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0001                ASMB,A,B,L
0002*
0003* THIS SOURCE IS FOR 3/1/08 VERSION OF MSUPREP.ABS
0004* PREVIOUS VERSION WITH SINGLE-TTY MOD FROM HTTP://RIKERS.ORG/HP2100
0005* THIS VERSION HAS BEEN MODIFIED TO USE 31KW MEMORY, ALL HI-MEM ORG'S
0006* HAVE BEEN INCREASED BY 36000, TWO BLS INSTRUCTIONS CHANGED TO RBL
0007* TO GENERATE 32KW-COMPATIBLE BYTE POINTERS.
0008* BUGS: SOMETHING IS BROKEN IN THE PART THAT ENTERS THE INFORMATION
0009* TABLE, CORRUPTS THE FIRST CHARACTER IN THE PROMPTS FOR CORE MEMORY.
0010* THE RESULTING ABS FILE SEEMS TO WORK FINE, BUT THIS IS A CONCERN.
0011*
0012                    HED *** PREPARE TIME-SHARE BASIC SYSTEM***
0013  60000         ORG 60000B
0014                SUP
0015*
0016                SPC 10
0017*
0018*          TIME-SHARE BASIC DRIVERS AND MONITOR
0019*
0020*                   KILE B. BAKER
0021*                   JOHN S. SHEMA
0022*
0023*               DATA RECORDING CENTER
0024*
0025*              MONTANA STATE UNIVERSITY
0026*
0027*                   16K SYSTEM
0028*
0029*
0030                SKP
0031*
0032*    REVISION - A    JSS  CSL/MSU DEC. 21, 1971
0033*    ALL CORRECTIONS HAVE BEEN NOTED BY THE MARKING - [A]
0034*    THE FOLLOWING CORRECTIONS HAVE BEEN MADE:
0035* (1) CARD READER DRIVER  CANNOT INTERRUPT ITSELF DURING HEAVY
0036*    USAGE OF I/O BY OTHER CHANNELS.
0037*
0038* (2) SYSTEM IGNORES CALL FOR CARD READER OR PHOTOREADER
0039*    TO BE USED WITH INACTIVE OR NONEXISTANT CHANNEL.
0040*
0041*
0042***   LISTS OF INSTRUCTIONS TO BE MODIFIED
0043*
0044  60000 067351  ZDLS1 DEF ZX1
0045  60001 067457        DEF ZX2
0046  60002 067460        DEF ZX2+1
0047  60003 067461        DEF ZX2+2
0048  60004 067466        DEF ZX2+7
0049  60005 067467        DEF ZX2+8
0050  60006 067470        DEF ZX2+9
0051  60007 067472        DEF ZX2+11
0052  60010 067314        DEF SRITB-1
0053*
0054***   LOG-TTY I/O INSTRUCTIONS
0055*
0056  60011 073146  ZDLS2 DEF LTTY1      (OTA)
0057  60012 073322        DEF LTTY2      (OTA)
0058  60013 075611        DEF LTTY4
0059  60014 075634        DEF LTTY5
0060  60015 073745        DEF CHINL+1  (LIA)
0061  60016 073751        DEF CHINL+5  (OTB)
0062  60017 073752        DEF CHINL+6  (STC,C)
0063  60020 073032        DEF LTTY3      (OTA)
0064  60021 073755        DEF CHOTL+1  (OTB)
0065  60022 073756        DEF CHOTL+2  (OTA)
0066  60023 073757        DEF CHOTL+3  (STC,C)
0067  60024 074663        DEF CLCL+1   (CLC)
0068*
0069***   CLOCK I/O INSTRUCTIONS
0070*
0071  60025 067340  ZDLS3 DEF CL1
0072  60026 067342        DEF CL2
0073  60027 075643        DEF CL3
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0074   60030 075631        DEF CL4
0075   60031 073547        DEF STM
0076*
0077***   HIGH SPEED TAPE READER I/O INSTRUCTIONS
0078*
0079   60032 072673  ZDLS4 DEF .RDR1
0080   60033 072547        DEF RDINT+3   (LIA)
0081   60034 072602        DEF ?OMIT     (STC,C)
0082   60035 072614        DEF ?LDR+3    (CLC)
0083   60036 072542        DEF .HSPR+5   (STC,C)
0084   60037 072606        DEF CRIN      (CLC)
0085*
0086***   CHANNEL 1 TTY I/O INSTRUCTIONS
0087*
0088   60040 073661  ZDLS5 DEF CHIN1+1   (LIA)
0089   60041 073665        DEF CHIN1+5   (OTB)
0090   60042 073666        DEF CHIN1+6   (STC,C)
0091   60043 073671        DEF CHOT1+1   (OTB)
0092   60044 073672        DEF CHOT1+2   (OTA)
0093   60045 073673        DEF CHOT1+3   (STC,C)
0094   60046 074647        DEF CLC1+1    (CLC)
0095*
0096***   CHANNEL 2 TTY I/O INSTRUCTIONS
0097*
0098   60047 073676  ZDLS6 DEF CHIN2+1   (LIA)
0099   60050 073702        DEF CHIN2+5   (OTB)
0100   60051 073703        DEF CHIN2+6   (STC,C)
0101   60052 073706        DEF CHOT2+1   (OTB)
0102   60053 073707        DEF CHOT2+2   (OTA)
0103   60054 073710        DEF CHOT2+3   (STC,C)
0104   60055 074652        DEF CLC2+1    (CLC)
0105*
0106***   CHANNEL 3 TTY I/O INSTRUCTIONS
0107*
0108   60056 073713  ZDLS7 DEF CHIN3+1   (LIA)
0109   60057 073717        DEF CHIN3+5   (OTB)
0110   60060 073720        DEF CHIN3+6   (STC,C)
0111   60061 073723        DEF CHOT3+1   (OTB)
0112   60062 073724        DEF CHOT3+2   (OTA)
0113   60063 073725        DEF CHOT3+3   (STC,C)
0114   60064 074655        DEF CLC3+1    (CLC)
0115*
0116***   CHANNEL 4 TTY I/O INSTRUCTIONS
0117*
0118   60065 073730  ZDLS8 DEF CHIN4+1   (LIA)
0119   60066 073734        DEF CHIN4+5   (OTB)
0120   60067 073735        DEF CHIN4+6   (STC,C)
0121   60070 073740        DEF CHOT4+1   (OTB)
0122   60071 073741        DEF CHOT4+2   (OTA)
0123   60072 073742        DEF CHOT4+3   (STC,C)
0124   60073 074660        DEF CLC4+1    (CLC)
0125   60074 061553  ZDLS9 DEF TOUT3
0126   60075 061556        DEF PNCH&+1
0127   60076 061557        DEF PNCH&+2
0128   60077 061560        DEF PNCH&+3
0129   60100 061444        DEF &T1
0130*
0131*
0132***   CARD READER I/O INSTRUCTIONS
0133*
0134   60101 072361  ZDL10 DEF SETM2+2   (CLC)
0135   60102 072346        DEF RCOL+2    (STC,C)
0136   60103 072350        DEF RCOL+4    (OTA)
0137   60104 072110        DEF CRDR1     (LIA,C)
0138*
0139***   MESSAGE PRINT TABLE
0140*
0141   60105 046117  ZZG1  ASC 11,LOG TTY I/O ADDRESS?
0142   60120 044516  ZZG2  ASC 10,INVALID I/O ADDRESS
0143   60132 047125  ZZG3  ASC 10,NUMBER OF CHANNELS?
0144   60144 044516  ZZG4  ASC 7,INVALID INPUT
0145   60153 041510  ZZG5  ASC 14,CHANNEL   TTY I/O ADDRESS?
0146   60171 041514  ZZG7  ASC 10,CLOCK I/O ADDRESS?
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0147   60203 050110  ZZG8  ASC 12,PHOTO READER IN SYSTEM?
0148   60217 054505  ZZG9  ASC 6,YES OR NO:
0149   60225 060226  ZAG10 DEF *+1
0150   60226 040503        ASC 8,ACCOUNT NUMBER?
0151   60236 060237  ZAG11 DEF *+1
0152   60237 044516        ASC 11,INVALID ACCOUNT NUMBER
0153   60252 060253  ZAG12 DEF *+1
0154   60253 041517        ASC 6,CODE WORD?
0155   60261 050110  ZZ12  ASC 13,PHOTOREADER I/O ADDRESS?
0156   60276 060277  ZAG14 DEF *+1
0157   60277 042516        ASC 11,ENTER CODE-WORD TABLE
0158   60312 042105  ZZG15 ASC 17,DECIMAL FREE CORE AVAILABLE:
0159   60333 051524  ZZG16 ASC 17,STANDARD FREE CORE IS DECIMAL
0160   60354 040503  ZZG17 ASC 11,ACCEPT STANDARD CORE?
0161   60367 060370  ZAG18 DEF *+1
0162   60370 052523        ASC 10,USER:   FREE CORE?
0163   60402 060373  ZAG19 DEF ZAG18+4
0164   60403 042516  ZZG20 ASC 12,ENTER INFORMATION TABLE
0165   60417 021440  ZZG21 ASC 9,# LINES EXCEED 10
0166   60430 060431  ZAG22 DEF *+1
0167   60431 046505        ASC 20,MEMORY REQUEST EXCEEDS AVAILABLE MEMORY
0168   60455 060456  ZAG23 DEF *+1
0169   60456 042125        ASC 8,DUPLICATE ENTRY
0170   60466 060467  ZAG25 DEF *+1
0171   60467 041517        ASC 18,CODE-WORD GIVEN SPECIFIES ACCOUNT:
0172   60511               BSS 1
0173   60512 060511  ZAG24 DEF *-1
0174   60513 060514  ZAG26 DEF *+1
0175   60514 044514        ASC 7,ILLEGAL FORMAT
0176   60523 051531  ZZG27 ASC 17,SYSTEM PUNCH DEVICE I/O ADDRESS?
0177   60544 025105  ZZG28 ASC 2,*END
0178   60546 052125  ZZG29 ASC 17,TURN ON TTY TAPE PUNCH, PRESS RUN
0179   60567 050125  ZZG30 ASC 10,PUNCH ABSOLUTE TAPE?
0180   60601 041501  ZZG31 ASC 11,CARD READER IN SYSTEM?
0181   60614 041501  ZZG32 ASC 13,CARD READER I/O ADDRESS?
0182*
0183***     SUBROUTINE TO DIVIDE FREE CORE
0184*
0185   60631 000000  ZFRC  NOP           FREE CORE SUBR.
0186   60632 063653        LDA ZRPLY
0187   60633 073652        STA ZANS    SET ZANS ADR
0188   60634 117617        JSB CRLF,I
0189   60635 163616        LDA FWFC,I  LOAD 1ST WD FR CORE
0190   60636 003004        CMA,INA
0191   60637 002004        INA
0192   60640 143615        ADA LWFC,I  FIND AMT FR CORE
0193   60641 073651        STA ZX      TEMP STORAGE
0194   60642 063646        LDA Z30     OUTPUT
0195   60643 070126        STA CCNT
0196   60644 067636        LDB ZG.15   TOTAL
0197   60645 074125        STB BADDR
0198   60646 063651        LDA ZX           AMT
0199   60647 114272        JSB OUTIN,I
0200   60650 060126        LDA CCNT           MESSAGE
0201   60651 067634        LDB ZAG15
0202   60652 117620        JSB ZCLOT,I
0203   60653 063651        LDA ZX      SUB ZLOT DESTR A
0204   60654 006404        CLB,INB
0205   60655 077650        STB ZONE    SETUP CNTR OF # OF USERS
0206   60656 167621        LDB &#USR,I LOAD - NUMBER OF USERS
0207   60657 007004        CMB,INB     +NUM OF USERS
0208   60660 057650        CPB ZONE    ONE USER?
0209*
0210***   1 USER - STANDARD CORE = TOTAL CORE
0211*
0212   60661 026705        JMP ZWRT    YES
0213   60662 037650        ISZ ZONE    NO:TRY 2
0214   60663 057650        CPB ZONE    TWO USERS?
0215   60664 002001        RSS
0216   60665 026670        JMP *+3
0217*
0218***   2 USERS - DIVIDE BY 2
0219*
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0220  60666 001100         ARS           YES:DIV BY 2
0221  60667 026705         JMP ZWRT
0222  60670 037650         ISZ ZONE      NO: TRY 3
0223  60671 057650         CPB ZONE      THREE USERS?
0224  60672 002001         RSS
0225  60673 026704         JMP ZWRT-1
0226*
0227***   3 USERS - DIVIDE BY 3
0228*
0229  60674 067651         LDB ZX        GET TOTAL CORE
0230  60675 002400         CLA           SET /3 COUNT = 0
0231  60676 002004         INA
0232  60677 044501         ADB M3        SUBTRACT 3 FROM TOTAL CORE
0233  60700 006021         SSB,RSS       FINISHED DIVISION?
0234  60701 026676         JMP *-3       NO - CONTINUE
0235  60702 040477         ADA M1        YES - TOO MANY SUBTRACT 1
0236  60703 002001         RSS           SET STND CORE
0237*
0238***   4 USERS - DIVIDE BY 4
0239*
0240  60704 001121         ARS,ARS       4 USERS-DIV BY 4
0241*
0242  60705 073651  ZWRT   STA ZX        STND CORE
0243  60706 063646         LDA Z30       OUTPUT
0244  60707 070126         STA CCNT
0245  60710 067637         LDB ZG.16     STND
0246  60711 074125         STB BADDR
0247  60712 063651         LDA ZX            AMT
0248  60713 114272         JSB OUTIN,I
0249  60714 060126         LDA CCNT           MESG
0250  60715 067635         LDB ZAG16
0251  60716 117620         JSB ZCLOT,I
0252  60717 117617         JSB CRLF,I
0253  60720 063623         LDA X22       OUTPUT
0254  60721 067647         LDB ZAG17       OK
0255  60722 117620         JSB ZCLOT,I
0256  60723 060511         LDA M11
0257  60724 067625         LDB ZX9
0258  60725 117620         JSB ZCLOT,I
0259  60726 060371         LDA .2
0260  60727 067653         LDB ZRPLY
0261  60730 117630         JSB ZCLIN,I
0262  60731 163653         LDA ZRPLY,I
0263  60732 053631         CPA XYES        ANSWER
0264  60733 027030         JMP XSTND
0265*
0266  60734 163616  ZRERE  LDA FWFC,I    SET FIRST WORD
0267  60735 073640         STA XFWC      AVAILABLE CORE
0268  60736 167615         LDB LWFC,I    SET LAST WORD
0269  60737 077641         STB XLWC      AVAILABLE CORE
0270  60740 003004         CMA,INA       COMPUTE AMT
0271  60741 002004         INA
0272  60742 040001         ADA B         OF FREE CORE
0273  60743 073643         STA XFCR      REMAINING
0274*
0275  60744 163621         LDA &#USR,I   LOAD -# USERS
0276  60745 073642         STA ZCCT      AND SAVE AS COUNTER
0277  60746 002404         CLA,INA       SET TO CHANNEL
0278  60747 073644         STA ZCHNX     NUMBER ONE
0279*
0280  60750 117617  ZRERD  JSB CRLF,I    OUTPUT CR-LF
0281  60751 063644         LDA ZCHNX     LOAD CHANNEL NUMBER
0282  60752 030425         IOR .48       ADD ON ASCII BITS
0283  60753 001727         ALF,ALF       POSITION TO UPPER WORD
0284  60754 030411         IOR .32       ADD ON BLANK
0285  60755 172402         STA ZAG19,I   STORE IN MESSAGE
0286*
0287  60756 060514         LDA M19
0288  60757 066367         LDB ZAG18     "USER (N) FREE CORE"
0289  60760 117620         JSB ZCLOT,I
0290  60761 060374         LDA .6        ASK FOR
0291  60762 067653         LDB ZRPLY     TTY
0292  60763 117630         JSB ZCLIN,I   INPUT
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0293   60764 067653          LDB ZRPLY     CONVERT TO
0294   60765 117602          JSB DVRT,I    BINARY
0295   60766 026750          JMP ZRERD     NOT-VALID INPUT
0296   60767 002003          SZA,RSS       REQUEST FOR ZERO CORE?
0297   60770 026750          JMP ZRERD     YES - REJECT
0298   60771 073643          STA XFCR      SAVE FREE CORE REQUESTED
0299   60772 040527          ADA MSK1      TOO SMALL REQUEST?
0300   60773 002020          SSA
0301   60774 026750          JMP ZRERD     NO-TRY AGAIN
0302*
0303***   SET USER FIRST WORD AVAILABLE MEMORY
0304*
0305   60775 063640          LDA XFWC      LOAD FIRST WORD FREE CORE
0306   60776 067603          LDB ZFWTB     LOAD FWFC TABLE BASE ADR
0307   60777 047644          ADB ZCHNX     INDEX BY CHANNEL #
0308   61000 164001          LDB B,I       LOAD STORE ADDRESS
0309   61001 170001          STA B,I       SET FIRST WORD AVAIL MEM.
0310*
0311***   SET USER LAST WORD AVAILABLE MEMORY
0312*
0313   61002 043643          ADA XFCR      INDEX F.W. BY AMT REQUESTED.
0314   61003 040477          ADA M1
0315   61004 067610          LDB ZLWTB     LOAD LWFC TABLE BASE ADR
0316   61005 047644          ADB ZCHNX     INDEX BY CHANNEL #
0317   61006 164001          LDB B,I       LOAD STORE ADDRESS
0318   61007 170001          STA B,I       SET LAST WORD AVAIL MEM.
0319   61010 002004          INA           INDEX TO NEXT WORD
0320   61011 073640          STA XFWC      SET NEW FIRST WORD CORE
0321*
0322   61012 003004          CMA,INA       SET A=NEG(A-1)
0323   61013 002004          INA
0324   61014 043641          ADA XLWC      ADD LW FREE CORE
0325   61015 002020          SSA
0326   61016 027023          JMP *+5       YES-ERROR MESSAGE
0327   61017 037644          ISZ ZCHNX     INDEX TO NEXT USER
0328   61020 037642          ISZ ZCCT      FINISHED?
0329   61021 026750          JMP ZRERD     NO-GET NEXT USER
0330   61022 126631          JMP ZFRC,I    YES-RETURN
0331*
0332*** ERROR ** FREE CORE SPACE EXCEEDED **
0333*
0334   61023 117617          JSB CRLF,I    OUTPUT CR-LF
0335   61024 063624          LDA Z39        OUTPUT MESSAGE:
0336   61025 066430          LDB ZAG22     "MEMORY REQUESTED EXCEEDS
0337   61026 117620          JSB ZCLOT,I   MEMORY AVAILABLE"
0338   61027 026734          JMP ZRERE     TRY AGAIN
0339*
0340*** SET   STANDARD CORE
0341*
0342   61030 163621  XSTND LDA &#USR,I  GET -# USERS
0343   61031 073642          STA ZCCT      SET AS COUNTER
0344   61032 163616          LDA FWFC,I    LOAD FIRST WORD FREE CORE
0345   61033 073640          STA XFWC      SAVE AS POINTER
0346*
0347   61034 002404          CLA,INA       SET TO USER # 1
0348   61035 073644          STA ZCHNX
0349*
0350   61036 063640          LDA XFWC      LOAD FIRST WORD F CORE
0351   61037 067603          LDB ZFWTB     LOAD FWAM TABLE BASE ADR
0352   61040 047644          ADB ZCHNX     INDEX BY CHANNEL #
0353   61041 164001          LDB B,I       LOAD STORE ADR IN (B)
0354   61042 170001          STA B,I       SET USER FIRST WORD MEM
0355   61043 043651          ADA ZX        COMPUTE LAST WORD MEM
0356   61044 040477          ADA M1
0357   61045 067610          LDB ZLWTB     LOAD LWAM TABLE BASE ADR
0358   61046 047644          ADB ZCHNX     INDEX BY USER #
0359   61047 164001          LDB B,I       LOAD STORE ADDRESS
0360   61050 170001          STA B,I       SET USER LWAM
0361   61051 002004          INA           INDEX BY 1
0362   61052 073640          STA XFWC      SET NEW FWAM
0363*
0364   61053 037644          ISZ ZCHNX     INDEX TO NEXT USER
0365   61054 037642          ISZ ZCCT      FINISHED?
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0366   61055 027036          JMP *-15      NO
0367   61056 126631          JMP ZFRC,I    YES-RETURN
0368*
0369***    LOAD AND CONSTRUCT CODE-WORD TABLE
0370*
0371   61057 000000  CDTBL NOP
0372   61060 167616          LDB FWFC,I    GET FIRST WORD AVAIL FREE CODE
0373   61061 177740          STB ?ACCT,I   SET START OF ACCOUNT TABLE
0374   61062 077627          STB XCODE     STORE FOR CODE WORD STORAGE
0375   61063 006400          CLB           SET CODE TABLE
0376   61064 077626          STB XLNTH     LENGTH = 0
0377   61065 077741          STB XNTRY     # ENTRIES = 0
0378   61066 117617          JSB CRLF,I
0379   61067 117617          JSB CRLF,I
0380   61070 063645          LDA X21
0381   61071 066276          LDB ZAG14     OUTPUT MESSAGE" ENTER CODE
0382   61072 117620          JSB ZCLOT,I   -WORD TABLE"
0383   61073 117617  ZLOP3 JSB CRLF,I    OUTPUT CR-LF
0384   61074 117617          JSB CRLF,I
0385   61075 060513          LDA M16       OUTPUT MESSAGE:
0386   61076 066225          LDB ZAG10     "ACCOUNT NUMBER?"
0387   61077 117620          JSB ZCLOT,I
0388*
0389   61100 063622          LDA X20       INPUT
0390   61101 067745          LDB XBUF      RESPONSE
0391   61102 117630          JSB ZCLIN,I   FROM TTY
0392   61103 002003          SZA,RSS       NULL INPUT?
0393   61104 027073          JMP ZLOP3     YES-TRY AGAIN
0394   61105 167745          LDB XBUF,I    LOAD FIRST CHARS
0395   61106 057744          CPB X/E       IS IT "/E"?
0396   61107 027310          JMP ZEND      YES-EXIT FROM ACCOUNT LOOP
0397*
0398   61110 027116          JMP ZOK1      NO - VALID INPUT
0399   61111 117617  ZER3  JSB CRLF,I    OUTPUT CR-LF
0400   61112 063623          LDA X22       OUTPUT MESSAGE:
0401   61113 066236          LDB ZAG11     "INVALID ACCOUNT NUMBER"
0402   61114 117620          JSB ZCLOT,I
0403   61115 027073          JMP ZLOP3     TRY AGAIN
0404   61116 067745  ZOK1  LDB XBUF      CONVERT TO BINARY
0405   61117 117746          JSB XVERT,I
0406   61120 027111          JMP ZER3      NOT VALID INPUT
0407   61121 070001          STA B         SAVE ACCOUNT # IN (B)
0408   61122 001723          ALF,RAR       POSITION
0409   61123 001723          ALF,RAR       ACCOUNT
0410   61124 001723          ALF,RAR       NUMBER
0411   61125 073735          STA ZACNT     AND STORE
0412   61126 047733          ADB ZM64      DOES ACCOUNT
0413   61127 006021          SSB,RSS       NUMBER EXCEED MAXIMUM
0414   61130 027111          JMP ZER3      OF 63?
0415*
0416   61131 117617  ZLOP4 JSB CRLF,I    OUTPUT CR-LF
0417   61132 060511          LDA M11       OUTPUT MESSAGE:
0418   61133 066252          LDB ZAG12     "CODE WORD?"
