET CONTROL WORD FORMAT

/BITS   MEANINGS
/1      LAST PACKET BIT
/2      PACKET'S ODD/EVEN BIT
/3-8    PACKET'S WORD COUNT
        / 0 = ACKS ALONE
        / 1-63 = NUMBER OF WORDS (INCLUDING LEADER)
/9      HOST/IMP BIT -- ONE FROM HOST
/10     UNUSED
/11-12  UNUSED (CHANNEL 3 & CHANNEL 2 ACKS)
/13     CHANNEL 1 ACK
/14     CHANNEL 0 ACK
/15     UNUSED (EXTENDED CHANNEL NUMBER)
/16     CHANNEL NUMBER
```

```
                    /VERY DISTANT HOST VARIABLES
                    VDHNC=2   /NUMBER OF CHANNELS

                    LEV VAR
37000          V    VD.TB:    BSS VDHNC       /TRANSMIT BUFFER POINTERS
                                               /ZERO MEANS UNUSED

37002          V    VD.RB:    BSS VDHNC       /RECEIVE BUFFER POINTERS
                                               /ZERO MEANS UNUSED

                    VD.ZVB:                   /BEGINNING OF VARIABLES TO BE ZEROE

37004 000000 V      VD.TFP:   0               /TRANSMIT FILL POINTER -- MUST "SEQ
37005 000000 V      VD.TEP:   0               /TRANSMIT EMPTY POINTER

37006 000000 V      VD.REP:   0               /RECEIVE EMPTY POINTER -- MUST "SEQ

37007          V    VD.TOE:   BSS VDHNC       /TRANSMIT ODD/EVEN BITS

37011          V    VD.ROE:   BSS VDHNC       /RECEIVE ODD/EVEN BITS

37013 000000 V      VD.T:     0               /COUNTS IF TOO LONG WITHOUT ACK
                                               /POSITIVE MEANS TOO LONG
37014 000000 V      VD.R:     0               /COUNTS IF IT IS TIME TO SEND DUP
                                               /POSITIVE MEANS SEND ON
37015 000000 V      VD.D:     0               /COUNTS IF LINE HAS BEEN HELD DEAD
                                               /NEG MEANS NOT LONG ENOUGH

37016          V    VD.TE:    BSS VDHNC       /TRANSMIT LAST PACKET BIT
37020          V    VD.RE:    BSS VDHNC       /RECEIVE LAST PACKET BIT


                    VD.ZVE:                   /END OF VARIABLES TO BE ZEROED

37022 000000 V      VD.HOL:   0               /EXPECTING OUTPUT OF LEADER FLAG

37023 000000 V      VD.RCN:   0               /RECEIVE CHANNEL NUMBER

37024 000000 V      VD.EXP:   0               /200 IF EXPECTING PKTS FROM HOST
                                               /0 IF EXPECTING FROM SELF (LOOPED)

                    15SECS=30
                    5SECS=10
                    2.5SECS=4
```

```
                    /VERY DISTANT HOST INITIALIZATION

                    LEV BCK
37025 000000 7      VD.I:       0
37026 005732 7                  LDA (4000)
37027 026567 7                  IMA VDHUPF      /MARK VDH AS UP
37030 100040 7                  SZE             /WAS ALREADY UP?
37031 103025 7                  JMP VD.I I      /YES, JUST GO AWAY QUIETLY
37032 011000 7                  STA VD.TB       /ZERO RECEIVE AND TRANSMIT BUFFER
37033 011001 7                  STA VD.TB 1
37034 011002 7                  STA VD.RB
37035 011003 7                  STA VD.RB 1
37036 005733 7                  LDA (200)       /BEGIN EXPECTING LINE UNLOOPED
37037 011024 7                  STA VD.EXP
37040 001001 7                  INH ALL
37041 121734 7 0                JST (GETFRE) I
37042 003112 7 0                JMP VD.I9       /NO BUFFERS FREE
37043 004000 7 0                LDA 0
37044 015735 7 0                ADD (100000+CNTL+1)
37045 010024 7 0                STA M1INBP+2"T"M,N
37046 015736 7 0                ADD (BUFE-CNTL-1)
37047 010025 7 0                STA M1INBP+2"T"M,N+1
37050 073737 7 0                LDX (-MAXVDH)
37051 045732 7 0                LDA ITBVDH+MAXVDH X       /VDHDEFS
37052 111740 7 0                STA (ITBVDL+MAXVDH XI) I
37053 024000 7 0                IRS 0
37054 003051 7 0                JMP .-3
37055 030473 7 0                M1IN+M,N
37056 021060 7 0                JST VD.REI
37057 103025 7 0                JMP VD.I I

                    LEV [VDI,T,0]               LCK ALL
37060 000000 1 0    VD.REI:     0               /REINITIALIZE
37061 073741 1 0                LDX (VD.ZVB 0-VD.ZVE
37062 140040 1 0                CRA             /ZERO VARIABLES WHICH NEED IT
37063 051022 1 0                STA VD.ZVE X
37064 024000 1 0                IRS 0
37065 003063 1 0                JMP .-2
37066 010036 1 0                STA VD.OIP      /CLEAR OUTPUT INTERRUPT PENDING FL
37067 072124 1 0                LDX MINUS4      /FREE ANY BUFFERS
37070 033022 1 0                STX VD.HOL      /INITIALIZE TO NON-ZERO
37071 032475 1 0                STX VD.OT       /FIX OUTPUT TYPE FLAG *TEMP*
37072 140040 1 0    VD.REK:     CRA
37073 067004 1 0                IMA VD.TB 4 X
37074 101040 1 0                SNZ
37075 003103 1 0                JMP VD.REJ
37076 033114 1 0                STX VD.REX
37077 140100 1 0                SSP
37100 010000 1 0                STA 0
37101 120671 1 0                JST FLUSHI I
37102 073114 1 0                LDX VD.REX
37103 024000 1 0    VD.REJ:     IRS 0
37104 003072 1 0                JMP VD.REK
37105 005742 1 0                LDA (-15SECS
37106 011015 1 0                STA VD.D        /MARK TO HOLD LINE DEAD
37107 005743 1 0                LDA (NOP        /DROP READY LINE
37110 111744 1 0                STA (SKST H.N) I
```

```
37111 103060 1 0              JMP VD.REI I    /DONE, SO RETURN

37112 024144 1 0 VD.I9:       IRS VDHRSF      /TRY AGAIN LATER
37113 003025 1 0              JMP VD.I
                        LEV VAR
37114 000000 V    VD.REX:     0
```

```
                    /VERY DISTANT HOST INPUT INTERRUPT ROUTINE
                    LEV VAR
37115 000000 V      VD.IK:    0               /SAVED KEYS
37116 000000 V      VD.IIB:   0               /BUFFER POINTER
37117 000000 V      VD.IA:    0               /SAVED A
37120 000000 V      VD.IX:    0               /SAVED X
37121 000000 V      VD.IM:    0               /SAVED MASK
37122 000000 V      VD.RBL:   0               /RECEIVE BUFFER LENGTH
37123 000000 V      VD.CWP:   0               /POINTER TO PACKET CONTROL WORD

37124 000000 1 0 VD.II:       INT VDI
37125 011117 1 0              STA VD.IA       /SAVE MASK AND REGISTERS
37126 033120 1 0              STX VD.IX
37127 105745 1 0              LDA (HOST34) I
37130 073746 1 0              LDX (VD.IIM)    /HOST34=0
37131 100040 1 0              SZE
37132 073747 1 0              LDX (VD..IM)    /HOST34>0
37133 100400 1 0              SPL
37134 073750 1 0              LDX (VD...M)    /HOST34<0
37135 004000 1 0              LDA 0
37136 170120 1 0              SMK INTM
37137 026134 1 0              IMA PRIM
37140 011121 1 0              STA VD.IM
37141 000043 1 0              INK
37142 011115 1 0              STA VD.IK
37143 120672 1 0              JST DODXA I     RET VDI
37144 004025 1                LDA M1INBP+1 2"T"M.N      /GET BUFFER POINTER
37145 140100 1                SSP
37146 017751 1                SUB (BUFE       /SAVE BUFFER POINTER
37147 011116 1                STA VD.IIB
37150 015752 1                ADD (CNTL 1
37151 011123 1                STA VD.CWP
37152 005015 1                LDA VD.D        /IS LINE BEING HELD DEAD
37153 100400 1                SPL
37154 003171 1                JMP VD.II2      /YES
37155 070473 1                M1ERR M.N       /ERROR?
37156 100000 1                SKP
37157 003171 1                JMP VD.II2      /YES
37160 105123 1                LDA VD.CWP I
37161 007733 1                ANA (200)
37162 013024 1                ERA VD.EXP      /IS PACKET FROM WHOM EXPECTED?
37163 101040 1                SNZ
37164 003212 1                JMP VD.II1      /YES, GO PROCESS IT
37165 013024 1                ERA VD.EXP      /NO, CHANGE STATE OF VD.EXP
37166 011024 1                STA VD.EXP
37167 001001 1                INH ALL
                    DEFHLT [VDH LOOP STATE CHANGED]
37170 021317 1 0              JST VD.APH
```