0419   61134 117620          JSB ZCLOT,I
0420*
0421   61135 060434          LDA .72       INPUT RESPONSE
0422   61136 067745          LDB XBUF      RESPONSE
0423   61137 117630          JSB ZCLIN,I
0424*
0425   61140 002003          SZA,RSS       NULL INPUT?
0426   61141 027131          JMP ZLOP4     YES - TRY AGAIN
0427   61142 073731          STA ZSVA      SAVE CHARS INPUT LENGTH
0428*
0429***    CHECK FOR ILLEGAL FORMAT
0430*
0431   61143 050370          CPA .1
0432   61144 027177          JMP ZERR
0433   61145 040505          ADA M7        INPUT TOO LONG?
0434   61146 002021          SSA,RSS
0435   61147 027177          JMP ZERR      YES-ILLEGAL FORMAT
0436   61150 063731          LDA ZSVA      RELOAD INPUT COUNT
0437   61151 002004          INA           INDEX BY 1
0438   61152 001100          ARS           SHIFT RIGHT FOR WORDS
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0439   61153 003004          CMA,INA    MAKE COUNT NEG
0440   61154 073742          STA XA1    SAVE AS WORD COUNTER
0441   61155 067745          LDB XBUF   SET BUFFER ADDRESS
0442   61156 077734          STB ZBF    POINTER
0443*
0444   61157 163734  ZLOP6 LDA ZBF,I    LOAD WORD
0445   61160 001727          ALF,ALF    POSITION TO UPPER CHAR
0446   61161 010443          AND M177   MASK OFF UPPER CHAR
0447   61162 050411          CPA BLANK  SPACE?
0448   61163 027177          JMP ZERR   YES-ERROR
0449   61164 163734          LDA ZBF,I  RELOAD INPUT
0450   61165 010443          AND M177   MASK TO LOW CHAR
0451   61166 050411          CPA BLANK  SPACE?
0452   61167 027174          JMP *+5    YES-PROCESS MORE
0453   61170 037734          ISZ ZBF    NO-INDEX BUFFER POINTER
0454   61171 037742          ISZ XA1    FINISHED?
0455   61172 027157          JMP ZLOP6  NO-CONTINUE
0456   61173 027204          JMP ZCFDE  YES - INPUT O.K.
0457   61174 067742          LDB XA1    LAST WORD?
0458   61175 054477          CPB M1
0459   61176 027204          JMP ZCFDE  YES - INPUT O.K.
0460   61177 117617  ZERR  JSB CRLF,I   OUTPUT CR-LF
0461   61200 063732          LDA Z14    OUTPUT MESSAGE:
0462   61201 066513          LDB ZAG26  "ILLEGAL FORMAT"
0463   61202 117620          JSB ZCLOT,I
0464   61203 027131          JMP ZLOP4   GET NEXT INPUT
0465*
0466***   CHECK FOR DUPLICATE ENTRY
0467*
0468   61204 063731  ZCFDE LDA ZSVA     RELOAD # CHARS INPUT
0469   61205 003021          CMA,SSA,RSS MAKE -1-# CHARS
0470   61206 027131          JMP ZLOP4   NOT VALID INPUT
0471   61207 070126          STA CCNT    SAVE LENGTH
0472   61210 067745          LDB XBUF    RELOAD BUFFER START ADR
0473*       BLS             GET ADR*2
0474   61211 005200          RBL             WTN mod for 32KW
0475   61212 074125          STB BADDR   SAVE AS BUFFER POINTER
0476   61213 114276          JSB GETCR,I GET A CHAR
0477   61214 027131          JMP ZLOP4   NOT VALID INPUT
0478   61215 167615          LDB LWFC,I  SET SYMBOL BUFFER
0479   61216 044522          ADB D100    START ADDRESS
0480   61217 074133          STB SBPTR   * INITIALIZE FOR
0481   61220 170133          STA SBPTR,I * TABLE SEARCH
0482   61221 163740          LDA ?ACCT,I TABLE ADR IN (A)
0483   61222 067741          LDB XNTRY   GET # ENTRIES
0484   61223 007007          CMB,INB,SZB,RSS  CONVERT TO NEG
0485   61224 027250          JMP ZPEIT
0486   61225 114262          JSB TSRCH,I CHECK FOR DUPLICATE ENTRY
0487   61226 027250          JMP ZPEIT   PUT ENTRY IN TABLE
0488*
0489***   DUPLICATE ENTRY IN TABLE
0490*
0491   61227 001727          ALF,ALF    ROTATE ACCOUNT #
0492   61230 001300          RAR        TO CORRECT POSITION
0493   61231 073743          STA XCHN%  SAVE ACCOUNT NUMBER
0494   61232 117617          JSB CRLF,I OUTPUT CR-LF
0495   61233 060402          LDA .15    OUTPUT MESSZGE:
0496   61234 066455          LDB ZAG23  "DUPLICATE ENTRY"
0497   61235 117620          JSB ZCLOT,I
0498   61236 060415          LDA .36    PUT
0499   61237 070126          STA CCNT   ACCOUNT
0500   61240 066512          LDB ZAG24  NUMBER
0501   61241 074125          STB BADDR  INTO
0502   61242 063743          LDA XCHN%  MESSAGE
0503   61243 114272          JSB OUTIN,I
0504   61244 060126          LDA CCNT   OUTPUT MESSAGE:
0505   61245 066466          LDB ZAG25  "CODE-WORD PREVIOUSLY
0506   61246 117620          JSB ZCLOT,I SPECIFIED FOR ACCOUNT:(N)"
0507   61247 027131          JMP ZLOP4  TRY AGAIN
0508*
0509   61250 063731  ZPEIT LDA ZSVA
0510   61251 043735          ADA ZACNT  INDEX BY ACCOUNT #
```

```
0512*
0513***    PUT ENTRY IN TABLE
0514*
0515  61252 173627         STA XCODE,I  STORE ACCOUNT #/LENGTH WORD
0516  61253 037627         ISZ XCODE    SET TO NEXT WORD
0517  61254 037626         ISZ XLNTH    INDEX LENGTH
0518  61255 037741         ISZ XNTRY    INDEX # OF ENTRIES
0519  61256 063731         LDA ZSVA     RELOAD CHARS INPUT COUNT
0520  61257 002114         CLE,SLA,INA  SET E=0 FOR FLAG
0521  61260 002300         CCE          SET E=1 FOR ODD # CHARS
0522  61261 001100         ARS          SHIFT AS WORD COUNTER
0523  61262 073731         STA ZSVA     SAVE AS COUNTER
0524  61263 002404         CLA,INA
0525  61264 073736         STA ZWCNT    WORD COUNTER = + 1
0526  61265 063745         LDA XBUF
0527  61266 073734         STA ZBF
0528  61267 067736  ZLOP5 LDB ZWCNT
0529  61270 057731         CPB ZSVA     LAST CHAR?
0530  61271 027301         JMP ZLAST    YES-PROCESS IT
0531  61272 037736         ISZ ZWCNT    INDEX COUNTER
0532  61273 163734         LDA ZBF,I    LOAD WORD FROM INPUT BUFFER
0533  61274 173627         STA XCODE,I  PUT IN CODE WORD TABLE
0534  61275 037627         ISZ XCODE    INDEX TO NEXT ADR
0535  61276 037626         ISZ XLNTH    INDEX CODE TABLE LENGTH
0536  61277 037734         ISZ ZBF
0537  61300 027267         JMP ZLOP5
0538  61301 163734  ZLAST LDA ZBF,I     LOAD LAST WORD
0539  61302 037626         ISZ XLNTH    INDEX CODE TABLE LENGTH
0540  61303 002040         SEZ          ODD/EVEN?
0541  61304 030411         IOR .32      ADD IN SPACE IF ODD
0542  61305 173627         STA XCODE,I  PUT IN CODE WORD TABLE
0543  61306 037627         ISZ XCODE    INDEX STORE ADR
0544  61307 027073         JMP ZLOP3    GET NEXT ACCOUNT
0545*
0546  61310 067741  ZEND  LDB XNTRY    LOAD CODE WORD TABLE LENGTH
0547  61311 007007         CMB,INB,SZB,RSS   NULL CODE TABLE?
0548  61312 027066         JMP ZLOP3-5  YES-ASK FOR CODE TABLE INPUT
0549  61313 177737         STB ?TBL,I   SET # ENTRIES IN CODE TABLE
0550  61314 067627         LDB XCODE    SET NEW FIRST WORD
0551  61315 177616         STB FWFC,I   AVAILABLE MEMORY
0552  61316 127057         JMP CDTBL,I
0553*
0554*
0555***    PREPARE ABSOLUTE TAPE OF SYSTEM
0556*
0557  61317 117617  ZABST JSB CRLF,I
0558  61320 063622         LDA X20      OUTPUT MESSAGE:
0559  61321 067601         LDB ZAG30    PUNCH ABSOLUTE TAPE?
0560  61322 117620         JSB ZCLOT,I
0561  61323 060511         LDA M11      OUTPUT MESSAGE:
0562  61324 067625         LDB ZX9      YES OR NO:
0563  61325 117620         JSB ZCLOT,I
0564  61326 060371         LDA .2       RESPONSE
0565  61327 067653         LDB ZRPLY
0566  61330 117630         JSB ZCLIN,I
0567  61331 002003         SZA,RSS      NULL INPUT?
0568  61332 027317         JMP ZABST    YES-TRY AGAIN
0569  61333 163653         LDA ZRPLY,I  GET FIRST TWO CHARS INPUT
0570  61334 053632         CPA XNO      = NO ?
0571  61335 124003         JMP 3B,I     YES - SKIP TAPE OUTPUT
0572  61336 053631         CPA XYES     = YES ?
0573  61337 002001         RSS          REQUEST PUNCH DEVICE
0574  61340 027317         JMP ZABST    NO VALID INPUT
0575  61341 117617  ZABSD JSB CRLF,I
0576  61342 063565         LDA M33      OUTPUT MESSAGE:
0577  61343 067576         LDB ZAG27    SYSTEM PUNCH
0578  61344 117620         JSB ZCLOT,I
0579  61345 060373         LDA .4       GET
0580  61346 067653         LDB ZRPLY    TTY
0581  61347 117630         JSB ZCLIN,I  RESPONSE
0582  61350 002003         SZA,RSS      NULL INPUT?
0583  61351 027431         JMP STTYI    SET TTY AS PUNCH DEVICE
0584  61352 050371         CPA .2       TWO CHARS INPUT?
```

```
0585   61353 027361       JMP *+6      YES-CHECK FOR VALID I/O
0586*
0587   61354 117617  ZER6 JSB CRLF,I   OUTPUT CR-LF
0588   61355 063622       LDA X20      OUTPUT MESSAGE:
0589   61356 067633       LDB XZG2     INVALID I/O ADDRESS
0590   61357 117620       JSB ZCLOT,I
0591   61360 027341       JMP ZABSD    TRY INPUT AGAIN
0592*
0593   61361 163653       LDA ZRPLY,I  LOAD 1ST CHARS INPUT
0594   61362 001727       ALF,ALF      POSITION
0595   61363 117573       JSB XNBER,I  CHECK FOR OCTAL
0596   61364 027354       JMP ZER6     NOT OCTAL-ERROR
0597   61365 002003       SZA,RSS      ZERO AS 1ST CHAR?
0598   61366 027354       JMP ZER6     YES-ERROR
0599   61367 001723       ALF,RAR      POSITION
0600   61370 173574       STA XI/O,I   SAVE 1ST CHAR
0601   61371 163653       LDA ZRPLY,I  RELOAD CHARS INPUT
0602   61372 117573       JSB XNBER,I  CHECK FOR OCTAL
0603   61373 027354       JMP ZER6     NOT OCTAL
0604   61374 133574       IOR XI/O,I
0605   61375 173574       STA XI/O,I   SAVE I/O CHANNEL
0606   61376 060502       LDA M4       4-ADR TO SET
0607   61377 067575       LDB ZLST9    SET I/O
0608   61400 117572       JSB XSETI,I  INSTRUCTIONS
0609*
0610***   PUNCH ELEMENTS OF SYSTEM PREPARED
0611*
0612   61401 017516  COPY JSB LTG      GENERATE LEADER
0613   61402 060371       LDA .2
0614   61403 007400       CCB          PUNCH FROM 2
0615   61404 147616       ADB FWFC,I   TO FWAM-1
0616   61405 017446       JSB PNCHA
0617*
0618   61406 063570       LDA $SEX$     PUNCH
0619   61407 002004       INA          BASIC INITIALIZATION
0620   61410 067566       LDB OINK     SECTION
0621   61411 017446       JSB PNCHA
0622   61412 163615       LDA LWFC,I
0623   61413 002004       INA          LWAM+1 TO
0624   61414 067567       LDB LWM      LAST WORD OF
0625   61415 017446       JSB PNCHA    MEMORY (37677B)
0626   61416 017516       JSB LTG      PUNCH TRAILER
0627   61417 102077       HLT 77B      END OF DUMP ROUTINE
0628   61420 102501       LIA 1        LOAD (A)=SWITCH REG
0629   61421 050536       CPA M15      SIGN BIT SET?
0630   61422 027401       JMP COPY     GO MAKE ANOTHER COPY
0631   61423 117617       JSB CRLF,I
0632   61424 060373       LDA .4       OUTPUT MESSAGE
0633   61425 067577       LDB ZAG28    *END
0634   61426 117620       JSB ZCLOT,I
0635   61427 102076       HLT 76B      FINISHED HALT
0636   61430 124003       JMP 3B,I
0637   61431 167571  STTYI LDB XLCHN,I LOAD SYSTEM I/O ADDRESS
0638   61432 177574       STB XI/O,I   SET FOR XSETI
0639   61433 060503       LDA M5       5-ADR TO BE SET
0640   61434 067575       LDB ZLST9    SET I/O
0641   61435 117572       JSB XSETI,I  INSTRUCTIONS
0642   61436 117617       JSB CRLF,I
0643   61437 063564       LDA .34      OUTPUT MESSAGE:
0644   61440 067600       LDB ZAG29    TURN ON TTY TAPE
0645   61441 117620       JSB ZCLOT,I
0646   61442 102011       HLT 11B      "READY" TO PUNCH HALT
0647   61443 067563       LDB HEWPY    SET TO OUTPUT
0648   61444 106600  &T1  OTB 0        MODE
0649   61445 027401       JMP COPY     PUNCH SYSTEM
0650*
0651*     SUBROUTINE TO PUNCH ABSOLUTE BLOCK
0652*
0653*     CALLING SEQUENCE:
0654*     (A)=FWA OF BLOCK
0655*     (B)=LWA OF BLOCK
0656*     (P)= JSB PNCH.,I   (PNCH. DEF PNCHA)
0657*     (P+1)       (RETURN)
```

```
0658*
0659  61446 000000  PNCHA NOP
0660  61447 006004        INB
0661  61450 073720        STA T1      SAVE FIRST AND LAST
0662  61451 077721        STB T2      WORD ADDRESSES
0663  61452 063726  P1    LDA M27     SET T3= -27 AS INDEX
0664  61453 073722        STA T3      FOR FILLING BUFFER
0665  61454 063720        LDA T1      SET BUF+1 FOR LOAD ADR
0666  61455 173660        STA BUF1,I  OF CURRENT BLOCK
0667  61456 073724        STA CKSUM   INITIALIZE CHECKSUM WORD.
0668  61457 002400        CLA         SET WORD COUNTER
0669  61460 173657        STA BUF,I   TO ZERO.
0670  61461 063657        LDA BUF     SET T4 TO ADDRESS
0671  61462 040371        ADA .2      OF WORD 3 OF BUFFER
0672  61463 073723        STA T4      FOR STORING WORDS
0673  61464 163720  P2    LDA T1,I    STORE CURRENT WORD FROM
0674  61465 173723        STA T4,I    MEMORY IN PUNCH BLOCK
0675  61466 037720        ISZ T1      INDEX TO NEXT LOAD AND
0676  61467 037723        ISZ T4      STORE ADDRESSES
0677  61470 043724        ADA CKSUM   ADD WORD TO CUMULATED
0678  61471 073724        STA CKSUM   CHECKSUM
0679  61472 137657        ISZ BUF,I   COUNT WORD STORED IN BUFFER
0680  61473 063720        LDA T1      CHECK FOR END OF BLOCK
0681  61474 053721        CPA T2
0682  61475 027500        JMP P3      YES, FWA=LWA
0683  61476 037722        ISZ T3      INDEX BUFFER COUNTER
0684  61477 027464        JMP P2      BUFFER NOT YET FILLED
0685*
0686  61500 063724  P3    LDA CKSUM   BUFFER FILLED. SET CHECKSUM
0687  61501 173723        STA T4,I    IN LAST WORD IN BUFFER
0688  61502 163657        LDA BUF,I   POSITION
0689  61503 001727        ALF,ALF     WORD COUNT TO UPPER
0690  61504 173657        STA BUF,I   CHARACTER WORD
0691  61505 001727        ALF,ALF     REPOSITION, ADD 3 FOR
0692  61506 040372        ADA .3      TOTAL RECORD LENGTH, SET
0693  61507 003004        CMA,INA     NEGATIVE FOR OUTPUT.
0694  61510 067657        LDB BUF     (B)=ADDR OF BUFFER
0695  61511 017522        JSB PUNCH   PUNCH RECORD
0696*
0697  61512 063720        LDA T1      FINISHED
0698  61513 053721        CPA T2      * PUNCHING
0699  61514 127446        JMP PNCHA,I YES-EXIT
0700  61515 027452        JMP P1      NO-SET NEXT RECORD
0701*
0702*    SUBROUTINE:  LTG (LEADER/TRAILER GENERATOR)
0703*
0704*    CALL:
0705*    (P) JSB LTG
0706*    (P+1)       -RETURN-
0707*
0708*    LTG PRODUCES APPROXIMATELY 10-INCHES
0709*    OF BLANK TAPE (FEED/FRAMES)
0710*
0711  61516 000000  LTG   NOP
0712  61517 002400        CLA
0713  61520 017522        JSB PUNCH
0714  61521 127516        JMP LTG,I
0715*
0716***  PUNCH BUFFER
0717*
0718***  SUBROUTINE TO PUNCH BINARY TAPE
0719*
0720*
0721*    CALLING SEQUENCE:
0722*    (A)=LENGTH (AND MODE) OF RECORD TO BE OUTPUT
0723*    (B)=STARTING ADDRESS OF DATA BUFFER
0724*
0725*
0726  61522 000000  PUNCH NOP
0727  61523 077717        STB BUFF    SAVE BUFFER START ADDRESS
0728  61524 002002        SZA         CHECK FOR FEED-FRAMES ONLY
0729  61525 027530        JMP *+3     NOT FEED FRAME MODE
0730  61526 063727        LDA .200
```

```
0731  61527 027546        JMP PP03+1   DO FEED FRAMES ONLY
0732*
0733  61530 001000        ALS          CONVERT COUNT TO CHARACTERS (X2)
0734  61531 073725        STA CHC1     AS COUNTER FOR OUTPUT SECTION
0735  61532 067730        LDB UL52     SET UPPER/LOWER CHAR INDICATOR
0736*
0737*      CHARACTER OUTPUT SECTION
0738*
0739  61533 163717  PP02  LDA BUFF,I   GET WORD CONTAINING CHARACTER
0740  61534 006021        SSB,RSS      IF UPPER/LOWER FLAG SAYS UPPER
0741  61535 001727        ALF,ALF      (SIGN=0) ROTATE TO LOWER
0742  61536 010445        AND M377     REMOVE UPPER CHAR
0743  61537 017555        JSB PNCH&    OUTPUT CHAR
0744  61540 006020        SSB          INDEX BUFFER WORD?
0745  61541 037717        ISZ BUFF     YES
0746  61542 005200        RBL          INDEX U/L FLAG
0747  61543 037725        ISZ CHC1     INDEX COUNTER
0748  61544 027533        JMP PP02     CONTINUE PUNCHING
0749*
0750*      COMPLETION SECION
0751*
0752  61545 060502  PP03  LDA M4       OUTPUT
0753  61546 073717        STA BUFF     FOUR
0754  61547 002400        CLA          FEED
0755  61550 017555        JSB PNCH&    OUTPUT CHAR
0756  61551 037717        ISZ BUFF     AT END
0757  61552 027547        JMP *-3      OF RECORD
0758*
0759  61553 106700  TOUT3 CLC 0
0760  61554 127522        JMP PUNCH,I
0761*
0762***   PUNCH SINGLE CHAR
0763*
0764  61555 000000  PNCH& NOP
0765  61556 102600        OTA 0        OUTPUT A
0766  61557 103700        STC 0,C      SINGLE CHAR
0767  61560 102300        SFS 0        ON PUNCH OUTPUT
0768  61561 027560        JMP *-1      DEVICE
0769  61562 127555        JMP PNCH&,I
0770*
0771  61563 110000  HEWPY OCT 110000
0772  61564 000042  .34   DEC 34
0773  61565 177737  M33   DEC -33
0774  61566 067666  OINK  DEF LEPIG
0775  61567 075653  LWM   DEF LWAMS
0776  61570 067114  $SEX$ DEF [SEX[
0777  61571 066705  XLCHN DEF ZLCHN
0778  61572 066521  XSETI DEF ZSETI
0779  61573 066510  XNBER DEF ZNBER
0780  61574 066675  XI/O  DEF ZI/O
0781  61575 060074  ZLST9 DEF ZDLS9
0782  61576 060523  ZAG27 DEF ZZG27
0783  61577 060544  ZAG28 DEF ZZG28
0784  61600 060546  ZAG29 DEF ZZG29
0785  61601 060567  ZAG30 DEF ZZG30
0786  61602 067501  DVRT  DEF DVERT
0787  61603 061603  ZFWTB DEF *
0788  61604 013206        DEF FWAM1
0789  61605 013336        DEF FWAM2
0790  61606 013466        DEF FWAM3
0791  61607 013616        DEF FWAM4
0792  61610 061610  ZLWTB DEF *
0793  61611 013207        DEF LWAM1
0794  61612 013337        DEF LWAM2
0795  61613 013467        DEF LWAM3
0796  61614 013617        DEF LWAM4
0797  61615 067044  LWFC  DEF LWAFC
0798  61616 067043  FWFC  DEF FWAFC
0799  61617 067475  CRLF  DEF CRLND
0800  61620 067345  ZCLOT DEF ZLOT
0801  61621 075052  &#USR DEF &USR
0802  61622 000024  X20   DEC 20
0803  61623 000026  X22   DEC 22
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0804   61624 000047  Z39   DEC 39
0805   61625 060217  ZX9   DEF ZZG9
0806   61626 000000  XLNTH NOP
0807   61627 000000  XCODE NOP
0808   61630 067403  ZCLIN DEF ZLIN
0809   61631 054505  XYES  ASC 1,YE
0810   61632 047117  XNO   ASC 1,NO
0811   61633 060120  XZG2  DEF ZZG2
0812   61634 060312  ZAG15 DEF ZZG15
0813   61635 060333  ZAG16 DEF ZZG16
0814   61636 060330  ZG.15 DEF ZZG15+14
0815   61637 060351  ZG.16 DEF ZZG16+14
0816   61640 000000  XFWC  NOP
0817   61641 000000  XLWC  NOP
0818   61642 000000  ZCCT  NOP
0819   61643 000000  XFCR  NOP
0820   61644 000000  ZCHNX NOP
0821   61645 000025  X21   DEC 21
0822   61646 000036  Z30   DEC 30
0823   61647 060354  ZAG17 DEF ZZG17
0824   61650         ZONE  BSS 1        TEMP STORAGE
0825   61651         ZX    BSS 1        AMT STND FR CORE
0826   61652 000000  ZANS  NOP
0827   61653 061654  ZRPLY DEF *+1       STORAGE FOR
0828   61654         BSS 3               OCTAL NUM
0829*
0830   61657 061661  BUF   DEF BUFFR
0831   61660 061662  BUF1  DEF BUFFR+1
0832*
0833   61661         BUFFR BSS 30
0834   61717 000000  BUFF  NOP
0835   61720 000000  T1    NOP
0836   61721 000000  T2    NOP
0837   61722 000000  T3    NOP
0838   61723 000000  T4    NOP
0839   61724 000000  CKSUM NOP
0840   61725 000000  CHC1  NOP
0841   61726 177745  M27   DEC -27
0842   61727 177470  .200  DEC -200
0843   61730 052525  UL52  OCT 52525
0844   61731 000000  ZSVA  NOP
0845   61732 000016  Z14   DEC 14
0846   61733 177700  ZM64  DEC -64
0847   61734 000000  ZBF   NOP
0848   61735 000000  ZACNT NOP
0849   61736 000000  ZWCNT NOP
0850   61737 073067  ?TBL  DEF TBL
0851   61740 073066  ?ACCT DEF ACCT#
0852   61741 000000  XNTRY NOP
0853   61742 000000  XA1   NOP
0854   61743 000000  XCHN% NOP
0855   61744 027505  X/E   ASC 1,/E
0856   61745 066713  XBUF  DEF ZBUF+1
0857   61746 067501  XVERT DEF DVERT
0858   66000         ORG 66000B
0859                 SKP
0860*
0861   66000 106700  PTSBS CLC 0         TURN OFF ALL DEVICES
0862   66001 102501        LIA 1         LOAD I/O ADDRESS OF TTY
0863   66002 010430        AND .63       MASK TO LOWER 6-BITS
0864   66003 070001        STA B         PUT ADDRESS IN B-REGISTER
0865   66004 001121        ARS,ARS       SHIFT TO BITS (5-3)
0866   66005 001100        ARS
0867   66006 002002        SZA           I/O ADDRESS >7?