```
                                LEV VDI
37171 005116 1    VD.II2:       LDA VD.IIB      /DO INPUT
37172 015735 1    VD.II8:       ADD (100000 CNTL 1
37173 010024 1                  STA M1INBP 2"T"M.N
37174 015736 1                  ADD (BUFE-CNTL-1
37175 010025 1                  STA M1INBP+1 2"T"M.N
37176 030473 1                  M1IN M.N
37177 073120 1                  LDX VD.IX       /RESTORE MASK AND REGISTERS
37200 001001 1                  INH MSK
37201 005121 1 0                LDA VD.IM
37202 170120 1 0                SMK INTM
37203 010134 1 0                STA PRIM
37204 000013 1 0                EXA
37205 005115 1 0                LDA VD.IK
37206 171020 1 0                OTK
37207 005117 1 0                LDA VD.IA
37210 000401 1 0                ENB VDI
37211 103124 1                  JMP VD.II I     /RETURN
```

```
37212 105123 1    VD,II1:   LDA VD,CWP I   /PROCESS ACKS
37213 072113 1              LDX ZERO       /CHANNEL ZERO ACK
37214 040576 1              ARS 2
37215 021273 1              JST VD,AP
37216 072114 1              LDX ONE        /CHANNEL ONE ACK
37217 105123 1              LDA VD,CWP I
37220 040575 1              ARS 3
37221 021273 1              JST VD,AP
37222 105123 1              LDA VD,CWP I   /IS PACKET A DUPLICATE
37223 006114 1              ANA ONE
37224 011023 1              STA VD,RCN     /SAVE CHANNEL # FOR LATER USE
37225 010000 1              STA 0
37226 105123 1              LDA VD,CWP I   /GET PACKET O/E BIT
37227 041676 1              ALR 2
37230 053011 1              ERA VD,ROE X   /MATCH AGAINST RECEIVE O/E BIT
37231 100100 1              SLZ
37232 003171 1              JMP VD,II2     /DUPLICATE
37233 105123 1              LDA VD,CWP I   /IS THERE ANY DATA
37234 141340 1              ICA
37235 006752 1              ANA C77
37236 101040 1              SNZ
37237 003171 1              JMP VD,II2     /NO
37240 011122 1              STA VD,RBL
37241 073023 1              LDX VD,RCN     /IS THERE ROOM FOR THIS BUFFER
37242 045002 1              LDA VD,RB X
37243 100040 1              SZE
37244 003171 1              JMP VD,II2     /NO
37245 105123 1              LDA VD,CWP I   /SAVE LAST PACKET BIT FOR BACKGROUN
37246 006112 1              ANA SIGN
37247 051020 1              STA VD,RE X
37250 001001 1              INH FRE        /IS THERE A FREE BUFFER
37251 104324 1 0            LDA FREE I
37252 101040 1 0            SNZ            /POSITIVE NO IN A REG
37253 003171 1 0            JMP VD,II2     /NO
37254 011014 1 0            STA VD,R       /MARK THAT THERE IS ACK TO SEND
37255 045011 1 0            LDA VD,ROE X   /COMPLEMENT O/E BIT
37256 012114 1 0            ERA ONE
37257 051011 1 0            STA VD,ROE X
37260 005116 1 0            LDA VD,IIB     /USE NEW BUFFER FOR INPUT
37261 051002 1 0            STA VD,RB X    /PASS RECEIVED BUFFER TO BACKGROUND
37262 010000 1 0            STA 0          /GET BUFFER LENGTH
37263 005122 1 0            LDA VD,RBL     /PUT COUNT IN BUFE
37264 050111 1 0            STA BUFE X
                       LEV VDI
37265 001001 1    VD,II7:   INH FRE
37266 024563 1 0            IRS NFS        /GET A FREE BUFFER NFS
37267 104324 1 0            LDA FREE I
37270 026324 1 0            IMA FREE
37271 000401 1 0            ENB VDI
37272 003172 1              JMP VD,II8
```

```
                    /VERY DISTANT HOST ACKNOWLEDGE PROCESSOR
                         /CALL WITH ACK BIT IN AC

37273 000000 1      VD.AP:    0
37274 053007 1                ERA VD.TOE X    /IS THIS A DUPLICATE ACK
37275 101100 1                SLN
37276 003312 1                JMP VD.AP1      /YES
37277 045007 1                LDA VD.TOE X    /COMPLEMENT TRANSMIT O/E BIT
37300 012114 1                ERA ONE
37301 051007 1                STA VD.TOE X
37302 045000 1                LDA VD.TB X
37303 001001 1                INM ALL
37304 100040 1 0              SZE             /SPURIOUS ACK?
37305 003307 1 0              JMP VD.AP2      /NO
                      DEFHLT [VDH SPURIOUS ACK]
37306 021317 1 0              JST VD.APH      /YES
37307 000401 1 0 VD.AP2:      ENB VDI
37310 140500 1                SSM             /MARK CHANNEL UNUSED
37311 051000 1                STA VD.TB X
37312 005753 1      VD.AP1:   LDA (-5SECS     /RESET T
37313 011013 1                STA VD.T
37314 004112 1                LDA SIGN        /BRING READY LINE UP
37315 111744 1                STA (SKST H,N) I
37316 103273 1                JMP VD.AP I

                      LCK M2I
37317 000000 1 0 VD.APH:      0
37320 120745 1 0              JST HLTNCC I
37321 021060 1 0              JST VD.REI
37322 003171 1 0              JMP VD.II2
```

```
                    /VERY DISTANT HOST OUTPUT INTERRUPT
                    LEV VAR
37323 000000 V      VD.OK:    0               /SAVED KEYS
37324 000000 V      VD.OA:    0               /SAVED A
37325 000000 V      VD.OX:    0               /SAVED X
37326 000000 V      VD.OM:    0               /SAVED MASK
37327 000000 V      VD.OB:    0               /SAVED POINTER
37330 000000 V      VD.CW:    0               /CONTROL WORD

37331 000000 2 0 VD.OI:       INT VDO
37332 011324 2 0              STA VD.OA       /SAVE MASK AND REGISTERS
37333 004502 2 0              LDA MOM
37334 170120 2 0              SMK INTM
37335 026134 2 0              IMA PRIM
37336 011326 2 0              STA VD.OM
37337 000043 2 0              INK
37340 011323 2 0              STA VD.OK
37341 120672 2 0              JST DODXA I     RET VDO
37342 033325 2                STX VD.OX
37343 140040 2                CRA
37344 010036 2                STA VD.OIP      /CLEAR OUTPUT INT PENDING FLAG
```

```
37345 005015 2              LDA VD.D        /LINE BEING HELD DEAD?
37346 100400 2              SPL
37347 003364 2              JMP VD.OI2      /YES
37350 021407 2              JST VD.OIS      /SERVICE ONE CHANNEL
37351 021407 2              JST VD.OIS      /SERVICE ANOTHER CHANNEL
37352 005014 2              LDA VD.R        /ACK WAITING TO GO BACK?
37353 100400 2              SPL
37354 003364 2              JMP VD.OI2      /NO
37355 021377 2              JST VD.OIT
37356 005754 2              LDA (VD.CW      /SETUP OUTPUT POINTER TO SEND CW
37357 010036 2              STA M1OTBP 2"T"M.N
37360 010037 2  VD.OI3:    STA M1OTBP+1 2"T"M.N
37361 005755 2              LDA (-2.5SECS   /RESET R
37362 011014 2              STA VD.R
37363 030073 2              M1OUT M.N       /DO OUTPUT


37364 073325 2  VD.OI2:    LDX VD.OX       /RESTORE MASK AND REGISTERS
37365 001001 2              INH MSK
37366 005326 2 0            LDA VD.OM
37367 170120 2 0            SMK INTM
37370 010134 2 0            STA PRIM
37371 000013 2 0            EXA
37372 005323 2 0            LDA VD.OK
37373 171020 2 0            OTK
37374 005324 2 0            LDA VD.OA
37375 000401 2 0            ENB VDO
37376 103331 2              JMP VD.OI I     /RETURN