0868   66007 026012        JMP ZGO       YES-INITIALIZE PREPARE BASIC TTY
0869*
0870   66010 102055        HLT 55B       INVALID I/O ADDRESS HALT
0871   66011 026000        JMP PTSBS     TRY AGAIN
0872*
0873   66012 076675  ZGO   STB ZI/O      SAVE PREPARE TSB
0874   66013 076705        STB ZLCHN     TTY CHANNEL
0875   66014 060507        LDA M9        9 INSTRUCTIONS TO BE MODIFIED
0876   66015 066574        LDB ZLST1     START ADR OF INST LIST
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0877  66016 016521        JSB ZSETI    SET I/O CHANNEL INST.
0878*
0879***   CALL FOR CLOCK I/O ADDRESS
0880*
0881  66017 017475        JSB CRLND    OUTPUT CR-LF
0882  66020 060514        LDA M19      OUTPUT MESSAGE:
0883  66021 066607        LDB ZA7      "CLOCK I/O ADDRESS?"
0884  66022 017345        JSB ZLOT
0885  66023 016535        JSB ZGADR    GET ADDRESS FROM TTY
0886  66024 076675        STB ZI/O     SAVE I/O ADDRESS
0887  66025 063031        LDA ZINS1    SET INTERRUPT CELL
0888  66026 170001        STA B,I      INSTRUCTION IN CLOCK CELL.
0889  66027 060503        LDA M5       5-ADDRESSES TO BE MODIFIED
0890  66030 066576        LDB ZLST3    SET I/O INSTRUCTIONS
0891  66031 016521        JSB ZSETI    FOR CLOCK.
0892*
0893***   CALL FOR LOG TTY I/O ADDRESS
0894*
0895  66032 017475        JSB CRLND
0896  66033 017475        JSB CRLND    OUTPUT RETURN
0897  66034 062665        LDA ZM22     OUTPUT MESSAGE:
0898  66035 066601        LDB ZAG1     "LOG TTY I/O
0899  66036 017345        JSB ZLOT     ADDRESS?"
0900  66037 016535        JSB ZGADR    INPUT LOG-TTY ADDRESS
0901  66040 076675        STB ZI/O     SAVE I/O ADDRESS
0902  66041 063032        LDA ZI/O6    SET INTERRUPT CELL
0903  66042 170001        STA B,I      LINKAGE INSTRUCTION
0904  66043 062663        LDA ZM12     12-ADDRESSES TO BE MODIFIED
0905  66044 066575        LDB ZLST2    INSTRUCTIONS ADDRESS LIST
0906  66045 016521        JSB ZSETI    SET I/O CHANNEL-LOG TTY
0907*
0908  66046 062575        LDA ZLST2    LOAD TABLE BASE ADR
0909  66047 042651        ADA Z5       INDEX BY 11
0910  66050 160000        LDA A,I      GET (OTB) INST ADR
0911  66051 160000        LDA A,I      GET INSTRUCTION
0912  66052 173027        STA ZTTYB,I  SET IN INITIALIZATION SECTION
0913  66053 173026        STA ZTTY[,I
0914*
0915  66054 062575        LDA ZLST2    LOAD TABLE BASE ADR
0916  66055 042652        ADA .11       INDEX BY 11
0917  66056 160000        LDA A,I      LOAD INST ADR
0918  66057 160000        LDA A,I      LOAD (CLC) INST
0919  66060 173030        STA ZTTYC,I  STORE IN INIT SECTION
0920*
0921***   GET NUMBER OF USERS (1-4)
0922*
0923  66061 017475        JSB CRLND
0924  66062 017475  ZGNU  JSB CRLND    OUTPUT CR-LF
0925  66063 062664        LDA ZM20     OUTPUT MESSAGE:
0926  66064 066603        LDB ZAG3     "NUMBER OF CHANNELS?"
0927  66065 017345        JSB ZLOT
0928  66066 062654        LDA Z20      GET
0929  66067 066712        LDB ZBUF     RESPONSE
0930  66070 017403        JSB ZLIN     FROM TTY
0931  66071 050370        CPA .1       1 CHAR INPUT?
0932  66072 026100        JMP ZPRCS    OK- PROCESS IT
0933  66073 017475  ZER2  JSB CRLND    OUTPUT CR-LF
0934  66074 062653        LDA Z13      OUTPUT MESSAGE:
0935  66075 066604        LDB ZAG4     "INVALID INPUT"
0936  66076 017345        JSB ZLOT
0937  66077 026062        JMP ZGNU     TRY AGAIN
0938*
0939  66100 066712  ZPRCS LDB ZBUF     CONVERT TO BINARY
0940  66101 017501        JSB DVERT
0941  66102 026073        JMP ZER2     NOT VALID INPUT
0942  66103 072674        STA ZPNU     SAVE + # USERS
0943  66104 003007        CMA,INA,SZA,RSS   MAKE COUNT NEGATIVE
0944  66105 026073        JMP ZER2     AND PRINT ERROR IF 0
0945  66106 072673        STA ZNUSR    SAVE -# USERS
0946  66107 040373        ADA .4       INDEX BY 4
0947  66110 002020        SSA          USER #>4?
0948  66111 026073        JMP ZER2     YES-ERROR
0949  66112 066673        LDB ZNUSR    LOAD (B)= - # USERS
```

```
0950  66113 176704         STB Z#USR,I  SET -USERS COUNT FOR CLOCK
0951  66114 176703         STB Z&USR,I  SET -USERS COUNT FOR MONITOR
0952*
0953***   SET CHANNEL I/O ADDRESSES
0954*
0955  66115 017475         JSB CRLND
0956  66116 002404         CLA,INA      SET = USER # 1
0957  66117 072672         STA ZCHN#
0958*
0959  66120 017475  ZLOP2 JSB CRLND     OUTPUT CR-LF
0960  66121 062672         LDA ZCHN#    LOAD CHANNEL #
0961  66122 030425         IOR .48      ADD ON ASCII # BITS
0962  66123 001727         ALF,ALF      POSITION TO UPPER WORD
0963  66124 030411         IOR .32      ADD ON BLANK
0964  66125 172606         STA ZA6,I    PUT IN PRINT BUFFER
0965  66126 062667         LDA ZM27     OUTPUT MESSAGE:
0966  66127 066605         LDB ZA5      "CHANNEL N TTY I/O
0967  66130 017345         JSB ZLOT     ADDRESS?"
0968  66131 016535         JSB ZGADR    GET ADDRESS
0969  66132 076675         STB ZI/O     AND SAVE
0970*
0971***   SET CHANNEL NUMBER INTO INTERRUPT TABLE
0972*
0973  66133 062701         LDA CTBL$
0974  66134 042672         ADA ZCHN#
0975  66135 174000         STB A,I
0976*
0977  66136 062617         LDA ZBTB1    LOAD INTERRUPT TABLE BASE
0978  66137 042672         ADA ZCHN#    ADDRESS & INDEX BY CHAN #.
0979  66140 160000         LDA A,I      LOAD INTERRUPT INSTRUCTION
0980  66141 170001         STA B,I      AND STORE IN INTERRUPT CELL
0981*
0982***   SET NEW FIRST WORD AVAILABLE FREE CORE
0983*
0984  66142 062567         LDA ZZFWA    LOAD TABLE BASE ADDRESS
0985  66143 042672         ADA ZCHN#    INDEX BY USER #
0986  66144 160000         LDA A,I      LOAD FWAM FROM TABLE
0987  66145 073043         STA FWAFC    STORE AS FWAM
0988*
0989***   CONFIGURE I/O INSTRUCTIONS
0990*
0991  66146 066624         LDB ZBTB2    LOAD INST. TABLE BASE ADR
0992  66147 046672         ADB ZCHN#    INDEX BY CHANNEL #
0993  66150 164001         LDB B,I      LOAD LIST ADDRESS
0994  66151 076706         STB ZCODE    SAVE LIST ADDRESS
0995  66152 060505         LDA M7       7 INSTRUCTIONS TO BE MODIFIED
0996  66153 016521         JSB ZSETI    MODIFY I/O INSTRUCTIONS
0997*
0998***   SET POWER FAIL INSTRUCTIONS
0999*
1000  66154 062706         LDA ZCODE    LOAD TABLE BASE ADR
1001  66155 040371         ADA .2       INDEX BY USER #
1002  66156 160000         LDA A,I      LOAD INST ADR
1003  66157 160000         LDA A,I      LOAD INST.
1004  66160 066636         LDB ZBTB4    LOAD TABLE BASE ADR
1005  66161 046672         ADB ZCHN#    INDEX BY USER #
1006  66162 164001         LDB B,I      LOAD DESTINATION ADR
1007  66163 170001         STA B,I      STORE INSTRUCTION
1008*


1010***   SET LOG-ON INITIALIZATION INSTRUCTIONS
1011*
1012  66164 062706         LDA ZCODE    LOAD LIST BASE ADDRESS
1013  66165 040370         ADA .1       INDEX BY 1
1014  66166 160000         LDA A,I      LOAD INST ADDRESS
1015  66167 160000         LDA A,I      LOAD INSTRUCTION (OTB)
1016  66170 067027         LDB ZTTYB    LOAD STORE ADDRESS BASE
1017  66171 046672         ADB ZCHN#    INDEX BY CHANNEL #
1018  66172 170001         STA B,I      SET INSTRUCTION (OTB)
1019*
1020  66173 066631         LDB ZBTB3    LOAD TABLE BASE ADR
1021  66174 046672         ADB ZCHN#    INDEX BY USER #
1022  66175 164001         LDB B,I      LOAD DESTINATION ADR
```

```
1023  66176 170001      STA B,I     STORE INSTRUCTION
1024  66177 066643      LDB ZBTB5
1025  66200 046672      ADB ZCHN#
1026  66201 164001      LDB B,I
1027  66202 170001      STA B,I
1028*
1029  66203 062706      LDA ZCODE   LOAD LIST BASE ADDRESS
1030  66204 040374      ADA .6      INDEX BY 6
1031  66205 160000      LDA A,I     LOAD INST ADR
1032  66206 160000      LDA A,I     LOAD INSTRUCTION (CLC)
1033  66207 067030      LDB ZTTYC   LOAD STORE BASE ADR
1034  66210 046672      ADB ZCHN#   INDEX BY USER #
1035  66211 170001      STA B,I     SET (CLC) INSTRUCTION
1036*
1037  66212 036672      ISZ ZCHN#   INDEX TO NEXT CHANNEL
1038  66213 036673      ISZ ZNUSR   DONE?
1039  66214 026120      JMP ZLOP2   NO-CONTINUE
1040*
1041***   CALL FOR CARD READER I/O ADDRESS
1042*
1043  66215 002400      CLA         CLEAR CARD READER IN SYSTEM FLAG
1044  66216 072671      STA CFLG$
1045  66217 017475      JSB CRLND
1046  66220 017475  GCRIO JSB CRLND  OUTPUT CR-LF
1047  66221 062660      LDA Z22     OUTPUT MESSAGE:
1048  66222 066615      LDB ZAG31   "CARD READER IN SYSTEM?"
1049  66223 017345      JSB ZLOT
1050  66224 060511      LDA M11     OUTPUT MESSAGE:
1051  66225 066611      LDB ZA9     "YES OR NO?"
1052  66226 017345      JSB ZLOT
1053  66227 062654      LDA Z20     * INPUT
1054  66230 066712      LDB ZBUF    * RESPONSE
1055  66231 017403      JSB ZLIN
1056*
1057  66232 002003      SZA,RSS     NULL INPUT?
1058  66233 026220      JMP GCRIO   YES - TRY AGAIN
1059  66234 162712      LDA ZBUF,I  GET FIRST TWO CHARS INPUT
1060  66235 053024      CPA ZNO     =NO?
1061  66236 026312      JMP NOCRD   NO CARD READER SET NEW LWAM
1062  66237 053025      CPA ZYES    =YES?
1063  66240 002001      RSS         YES - GET CARD READER I/O ADR
1064  66241 026220      JMP GCRIO   INVALID RESPONSE - TRY AGAIN
1065*
1066  66242 017475      JSB CRLND   OUTPUT CR-LF
1067  66243 063113      LDA ZM25    OUTPUT MESSAGE:
1068  66244 066616      LDB ZAG32   "CARD READER I/O
1069  66245 017345      JSB ZLOT      ADDRESS?"
1070  66246 016535      JSB ZGADR   GET CHANNEL NUMBER
1071  66247 076675      STB ZI/O    SAVE FOR I/O MODIFICATION
1072  66250 063034      LDA ZI/O8   SET CARD READER
1073  66251 170001      STA B,I     INTERRUPT INSTRUCTION
1074  66252 063114      LDA ZM4     SET CARD READER
1075  66253 066600      LDB ZLS10   I/O INSTRUCTIONS
1076  66254 016521      JSB ZSETI
1077*
1078  66255 062600      LDA ZLS10   SET CLC
1079  66256 160000      LDA A,I     IN POWER FAIL
1080  66257 160000      LDA A,I
1081  66260 173042      STA CFRDR,I
1082*
1083  66261 063106      LDA JMP$1   PUT <JMP X3,I> INSTR
1084  66262 173103      STA ERRO.,I IN 545B
1085*
1086  66263 063107      LDA JMP$2   PUT <JMP X1,I> INSTR
1087  66264 173104      STA RUN1,I  IN 2141B
1088*
1089  66265 063110      LDA JMP$3   PUT <JMP X2,I> INSTR
1090  66266 173105      STA RUN2,I  IN 2142B
1091  66267 063111      LDA JMP$4   LOAD <JMP X6,I> INSTR
1092  66270 064252      LDB $RUN$   LOAD ADDRESS TO MFASE IN BASIC
1093  66271 044371      ADB .2      INDEX BY 2
1094  66272 170001      STA B,I     MODIFY INSTRUCTION
1095  66273 064257      LDB $LST$   LOAD LINK TO LIST IN BASIC
```

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1096   66274 044400        ADB .10     INDEX BY 10
1097   66275 170001        STA B,I     MODIFY INSTRUCTION
1098   66276 046662        ADB Z129    INDEX ADDRESS
1099   66277 170001        STA B,I     MODIFY INSTRUCTION
1100   66300 044372        ADB .3      INDEX ADDRESS
1101   66301 170001        STA B,I     MODIFY INSTRUCTION
1102   66302 060057        LDA X6      LOAD LINK WORD
1103   66303 064253        LDB $FS3$
1104   66304 044510        ADB M10     SUBTRACT 10
1105   66305 170001        STA B,I     MODIFY INSTRUCTION
1106   66306 006004        INB         INDEX STORE ADDRESS
1107   66307 170001        STA B,I     MODIFY INSTRUCTION
1108   66310 072671        STA CFLG$   SET CARD RDR IN SYSTEM FLAG
1109   66311 026320        JMP GPI/O-1 GET PHOTORDR CHANNEL NUMBER
1110*
1111   66312 002400  NOCRD CLA         DELETE CHECK CARD READER
1112   66313 173035        STA ?CARD,I INSTRUCTION IN MONITOR
1113   66314 003400        CCA         DELETE "CARD" COMMAND
1114   66315 173037        STA ?CRD?,I
1115   66316 063045        LDA LWACR   GET NEW LAST WORD MEM
1116   66317 073044        STA LWAFC   SET NEW LWAM
1117*
1118***   GET PHOTOREADER I/O ADDRESS
1119*
1120   66320 017475        JSB CRLND
1121   66321 017475  GPI/O JSB CRLND   OUTPUT CR-LF
1122   66322 062661        LDA Z23
1123   66323 066610        LDB ZA8
1124   66324 017345        JSB ZLOT
1125   66325 060511        LDA M11
1126   66326 066611        LDB ZA9
1127   66327 017345        JSB ZLOT
1128   66330 062654        LDA Z20     INPUT
1129   66331 066712        LDB ZBUF    RESPONSE
1130   66332 017403        JSB ZLIN
1131   66333 002003        SZA,RSS     NULL INPUT?
1132   66334 026321        JMP GPI/O   YES-TRY AGAIN
1133   66335 162712        LDA ZBUF,I  GET INPUT CHARS
1134   66336 053025        CPA ZYES    =YES?
1135   66337 026357        JMP ZPRIO   GET PHOTOREADER I/O ADDRESS
1136   66340 053024        CPA ZNO     =NO?
1137   66341 002001        RSS         YES-DELETE PHOTOREADER DRIVER
1138   66342 026321        JMP GPI/O
1139*
1140   66343 062405        LDA ZCIT1+6 DELETE CHECK PHOTOREADER
1141   66344 173036        STA ?PHTO,I INSTRUCTION IN MONITOR
1142   66345 003400        CCA         DELETE "PTAPE" COMMAND
1143   66346 173040        STA ?PHO?,I
1144   66347 062671        LDA CFLG$   CARD READER IN SYSTEM?
1145   66350 002002        SZA
1146   66351 026376        JMP LCCWT   YES - DO NOT RESET LWAM
1147   66352 162700        LDA PTINS,I DELETE CHECK LOCALL TTY INPUT
1148   66353 172702        STA ZPTZ,I
1149   66354 063046        LDA LWPRD   GET NEW LAST WORD MEM
1150   66355 073044        STA LWAFC   UPDATE LAST WORD
1151   66356 026376        JMP LCCWT   ASK FOR CODE TABLE
1152*
1153   66357 017475  ZPRIO JSB CRLND   OUTPUT CR-LF
1154   66360 060516        LDA M25     OUTPUT MESSAGE:
1155   66361 066612        LDB ZA12    "PHOTO READER I/O
1156   66362 017345        JSB ZLOT    ADDRESS?"
1157   66363 016535        JSB ZGADR   GET CHANNEL NUMBER
1158   66364 076675        STB ZI/O    SAVE FOR I/O MODIFICATION
1159   66365 063033        LDA ZI/O7   SET PHOTOREADER
1160   66366 170001        STA B,I     INTERRUPT INSTRUCTION
1161   66367 062650        LDA ZG.6    SET PHOTOREADER
1162   66370 066577        LDB ZLST4   I/O INSTRUCTIONS
1163   66371 016521        JSB ZSETI
1164   66372 062577        LDA ZLST4   SET CLC RDR
1165   66373 160000        LDA A,I     IN POWER FAIL
1166   66374 160000        LDA A,I
1167   66375 173041        STA PFRDR,I RESTART
1168*
```

```
1169***    LOAD AND CONSTRUCT CODE WORD TABLE
1170*
1171  66376 117112  LCCWT JSB CCWT,I
1172*
1173***    ENTER AND CONSTRUCT INFORMATION TABLE
1174*
1175  66377 063062  ZCIT1 LDA ZLNTT    LOAD TABLE LENGTH ADR
1176  66400 072710        STA ZLNTH    SAVE FOR STORE POINTER
1177  66401 067047        LDB ZADRT    LOAD TABLE ADDRESS ADR
1178  66402 076677        STB ZSTOR    SAVE FOR STORE POINTER
1179  66403 067043        LDB FWAFC    GET FIRST WORD AVAIL MEM.
1180  66404 076706        STB ZCODE    SAVE AS STORE POINTER
1181*
1182  66405 002400        CLA          SET LINES "IN"
1183  66406 072676        STA ZCNT     COUNT TO ZERO
1184  66407 064511        LDB M11      SET MAX LINE COUNTER
1185  66410 076672        STB ZCHN#    TO MINUS 11.
1186*
1187  66411 017475        JSB CRLND
1188  66412 017475        JSB CRLND    OUTPUT CR-LF
1189  66413 062655        LDA .24      OUTPUT MESSAGE:
1190  66414 066613        LDB ZAG20    "ENTER INFORMATION TABLE"
1191  66415 017345        JSB ZLOT
1192*
1193  66416 017475  ZCIT2 JSB CRLND    OUTPUT CR-LF
1194  66417 060434        LDA .72      INPUT 72 CHARS
1195  66420 066712        LDB ZBUF     INTO ZBUF
1196  66421 017403        JSB ZLIN
1197  66422 166712        LDB ZBUF,I   GET FIRST TWO CHARS INPUT
1198  66423 057023        CPB /E       END-OF-INPUT?
1199  66424 026454        JMP ZCIT3    YES - COMPRESS TABLE
1200  66425 002003        SZA,RSS      NULL INPUT?
1201  66426 026417        JMP ZCIT2+1  YES - GET NEXT LINE
1202  66427 036672        ISZ ZCHN#    TOO MANY LINES?
1203  66430 026436        JMP *+6      NO - ACCEPT NEW LINE
1204  66431 017475        JSB CRLND    OUTPUT ERROR MESSAGE:
1205  66432 062656        LDA Z18
1206  66433 066614        LDB ZAG21    "# LINES EXCEEDS 10"
1207  66434 017345        JSB ZLOT
1208  66435 026377        JMP ZCIT1    RE-ENTER TABLE
1209*
1210***    PROCESS NEW LINE
1211*
1212  66436 036676        ISZ ZCNT     INDEX LINE COUNTER
1213  66437 172710        STA ZLNTH,I  SAVE LINE LENGTH
1214  66440 072450        STA *+8      SAVE IN CALL TO MOVE STACK
1215  66441 066706        LDB ZCODE    LOAD STORE ADDRESS
1216  66442 176677        STB ZSTOR,I  SAVE IN ADR TABLE
1217  66443 040001        ADA B        INDEX (A) BY (B)
1218  66444 072706        STA ZCODE    SET NEW F.W.A.M.