37377 000000 2  VD.OIT:    0               /BUILD ACKS
37400 001001 2              INH VDI
37401 005012 2 1            LDA VD.ROE 1
37402 041577 2 1            ALS 1
37403 013011 2 1            ERA VD.ROE
37404 041576 2 1            ALS 2
37405 011330 2 1            STA VD.CW
37406 103377 2 1            JMP VD.OIT I
```

```
                    RET VDO
37407 000000 2      VD.OIS:   0
37410 005005 2                LDA VD.TEP      /TRY OTHER CHANNEL
37411 012114 2                ERA ONE
37412 011005 2                STA VD.TEP
37413 001001 2                INH VDI
37414 073005 2 1              LDX VD.TEP
37415 045000 2 1              LDA VD.TB X
37416 101040 2 1              SNZ
37417 103407 2 1              JMP VD.OIS I    /NOTHING TO DO WITH CHANNEL
37420 100400 2 1              SPL
37421 003445 2 1              JMP VD.OI1
37422 011327 2 1              STA VD.OB
37423 021377 2 1              JST VD.OIT
37424 045007 2 1              LDA VD.TOE X    /SET UP MORE OF CONTROL WORD
37425 040676 2 1              ARR 2
37426 013330 2 1              ERA VD.CW       /O/E BIT
37427 013005 2 1              ERA VD.TEP      /CHANNEL NUMBER
37430 053016 2 1              ERA VD.TE X     /LAST PACKET BIT
37431 011330 2 1              STA VD.CW
37432 073327 2 1              LDX VD.OB       /SET UP CONTROL WORD IN OUTPUT BUF"I
37433 044111 2 1              LDA BUFE X      /PUT COUNT IN CW
37434 141240 2 1              ICR
37435 015330 2 1              ADD VD.CW
37436 050010 2 1              STA CNTL 1 X
37437 004000 2 1              LDA 0           /SET UP OUTPUT POINTERS
37440 015752 2 1              ADD (CNTL 1
37441 010036 2 1              STA M1OTBP 2"T"M.N
37442 054111 2 1              ADD BUFE X
37443 140100 2 1              SSP 0"A"TWOQ
37444 003360 2 1              JMP VD.OI3
37445 140040 2 1 VD.OI1:      CRA
37446 067000 2 1              IMA VD.TB X
37447 140100 2 1              SSP             /FREE BUFFER
37450 010000 2 1              STA 0
37451 001001 2 1              INH FRE
37452 120671 2 0              JST FLUSHI I
37453 103407 2 0              JMP VD.OIS I
```

```
                    /VERY DISTANT HOST TIMEOUT ROUTINE

                    LEV T,0
37454 000000 5      VD.TO:      0
37455 140040 5                  CRA
37456 026476 5                  IMA VD,RDY      /DID IH FLAP READY LINE?
37457 100040 5                  SZE
37460 003476 5                  JMP VD.TO3      /YES
37461 005015 5                  LDA VD,D        /IS D COUNTING
37462 101400 5                  SMI
37463 003471 5                  JMP VD.TO1      /NO
37464 025015 5                  IRS VD,D        /WAITED LONG ENOUGH ?
37465 103454 5                  JMP VD,TO I     /NO
37466 005755 5                  LDA (-2.5SECS   /RESET R
37467 011014 5                  STA VD,R
37470 103454 5                  JMP VD,TO I
37471 005013 5      VD.TO1:     LDA VD,T
37472 101400 5                  SMI
37473 103454 5                  JMP VD,TO I
37474 025013 5                  IRS VD,T        /HAS LINE GONE DEAD
37475 003501 5                  JMP VD.TO2      /NO
37476 001001 5      VD.TO3:     INH VDI
37477 021060 5 1                JST VD,REI      /REINITIALIZE
37500 103454 5 1                JMP VD,TO I
37501 025014 5 1    VD.TO2:     IRS VD,R        /TIME TO SEND HELLO?
37502 101000 5 1                NOP
37503 103454 5 1                JMP VD,TO I
```