1219  66445 062712        LDA ZBUF     SOURCE ADR IN (A)
1220  66446 166677        LDB ZSTOR,I  DEST ADR IN (B)
1221  66447 117565        JSB ?MOVE,I  MOVE STACK OF
1222  66450 000000        NOP          (NOP) ELEMENTS
1223*
1224  66451 036710        ISZ ZLNTH    INDEX
1225  66452 036677        ISZ ZSTOR    TABLE POINTERS
1226  66453 026416        JMP ZCIT2    GET NEXT ENTRY
1227*
1228  66454 066676  ZCIT3 LDB ZCNT     LOAD LINES-IN COUNT
1229  66455 007007        CMB,INB,SZB,RSS  IF ZERO THEN-
1230  66456 026377        JMP ZCIT1    ASK AGAIN FOR INPUT
1231  66457 177075        STB Z?LNT,I  STORE-# LINES IN LOG-IN
1232  66460 066676        LDB ZCNT     RELOAD # LINES
1233  66461 076466        STB *+5      SAVE FOR MOVE STACK
1234  66462 063062        LDA ZLNTT    LOAD (A)=SOURCE ADR
1235  66463 066706        LDB ZCODE    (B)=DEST ADR
1236  66464 177076        STB Z?TBL,I  SAVE START ADR IN LOG-IN
1237  66465 117565        JSB ?MOVE,I  MOVE STACK OF LENGTH
1238  66466 000000        NOP          VALUES
1239  66467 066706        LDB ZCODE    LOAD FWAM
1240  66470 046676        ADB ZCNT     UPDATE BY VALUE IN (ZCNT)
1241  66471 076706        STB ZCODE    SAVE RESULT
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1242  66472 177077      STB Z?ADR,I  SAVE ADR TABLE ADR IN LOG-IN
1243  66473 062676      LDA ZCNT     LOAD # LINES INPUT AND
1244  66474 072477      STA *+3      STORE FOR MOVE-STACK
1245  66475 063047      LDA ZADRT    LOAD (A)=SOURCE ADR
1246  66476 117565      JSB ?MOVE,I  MOVE STACK OF ADDRESS
1247  66477 000000      NOP          VALUES
1248  66500 066706      LDB ZCODE    RESET FIRST
1249  66501 046676      ADB ZCNT     WORD AVAILABLE
1250  66502 077043      STB FWAFC    FREE CORE.
1251*
1252  66503 117100      JSB ZFCOR,I
1253  66504 067101      LDB ZSEXZ    SET START ADR
1254  66505 074003      STB 3B       IN 3B
1255  66506 017475      JSB CRLND
1256  66507 127102      JMP #PT#,I   PUNCH SYSTEM TAPE
1257*
1258*
1259***   SUBROUTINE TO CONVERT CHARACTER TO OCTAL
1260*
1261  66510 000000  ZNBER NOP
1262  66511 010443      AND M177     MASK TO LOWER 6-BITS
1263  66512 042670      ADA ZN60     INDEX BY -OCT60
1264  66513 070001      STA B        SAVE IN (B)
1265  66514 005121      BRS,BRS      SHIFT OUT BITS
1266  66515 005100      BRS          (0-2)
1267  66516 006003      SZB,RSS      TEST FOR ZERO REMAINDER
1268  66517 036510      ISZ ZNBER    SET "SUCCESS" EXIT
1269  66520 126510      JMP ZNBER,I  RETURN
1270*
1271***   SUBROUTINE TO MODIFY THE INSTRUCTIONS IN A LIST
1272*
1273  66521 000000  ZSETI NOP
1274  66522 072676      STA ZCNT     SAVE # WORDS TO MODIFY
1275  66523 076707      STB ZBUFF    SAVE BASE ADDRESS
1276  66524 166707  ZLP1 LDB ZBUFF,I  LOAD ADDRESS
1277  66525 160001      LDA B,I      ACCESS INSTRUCTION
1278  66526 010522      AND D100     MASK OFF BITS (0-5)
1279  66527 032675      IOR ZI/O     ADD ON CHANNEL NUMBER
1280  66530 170001      STA B,I      RESTORE INSTRUCTION
1281  66531 036707      ISZ ZBUFF    INDEX TO NEXT WORD IN LIST
1282  66532 036676      ISZ ZCNT     DONE?
1283  66533 026524      JMP ZLP1     NO
1284  66534 126521      JMP ZSETI,I  YES-RETURN
1285*
1286*
1287***   SUBROUTINE TO INPUT CHANNEL # FROM TTY
1288*
1289  66535 000000  ZGADR NOP
1290  66536 062654      LDA Z20      SET TO INPUT 20 CHARS
1291  66537 066712      LDB ZBUF     GIVE I/O BUFFER ADDRESS
1292  66540 017403      JSB ZLIN     GET INPUT FROM TTY
1293*
1294  66541 050371      CPA .2       2 CHARS INPUT?
1295  66542 026551      JMP ZTWO     YES-PROCESS
1296*
1297  66543 017475  ZERRR JSB CRLND
1298  66544 062654      LDA Z20      OUTPUT MESSAGE:
1299  66545 066602      LDB ZAG2     "INVALID I/O
1300  66546 017345      JSB ZLOT     ADDRESS"
1301  66547 017475      JSB CRLND    GET NEW INPUT
1302  66550 026536      JMP ZGADR+1
1303*
1304  66551 162712  ZTWO LDA ZBUF,I  LOAD FIRST CHARS
1305  66552 001727      ALF,ALF      FROM TTY INPUT
1306  66553 016510      JSB ZNBER    BUFFER.
1307  66554 026543      JMP ZERRR    NOT A NUMBER
1308  66555 002003      SZA,RSS      TEST IF ZERO
1309  66556 026543      JMP ZERRR    NOT A NUMBER
1310  66557 001723      ALF,RAR      POSITION NUMBER
1311  66560 072675      STA ZI/O     SAVE IT
1312  66561 162712      LDA ZBUF,I   GET NEXT CHAR
1313  66562 016510      JSB ZNBER    IS IT A NUMBER?
1314*
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```
1315   66563 026543        JMP ZERRR   NOT A NUMBER
1316   66564 032675        IOR ZI/O    ADD ON PREVIOUS NUMBER
1317   66565 070001        STA B       PUT IN B-REG
1318   66566 126535        JMP ZGADR,I RETURN
1319*
1320***    FIRST WORD AVAILABLE MEMORY TABLE
1321*
1322   66567 066567  ZZFWA DEF *
1323   66570 013333        DEF SK2
1324   66571 013463        DEF SK3
1325   66572 013613        DEF SK4
1326   66573 013743        DEF FINIS
1327*
1328***    LINKS TO LISTS OF INSTRUCTIONS TO BE MODIFIED
1329*
1330   66574 060000  ZLST1 DEF ZDLS1
1331   66575 060011  ZLST2 DEF ZDLS2
1332   66576 060025  ZLST3 DEF ZDLS3
1333   66577 060032  ZLST4 DEF ZDLS4
1334   66600 060101  ZLS10 DEF ZDL10
1335*
1336***    LINKS TO MESSAGE PRINT TABLE
1337*
1338   66601 060105  ZAG1  DEF ZZG1
1339   66602 060120  ZAG2  DEF ZZG2
1340   66603 060132  ZAG3  DEF ZZG3
1341   66604 060144  ZAG4  DEF ZZG4
1342   66605 060153  ZA5   DEF ZZG5
1343   66606 060157  ZA6   DEF ZZG5+4
1344   66607 060171  ZA7   DEF ZZG7
1345   66610 060203  ZA8   DEF ZZG8
1346   66611 060217  ZA9   DEF ZZG9
1347   66612 060261  ZA12  DEF ZZ12
1348   66613 060403  ZAG20 DEF ZZG20
1349   66614 060417  ZAG21 DEF ZZG21
1350   66615 060601  ZAG31 DEF ZZG31
1351   66616 060614  ZAG32 DEF ZZG32
1352*
1353***    CONSTANTS AND DATA DECLARATIONS
1354*
1355   00000         A     EQU 0
1356   00001         B     EQU 1
1357   66617 066617  ZBTB1 DEF *
1358   66620 114031        JSB I/O2,I
1359   66621 114032        JSB I/O3,I
1360   66622 114033        JSB I/O4,I
1361   66623 114034        JSB I/O5,I
1362*
1363   66624 066624  ZBTB2 DEF *
1364   66625 060040        DEF ZDLS5
1365   66626 060047        DEF ZDLS6
1366   66627 060056        DEF ZDLS7
1367   66630 060065        DEF ZDLS8
1368   66631 066631  ZBTB3 DEF *
1369   66632 075612        DEF LTTY4+1
1370   66633 075613        DEF LTTY4+2
1371   66634 075614        DEF LTTY4+3
1372   66635 075615        DEF LTTY4+4
1373*
1374   66636 066636  ZBTB4 DEF *
1375   66637 075635        DEF LTTY5+1
1376   66640 075636        DEF LTTY5+2
1377   66641 075637        DEF LTTY5+3
1378   66642 075640        DEF LTTY5+4
1379*
1380   66643 066643  ZBTB5 DEF *
1381   66644 075617        DEF LTTY4+6
1382   66645 075621        DEF LTTY4+8
1383   66646 075623        DEF LTTY4+10
1384   66647 075625        DEF LTTY4+12
1385*
1386   66650 177772  ZG.6  DEC -6
1387   66651 000005  Z5    DEC 5
```

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1388  66652 000013  .11   DEC 11
1389  66653 000015  Z13   DEC 13
1390  66654 000024  Z20   DEC 20
1391  66655 000030  .24   DEC 24
1392  66656 000022  Z18   DEC 18
1393  66657 000025  Z21   DEC 21
1394  66660 000026  Z22   DEC 22
1395  66661 000027  Z23   DEC 23
1396  66662 000201  Z129  DEC 129
1397  66663 177764  ZM12  DEC -12
1398  66664 177754  ZM20  DEC -20
1399  66665 177752  ZM22  DEC -22
1400  66666 177750  ZM24  DEC -24          CHARS IN MESG.
1401  66667 177745  ZM27  DEC -27
1402  66670 177720  ZN60  OCT -60
1403  66671 000000  CFLG$ NOP
1404  66672 000000  ZCHN# NOP
1405  66673 000000  ZNUSR NOP           - # USERS
1406  66674 000000  ZPNU  NOP           + # USERS
1407  66675 000000  ZI/O  NOP
1408  66676 000000  ZCNT  NOP
1409  66677 000000  ZSTOR NOP
1410  66700 074020  PTINS DEF CKL+8
1411  66701 074357  CTBL$ DEF CHTBA
1412  66702 074027  ZPTZ  DEF .LD.-1
1413  66703 075052  Z&USR DEF &USR
1414  66704 073646  Z#USR DEF #USRS
1415  66705 000000  ZLCHN NOP
1416  66706 000000  ZCODE NOP
1417  66707 000000  ZBUFF NOP
1418  66710 000000  ZLNTH NOP
1419  66711 000000  ZNTRY NOP
1420  66712 066713  ZBUF  DEF *+1
1421  66713          BSS 72
1422  67023 027505  /E    ASC 1,/E
1423  67024 047117  ZNO   ASC 1,NO
1424  67025 054505  ZYES  ASC 1,YE
1425  67026 075627  ZTTY[ DEF ZT[
1426  67027 067316  ZTTYB DEF SRITB+1
1427  67030 067332  ZTTYC DEF ZCLCZ
1428  67031 114030  ZINS1 JSB I/O1,I
1429  67032 114035  ZI/O6 JSB I/O6,I   LOG TTY INT CELL INST
1430  67033 114036  ZI/O7 JSB I/O7,I   PHOTRDR INT CELL INST
1431  67034 114037  ZI/O8 JSB I/O8,I   CARD READER INT CELL INST
1432  67035 074036  ?CARD DEF CKPTR
1433  67036 074037  ?PHTO DEF CKPTR+1
1434  67037 073016  ?CRD? DEF CA
1435  67040 073015  ?PHO? DEF PT
1436  67041 075641  PFRDR DEF ?PFLI
1437  67042 075642  CFRDR DEF ?PFLI+1
1438  67043 013203  FWAFC DEF STCKS
1439  67044 071707  LWAFC DEF LWTSB-1
1440  67045 072534  LWACR DEF .HSPR-1
1441  67046 073022  LWPRD DEF MSSG-1
1442*
1443  67047 067050  ZADRT DEF *+1       DEFINES INFO TABLE TEMP ADRS
1444  67050          BSS 10
1445  67062 067063  ZLNTT DEF *+1       DEFINES INFO TABLE TEMP LNGTS
1446  67063          BSS 10
1447  67075 073070  Z?LNT DEF SYIN#
1448  67076 073072  Z?TBL DEF SLENA
1449  67077 073071  Z?ADR DEF SINA
1450  67100 060631  ZFCOR DEF ZFRC
1451  67101 067115  ZSEXZ DEF .SEX.
1452  67102 061317  #PT#  DEF ZABST
1453*
1454  67103 000545  ERRO. DEF ..ERR
1455  67104 002141  RUN1  DEF RN.$.
1456  67105 002142  RUN2  DEF RN.$.+1
1457  67106 124056  JMP$1 JMP X4,I
1458  67107 124053  JMP$2 JMP X1,I
1459  67110 124054  JMP$3 JMP X2,I
1460  67111 124057  JMP$4 JMP X6,I
```

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1461  67112 061057  CCWT  DEF CDTBL
1462  67113 177747  ZM25  DEC -25
1463  67114 177774  ZM4   DEC -4
1464                      HED ***** TIME-SHARE BASIC DRIVERS AND MONITOR *****
1465  67115 106700  .SEX. CLC 0
1466  67116 017475        JSB CRLND
1467*
1468***   INITIALIZE CLOCK
1469*
1470  67117 017475  ?I1   JSB CRLND    OUTPUT CR-LF
1471  67120 063641        LDA ZTI1     OUTPUT MESSAGE:
1472  67121 067642        LDB ZTA1     "YEAR?"
1473  67122 017345        JSB ZLOT
1474  67123 060373        LDA .4       INPUT RESPONSE OF YEAR
1475  67124 067571        LDB PTBA?
1476  67125 017403        JSB ZLIN
1477  67126 050371        CPA .2       TWO CHARS INPUT?
1478  67127 002001        RSS          YES - INPUT O.K.
1479  67130 027117        JMP ?I1      NO - TRY AGAIN
1480*
1481  67131 067571        LDB PTBA?    CONVERT TO
1482  67132 017501        JSB DVERT    BINARY
1483  67133 027117        JMP ?I1      INVALID INPUT
1484  67134 163571        LDA PTBA?,I
1485  67135 173576        STA YBUF,I
1486*
1487  67136 017475  ?I2   JSB CRLND    OUTPUT CR-LF
1488  67137 063646        LDA ZTI2     OUTPUT MESSAGE:
1489  67140 067647        LDB ZTA2     "MONTH?"
1490  67141 017345        JSB ZLOT
1491  67142 060373        LDA .4       INPUT RESPONSE OF MONTH
1492  67143 067571        LDB PTBA?
1493  67144 017403        JSB ZLIN
1494  67145 050371        CPA .2       TWO CHARS INPUT?
1495  67146 002001        RSS          YES - INPUT O.K.
1496  67147 027136        JMP ?I2      NO - TRY AGAIN
1497*
1498  67150 067571        LDB PTBA?    CONVERT TO
1499  67151 017501        JSB DVERT    BINARY
1500  67152 027136        JMP ?I2      INVALID INPUT
1501  67153 002003        SZA,RSS      MONTH=0?
1502  67154 027136        JMP ?I2      YES-REJECT
1503  67155 043637        ADA ZM13     SUBTRACT 13
1504  67156 002021        SSA,RSS      MONTH<13?
1505  67157 027136        JMP ?I2      NO-REJECT
1506  67160 163571        LDA PTBA?,I
1507  67161 173574        STA MBUF,I
1508*
1509  67162 017475  ?I3   JSB CRLND    OUTPUT CR-LF
1510  67163 063654        LDA ZTI3     OUTPUT MESSAGE:
1511  67164 067655        LDB ZTA3     "DAY"?
1512  67165 017345        JSB ZLOT
1513  67166 060373        LDA .4       INPUT RESPONSE OF DAY
1514  67167 067571        LDB PTBA?
1515  67170 017403        JSB ZLIN     DAY BUFFER
1516  67171 050371        CPA .2       TWO CHARS INPUT?
1517  67172 002001        RSS          YES - INPUT O.K.
1518  67173 027162        JMP ?I3      NO - TRY AGAIN
1519  67174 067571        LDB PTBA?    CONVERT TO
1520  67175 017501        JSB DVERT    BINARY
1521  67176 027162        JMP ?I3      INVALID INPUT
1522*
1523  67177 173572        STA DATE?,I  NO-SAVE DATE
1524  67200 163571        LDA PTBA?,I

1526  67201 173575        STA ?DBUF,I
1527*
1528***   GET TIME
1529*
1530  67202 017475  ?I5   JSB CRLND
1531  67203 063661        LDA ZTI4     OUTPUT MESSAGE:
1532  67204 067662        LDB ZTA4     "TIME?"
1533  67205 017345        JSB ZLOT
```

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1534   67206  060374        LDA .6        INPUT RESPONSE
1535   67207  067571        LDB PTBA?     AND STORE IN
1536   67210  017403        JSB ZLIN      TIME BUFFER
1537   67211  050373        CPA .4        4 CHARS INPUT?
1538   67212  002001        RSS           YES - INPUT O.K.
1539   67213  027202        JMP ?I5       NO - TRY AGAIN
1540   67214  060371        LDA .2        CONVERT
1541   67215  067571        LDB PTBA?     TO
1542   67216  017501        JSB DVERT     BINARY
1543   67217  027202        JMP ?I5       INVALID INPUT
1544   67220  173570        STA HR?,I     SAVE HOURS COUNT
1545   67221  040516        ADA M25
1546   67222  002021        SSA,RSS       HOURS>24?
1547   67223  027202        JMP ?I5       YES-REJECT
1548   67224  060371        LDA .2        CONVERT
1549   67225  067571        LDB PTBA?     INPUT
1550   67226  006004        INB           TO
1551   67227  017501        JSB DVERT     BINARY
1552   67230  027202        JMP ?I5       INVALID INPUT
1553   67231  173567        STA MNTS?,I   STORE MINUTES
1554   67232  043640        ADA ZM61      MINUTES >60?
1555   67233  002021        SSA,RSS
1556   67234  027202        JMP ?I5       YES-REJECT
1557   67235  017475        JSB CRLND
1558*
1559***   TIME SHARE BASIC INITIALIZATION SECTION
1560*
1561   67236  167634        LDB &&USR,I  GET -# USERS
1562   67237  177563        STB ?CT,I    SAVE AS COUNTER
1563   67240  006404        CLB,INB      SET TEMPS
1564   67241  074063        STB USN      TO FIRST
1565   67242  177560        STB ?USNT,I  USER
1566*
1567   67243  063562  ?LP1  LDA ?ON       LOAD LINK TO -ON- ROUTINE
1568   67244  067622        LDB BSTK5     LOAD LINKAGE TABLE BASE ADDRESS
1569   67245  044063        ADB USN       INDEX BY USER #
1570   67246  164001        LDB B,I       LOAD DESTINATION ADDRESS
1571   67247  170001        STA B,I       STORE LINK IN WRITE RETURN
1572*
1573   67250  060536        LDA M15       SET DATA FLAG
1574   67251  067615        LDB BSTK4     LOAD DATA FLAG TABLE BASE ADR
1575   67252  044063        ADB USN       INDEX BY USER #
1576   67253  164001        LDB B,I       LOAD DATA FLAG ADR IN (B)
1577   67254  170001        STA B,I       SET DATA FLAG
1578*
1579***   INITIALIZE USER STACKS
1580*
1581   67255  063627        LDA BSTK6     LOAD STACK NAME BASE ADDRESS
1582   67256  040063        ADA USN       INDEX BY USER #
1583   67257  160000        LDA A,I       LOAD USER STACK NAME
1584   67260  160000        LDA A,I
1585   67261  064064        LDB ASTK      LOAD ADDR OF ACTIVE STACK
1586   67262  117565        JSB ?MOVE,I   MOVE 5 ELEMENTS STACK
1587   67263  000005        OCT 5
1588*
1589   67264  060115        LDA LWAM
1590   67265  043556        ADA M72
1591   67266  070116        STA .BUFA
1592   67267  070117        STA SYMTA
1593   67270  043555        ADA D97
1594   67271  070120        STA SBUFA
1595   67272  040477        ADA M1
1596   67273  070115        STA LWAM
1597   67274  060114        LDA FWAM      LOAD FIRST WORD
1598   67275  070121        STA PBUFF     INITIALIZE PROGRAM BUFFR
1599   67276  070122        STA PBPTR     INITIALIZE PROG POINTR
1600   67277  060411        LDA .32       LOAD OCT 40
1601   67300  070411        STA BLANK     INITIALIZE BLANK CHARACTER
1602   67301  002400        CLA
1603   67302  070124        STA .LNUM     SET LINE NUMBER =0
1604   67303  067627        LDB BSTK6     LOAD STACK NAME BASE ADDRESS
1605   67304  044063        ADB USN       INDEX BY USER NAME
1606   67305  164001        LDB B,I       LOAD USER STACK NAME
```

```
1607  67306 164001        LDB B,I
1608  67307 117564        JSB ?MOUT,I  MOVE ACTIVATED STACK OUT
1609*
1610*
1611*
1612  67310 034063        ISZ USN      INDEX TO NEXT
1613  67311 137560        ISZ ?USNT,I  USER.
1614  67312 137563        ISZ ?CT,I    LAST USER?
1615  67313 027243        JMP ?LP1     NO-PROCESS NEXT USER
1616*
1617*
1618***   SET RUBOUTS INTO TTYS AND CLC
1619*
1620  67314 106700        CLC 0        CLEAR PREPARE SYSTEM TTY
1621  67315 064443  SRITB LDB RBOUT    LOAD RUBOUT CHAR
1622  67316 000000        NOP          (OTB LOG TTY)
1623  67317 000000        NOP          (OTB USER # 1)
1624  67320 000000        NOP          (OTB USER # 2)
1625  67321 000000        NOP          (OTB USER # 3)
1626  67322 000000        NOP          (OTB USER # 4)
1627  67323 002400        CLA          SET SECONDS ELAPSED
1628  67324 173573        STA SEKS?,I  TIME TO ZERO
1629  67325 003400        CCA          SET FLAG1 TO -1
1630  67326 173557        STA ?FL1,I
1631  67327 163634        LDA &&USR,I  SET LAST ACTIVATED USER # IN USN
1632  67330 003004        CMA,INA
1633  67331 070063        STA USN
1634  67332 000000  ZCLCZ NOP          (CLC LOG TTY)
1635  67333 000000        NOP          (CLC USER # 1)
1636  67334 000000        NOP          (CLC USER # 2)
1637  67335 000000        NOP          (CLC USER # 3)
1638  67336 000000        NOP          (CLC USER # 4)
1639  67337 060373        LDA .4
1640  67340 102600  CL1   OTA 0        INITIATE TIME-BASE
1641  67341 102704        STC PFL      INITIATE POWER FAIL
1642  67342 103700  CL2   STC 0,C      GENERATOR
1643  67343 102100        STF 0        TURN ON INTERRUPT
1644  67344 127562        JMP ?ON,I    GO TO LOG-ON SECTION
1645*
1646***   SUBROUTINE TO CONVERT ASCII NUMBERS TO DECIMAL
1647*
1648*
1649***   NON-INTERRUPT TTY DRIVER FOR PREPARE TIME-SHARE
1650*
1651  67345 000000  ZLOT  NOP          SUBROUTINE TO OUTPUT A RECORD
1652  67346 073577        STA ZL1      SAVE LENGTH
1653  67347 077600        STB ZA1      SAVE ADDRESS
1654  67350 067601        LDB OT.FL    LOAD OUTPUT COMMAND
1655  67351 106600  ZX1   OTB 0        SET TTY TO OUTPUT MODE
1656  67352 002003        SZA,RSS      ZERO CHAR?