```
                    /VERY DISTANT HOST BACKGROUND ROUTINE
                    LEV VAR
37504 000000 V      VD.BM:    0               /SAVED MASK
37505 000000 V      VD.IB:    0
37506 000000 V      VD.BB:    0
37507 000000 V      VD.BBT:   0
37510 000000 V      VD.BBF:   0

                    LEV VDB
37511 000000 3      VD.B:     0
37512 001001 3                INH MSK
37513 004500 3 0              LDA IHM
37514 170120 3 0              SMK INTM
37515 026134 3 0              IMA PRIM
37516 011504 3 0              STA VD.BM
37517 000401 3 0              ENB VDB
37520 105756 3                LDA (HITT H.N) I          /IS HOST WAITING FOR INPU'
37521 022121 3                CAS MINUS1
37522 100000 3                SKP
37523 003612 3                JMP VD.B1       /NO
37524 005743 3                LDA (NOP
37525 111757 3                STA (EMFH H.N) I
37526 073006 3                LDX VD.REP      /HAS THE NEXT SEQUENTIAL PACKET ARR
37527 045002 3                LDA VD.RB X
37530 101040 3                SNZ
37531 003612 3                JMP VD.B1       /NO
37532 011505 3                STA VD.IB       /SAVE BUFFER POINTER FOR LATER USE
37533 004454 3                LDA HILO H.N
37534 013760 3                ERA (HIFRST     /INITIAL INPUT EXPECTED BY HI
37535 101040 3                SNZ
37536 003605 3                JMP VD.B4       /YES
37537 013761 3                ERA (0 0 HIFRST"X"VD.1P  /HI EXPECTING LEADER
37540 100040 3                SZE
37541 003560 3                JMP VD.B3       /NO
37542 073505 3                LDX VD.IB       /SAVE LEADER IN HOST BUFFER
37543 044011 3                LDA DATA X
37544 110052 3                STA VD.HIB I
37545 044012 3                LDA DATA 1 X
37546 024052 3                IRS VD.HIB
37547 110052 3                STA VD.HIB I
37550 073006 3                LDX VD.REP      /LAST PACKET IN MESSAGE
37551 045020 3                LDA VD.RE X
37552 100400 3                SPL
37553 003605 3                JMP VD.B4       /YES
37554 001001 3    VD.B53:     INH FRE         /FLUSH THE BUFFER THE LEADER CAME '
37555 073505 3 0              LDX VD.IB
37556 120671 3 0              JST FLUSHI I
37557 003577 3 0              JMP VD.B13
```

```
                    LEV VDB
37560 005505 3      VD.B3:    LDA VD.IB       /SWAP RECEIVED BUFFER WITH HOST BUFF
37561 127762 3                IMA (HISP H.N) I
37562 010000 3                STA 0
37563 050111 3                STA BUFE X
37564 001001 3                INH FRE         /RETURN HOST BUFFER TO FREE LIST
37565 120671 3 0              JST FLUSHI I
37566 073505 3 0              LDX VD.IB       /SET UP HARDWARE BUFFER POINTER
37567 044111 3 0              LDA BUFE X
37570 015505 3 0              ADD VD.IB
37571 015763 3 0              ADD (DATA
37572 010052 3 0              STA VD.HIB
37573 073006 3 0              LDX VD.REP
37574 045020 3 0              LDA VD.RE X
37575 100400 3 0              SPL
37576 111757 3 0              STA (EMFH H.N) I
37577 073006 3 0 VD.B13:      LDX VD.REP
37600 140040 3 0              CRA
37601 051002 3 0              STA VD.RB X     /CLEAR CHANNEL
37602 005006 3 0              LDA VD.REP      /SEQUENCE REP
37603 012114 3 0              ERA ONE
37604 011006 3 0              STA VD.REP
                    LEV VDB
37605 001001 3      VD.B4:    INH SIN
37606 000013 3 0              EXA
37607 120101 3 0              JST VD.HII I    RET VDB
37610 001001 3                INH ALL
37611 120672 3 0              JST DODXA I     RET VDB
```

```
37612 073004 3   VD.B1:    LDX VD.TFP      /IS NEXT SEQUENTIAL OUTPUT CHANNEL A
37613 045000 3              LDA VD.TB X
37614 100040 3              SZE
37615 003704 3              JMP VD.B2       /NO
37616 051016 3              STA VD.TE X     /CLEAR LAST PACKET INDICATOR
37617 004046 3              LDA VD.IHB      /IS THERE SOMETHING TO SEND FROM H'S
37620 101040 3              SNZ
37621 003704 3              JMP VD.B2       /NO
37622 121734 3              JST (GETFRE) I LCK FRE   /CAN WE HAVE A FREE BUFF'R
37623 003704 3 0            JMP VD.B2       /NO
37624 000401 3 0            ENB VDB
37625 033506 3              STX VD.BB       /PUT BUFFER IN OUTPUT CHANNEL
37626 027022 3              IMA VD.HOL      /LEADER?
37627 100040 3              SZE
37630 003646 3              JMP VD.B6       /YES
37631 004047 3              LDA VD.IHB+1    /SAVE LENGTH
37632 016046 3              SUB VD.IHB
37633 141206 3              AOA
37634 050111 3              STA BUFE X
37635 104046 3   VD.B6N:    LDA VD.IHB I    /COPY A WORD
37636 050011 3              STA DATA X
37637 024000 3              IRS 0
37640 024046 3              IRS VD.IHB
37641 004047 3              LDA VD.IHB+1    /DONE?
37642 016046 3              SUB VD.IHB
37643 101400 3              SMI
37644 003635 3              JMP VD.B6N      /NO
37645 003662 3              JMP VD.B6D
```

```
37646 104046 3   VD.B6:    LDA VD.IHB I   /COPY LEADER
37647 050011 3             STA DATA X
37650 024046 3             IRS VD.IHB
37651 104046 3             LDA VD.IHB I
37652 050012 3             STA DATA 1 X
37653 004115 3             LDA TWO        /SET UP WORD COUNT
37654 050111 3             STA BUFE X
37655 004046 3             LDA VD.IHB
37656 024046 3             IRS VD.IHB
37657 016047 3             SUB VD.IHB 1   /ONLY LEADER IN MESSAGE?
37660 100040 3             SZE
37661 003676 3             JMP VD.B6K     /NO
37662 140040 3   VD.B6D:   CRA
37663 026475 3             IMA VD.OT      /CLEAR FINAL OUT FLAG
37664 011022 3             STA VD.HOL     /SET EXPECTING LEADER OR NOT
37665 100040 3             SZE
37666 004112 3             LDA SIGN       /PASS LAST PACKET BIT TO OUTPUT
37667 073004 3             LDX VD.TFP
37670 051016 3             STA VD.TE X
37671 001001 3             INH SIN
37672 000013 3 0           EXA
37673 120077 3 0           JST VD.HOI I   RET VDB   /FAKE HOST INTERRUPT
37674 001001 3             INH SIN
37675 120672 3 0           JST DODXA I    RET VDB
37676 073004 3   VD.B6K:   LDX VD.TFP     /FILL OUTPUT CHANNEL
37677 005506 3             LDA VD.BB
37700 051000 3             STA VD.TB X
37701 005004 3             LDA VD.TFP     /SEQUENCE TFP
37702 012114 3             ERA ONE
37703 011004 3             STA VD.TFP

37704 004036 3   VD.B2:    LDA VD.OIP     /OUTPUT INTERRUPT PENDING?
37705 001001 3             INH SIN
37706 000013 3 0           EXA
37707 101040 3 0           SNZ
37710 021331 3 0           JST VD.OI      RET VDB   /NO == WAKE UP OUTPUT I!
37711 001001 3             INH MSK
37712 005504 3 0           LDA VD.BM
37713 170120 3 0           SMK INTM
37714 010134 3 0           STA PRIM
37715 120672 3 0           JST DODXA I    RET VDB
37716 103511 3             JMP VD.B I
```

```
                        LEV CON
37717                 C ITBVDH:   BSS MAXVDH
37732 004000          C           CONSTANTS
37733 000200          C
37734 004372          C
37735 100010          C
37736 000101          C
37737 177765          C
37740 142374          C
37741 177762          C
37742 177750          C
37743 101000          C
37744 021663          C
37745 001005          C
37746 154000          C
37747 150000          C
37750 140000          C
37751 000111          C
37752 000010          C
37753 177770          C
37754 037330          C
37755 177774          C
37756 013140          C
37757 013314          C
37760 013400          C
37761 007453          C
37762 013334          C
37763 000011          C
                        VDHEND=37777
                        START
```