1657  67353 027376        JMP CR.LF    YES-GIVE CARRIAGE RETURN-LF
1658  67354 002021        SSA,RSS      CHECK IF COUNT NEGATIVE
1659  67355 003004        CMA,INA      NO-MAKE IT NEGATIVE
1660  67356 073603        STA ZCT1     STORE NEGATIVE COUNT
1661  67357 067604        LDB ZULFL    LOAD UPPER / LOWER FLAG
1662*
1663  67360 163600  C..C  LDA ZA1,I    GET WORD FROM BUFFER
1664  67361 005200        RBL          ROTATE AND
1665  67362 004010        SLB          TEST FLAG
1666  67363 037600        ISZ ZA1      INDEX TO NEXT WORD
1667  67364 006011        SLB,RSS      LOAD CORRECT CHARACTER
1668  67365 001727        ALF,ALF      UPPER / ROTATE TO LOWER
1669  67366 010443        AND M177     GET SINGLE CHAR
1670  67367 030444        IOR M200     ADD PARITY BIT
1671  67370 017456        JSB ZXLOT
1672  67371 037603        ISZ ZCT1     LAST CHARACTER?
1673  67372 027360        JMP C..C     NO-GET NEXT TO OUTPUT
1674*
1675***   CHECK IF CR-LF
1676*
1677  67373 063577        LDA ZL1      CHECK ORIGINAL COUNTER
1678  67374 002020        SSA
1679  67375 127345        JMP ZLOT,I   NEGATIVE - RETURN
```

```
1680  67376 063605  CR.LF LDA ZCRET    POSITIVE - CR-LF
1681  67377 017456        JSB ZXLOT
1682  67400 063606        LDA ZLNFD     LOAD LF
1683  67401 017456        JSB ZXLOT
1684  67402 127345        JMP ZLOT,I    RETURN
1685*
1686***   SUBROUTINE TO INPUT A RECORD
1687*
1688  67403 000000  ZLIN  NOP
1689  67404 003004        CMA,INA       MAKE COUNT NEGATIVE
1690  67405 073603        STA ZCT1      SAVE COUNTER
1691  67406 073607        STA ZCT2      SAVE FOR RESET
1692  67407 077600        STB ZA1       SAVE ADDRESS
1693  67410 077610        STB ZA2       SAVE FOR RESET
1694*
1695  67411 006400        CLB           CLEAR TRUE COUNTER
1696  67412 077611        STB ZL2
1697*
1698  67413 017464  ZNXTC JSB ZXLIN
1699  67414 002003        SZA,RSS       SKIP IF NOT NULL CHAR
1700  67415 027413        JMP ZNXTC
1701  67416 053606        CPA ZLNFD
1702  67417 027413        JMP ZNXTC
1703  67420 053605        CPA ZCRET     CR?
1704  67421 027445        JMP ZZDNE     YES - GO TO END SECTION
1705  67422 053613        CPA ZESCP     ESC CHAR?
1706  67423 027447        JMP ZDEL      YES-DELETE LINE
1707  67424 053612        CPA ZMODE     ALT MODE ?
1708  67425 027447        JMP ZDEL      YES - DELETE LINE
1709  67426 067603        LDB ZCT1      LOAD NEGATIVE COUNT
1710  67427 006006        INB,SZB       SKIP IF B IS POSITIVE
1711  67430 006020        SSB           CHAR IS NEG OR ZERO -OK
1712  67431 002001        RSS           IGNORE AND GO FOR NEXT CHAR
1713  67432 027413        JMP ZNXTC
1714  67433 077603        STB ZCT1      RESTORE COUNT
1715  67434 067611        LDB ZL2       LOAD POSITIVE COUNT
1716  67435 006015        SLB,INB,RSS   TEST AND INCREMENT
1717  67436 001737        ALF,SLA,ALF   UPPER CHAR-POSITION IT
1718  67437 133600        IOR ZA1,I     LOWER CHAR-MERGE CHAR
1719  67440 173600        STA ZA1,I     STORE WORD.
1720  67441 006011        SLB,RSS       NEW WORD?
1721  67442 037600        ISZ ZA1       YES
1722  67443 077611        STB ZL2       STORE POSITIVE COUNTER
1723  67444 027413        JMP ZNXTC     GET NEXT CHARACTER
1724*
1725  67445 063611  ZZDNE LDA ZL2       LOAD LENGTH
1726  67446 127403        JMP ZLIN,I    RETURN
1727  67447 002400  ZDEL  CLA           OUTPUT A
1728  67450 017345        JSB ZLOT      CR-LF
1729  67451 063607        LDA ZCT2      LOAD LENGTH
1730  67452 073603        STA ZCT1      RESET IN CALL PARAMETER
1731  67453 063610        LDA ZA2       LOAD ADDRESS
1732  67454 073600        STA ZA1       RESET IN CALL PARAMETER
1733  67455 027411        JMP ZNXTC-2   SET UP NEW INPUT
1734*
1735***   SINGLE CHARACTER DRIVERS
1736*
1737  67456 000000  ZXLOT NOP
1738  67457 102600  ZX2   OTA 0
1739  67460 103700        STC 0,C
1740  67461 102300        SFS 0
1741  67462 027461        JMP *-1
1742  67463 127456        JMP ZXLOT,I
1743*
1744  67464 000000  ZXLIN NOP
1745  67465 067602        LDB IN.FL
1746  67466 106600        OTB 0
1747  67467 103700        STC 0,C
1748  67470 102300        SFS 0
1749  67471 027470        JMP *-1
1750  67472 102500        LIA 0
1751  67473 010443        AND M177      MASK TO LOWER 7-BITS
1752  67474 127464        JMP ZXLIN,I
```

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1753*
1754***   SUBROUTINE TO OUTPUT A CR-LF.
1755*
1756  67475 000000  CRLND NOP
1757  67476 002400        CLA         SET UP AND EXECUTE A
1758  67477 017345        JSB ZLOT    CALL TO OUTPUT DRIVER
1759  67500 127475        JMP CRLND,I  TO OUTPUT A CR-LF
1760*
1761  67501 000000  DVERT NOP          ENTRY/EXIT POINT
1762  67502 003007        CMA,INA,SZA,RSS  TEST FOR ZERO RCRD LNTH
1763  67503 027553        JMP XRETX
1764  67504 077577        STB ZL1     SAVE BUFFER START ADR
1765  67505 073600        STA ZA1     SAVE CHAR COUNTER
1766  67506 002400        CLA         SET A=0
1767  67507 073610        STA ZA2     SET NUMBER COUNT TO ZERO
1768  67510 073611        STA ZL2     SET ODD/EVEN FLAG TO ZERO
1769  67511 067611        LDB ZL2     LOAD ODD/EVEN FLAG
1770  67512 163577  P1..  LDA ZL1,I   FETCH CONTENTS OF BUFFER
1771  67513 006011        SLB,RSS     SKIP IF EVEN
1772  67514 001727        ALF,ALF     POSITION BYTES CORRECTLY
1773  67515 010443        AND M177    MASK TO LOWEST BYTE
1774  67516 050411        CPA .32     TEST FOR SPACE
1775  67517 027544        JMP .NEXT   IS A SPACE, THROW IT OUT
1776  67520 002003        SZA,RSS     TEST FOR A NULL CHARACTER
1777  67521 027544        JMP .NEXT   IS A NULL, THROW IT OUT
1778  67522 073635        STA XTMP    SAVE CHARACTER
1779  67523 043636        ADA OCT60   SUBTRACT OCTAL 60
1780  67524 002020        SSA         TEST IF BELOW NUMBER RANGE
1781  67525 027544        JMP .NEXT   NOT A NUMBER, IGNORE
1782  67526 040510        ADA M10     SUBTRACT DEC 10
1783  67527 002021        SSA,RSS     TEST IF GREATER THAN OCT 71
1784  67530 027544        JMP .NEXT   NOT A NUMBER, IGNORE
1785  67531 063635        LDA XTMP    RESTORE CHARACTER
1786  67532 010402        AND .15     MASK TO NUMBER PART
1787  67533 067610        LDB ZA2     LOAD PARTIAL NUMBER INTO B
1788  67534 103101        CLO         CLEAR OVERFLOW FLAG
1789  67535 005020        BLS,BLS     MULTIPLY BY TEN
1790  67536 047610        ADB ZA2     ADD ON ONES
1791  67537 005000        BLS
1792  67540 044000        ADB A       THEN-
1793  67541 077610        STB ZA2     STORE RESULT
1794  67542 102201        SOC         TEST FOR OVERFLOW
1795  67543 027554        JMP OVFLW   GO TO OVERFLOW RETURN
1796  67544 037611  .NEXT ISZ ZL2     INDEX ODD/EVEN FLAG
1797  67545 067611        LDB ZL2     LOAD ODD/EVEN FLAG
1798  67546 006011        SLB,RSS     TEST STATUS
1799  67547 037577        ISZ ZL1     SET TO NEXT WORD IN BUFFER
1800  67550 037600        ISZ ZA1     TEST IF ALL NUMBERS PROCESSED
1801  67551 027512        JMP P1..    NOT FINISHED, COMTINUE
1802  67552 063610        LDA ZA2     FETCH COMPLETE CONVERTED #
1803  67553 037501  XRETX ISZ DVERT
1804  67554 127501  OVFLW JMP DVERT,I  RETURN WITH RESULT IN A
1805*
1806***   LINKS TO OTHER PLACES AND THINGS
1807*
1808  67555 177637  D97   DEC -97
1809  67556 177670  M72   DEC -72
1810  67557 075066  ?FL1  DEF FLAG1
1811  67560 075077  ?USNT DEF USNT
1812  67561 073465  CLTMA DEF CLTM
1813  67562 073073  ?ON   DEF LOGON
1814  67563 075070  ?CT   DEF CT
1815  67564 074251  ?MOUT DEF MVUOT
1816  67565 074774  ?MOVE DEF MVSTK
1817  67566 074000  ?MON  DEF MONIT
1818  67567 073556  MNTS? DEF MINTS
1819  67570 073557  HR?   DEF HOUR
1820  67571 073763  PTBA? DEF PTBUF
1821  67572 073560  DATE? DEF DATE
1822  67573 073555  SEKS? DEF SEKS
1823  67574 073431  MBUF  DEF LGOM4+9
1824  67575 073433  ?DBUF DEF LGOM4+11
1825  67576 073435  YBUF  DEF LGOM4+13
```

```
1826   67577 000000   ZL1   NOP
1827   67600 000000   ZA1   NOP
1828   67601 120000   OT.FL OCT 120000
1829   67602 160000   IN.FL OCT 160000
1830   67603 000000   ZCT1  NOP
1831   67604 052525   ZULFL OCT 52525
1832   67605 000015   ZCRET OCT 15
1833   67606 000012   ZLNFD OCT 12
1834   67607 000000   ZCT2  NOP
1835   67610 000000   ZA2   NOP
1836   67611 000000   ZL2   NOP
1837   67612 000033   ZMODE OCT 33
1838   67613 000176   ZESCP OCT 176
1839   67614 000000   ZCTE  NOP
1840   67615 067615   BSTK4 DEF *
1841   67616 075121         DEF DATA1
1842   67617 075134         DEF DATA2
1843   67620 075147         DEF DATA3
1844   67621 075162         DEF DATA4
1845   67622 067622   BSTK5 DEF *
1846   67623 074423         DEF WRIT1
1847   67624 074517         DEF WRIT2
1848   67625 074554         DEF WRIT3
1849   67626 074611         DEF WRIT4
1850   67627 067627   BSTK6 DEF *
1851   67630 000071         DEF BSK1
1852   67631 000072         DEF BSK2
1853   67632 000073         DEF BSK3
1854   67633 000074         DEF BSK4
1855   67634 075052   &&USR DEF &USR
1856   67635 000000   XTMP  NOP
1857   67636 177720   OCT60 OCT -60
1858   67637 177763   ZM13  DEC -13
1859   67640 177703   ZM61  DEC -61
1860   67641 177772   ZTI1  DEC -6
1861   67642 067643   ZTA1  DEF *+1
1862   67643 054505         ASC 3,YEAR?
1863   67646 177771   ZTI2  DEC -7
1864   67647 067650   ZTA2  DEF *+1
1865   67650 046517         ASC 4,MONTH?
1866   67654 177773   ZTI3  DEC -5
1867   67655 067656   ZTA3  DEF *+1
1868   67656 042101         ASC 3,DAY?
1869   67661 177772   ZTI4  DEC -6
1870   67662 067663   ZTA4  DEF *+1
1871   67663 052111         ASC 3,TIME?
1872   67666         LEPIG EQU *
1873                        SKP
1874   71710               ORG 71710B                              [A]
1875   71710         LWTSB EQU *
1876   71710 020061   ETBL  ASC 10, 1234567890*;#$@ UX.
1877   71722 024455         ASC 10,)-^>:%'TWZ(+/<"?&SVY
1878   71734 020061   OTBL  ASC 10, 1234567890CFILORUX.
1879   71746 026102         ASC 10,,BEHKNQTWZ=ADGJMPSVY
1880   71760 006414         OCT 6414     =DEC 13,12, OCT 15,14
1881   71761 010421         OCT 10421    =DEC 17,17, OCT 21,21
1882   71762 013027         OCT 13027    =DEC 22,23, OCT 26,27
1883   71763 015432         OCT 15432    =DEC 27,26, OCT 33,32
1884   71764 017437         OCT 17437    =DEC 31,31, OCT 37,37
1885   71765 021443         OCT 21443    =DEC 35,35, OCT 43,43
1886   71766 023451         OCT 23451    =DEC 39,41, OCT 47,51
1887   71767 027056         OCT 27056    =DEC 46,46, OCT 56,56
1888   71770 031066         OCT 31066    =DEC 50,54, OCT 62,66
1889   71771 004406   OTBLZ OCT 4406     =DEC 09,09, OCT 11,06     [A]
1890   71772 000401         OCT 401      =DEC 01,01, OCT 01,01
1891   72000               ORG 72000B
1892*
1893*
1894*      ****************************************************************
1895*
1896*      CARD READER MODIFICATIONS TO THE BASIC INTERPRETER    *
1897*
1898*      ****************************************************************
```

```
1899*
1900*    RUN WHEN IN CARD MODE
1901*
1902  72000 060127  Y1    LDA TFLAG    LOAD PTAPE & CARD FLAG
1903  72001 002003        SZA,RSS      0?
1904  72002 124252        JMP RUNA,I   GO TO RUN
1905  72003 062414        LDA CCONT    OUTPUT RUNCARD CONTENTS
1906  72004 064116        LDB .BUFA
1907  72005 114112        JSB WRITE,I
1908  72006 002400        CLA
1909  72007 072414        STA CCONT    RESET CCNT=0 FOR ERROR
1910  72010 124252        JMP RUNA,I   GO TO RUN
1911*
1912*     SCRATCH
1913*
1914  72011 060127  Y2    LDA TFLAG    ARE WE IN CARD OR PTAPE MODE?
1915  72012 002003        SZA,RSS
1916  72013 124055        JMP X3,I     NOT CARD, GO TO FLUSH
1917  72014 060504        LDA M6       LOAD -6
1918  72015 066050        LDB PAGE     LOAD PAGE BUF
1919  72016 114112        JSB WRITE,I
1920  72017 062414        LDA CCONT    LOAD COUNT
1921  72020 064116        LDB .BUFA    LOAD BUFFER ADDRESS
1922  72021 114112        JSB WRITE,I  OUTPUT SCR COMMAND
1923  72022 060114        LDA FWAM
1924  72023 070121        STA PBUFF
1925  72024 070122        STA PBPTR
1926  72025 060411        LDA .32
1927  72026 070123        STA BLNK
1928  72027 002400        CLA
1929  72030 070124        STA LNUM
1930  72031 170256  Y5    STA DRQST,I  CLEAR DATA REQUEST FLAG
1931  72032 124254        JMP PEXMA,I
1932*
1933*     ERROR
1934*
1935  72033 060544  Y3    LDA ERROR    SAVE RETURN ADDRESS
1936  72034 070176        STA STK19
1937  72035 060127        LDA TFLAG    CARD OR PTAPE?
1938  72036 002003        SZA,RSS
1939  72037 026047        JMP *+8
1940  72040 062414        LDA CCONT    LOAD CARD COUNT
1941  72041 002003        SZA,RSS      ZERO?
1942  72042 026047        JMP *+5      YES:  RUN TIME ERROR
1943  72043 050477        CPA M1       -1?
1944  72044 060434        LDA .72      YES, TOO MANY CHAR
1945  72045 064116        LDB .BUFA    LOAD BUFFER ADDRESS
1946  72046 114112        JSB WRITE,I  OUTPUT INCORRECT LINE
1947  72047 024547        JMP ERROR+3
1948  72050 072051  PAGE  DEF *+1
1949  72051 005012        OCT 5012,5012,5012
1950  72054 060127  Y6    LDA TFLAG    CHECK IF IN CARD OR PTAPE MODE
1951  72055 002003        SZA,RSS      ZERO?
1952  72056 124255        JMP RDYDA,I  YES - TTY MODE
1953  72057 002400        CLA          NO - CARD OR PTAPE
1954  72060 114104        JSB SEXUA,I  SET EXECUTION FLAG
1955  72061 026031        JMP Y5
1956*****************************************
1957***                                  ***
1958*** TIME-SHARE BASIC CARD READER DRIVER ***
1959***                                  ***
1960*****************************************
1961*
1962*     CALL FROM BASIC:
1963*     LDB <BUFFER START ADDRESS>
1964*     LDA <BUFFER LENGTH IN CHARACTERS>
1965*     JSB .CARD,I
1966*
1967*     <P+1>        RETURN
1968*
1969  72062 000000  CARDS NOP           INITIATOR FOR CARD READER
1970  72063 076415        STB CBUFD    SAVE BUFFER ADDRESS
1971  72064 072420        STA COUNX    SAVE INPUT COUNT              [A]
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1972  72065 002400        CLA
1973  72066 072414        STA CCONT   SET CHARZCTER COUNT CLEAR
1974  72067 072416        STA COLC    CLEAR COLUMN COUNTER
1975  72070 072417        STA CONDT   SET CONDITION INDICATOR
1976  72071 060103        LDA &MON&   LOAD ADDRESS OF MONITOR
1977  72072 072077        STA CRINT   STORE IT IN INT. NOP FOR RETURN
1978  72073 062413        LDA CRUSN   SET TEMP CARD
1979  72074 072533        STA CRUST     INDICATOR IN CASE OF STOP
1980  72075 116534        JSB XINTA,I SET TTY INT. TO EXECUTION
1981  72076 026344        JMP RCOL    START CARD FEED
1982*
1983*
1984***   CARD READER INTERRUPT PROCESSOR
1985*
1986  72077 000000  CRINT NOP         CARD READER INTERRUPT PROCESSOR
1987  72100 072421        STA CSAVA   SAVE A REGISTER
1988  72101 076422        STB CSAVB   SAVE B REGISTER
1989  72102 002400        CLA         SAVE E & O REGISTER
1990  72103 102201        SOC         IS OVERFLOW CLEAR
1991  72104 002004        INA         YES INCREMENT A
1992  72105 001500        ERA         SAVE E
1993  72106 072423        STA CSAVE
1994  72107 103100        CLF 0       TURN OFF INTERRUPT SYSTEM    [A]
1995*
1996  72110 103500  CRDR1 LIA 0,C     LOAD IN CHARACTER
1997  72111 066417        LDB CONDT   LOAD CONDITIONS
1998  72112 006003        SZB,RSS     IS IT TRYING TO FEED A CARD?
1999  72113 026332        JMP RCOLI   YES, SEE IF SUCCESS
2000  72114 006020        SSB         NO, SEE IF WAITING FOR END OF CARD
2001  72115 026275        JMP CKCN1   YES, CHECK FOR END
2002  72116 036416        ISZ COLC    GET NEXT COLUMN
2003  72117 066416        LDB COLC    CHECK IF 37 (CONTINUE COLUMN)
2004  72120 054416        CPB .37
2005  72121 026271        JMP CKCON   YES - CONTINUE?
2006  72122 012525        AND B7777   GET RID OF STATUS
2007  72123 002003        SZA,RSS     NO - NULL?
2008  72124 026307        JMP RRET    YES - WAIT FOR NEXT COLUMN
2009  72125 007400        CCB         SET B=-1
2010  72126 076424        STB TOPFL   INITIALIZE TOP
2011  72127 076425        STB BTMFL   AND BOTTOM FLAGS
2012  72130 064507        LDB M9      INITIALIZE ROW COUNTER
2013  72131 076426        STB RCTRX
2014  72132 006400        CLB         CLEAR B FOR CODE ACCUMULATION
2015  72133 000010        SLA         CHECK ROW 12
2016  72134 026246        JMP SET12
2017  72135 001310  R1    RAR,SLA     CHECK ROW 11
2018  72136 026252        JMP SET11
2019  72137 001310        RAR,SLA     CHECK ROW 10
2020  72140 026256        JMP SET10
2021  72141 001722        ALF,RAL     POSITION BITS
2022  72142 001200  R2    RAL
2023  72143 002020        SSA         CHECK 1-9
2024  72144 026262        JMP SET19
2025  72145 036426        ISZ RCTRX   CHECK IF MORE ROWS
2026  72146 026142        JMP R2      YES

2028*
2029*
2030*     B CONTINS THE CHAR CODE (1-39)
2031  72147 060001        LDA B       CHAR CODE INTO A
2032  72150 066416        LDB COLC    GET COLUMN CTR IN B
2033  72151 044503        ADB M5      B=B-5
2034  72152 006020        SSB         B<=0?
2035  72153 026241        JMP STNO    COL. 1,2,3,4   STMT NO.
2036  72154 044500        ADB M2
2037  72155 006020        SSB         IS COLC <=6?
2038  72156 026175        JMP COL56   COL. 5,6   COMMAND
2039  72157 000065  R3    CLE,ERA
2040  72160 004010        SLB
2041  72161 026173        JMP EVENC   EVEN COLUMN
2042*
2043*     ODD COLUMN
2044*
```

```
2045   72162 066431          LDB OTBLA    LOAD ODD TABLE ADR
2046   72163 040001  R4      ADA 1        ADDR OF CHARS NOW IN A
2047   72164 160000          LDA 0,I      GET CHARS
2048   72165 002041          SEZ,RSS      LEFT OR RIGHT?
2049   72166 001727          ALF,ALF      WAS LEFT, MOVE RIGHT
2050   72167 066414          LDB CCONT    LOAD CHAR COUNT
2051   72170 016317          JSB STCHR    STORE THE CHARACTER
2052   72171 076414          STB CCONT
2053   72172 026307          JMP RRET     GO WAIT FOR NEXT COLUMN
2054   72173 066430  EVENC   LDB ETBLA    LOAD EVEN TABLE ADDRESS
2055   72174 026163          JMP R4
2056   72175 103101  COL56   CLO          CLEAR O
2057   72176 006011          SLB,RSS      SET O IF COL 5
2058   72177 102101          STO
2059   72200 066414          LDB CCONT    LOAD COUNT
2060   72201 040510          ADA M10
2061   72202 002020          SSA
2062   72203 026213          JMP OKCRD    IF A<10 THEN OK
2063   72204 040510          ADA M10
2064   72205 002003          SZA,RSS      IF A=20, CONVERT
2065   72206 026213          JMP OKCRD    TO ZERO
2066   72207 040510          ADA M10
2067   72210 002002          SZA          IF A=30, CONVERT TO ONE
2068   72211 026307          JMP RRET     INVALID CODE, IGNORE
2069   72212 002004          INA          A=1
2070   72213 042432  OKCRD   ADA ADTBL    GET ADDR OF REF TABLE
2071   72214 160000          LDA 0,I      GET ENTRY
2072   72215 102201          SOC          LEFT OR RIGHT?
2073   72216 001727          ALF,ALF      WAS LEFT, MOVE RIGHT
2074   72217 010430          AND .77      STRIP TO 6 BITS
2075   72220 042433          ADA NMLST    N ADD ADDR OF NAME TABLE
2076   72221 072532          STA ADTMP    SAVE ADDRESS OF CURRENT CHAR
2077   72222 060411          LDA SP       LOAD SPACE CHAR
2078   72223 016317          JSB STCHR    STORE CHARACTER
2079   72224 162532  NEXTC   LDA ADTMP,I  GET NEXT  HAR
2080   72225 102201          SOC          LEFT OR RIGHT
2081   72226 001727          ALF,ALF      WAS LEFT, MOVE RIGHT
2082   72227 010443          AND B177     7 BITS
2083   72230 050431          CPA AT       @=END
2084   72231 026235          JMP FINSH
2085   72232 016317          JSB STCHR    STORE CHAR
2086   72233 036532          ISZ ADTMP    GET NEXT CHAR
2087   72234 026224          JMP NEXTC
2088   72235 060411  FINSH   LDA SP       ADD SPACE
2089   72236 016317          JSB STCHR
2090   72237 076414          STB CCONT    STORE COUNT
2091   72240 026307          JMP RRET     WAIT FOR NEXT COLUMN
2092   72241 040511  STNO    ADA M11      IS IT A NUMBER
2093   72242 002021          SSA,RSS
2094   72243 026307          JMP RRET     NO - DELET IT
2095   72244 042531          ADA .11.
2096   72245 026157          JMP R3
2097   72246 036424  SET12   ISZ TOPFL
2098   72247 000000  TEM     NOP
2099   72250 044407          ADB .30      RECORD ROW 12 PUNCH
2100   72251 026135          JMP R1
2101   72252 036424  SET11   ISZ TOPFL
2102   72253 026307          JMP RRET     INVALID CODE
2103   72254 046526          ADB .20      RECORD ROW 11 PUNCH
2104   72255 026137          JMP R1+2
2105   72256 036424  SET10   ISZ TOPFL
2106   72257 026307          JMP RRET     INVALID
2107   72260 044400          ADB .10      RECORD IT
2108   72261 026141          JMP R2-1
2109   72262 036425  SET19   ISZ BTMFL
2110   72263 026307          JMP RRET     INVALID
2111   72264 076247          STB TEM      SAVE RUNNING TOTAL
2112   72265 066426          LDB RCTRX
2113   72266 007004          CMB,INB
2114   72267 046247          ADB TEM
2115   72270 026145          JMP R2+3
2116*
2117*
```

```
2118*
2119*
2120*      CHECK CONTINUE COLUMN
2121*
2122*
2123  72271 072530  CKCON STA CONCD    GET ROW 12 INTO CONTINUE CODE
2124  72272 003400        CCA
2125  72273 072417        STA CONDT    SET CONDITION -1 WAIT FOR CARD END
2126  72274 026307        JMP RRET     RETURN
2127  72275 001200  CKCN1 RAL          CHECK FOR CARD END
2128  72276 002021        SSA,RSS
2129  72277 026307        JMP RRET     NO WAIT FOR END
2130*
2131  72300 062530        LDA CONCD    LOAD CONTINUE CODE
2132  72301 002011        SLA,RSS      ROW 12 SET?
2133  72302 026352        JMP PAU      NO - DONE
2134  72303 002400        CLA          YES
2135  72304 072416        STA COLC     RESET COLUMN COUNT
2136  72305 072417        STA CONDT    RESET CONDITION
2137  72306 026344        JMP RCOL     START NEW CARD
2138*
2139*     RETURN
2140*
2141  72307 103101  RRET  CLO          RESTORE REGISTER
2142  72310 062423        LDA CSAVE
2143  72311 001610        ELA,SLA
2144  72312 102101        STO
2145  72313 062421        LDA CSAVA
2146  72314 066422        LDB CSAVB
2147  72315 102100        STF 0        ENABLE INTERRUPT SYSTEM     [A]
2148  72316 126077        JMP CRINT,I  RETURN
2149*
2150*
2151*
2152*      SUBROUTINE TO STORE THE CHARACTER
2153*
2154  72317 000000  STCHR NOP
2155  72320 056420        CPB COUNX    TEST FOR BUFFER OVERFLOW    [A]
2156  72321 126317        JMP STCHR,I  RETURN IF OVERFLOW         [A]
2157  72322 010443        AND B177     MASK OFF TO 7 BITS
2158  72323 006011        SLB,RSS      CHECK COUNT FOR CHAR POSITION
2159  72324 001737        ALF,SLA,ALF  UPPER CHAR
2160  72325 132415        IOR CBUFD,I  LOWER,  ADD ON UPPER
2161  72326 172415        STA CBUFD,I  STORE WORD
2162  72327 006014        SLB,INB      INCREMENT COUNTER AND TEST
2163  72330 036415        ISZ CBUFD    GO TO NEXT WORD
2164  72331 126317        JMP STCHR,I  RETURN
2165*
2166*
2167*
2168*      SECTION TO START READING A CARD
2169*
2170*
2171  72332 002021  RCOLI SSA,RSS      IS STATUS OK?
2172  72333 026336        JMP CR2      NO
2173  72334 036417        ISZ CONDT    SET CONDITION CODE
2174*
2175  72335 026307        JMP RRET     READ FIRST COLUMN
2176  72336 001200  CR2   RAL
2177  72337 002020        SSA
2178  72340 026357        JMP SETM2    END-OF-CARD   "ERROR"
2179  72341 036427        ISZ TRYCT    TRY AGAIN?
2180  72342 026346        JMP RCOL+2   YES
2181  72343 026357        JMP SETM2    NO CARDS   "ERROR"
2182*
2183*
2184*
2185  72344 060503  RCOL  LDA M5       SET RETRY COUNTER
2186  72345 072427        STA TRYCT
2187  72346 103700        STC 0,C      ENABLE READER
2188  72347 002404        CLA,INA      START FEED
2189  72350 102600        OTA 0
2190  72351 026307        JMP RRET     READER RETURN
```

```
2191*
2192*
2193*     SET DATA FLAG
2194*
2195*     AND CLEAR CARD READER
2196*
2197*
2198  72352 002404  PAU   CLA,INA
2199  72353 072412        STA CDATA    SET CARD READER DATA FLAG
2200  72354 002400        CLA          CLEAR CARD TEMP INC
2201  72355 072533        STA CRUST
2202  72356 026307        JMP RRET     RETURN
2203  72357 060501  SETM2 LDA M3       LOAD ERROR CONDITION
2204  72360 072412        STA CDATA
2205  72361 106700        CLC 0        CLEAR READER
2206  72362 026354        JMP *-6
2207  72363 026307        JMP RRET
2208*
2209*
2210*
2211***   CHECK CARD READER
2212*
2213*
2214  72364 000000  CCARD NOP          SUBROUTINE TO CHECK IF CARD READER
2215  72365 062412        LDA CDATA    NEEDS SERVICE
2216  72366 002003        SZA,RSS      IS DATA FLAG 0?
2217  72367 126364        JMP CCARD,I  YES - GO BACK TO MONITOR
2218  72370 006400        CLB          NO - RESET IT
2219  72371 076412        STB CDATA
2220  72372 073010        STA TEM3     SAVE DATA FLAG
2221  72373 003400        CCA          SET FLAG1=-1
2222  72374 172703        STA FLG1,I   TO INDICATE USER CHECK
2223  72375 042413        ADA CRUSN    USER #-1=BIAS
2224  72376 173020        STA BIAS.,I
2225  72377 117022        JSB ACT.,I   ACTIVATE THE USER
2226  72400 062527        LDA EXU.     IS OT A STOP CONDITION?
2227  72401 143020        ADA BIAS.,I  CHECK EXU FLAG TO SEE.
2228  72402 160000        LDA A,I
2229  72403 002020        SSA
2230  72404 114110        JSB I.STP,I  YES - GO TO STOP ROUTINE
2231  72405 062414        LDA CCONT    NO - LOAD CHARACTER COUNT
2232  72406 067010        LDB TEM3     LOAD DATA FLAG
2233  72407 006020        SSB          IS FLAG NEGATIVE?
2234  72410 063010        LDA TEM3     YES GET FLAG TO A REG.
2235  72411 126062        JMP CARDS,I  RETURN TO BASIC
2236  72412 000000  CDATA NOP          CARD READER DATA FLAG
2237  72413 000000  CRUSN NOP          CARD REACER USER NUMBER
2238  72414 000000  CCONT NOP          CHARACTER COUNT
2239  72415 000000  CBUFD NOP          BUFFER ADDRESS
2240  72416 000000  COLC  NOP          COLUMN COUNT
2241  72417 000000  CONDT NOP          CONDITION OF CARD READER
2242  72420 000000  COUNX NOP                                    [A]
2243  72421 000000  CSAVA NOP          SAVE A REGISTER
2244  72422 000000  CSAVB NOP
2245  72423 000000  CSAVE NOP
2246  72424 000000  TOPFL NOP
2247  72425 000000  BTMFL NOP
2248  72426 000000  RCTRX NOP
2249  72427 000000  TRYCT NOP          COUNTER FOR FEED ATTEMPTS
2250  00000         CIN   EQU 0
2251  72430 071710  ETBLA DEF ETBL
2252  72431 071734  OTBLA DEF OTBL
2253  72432 071771  ADTBL DEF OTBLZ                              [A]
2254  72433 072433  NMLST DEF *
2255  72434 051514        ASC 10,SLCIRSATT@CPHU@NRCUH
2256  72446 047100        ASC 10,N@@RLEEATD@@DPARTIAN
2257  72460 040124        ASC 10,@TG@OITFO@@NFEOXRT@@
2258  72472 042105        ASC 10,DEINMD@@DGEOFS@URBE@
2259  72504 052123        ASC 10,TSUTRONP@@RREEMS@TMO
2260  72516 040522        ASC 7,ARTE@@ C O M @
2261  72525 007777  B7777 OCT 7777
2262  72526 000024  .20   DEC 20
2263  72527 000065  EXU.  DEF EXU1
```

```
2264  72530 000000  CONCD NOP
2265  72531 000013  .11.  DEC 11
2266  72532 000000  ADTMP NOP
2267  72533 000000  CRUST NOP
2268  72534 074404  XINTA DEF XINT
2269*
2270*
2271*
2272*********************************************
2273***                                      ***
2274***   TIME-SHARE BASIC PHOTOREADER DRIVER   ***
2275***                                      ***
2276*********************************************
2277*
2278*      CALL FROM BASIC:
2279*
2280*      LDB <BUFFER START ADDRESS>
2281*      LDA <BUFFER LENGTH IN CHARACTERS>
2282*      JSB .HSPR,I
2283*
2284*      <P+2>         RETURN
2285*
2286*
2287  72535 000000  .HSPR NOP           ENTRY POINT TO PHOTOREADER DRIVER
2288  72536 072637        STA HSROC     STORE CHARACTER COUNT
2289  72537 076640        STB BLNTH     SAVE BUFFER ADDRESS
2290  72540 002400        CLA           CLEAR A-REGISTER AND-
2291  72541 072641        STA HSPTR     STORE IN CHARACTER IN COUNT
2292  72542 103700        STC 0,C       INITIATE PHOTOREADER INPUT
2293  72543 124103        JMP &MON&,I   GO TO MONITOR
2294*
2295***   PHOTOREADER INTERRUPT PROCESSOR
2296*
2297  72544 000000  RDINT NOP
2298  72545 072642        STA ?SAVA     SAVE CONTENTS OF A-REGISTER
2299  72546 076643        STB ?SAVB     SAVE CONTENTS OF B-REG
2300  72547 102500        LIA 0         LOAD CHARACTER
2301  72550 010443        AND M177      MASK PARITY
2302  72551 053761        CPA RTA       IS IT A RETURN?
2303  72552 026606        JMP CRIN      SET CARRIAGE RETURN FLAG
2304  72553 050400        CPA LF        IS IT A LINE-FEED?
2305  72554 026602        JMP ?OMIT     YES-IGNORE
2306  72555 050443        CPA RBOUT     IS IT A RUBOUT?
2307  72556 026602        JMP ?OMIT     YES - IGNORE
2308*
2309  72557 052646        CPA AMDE      ALT MODE?                  [A]
2310  72560 026620        JMP NWLNE     YES                        [A]
2311  72561 050405        CPA EMODE     ESCAPE?                    [A]
2312  72562 026620        JMP NWLNE     YES - DELETE ENTIRE LINE   [A]
2313  72563 052647        CPA AROW      LEFT ARROW?                [A]
2314  72564 026623        JMP DLET.     YES - DELETE LAST CHARACTER [A]
2315  72565 002003        SZA,RSS       TEST FOR NULL
2316  72566 026611        JMP ?LDR      TEST FOR LEADER/TRAILER TAPE
2317  72567 036644        ISZ TPFLG     INDEX CHARACTER FLAG
2318  72570 066641        LDB HSPTR     LOAD CHARACTER IN COUNT
2319  72571 056637        CPB HSROC     TEST FOR FULL BUFFER
2320  72572 026602        JMP ?OMIT     YES-IGNORE LAST CHARACTER
2321  72573 006011        SLB,RSS       STORE
2322  72574 001737        ALF,SLA,ALF    CHARACTER        *
2323  72575 132640        IOR BLNTH,I      IN             *
2324  72576 172640        STA BLNTH,I       BUFFER        *
2325  72577 006014        SLB,INB                         *
2326  72600 036640        ISZ BLNTH                       *
2327  72601 076641        STB HSPTR     SAVE CHARACTER IN COUNT
2328  72602 103700  ?OMIT STC 0,C       START NEXT INPUT
2329  72603 062642        LDA ?SAVA     RESTORE A-REGISTER
2330  72604 066643        LDB ?SAVB     RESTORE B-REGISTER
2331  72605 126544        JMP RDINT,I   RETURN
2332*
2333  72606 106700  CRIN  CLC 0
2334  72607 072645        STA HSRDT     SET RECORD IN FLAG
2335  72610 026603        JMP ?OMIT+1
2336*
```

```
2337  72611 062644  ?LDR  LDA TPFLG    LOAD LEADER/TRAILER FLAG
2338  72612 002003        SZA,RSS      TEST FOR TRAILER
2339  72613 026602        JMP ?OMIT    LEADER TAPE-IGNORE
2340  72614 106700        CLC 0        TURN OFF PHOTOREADER
2341  72615 064510        LDB M10      LOAD B=-10
2342  72616 076645        STB HSRDT    SET EOT FLAG
2343  72617 026602        JMP ?OMIT    RETURN
2344*
2345***   DELETE ENTIRE LINE
2346*
2347  72620 006400  NWLNE CLB          SET RECORD IN COUNT        [A]
2348  72621 076641        STB HSPTR     TO ZERO                   [A]
2349  72622 026606        JMP CRIN     SET RECORD-IN FLAG         [A]
2350*
2351***   DELETE LAST CHARACTER IN BUFFER
2352*
2353  72623 066641  DLET. LDB HSPTR    CHECK FOR EMPTY BUFFER     [A]
2354  72624 006003        SZB,RSS                                 [A]
2355  72625 026602        JMP ?OMIT    IF EMPTY - GET NEXT CHARACTER [A]
2356  72626 003400        CCA                                     [A]
2357  72627 044000        ADB A        DECREMENT CHARACTER COUNT  [A]
2358  72630 006011        SLB,RSS      ODD OR EVEN CHARACTER?     [A]
2359  72631 026601        JMP ?OMIT-1  EVEN - JUST DECREMENT ADDRESS [A]
2360  72632 042640        ADA BLNTH       POINTER.                [A]
2361  72633 162640        LDA BLNTH,I  ODD - DELETE LAST CHARACTER [A]
2362  72634 010527        AND MSK1        INPUT.                  [A]
2363  72635 172640        STA BLNTH,I                             [A]
2364  72636 026601        JMP ?OMIT-1                             [A]
2365*
2366***   PHOTOREADER DATA VALUES
2367*
2368*
2369  72637 000000  HSROC NOP          PHOTOREADER ORIGINAL DATA COUNT
2370  72640 000000  BLNTH NOP          PHOTOREADER BUFFER STORE POINTER
2371  72641 000000  HSPTR NOP          CHARACTER IN COUNTER
2372  72642 000000  ?SAVA NOP
2373  72643 000000  ?SAVB NOP
2374  72644 000000  TPFLG NOP          LEADER/TRAILER TAPE FLAG
2375  72645 000000  HSRDT NOP          PHOTOREADER DATA FLAG
2376*
2377  72646 000176  AMDE  OCT 176                                 [A]
2378  72647 000137  AROW  OCT 137                                 [A]
2379***   STORAGE FOR USER # WHILE PTAPE ACTIVATED
2380*
2381  72650 000000  PTUSN NOP          TAPE USER # STORAGE
2382*
2383***   CHECK PHOTOREADER
2384*
2385  72651 000000  CPHTO NOP
2386  72652 062645        LDA HSRDT    GET PHOTOREADER DATA FLAG
2387  72653 002003        SZA,RSS      DATA FLAG SET?
2388  72654 126651        JMP CPHTO,I  NO-RETURN TO MONITOR
2389  72655 036535        ISZ .HSPR    SET RETURN TO P+2
2390  72656 006400        CLB
2391  72657 076645        STB HSRDT    CLEAR PHOTOREADER FLAG
2392  72660 073010        STA TEM3     SAVE DATA FLAG
2393  72661 003400        CCA          SET FLAG1=-1
2394  72662 172703        STA FLG1,I   (USER CHECK)
2395  72663 042650        ADA PTUSN    COMPUTE PTAPE USER
2396  72664 173020        STA BIAS.,I
2397  72665 117022        JSB ACT.,I   ACTIVATE THE USER
2398  72666 062641        LDA HSPTR    LOAD CHAR -IN- COUNT
2399  72667 067010        LDB TEM3     RELOAD DATA FLAG
2400  72670 054510        CPB M10      END-OF-TAPE?
2401  72671 002001        RSS          YES-PROCESS EOT
2402  72672 126535        JMP .HSPR,I  NO-RETURN
2403  72673 106700  .RDR1 CLC 0        TURN OFF PHOTOREADER
2404  72674 006400        CLB
2405  72675 076644        STB TPFLG    CLEAR LEADER/TRAILER FLAG.
2406  72676 060401        LDA .12       OUTPUT "TAPE LOADED"
2407  72677 066704        LDB TLRDR     TO TELETYPE
2408  72700 114112        JSB WRITE,I
2409  72701 060501        LDA M3        LOAD EOT FLAG
```

```
2410  72702 126535        JMP .HSPR,I  RETURN
2411  72703 075066  FLG1  DEF FLAG1
2412  72704 072705  TLRDR DEF *+1
2413  72705 052101        ASC 6,TAPE LOADED
2414*
2415***   RETURN AFTER INPUT FROM LOCAL TTY
2416*
2417  72713 073010  PTPRC STA TEM3
2418  72714 007400        CCB          SET LOG TTY BUSY FLAG
2419  72715 077564        STB BUSY
2420  72716 002400        CLA          OUTPUT CR-LF
2421  72717 117656        JSB LCLOT,I
2422  72720 117657        JSB LCLIN,I  INITIATE NEW INPUT
2423  72721 002400        CLA          CLEAR LOG TTY BUSY FLAG
2424  72722 073564        STA BUSY
2425*
2426*     MODIFY PTPRC
2427*
2428  72723 064063        LDB USN      LOAD THE USER NUMBER
2429  72724 006003        SZB,RSS      IS IT ZERO?
2430  72725 026731        JMP *+4      YES NO ONE IN
2431  72726 047021        ADB .BSKA    NO, GET USER STACK ADDRESS
2432  72727 164001        LDB B,I
2433  72730 117017        JSB #MOT#,I  MOVE THE USER OUT
2434  72731 002400        CLA
2435  72732 070063        STA USN      CLEAR USER NUMBER
2436  72733 067763        LDB PTBUF    LOAD INPUT BUFFER
2437  72734 074127        STB TFLAG    SET PT FLAG
2438  72735 057015        CPB PT       IS IT A PTABE
2439  72736 026742        JMP ?PTCR
2440  72737 057016        CPB CA       IS IT  A CARD?
2441  72740 002001        RSS
2442  72741 124103        JMP &MON&,I  NO  RETURN TO MONITOR
2443  72742 063762  ?PTCR LDA PTBFA    LOAD PTAPE BUFFER
2444  72743 001200        RAL
2445  72744 070125        STA BADDR
2446  72745 063010        LDA TEM3     LOAD CHARACTER COUNT
2447  72746 003000        CMA          CHAR TO -#-1
2448  72747 070126        STA CCNT
2449  72750 114276        JSB GETCR,I  GET A CHARACTER
2450  72751 124103        JMP &MON&,I  NO MORE CHARS  INVALID
2451  72752 114277        JSB DIGCK,I  IS IT A DIGIT?
2452  72753 026750        JMP *-3      NO
2453  72754 073010        STA TEM3     SAVE USER #
2454  72755 002003        SZA,RSS      TEST FOR ZERO USER #          [A]
2455  72756 124103        JMP &MON&,I  RETURN IF USER 0             [A]
2456  72757 040503        ADA M5       TEST FOR USER NUMBER         [A]
2457  72760 002021        SSA,RSS           GREATER THAN 4          [A]
2458  72761 124103        JMP &MON&,I  RETURN IF TOO LARGE          [A]
2459  72762 063010        LDA TEM3     RELOAD USER NUMBER           [A]
2460  72763 064127        LDB TFLAG    LOAD FLAG
2461  72764 040477        ADA M1       SUBTRACT 1
2462  72765 173020        STA BIAS.,I  SET BIAS
2463  72766 043014        ADA DRS.     CHECK FOR INACTIVE USER      [A]
2464  72767 160000        LDA A,I                                   [A]
2465  72770 020536        XOR M15      THIS IS A CHANNEL IN THE     [A]
2466  72771 160000        LDA A,I           LOGGING ROUTINES        [A]
2467  72772 053013        CPA LOGGR                                 [A]
2468  72773 124103        JMP &MON&,I  RETURN IF INACTIVE USER      [A]
2469  72774 163020        LDA BIAS.,I  RESTORE BIAS IN (A)          [A]
2470  72775 117022        JSB ACT.,I   ACTIVATE THE USER
2471  72776 063010        LDA TEM3     RELOAD USER #
2472  72777 057016        CPB CA       IS IT CARD READER
2473  73000 072413        STA CRUSN    YES
2474  73001 057015        CPB PT       PTAPE?
2475  73002 072650        STA PTUSN    YES
2476  73003 003400        CCA          SET A=-1 FOR PT
2477  73004 057016        CPB CA       IS IT CARDS?
2478  73005 060536        LDA M15      YES A=15
2479  73006 070127        STA TFLAG    SET FLAG
2480  73007 124061        JMP PTAP,I   GO TO PTAPE IN BASIC
2481*
2482  73010 000000  TEM3  NOP
```

```
2483   73011 000000  &BAD& NOP
2484   73012 000000  &CNT& NOP
2485   73013 073076  LOGGR DEF LOGON+3                              [A]
2486   73014 075062  DRS.  DEF DRS+1                                [A]
2487*
2488   73015 050124  PT    ASC 1,PT
2489   73016 041501  CA    ASC 1,CA
2490   73017 074251  #MOT# DEF MVUOT
2491   73020 075071  BIAS. DEF BIAS
2492   73021 000070  .BSKA DEF BSK1-1
2493   73022 074223  ACT.  DEF ACT
2494*
2495*
2496*
2497***    EXECUTE "MESG" COMMAND
2498*
2499   73023 002400  MSSG  CLA        OUTPUT CR-LF ON
2500   73024 114112        JSB WRITE,I USER TTY
2501   73025 063564        LDA BUSY   LOAD BUSY FLAG
2502   73026 002002        SZA        AND RETURN IF
2503   73027 027445        JMP NOGO2  LOG TTY IS BUSY
2504   73030 063563        LDA PNCMD  OTHERWISE-SET LOG
2505   73031 073564        STA BUSY   TTY MOTOR ON AND
2506   73032 102600  LTTY3 OTA 0      SET BUSY FLAG.
2507   73033 067065        LDB D500   FOR LOG TTY
2508   73034 063065        LDA D500   GIVE DELAY
2509   73035 002006        INA,SZA    MOTOR
2510   73036 027035        JMP *-1    TO COME
2511   73037 006006        INB,SZB    UO TO
2512   73040 027034        JMP *-4    PRINT SPEED
2513   73041 060063        LDA USN    GET USER #
2514   73042 030425        IOR .48    ADD ON ASCII # BITS
2515   73043 001727        ALF,ALF    POSITION TO UPPER WORD
2516   73044 073064        STA CMSG   PUT IN BUFFER
2517   73045 063054        LDA .13    OUTPUT MESSAGE:
2518   73046 067055        LDB MSGA   "MSG CH: X"
2519   73047 117656        JSB LCLOT,I
2520   73050 117657        JSB LCLIN,I
2521   73051 002400        CLA        CLEAR BUSY FALG
2522   73052 073564        STA BUSY
2523   73053 124255        JMP RDYDA,I RETURN TO BASIC
2524*
2525   73054 000015  .13   DEC 13
2526   73055 073056  MSGA  DEF *+1
2527   73056 003407        OCT 3407
2528   73057 003407        OCT 3407
2529   73060 046523        ASC 4,MSG CH:
2530   73064         CMSG  BSS 1
2531   73065 177014  D500  DEC -500
2532*
2533   73066 000000  ACCT# NOP
2534   73067 000000  TBL   NOP
2535   73070         SYIN# BSS 1
2536   73071         SINA  BSS 1
2537   73072         SLENA BSS 1

2539*
2540*
2541*     LOGGING ROUTINES
2542*
2543*
2544*
2545****************************
2546***                    ***
2547***   LOG-ON SUBROUTINE  ***
2548***                    ***
2549****************************
2550*
2551   73073 060434  LOGON LDA .72    ASK FOR 72 CHARS INPUT
2552   73074 064116        LDB .BUFA  GIVE I/O BUFFER ADDRESS
2553   73075 114113        JSB REED,I  GET KEYBOARD INPUT
2554   73076 002020        SSA         RECORD DELETED?
2555   73077 027305        JMP DLET
```

```
2556  73100 070227       STA INFO1    SAVE INPUT COUNT
2557  73101 060374       LDA .6       SET (A) TO 6
2558  73102 064116       LDB .BUFA    LOAD BUFFER ADDRESS
2559  73103 017264       JSB SETUP    SET-UP CALL TO TABLE SEARCH
2560  73104 063300       LDA HELLO    GET "HELLO" ADDRESS
2561  73105 007400       CCB
2562  73106 114262       JSB TSRCH,I  SEARCH TABLE
2563  73107 027246       JMP INVAL    NO- INVALID ACCESS
2564  73110 064116       LDB .BUFA    RELOAD BUFFER ADDRESS
2565  73111 044372       ADB .3       INDEX BY 3.
2566  73112 060227       LDA INFO1    RELOAD CHAR INPUT COUNT
2567  73113 040504       ADA M6       SUBTRACT 6
2568  73114 017264       JSB SETUP    SET-UP CALL TO TABLE SEARCH
2569  73115 063066       LDA ACCT#    GET ACCOUNT CODE ADDRESS
2570  73116 067067       LDB TBL      GET TABEL LENGTH
2571  73117 114262       JSB TSRCH,I  SEARCH TABLE
2572  73120 027246       JMP INVAL    NOT VALID- INVALID ACCESS
2573  73121 001727       ALF,ALF      ROTATE ACCOUNT NUMBER
2574  73122 001300       RAR          INTO POSITION
2575  73123 067565       LDB USAC#    LOAD USER ACCOUNT ADDRESS.
2576  73124 044063       ADB USN      INDEX BY USER NUMBER.
2577  73125 170001       STA B,I      SAVE USER ACCOUNT #
2578*
2579***   INPUT USER NAME AND I.D.
2580*
2581  73126 060511  NAME LDA M11      OUTPUT MESSAGE:
2582  73127 067647       LDB MES1A    NAME-I.D.
2583  73130 114112       JSB WRITE,I
2584  73131 060434       LDA .72      INPUT 72 CHARS
2585  73132 064116       LDB .BUFA    GIVE INPUT BUFFER ADR
2586  73133 114113       JSB REED,I   ASK FOR KEY BOARD INPUT
2587  73134 002003       SZA,RSS      TEST FOR NULL INPUT
2588  73135 027126       JMP NAME     NULL INPUT - TRY AGAIN
2589  73136 002020       SSA          TEST FOR DELETED RECORD
2590  73137 027126       JMP NAME     RECORD DELETED - TRY AGAIN
2591  73140 070230       STA INFO2    SAVE INPUT COUNT
2592  73141 067564       LDB BUSY     LOAD BUSY FLAG
2593  73142 006002       SZB          LOG TTY BUSY?
2594  73143 027437       JMP NOGO1    YES-TRY AGAIN
2595  73144 063563       LDA PNCMD    LOAD PUNCH COMMAND
2596  73145 073564       STA BUSY     TURN ON LOG TTY AND
2597  73146 102600  LTTY1 OTA 0       SET BUSY FLAG
2598  73147 002400       CLA          OUTPUT
2599  73150 114112       JSB WRITE,I  CR-LF ON USER TTY
2600  73151 017364       JSB ONOFF    SET UP HEADER
2601  73152 070231       STA INFO3    SAVE CHARACTER COUNT
2602*
2603***   SET UP "TIME-ON" HEADER
2604*
2605  73153 064400       LDB .10      SET CCNT TO 10
2606  73154 074126       STB CCNT     CHARS OUT
2607  73155 067436       LDB LGOM5    SET BADDR TO BUFFER
2608  73156 074125       STB BADDR    ADDRESS -1
2609  73157 063557       LDA HOUR     LOAD HOURS COUNT
2610  73160 017226       JSB OUTIM    OUTPUT HOURS COUNT
2611  73161 063556       LDA MINTS    LOAD MINUTES COUNT
2612  73162 017226       JSB OUTIM    OUTPUT MINUTES COUNT
2613*
2614***   OUTPUT LOG-ON DATA
2615*
2616*
2617  73163 060231       LDA INFO3    OUTPUT CHANNEL
2618  73164 067404       LDB LGOM1    INFO TO USER
2619  73165 114112       JSB WRITE,I
2620  73166 063605       LDA GTBSL    OUTPUT TIME TO
2621  73167 067420       LDB LGOM4    USER
2622  73170 114112       JSB WRITE,I
2623  73171 002400       CLA          OUTPUT
2624  73172 117656       JSB LCLOT,I  CR-LF
2625  73173 060231       LDA INFO3    OUTPUT CHANNEL
2626  73174 067404       LDB LGOM1    INFOR TO LOG
2627  73175 117656       JSB LCLOT,I
2628  73176 063605       LDA GTBSL    OUTPUT TIME-ON
```

```
2629  73177 067420        LDB LGOM4     TO LOG.
2630  73200 117656        JSB LCLOT,I
2631  73201 060230        LDA INFO2
2632  73202 064116        LDB .BUFA    OUTPUT USER MESSAGE
2633  73203 117656        JSB LCLOT,I  TO LOG.
2634  73204 117657        JSB LCLIN,I
2635  73205 002400        CLA
2636  73206 073564        STA BUSY      CLEAR BUSY FLAG
2637*
2638*    OUTPUT SYSTEMS INFO
2639*
2640*     SYIN# IS NUMBER OF LINES TO BE OUTPUTTED
2641*     SLENA IS ADDRESS OF TABLE OF LINE LENGTHS
2642*     SINA IS ADDRESS OF TABLE OF LINE ADDRESSES
2643*
2644*
2645  73207 063070        LDA SYIN#    LOAD NUMBER OF LINES
2646  73210 070227        STA INFO1    SAVE IN COUNT
2647  73211 063072        LDA SLENA    GET ADDRESS OF LENGTH TABLE
2648  73212 070230        STA INFO2    SAVE IT
2649  73213 063071        LDA SINA     GET ADDRESS OF ADDRESS TABLE
2650  73214 070231        STA INFO3    SAVE IT
2651*
2652  73215 160230  SYST  LDA INFO2,I  GET LENGTH
2653  73216 164231        LDB INFO3,I  GET ADDRESS
2654  73217 114112        JSB WRITE,I  OUTPUT LINE
2655  73220 034230        ISZ INFO2    INDEX TO NEXT LENGTH
2656  73221 034231        ISZ INFO3    NEXT ADDRESS
2657  73222 034227        ISZ INFO1    CHECK IF LAST ONE
2658  73223 027215        JMP SYST     NO
2659*      CLEAR TIME
2660  73224 017465        JSB CLTM
2661  73225 124100        JMP ONADR,I  GO TO BASIC
2662*
2663*
2664***   SUBROUTINE TO SET UP "TIME-ON" HEADER
2665*
2666  73226 000000  OUTIM NOP
2667  73227 073245        STA DTMP     SAVE IN TEMP
2668  73230 040510        ADA  M10     SUBTRACT 10
2669  73231 002021        SSA,RSS      POS?
2670  73232 027235        JMP *+3      YES-TIME>=0
2671  73233 060425        LDA .48      OUTPUT A ZERO
2672  73234 114275        JSB OUTCR,I  TO CLOCK BUFFER
2673*
2674  73235 063245        LDA DTMP     RELOAD CLOCK COUNT
2675  73236 002002        SZA          ZERO?
2676  73237 027243        JMP *+4      NO-SET WITH OUTIN
2677  73240 060425        LDA .48      YES-PUT IN ZERO
2678  73241 114275        JSB OUTCR,I  IN CLOCK BUFFER
2679  73242 002001        RSS
2680  73243 114272        JSB OUTIN,I  INSERT TIME IN BUFFER
2681  73244 127226        JMP OUTIM,I  RETURN
2682*
2683  73245 000000  DTMP  NOP
2684*
2685*    INVALID ACCESS
2686*
2687*
2688  73246 002400  INVAL CLA          OUTPUT A CR-LF
2689  73247 114112        JSB WRITE,I
2690  73250 063631        LDA .14      OUTPUT MESSAGE:
2691  73251 067254        LDB INVA     "INVALID ACCESS"
2692  73252 114112        JSB WRITE,I
2693  73253 027073        JMP LOGON    GO TO LOG-IN SECTION
2694*
2695  73254 073255  INVA  DEF *+1
2696  73255 044516        ASC 7,INVALID ACCESS
2697*
2698***   SET UP CALL TO TABLE SEARCH
2699*
2700  73264 000000  SETUP NOP
2701  73265 003021        CMA,SSA,RSS  MAKE COUNT = -1-COUNT
```

```
2702  73266 027246        JMP INVAL
2703  73267 070126        STA CCNT
2704*       BLS           GET ADDRESS*2
2705  73270 005200        RBL           WTN mod for 32KW
2706  73271 074125        STB BADDR     SET AS BUFFER POINTER
2707  73272 114276        JSB GETCR,I   GET A CHARACTER
2708  73273 027246        JMP INVAL     NOT A VALID CHARACTER
2709  73274 064120        LDB SBUFA     *
2710  73275 074133        STB SBPTR     * INITIALIZE SYNTAX BUFFER
2711  73276 170133        STA SBPTR,I
2712  73277 127264        JMP SETUP,I   RETURN
2713*
2714  73300 073301  HELLO DEF *+1
2715  73301 000006        OCT 0006
2716  73302 044105        ASC 3,HELLO-
2717  73305 002404  DLET  CLA,INA       OUTPUT AN ESCAPE (\)
2718  73306 067311        LDB ESCP      ON USER TTY
2719  73307 114112        JSB WRITE,I
2720  73310 027073        JMP LOGON
2721  73311 073312  ESCP  DEF *+1
2722  73312 056040        ASC 1,\
2723**************************
2724*                          *
2725***   LOG-OFF ROUTINE   ***
2726*                          *
2727**************************
2728  73313 002400  LOGOF CLA
2729  73314 114112        JSB WRITE,I  OUTPUT CR-LF
2730  73315 063564        LDA BUSY     LOAD BUSY FLAG
2731  73316 002002        SZA          IS LOG TTY BUSY?
2732  73317 027445        JMP NOGO2    YES- PRINT BUSY MESSAGE
2733  73320 063563        LDA PNCMD    NO- LOAD PUNCH COMMAND
2734  73321 073564        STA BUSY     SET BUSY FLAG
2735  73322 102600  LTTY2 OTA 0        OUTPUT MOTOR CONTROL COMMAND
2736  73323 017364        JSB ONOFF    SET UP USER XX ACCOUNT XX
2737  73324 070231        STA INFO3    SAVE CHARACTER COUNT
2738  73325 067404        LDB LGOM1     OUTPUT IT
2739  73326 114112        JSB WRITE,I    ON USER TTY
2740*
2741***   OUTPUT CONNECT TIME TO USER
2742*
2743  73327 063631        LDA .14      SET CHARACTER OUT COUNT
2744  73330 070126        STA CCNT     TO 14.
2745  73331 067604        LDB TIME1    GET CONNECT TIME STORE ADDRESS
2746  73332 074125        STB BADDR
2747  73333 063634        LDA MINA     GET MINUTES ADDRESS
2748  73334 040063        ADA USN      INDEX BY USER NUMBER
2749  73335 160000        LDA A,I      LOAD MINUTES
2750  73336 114272        JSB OUTIN,I  OUTPUT CONNECT TIME TO BUFFER
2751  73337 060126        LDA CCNT     THEN OUTPUT
2752  73340 067572        LDB CONTA       CONNECT TIME
2753  73341 114112        JSB WRITE,I          ON USER TTY
2754*
2755*
2756***   GLAD TO BE OF SERVICE, BYE
2757*
2758  73342 063605        LDA GTBSL    LOAD MESSAGE LENGTH
2759  73343 067606        LDB GTBSA    LOAD ADDRESS
2760  73344 114112        JSB WRITE,I  OUTPUT MESSAGE ON USER TTY
2761*
2762***   OUTPUT LOG-OFF ON LOG TTY
2763*
2764  73345 002400        CLA          OUTPUT CR-LF
2765  73346 117656        JSB LCLOT,I
2766  73347 060231        LDA INFO3    GET USER # ACCOUNT #
2767  73350 067404        LDB LGOM1
2768  73351 117656        JSB LCLOT,I
2769  73352 060126        LDA CCNT     GET CONNECT TIME COUNT
2770  73353 067572        LDB CONTA    LOAD MESSAGE START ADRESS
2771  73354 117656        JSB LCLOT,I  OUTPUT CONNECT TIME ON LOG TTY
2772*
2773*
2774  73355 002400        CLA          OUTPUT CR-LF
```

```
2775  73356 117656          JSB LCLOT,I
2776  73357 017465          JSB CLTM      CLEAR TIME
2777*
2778  73360 117657          JSB LCLIN,I
2779  73361 002400          CLA
2780  73362 073564          STA BUSY      CLEAR BUSY FLAG
2781  73363 027073          JMP LOGON
2782*
2783***   THIS SUBROUTINE SETS UP THE HEADER:
2784*
2785***   USER # ACCOUNT #
2786*
2787*
2788  73364 000000  ONOFF NOP
2789  73365 060063          LDA USN       LOAD USER NUMBER
2790  73366 030425          IOR .48       ADD ON ASCII # BITS
2791  73367 001727          ALF,ALF       POSITION TO UPPER WORDS
2792  73370 030411          IOR BLANK     ADD ON SPACE CHAR
2793  73371 173416          STA LGOM2,I   PUT IN BUFFER
2794  73372 063632          LDA .16       SET OUTPUT COUNT TO 16 CHARS
2795  73373 070126          STA CCNT
2796  73374 067417          LDB LGOM3     FETCH ACCOUNT # STORE ADDRESS
2797  73375 074125          STB BADDR
2798  73376 067565          LDB USAC#     GET ADDRESS OF ACCOUNT TABLE
2799  73377 044063          ADB USN       INDEX BY USER NUMBER
2800  73400 160001          LDA B,I       LOAD ACTUAL USER ACCOUNT NUMBER
2801  73401 114272          JSB OUTIN,I   ADD IT TO CHARACTER STRING
2802  73402 060126          LDA CCNT      LOAD CHARACTERS IN COUNT
2803  73403 127364          JMP ONOFF,I   RETURN
2804*
2805  73404 073405  LGOM1 DEF *+1
2806  73405 041510          ASC 9,CHAN:   ACCOUNT
2807  73416 073410  LGOM2 DEF LGOM1+4
2808  73417 073414  LGOM3 DEF LGOM1+8
2809  73420 073421  LGOM4 DEF *+1
2810  73421 052111          ASC 13,TIME ON:          /   /
2811  73436 073425  LGOM5 DEF LGOM4+5
2812*
2813  73437 002400  NOGO1 CLA
2814  73440 114112          JSB WRITE,I
2815  73441 067452          LDB NOGOA
2816  73442 063451          LDA NOGOL     LOAD LENGTH OF BUSY MESSAGE
2817  73443 114112          JSB WRITE,I   OUTPUT MESSAGE
2818  73444 027126          JMP NAME
2819  73445 067452  NOGO2 LDB NOGOA
2820  73446 063451          LDA NOGOL     LOAD LENGTH
2821  73447 114112          JSB WRITE,I
2822  73450 124254          JMP PEXMA,I
2823  73451 000023  NOGOL DEC 19
2824  73452 073453  NOGOA DEF *+1
2825  73453 046117          ASC 10,LOG BUSY, TRY AGAIN
2826*
2827*
2828*     CLEAR TIME SUBROUTINE
2829*
2830*
2831  73465 000000  CLTM  NOP
2832  73466 002400          CLA           A=0
2833  73467 067641          LDB SECA
2834  73470 044063          ADB USN
2835  73471 170001          STA B,I       CLEAR CONNECT SEC COUNTER
2836  73472 002004          INA           A=1
2837  73473 067634          LDB MINA
2838  73474 044063          ADB USN
2839  73475 170001          STA B,I       MINUTE COUNTER = 1
2840  73476 127465          JMP CLTM,I    RETURN
2841*
2842**************************
2843***                   ***
2844***   INTERRUPT TIMER  ***
2845***                   ***
2846**************************
2847*
```

```
2848  73477 000000  TIMR  NOP
2849*
2850  73500 073627        STA SAVAC
2851  73501 077630        STB SAVBC
2852  73502 067646        LDB #USRS    LOAD -NUMBER OF USERS
2853  73503 077626        STB CHN      SET FOR COUNTER
2854  73504 067633        LDB .60      SET FOR 60 SEC=1 MIN
2855  73505 063641        LDA SECA     GET SECOND TABLE ADDRESS
2856  73506 002004        INA          ADD 1
2857  73507 073625        STA SEC      SAVE ADDRESS
2858  73510 063634        LDA MINA     GET MINUTE TABLE ADDRESS
2859  73511 002004        INA          ADD 1
2860  73512 073624        STA MIN      SAVE IT
2861  73513 002400        CLA          SET A=0
2862*
2863  73514 137625  INC.  ISZ SEC,I    INCREMENT SECONDS
2864  73515 157625        CPB SEC,I    IS IT 60?
2865  73516 027551        JMP MINUT     YES
2866  73517 037625  NEXTU ISZ SEC      NEXT USER
2867  73520 037624        ISZ MIN
2868  73521 037626        ISZ CHN
2869  73522 027514        JMP INC.
2870*
2871  73523 037555        ISZ SEKS     INCREMENT SECONDS COUNTER
2872  73524 057555        CPB SEKS     60 SECONDS ELAPSED?
2873  73525 002001        RSS          YES-INDEX MINUTES COUNT
2874  73526 027545        JMP STM-2    NO-RETURN
2875*
2876  73527 073555        STA SEKS     RESET SECONDS TO ZERO
2877  73530 037556        ISZ MINTS    INCREMENT MINUTES COUNT
2878  73531 057556        CPB MINTS    60 MINUTES ELAPSED?
2879  73532 002001        RSS          YES-INDEX HOUR COUNT
2880  73533 027545        JMP STM-2    NO-RETURN
2881*
2882  73534 073556        STA MINTS    RESET MINUTES TO ZERO
2883  73535 037557        ISZ HOUR     INCREMENT HOURS COUNT
2884  73536 067561        LDB ?24      LOAD (B)=24
2885  73537 057557        CPB HOUR     24 HOURS ELAPSED?
2886  73540 002001        RSS          YES-PROCESS DAY
2887  73541 027545        JMP STM-2    RETURN
2888*
2889  73542 073557        STA HOUR     RESET HOURS TO ZERO
2890  73543 037560        ISZ DATE     INDEX DATE
2891  73544 137554        ISZ FLG2A,I  SET DAY CHANGE FLAG
2892*
2893*
2894* RESTORE REGISTERS AND RETURN
2895*
2896  73545 063627        LDA SAVAC
2897  73546 067630        LDB SAVBC
2898  73547 103700  STM   STC 0,C      SET CONTROL ON CLOCK
2899  73550 127477        JMP TIMR,I   RETURN
2900*
2901*
2902  73551 137624  MINUT ISZ MIN,I    INCREMENT MINUT COUNTER
2903  73552 173625        STA SEC,I    CLEAR SECONDS COUNT
2904  73553 027517        JMP NEXTU
2905*
2906*
2907*
2908*
2909  73554 074120  FLG2A DEF FLAG2
2910  73555 000000  SEKS  NOP
2911  73556 000000  MINTS NOP
2912  73557 000000  HOUR  NOP
2913  73560 000000  DATE  NOP
2914  73561 000030  ?24   DEC 24
2915  73562 073432  DBUF  DEF LGOM4+10
2916  73563 110000  PNCMD OCT 110000
2917*
2918  73564 000000  BUSY  NOP
2919  73565 073565  USAC# DEF *        USER ACCOUNTS-1
2920  73566              BSS 4         USER ACCOUNTS
```

```
2921  73572 073573  CONTA DEF *+1
2922  73573 041517        ASC 7,CONNECT TIME:
2923  73602              BSS 2
2924  73604 073601  TIME1 DEF *-3
2925*
2926*
2927  73605 000032  GTBSL DEC 26
2928  73606 073607  GTBSA DEF *+1
2929  73607 043514        ASC 13,GLAD TO BE OF SERVICE, BYE
2930  73624 000000  MIN   NOP
2931  73625 000000  SEC   NOP
2932  73626 000000  CHN   NOP
2933  73627 000000  SAVAC NOP
2934  73630 000000  SAVBC NOP
2935  73631 000016  .14   DEC 14
2936  73632 000020  .16   DEC 16
2937  73633 000074  .60   DEC 60
2938  73634 073634  MINA  DEF *
2939  73635 000000        NOP
2940  73636 000000        NOP
2941  73637 000000        NOP
2942  73640 000000        NOP
2943  73641 073641  SECA  DEF *
2944  73642 000000        NOP
2945  73643 000000        NOP
2946  73644 000000        NOP
2947  73645 000000        NOP
2948  73646 000000  #USRS NOP
2949*
2950*
2951*
2952  73647 073650  MES1A DEF *+1
2953  73650 006412        OCT 6412
2954  73651 047101        ASC 5,NAME-I.D.
2955  73656 074704  LCLOT ABS OUTL
2956*
2957  73657 074665  LCLIN ABS READL
2958                     SKP
2959*
2960*
2961*
2962*
2963*      SINGLE CHARACTER SUBROUTINES
2964*
2965*
2966*      USER # 1
2967*
2968*
2969  73660 000000  CHIN1 NOP
2970  73661 102500        LIA 0       LOAD CHARACTER
2971  73662 010443        AND M177    MASK PARITY
2972  73663 053761        CPA RTA     IS IT A CARRIAGE RETURN?
2973  73664 127660        JMP CHIN1,I  YES- RETURN TO P+1
2974  73665 106600        OTB 0       NO, OUTPUT TTY BOARD COMMAND
2975  73666 103700        STC 0,C     START INPUT
2976  73667 127660        JMP CHIN1,I  RETURN
2977*
2978*
2979  73670 000000  CHOT1 NOP
2980  73671 106600        OTB 0       OUTPUT COMMAND
2981  73672 102600        OTA 0       OUTPUT CHARACTER
2982  73673 103700        STC 0,C     START OUTPUT
2983  73674 127670        JMP CHOT1,I
2984*
2985*      USER # 2
2986*
2987  73675 000000  CHIN2 NOP
2988  73676 102500        LIA 0       LOAD CHARACTER
2989  73677 010443        AND M177    MASK PARITY
2990  73700 053761        CPA RTA     IS IT A CARRIAGE RETURN?
2991  73701 127675        JMP CHIN2,I  YES- RETURN TO P+1
2992  73702 106600        OTB 0       NO, OUTPUT TTY BOARD COMMAND
2993  73703 103700        STC 0,C     START INPUT
```

```
2994  73704 127675        JMP CHIN2,I  RETURN
2995*
2996*
2997  73705 000000  CHOT2 NOP
2998  73706 106600        OTB 0        OUTPUT COMMAND
2999  73707 102600        OTA 0        OUTPUT CHARACTER
3000  73710 103700        STC 0,C      START OUTPUT
3001  73711 127705        JMP CHOT2,I
3002*
3003*     USER # 3
3004*
3005  73712 000000  CHIN3 NOP
3006  73713 102500        LIA 0        LOAD CHARACTER
3007  73714 010443        AND M177     MASK PARITY
3008  73715 053761        CPA RTA      IS IT A CARRIAGE RETURN?
3009  73716 127712        JMP CHIN3,I  YES- RETURN TO P+1
3010  73717 106600        OTB 0        NO, OUTPUT TTY BOARD COMMAND
3011  73720 103700        STC 0,C      START INPUT
3012  73721 127712        JMP CHIN3,I  RETURN
3013*
3014*
3015  73722 000000  CHOT3 NOP
3016  73723 106600        OTB 0        OUTPUT COMMAND
3017  73724 102600        OTA 0        OUTPUT CHARACTER
3018  73725 103700        STC 0,C      START OUTPUT
3019  73726 127722        JMP CHOT3,I
3020*
3021***   USER # 4
3022*
3023  73727 000000  CHIN4 NOP
3024  73730 102500        LIA 0        LOAD CHARACTER
3025  73731 010443        AND M177     MASK PARITY BIT
3026  73732 053761        CPA RTA      IS IT A CR?
3027  73733 127727        JMP CHIN4,I  YES-RETURN TO P+1
3028  73734 106600        OTB 0        NO-OUTPUT TTY BOARD COMMAND
3029  73735 103700        STC 0,C      START INPUT
3030  73736 127727        JMP CHIN4,I  RETURN
3031*
3032  73737 000000  CHOT4 NOP
3033  73740 106600        OTB 0        OUTPUT TTY COMMAND
3034  73741 102600        OTA 0        OUTPUT CHARACTER
3035  73742 103700        STC 0,C      START OUTPUT
3036  73743 127737        JMP CHOT4,I  RETURN
3037*
3038*     LOG TTY
3039*
3040  73744 000000  CHINL NOP
3041  73745 102500        LIA 0        LOAD CHARACTER
3042  73746 010443        AND M177     MASK PARITY
3043  73747 053761        CPA RTA      IS IT A CARRIAGE RETURN?
3044  73750 127744        JMP CHINL,I  YES- RETURN TO P+1
3045  73751 106600        OTB 0        NO, OUTPUT TTY BOARD COMMAND
3046  73752 103700        STC 0,C      START INPUT
3047  73753 127744        JMP CHINL,I  RETURN
3048*
3049*
3050  73754 000000  CHOTL NOP
3051  73755 106600        OTB 0
3052  73756 102600        OTA 0
3053  73757 103700        STC 0,C
3054  73760 127754        JMP CHOTL,I
3055*
3056*
3057  73761 000015  RTA   OCT 15
3058  73762 073763  PTBFA DEF PTBUF
3059  73763         PTBUF BSS 3

3061  73766         ENBUF EQU *
3062                      SKP
3063  74000               ORG 74000B
3064*
3065***   MONITOR
3066*
```

```
3067*
3068*      PRIMARY MONITOR LOCATION
3069*
3070  74000 016122  MONIT JSB CHIFL    CHECK INTERRUPT FLAGS
3071  74001 002400        CLA
3072  74002 067066        LDB FLAG1     LOAD FLAG
3073  74003 006020        SSB           IS IT IN LOCAL?
3074  74004 026040        JMP USER      YES
3075  74005 006002        SZB           IS IT IN USER?
3076  74006 026071        JMP MON2      NO IN EXECUTION CHECK
3077  74007 026053        JMP MON1      YES  CHECK I/O FLAGS
3078*
3079*
3080*
3081*      CHECK LOCAL TTY
3082*
3083  74010 062120  CKL   LDA FLAG2     LOAD DAY CHANGE FLAG
3084  74011 002002        SZA
3085  74012 026077        JMP DAYCH     DAY CHANGE
3086  74013 003400        CCA           SET A= -1
3087  74014 073066        STA FLAG1     USER CHECK
3088  74015 006400        CLB           B=0
3089  74016 063175        LDA DATAL     LOAD DATA FLAG
3090  74017 002003        SZA,RSS       IS IT ZERO?
3091  74020 026036        JMP CKPTR     GO CHECK PHOTOREADER
3092  74021 077175        STB DATAL     CLEAR DATA FLAG
3093  74022 050536        CPA M15       DATA FLAG OUTPUT
3094  74023 026030        JMP .LD.      YES
3095  74024 050500        CPA M2        NO - DELETED?
3096  74025 026035        JMP REDL      YES
3097  74026 063177        LDA PCNTL     NO - INPUT
3098  74027 127230        JMP PTPRA,I   CHECK LOCAL INPUT
3099*
3100  74030 003400  .LD.  CCA           A=-1
3101  74031 043053        ADA LUSN      ADD LOCAL USER #
3102  74032 073071        STA BIAS      SAVE BIAS
3103  74033 016223        JSB ACT       ACTIVATE USER
3104  74034 126704        JMP WRITL,I   RETURN
3105*
3106  74035 016665  REDL  JSB READL
3107*
3108***   CHECK PHOTOREADER IF IN SYSTEM
3109*
3110  74036 117072  CKPTR JSB @CARD,I   CHECK IF CARD READER SERVICE
3111  74037 117073        JSB @PHTO,I   CHECK IF PHOTO READER NEED SERVICE
3112*
3113*
3114*      CHECK USERS
3115*
3116  74040 073066  USER  STA FLAG1     CLEAR FLAG
3117  74041 073071        STA BIAS       CLEAR BIAS COUNTER
3118  74042 067203        LDB IOSKA     LOAD I/O STACK POINTER ADDRESS
3119  74043 077067        STB MAIN      SAVE IT
3120  74044 067052        LDB &USR      LOAD NUMBER OF USERS
3121  74045 077070        STB CT        SAVE IN COUNTER
3122  74046 167067  CKDF  LDB MAIN,I    LOAD STACK ADDRESS
3123  74047 047046        ADB .5        ADD INDEX
3124  74050 160001        LDA B,I       LOAD DATA FLAG
3125  74051 002002        SZA           0?
3126  74052 026150        JMP .D.       YES
3127*
3128  74053 037071  MON1  ISZ BIAS      NO - NEXT USER
3129  74054 037067        ISZ MAIN
3130  74055 037070        ISZ CT        INC. COUNTER
3131  74056 026046        JMP CKDF      NOT DONE
3132*
3133*      CHECK EXECUTION FLAGS
3134*
3135  74057 063563        LDA EXUA.     GET ADDRESS OF EXU FLAGS
3136  74060 073066        STA FLAG1     SET FLAG
3137  74061 073067        STA MAIN
3138  74062 063052        LDA &USR      LOAD NUMBER OF USERS
3139  74063 073070        STA CT
```

```
3140  74064 002400       CLA
3141  74065 073071       STA BIAS     CLEAR BIAS
3142  74066 163067  MON3 LDA MAIN,I   LOAD EXU FLAG
3143  74067 002002       SZA          0?
3144  74070 026213       JMP .X.      NO
3145  74071 037067  MON2 ISZ MAIN
3146  74072 037071       ISZ BIAS
3147  74073 037070       ISZ CT
3148  74074 026066       JMP MON3
3149  74075 016122       JSB CHIFL    CHECK USER INTERRUPT FLAGS
3150  74076 026010       JMP CKL      LOOP THROUGH MONITOR
3151*
3152  74077 064063  DAYCH LDB USN     LOAD USER #
3153  74100 006003       SZB,RSS      ZERO?
3154  74101 026105       JMP *+4      YES - NO ONE IN
3155  74102 047075       ADB BSKA     NO - ADD USER STACK POINTER
3156  74103 164001       LDB B,I      LOAD DORMANT STACK ADR
3157  74104 016251       JSB MVUOT    AND MOVE OUT
3158  74105 002400       CLA          CLEAR DAY FLAG
3159  74106 072120       STA FLAG2
3160  74107 070126       STA CCNT
3161  74110 070063       STA USN      USN=0
3162  74111 062121       LDA DDBUF
3163  74112 070125       STA BADDR    STORE BUFFER ADDRESS
3164  74113 162116       LDA ADTA,I   OUTPUT NEW DAY
3165  74114 116117       JSB OUTM,I   BUFFER
3166  74115 026013       JMP CKL+3    CHECK LOCAL TTY
3167  74116 073560  ADTA DEF DATE
3168  74117 073226  OUTM DEF OUTIM
3169  74120 000000  FLAG2 NOP
3170  74121 073432  DDBUF DEF LGOM4+10
3171*
3172*
3173*
3174*
3175***   SUBROUTINE TO CHECK INTERRUPT FLAGS
3176*
3177  74122 000000  CHIFL NOP
3178  74123 060503       LDA M5       LOAD -5 FOR 4 CHAN + LOG
3179  74124 073047       STA &CT      SAVE -NUMBER OF USERS
3180  74125 002404       CLA,INA      SET USER NUMBER -
3181  74126 073050       STA &BIAS      -- TO 1
3182  74127 063100       LDA INTF     LOAD ADDRESS OF INTERRUPT FLAGS
3183  74130 073051       STA &MAIN
3184  74131 163051  &INT& LDA &MAIN,I  LOAD INTERRUPT FLAG
3185  74132 002002       SZA          ZERO ?
3186  74133 026141       JMP &EXE&    NO - PROCESS INTERRUPT
3187  74134 037050  &NEX& ISZ &BIAS    INDEX USER BIAS COUNTER
3188  74135 037051       ISZ &MAIN     COMPUTE NEXT ADDRESS
3189  74136 037047       ISZ &CT       FINISHED?
3190  74137 026131       JMP &INT&    NO
3191  74140 126122       JMP CHIFL,I  YES - RETURN
3192*
3193  74141 006400  &EXE& CLB
3194  74142 177051       STB &MAIN,I  CLEAR INTERRUPT FLAG
3195  74143 067076       LDB INTA     LOAD INTERRUPT ADDRESS
3196  74144 047050       ADB &BIAS     INDEX BY USER BIAS
3197  74145 164001       LDB B,I      LOAD INTERRUPT PROCESS ADR
3198  74146 114001       JSB B,I      PROCESS INTERRUPT
3199  74147 026134       JMP &NEX&    CHECK NEXT USER
3200*
3201*
3202*     DATA FLAG SET
3203*
3204  74150 073074  .D.  STA TEMP1    SAVE FLAG
3205  74151 016223       JSB ACT      ACTIVATE THE USER
3206  74152 002400       CLA          CLEAR
3207  74153 170001       STA B,I       DATA FLAG
3208  74154 063563       LDA EXUA.     LOAD EXU FLAG ADDRESSES
3209  74155 043071       ADA BIAS     GET USER FLAG ADDRESS
3210  74156 160000       LDA A,I      GET EXU FLAG
3211  74157 002020       SSA          TEST FOR STPP CONDITION
3212  74160 114110       JSB I.STP,I  STOP!
```

```
3213   74161 063074        LDA TEMP1    RELOAD FLAG
3214   74162 050500        CPA M2       -2?
3215   74163 026203        JMP RRED     READ RETURN
3216   74164 050477        CPA M1       -1?
3217   74165 026203        JMP RRED     READ RETURN
3218   74166 050536        CPA M15      BIT 15?
3219   74167 026207        JMP WRRET    WRITE RETURN
3220   74170 044373        ADB .4       INDEX TO TAPE FLAG
3221   74171 160001        LDA B,I      LOAD TAPE FLAG
3222   74172 002003        SZA,RSS      TAPE?
3223   74173 026201        JMP *+6      NO
3224*
3225   74174 063106        LDA TCNTA    LOAD TAPE CNT ADDRESS TABLE
3226   74175 043071        ADA BIAS
3227   74176 002004        INA          SET A= ADR OF TAPE COUNTER
3228   74177 160000        LDA A,I      LOAD TAPE COUNTER
3229   74200 026203        JMP RRED     RETURN
3230*
3231   74201 044500        ADB M2       SUBTRACT 2
3232   74202 160001        LDA B,I      LOAD PCNT
3233*
3234*     READ RETURN
3235*
3236   74203 067061  RRED  LDB DRS      GET ADDRESS OF READ ADDRESSES
3237   74204 047071        ADB BIAS     ADD USER BIAS
3238   74205 164001        LDB B,I      LOAD RETURN ADDRESS INTO -B-
3239   74206 124001        JMP B,I      RETURN
3240*
3241*     WRITE RETURN
3242*
3243   74207 067054  WRRET LDB DWS      GET ADDRESS OF WRITE ADDRESSES
3244   74210 047071        ADB BIAS     ADD USER BIAS
3245   74211 164001        LDB B,I      LOAD RETURN ADDRESS INTO -B-
3246   74212 124001        JMP B,I
3247*
3248*
3249*     EXECUTION FLAG SET
3250*
3251   74213 073074  .X.   STA TEMP1    SAVE FLAG
3252   74214 050500        CPA M2       I/O STOP?
3253   74215 026071        JMP MON2     YES - GO BACK TO MONIT
3254   74216 016223        JSB ACT      ACTIVATE THE USER
3255   74217 063074        LDA TEMP1    RELOAD EXU FLAG
3256   74220 002007        INA,SZA,RSS  -1?
3257   74221 114110        JSB I.STP,I  YES STOP
3258   74222 124107        JMP XECUT,I  NO - EXECUTE PROGRAM
3259                       SKP
3260*
3261*
3262*
3263*
3264*     ACTIVATE THE USER
3265*
3266   74223 000000  ACT   NOP
3267   74224 076250        STB BTEM     SAVE B REG
3268   74225 063071        LDA BIAS     GET USER BIAS
3269   74226 002004        INA          ADD 1 TO GET USER #
3270   74227 050063        CPA USN      COMPARE WITH PRESENT ACTIVE USR
3271   74230 126223        JMP ACT,I    SAME
3272   74231 060063        LDA USN      LOAD USER NUMBER
3273   74232 002003        SZA,RSS      IF 0 THEN NO ONE TO BE MOVED OUT
3274   74233 026240        JMP *+5
3275*
3276   74234 067075        LDB BSKA     GET ADDRESS OF STACK ADDRESSES
3277   74235 044063        ADB USN      ADD OLD USER NUMBER
3278   74236 164001        LDB B,I      GET ACTUAL STACK ADDRESS
3279   74237 016251        JSB MVUOT    MOVE USER OUT
3280*
3281   74240 063071        LDA BIAS     GET BIAS
3282   74241 002004        INA          CONVERT TO NEW USN
3283   74242 070063        STA USN       SET NEW USER #
3284   74243 043075        ADA BSKA     ADD ADDRESS OF STACK ADDRESSES
3285   74244 160000        LDA A,I      GET ACTUAL STACK ADDRESS
```

```
3286  74245 016256        JSB MVUIN    MOVE USER IN
3287  74246 066250        LDB BTEM     RESTORE B
3288  74247 126223        JMP ACT,I    USER IS ACTIVATED
3289  74250 000000  BTEM  NOP
3290*
3291*
3292*
3293***   MOVE USER OUT ROUTINE
3294*
3295*     <B> CONTAINS USER DORMANT STACK ADDRESS
3296*
3297  74251 000000  MVUOT NOP
3298  74252 060064        LDA ASTK     LOAD ADDRESS OF ACTIVE STACK
3299  74253 016263        JSB &MSTK    MOVE STACK
3300  74254 000127        DEC 87
3301  74255 126251        JMP MVUOT,I  RETURN
3302*
3303***   MOVE USER IN ROUTINE
3304*
3305*     <A> CONTAINS ADDRESS OF USER'S DORMANT STACK
3306*
3307  74256 000000  MVUIN NOP
3308  74257 064064        LDB ASTK     LOAD ADDRESS OF ACTIVE STACK
3309  74260 016263        JSB &MSTK    MOVE STACK
3310  74261 000127        DEC 87
3311  74262 126256        JMP MVUIN,I  RETURN
3312*
3313***   ACTIVATION MOVE-STACK SUBROUTINE
3314*
3315  74263 000000  &MSTK NOP
3316  74264 072300        STA &ORST    SAVE ORIGIN STACK ADDRESS
3317  74265 162263        LDA &MSTK,I   LOAD # OF WORDS TO TRANSFER
3318  74266 003004        CMA,INA      MAKE COUNT NEGATIVE FOR COUNTER
3319  74267 072301        STA &TEMP    SAVE AS COUNTER
3320  74270 162300  P1&&& LDA &ORST,I  LOAD CELL FROM ORIGIN STACK
3321  74271 170001        STA B,I      TRANSFER TO DESTINATION STACK
3322  74272 006004        INB          B = NEXT ADR IN D - STACK
3323  74273 036300        ISZ &ORST    INDEX TO NEXT ADR IN O - STACK
3324  74274 036301        ISZ &TEMP    TEST IF FINISHED
3325  74275 026270        JMP P1&&&    NO, CONTINUE
3326  74276 036263        ISZ &MSTK    FINISHED, COMPUTE RETURN ADDRESS
3327  74277 126263        JMP &MSTK,I  RETURN
3328*
3329  74300 000000  &ORST NOP
3330  74301 000000  &TEMP NOP
3331*
3332*     SET I/O INTERRUPT
3333*
3334  74302 000000  IINT  NOP
3335  74303 062312        LDA IINTA    GET ADDRESS OF I/O INT LINK ADDR
3336  74304 043077        ADA USNT     INDEX BY USER # TEMP
3337  74305 160000        LDA A,I      GET ACTUAL LINK
3338  74306 067076        LDB INTA     LOAD ADDRESS OF LINKAGE AREA-1
3339  74307 047077        ADB USNT     INDEX BY USER NUMBER
3340  74310 170001        STA B,I      STORE LINK
3341  74311 126302        JMP IINT,I
3342*
3343  74312 074312  IINTA DEF *
3344  74313 074476        DEF INT1
3345  74314 074533        DEF INT2
3346  74315 074570        DEF INT3
3347  74316 074625        DEF INT4
3348*
3349*     EXECUTION INTERRUPT PROCESSOR
3350  74317 000000  XNT   NOP
3351  74320 103100        CLF 0        TURN OFF INTERUPT
3352  74321 072353        STA XSVA     SAVE A REGISTER AND B REGISTER
3353  74322 076354        STB XSVB
3354  74323 102504        LIA 4        LOAD INTERRUPT SELECT CODE
3355  74324 072355        STA SCNUM    SAVE IT
3356  74325 062356        LDA CLCC     LOAD CLC COMMAND
3357  74326 032355        IOR SCNUM    ADD IN SELECT CODE
3358  74327 072330        STA *+1
```

```
3359  74330 000000         NOP         EXECUTE CLC INST.
3360  74331 066357         LDB CHTBA   LOAD ADDRESS OF CHANNEL NUMBER TABLE
3361  74332 006004         INB         NEXT CHANNEL
3362  74333 160001         LDA B,I     LOAD SC NUMBER
3363  74334 052355         CPA SCNUM   SAME?
3364  74335 002001         RSS         YES  COMPUTE CHANNEL NUMBER
3365  74336 026332         JMP *-4
3366  74337 062357         LDA CHTBA   COMPUTE CHANNEL NUMBER
3367  74340 003004         CMA,INA
3368  74341 040001         ADA B       CHANNEL # IN A REG
3369  74342 007400         CCB         B=-1  FOR EXECUTION STOP
3370  74343 152364         CPA CRSTA,I CARD READER STOP?
3371  74344 064500         LDB M2      YES I/O STOP
3372  74345 043564         ADA &EXU    COMPUTE EXU FLAG ADDRESS
3373  74346 174000         STB A,I     STORE STOP CONDITION
3374  74347 062353         LDA XSVA    RESTORE REGISTERS
3375  74350 066354         LDB XSVB
3376  74351 102100         STF 0       TURN ON INTERRUPT
3377  74352 126317         JMP XNT,I   RETUNR
3378  74353 000000  XSVA   NOP
3379  74354 000000  XSVB   NOP
3380  74355 000000  SCNUM  NOP
3381  74356 106700  CLCC   CLC 0
3382  74357 074357  CHTBA  DEF *
3383  74360                 BSS 4       TABLE FOR SC CODES FOR EACH CHANNEL
3384  74364 072533  CRSTA  DEF CRUST
3385*
3386*
3387*
3388*
3389*
3390*      SET EXECUTION FLAG
3391*
3392*      A REG CONTAINS FLAG SETTINGS
3393*
3394  74365 000000  SEXU   NOP
3395  74366 072402         STA SA      SAVE A
3396  74367 076403         STB SB       SAVE B
3397  74370 007400         CCB         B=-1
3398  74371 047563         ADB EXUA.    B=ADDRESS OF EXU FLAGS-1
3399  74372 044063         ADB USN     ADD USER NUMBER
3400  74373 170001         STA B,I     STORE EXU
3401  74374 002003         SZA,RSS
3402  74375 026377         JMP RESSR
3403  74376 016404         JSB XINT    SET EXECUTION INTERRUPT
3404  74377 062402  RESSR  LDA SA      RESTORE A
3405  74400 066403         LDB SB      RESTORE B
3406  74401 126365         JMP SEXU,I
3407  74402 000000  SA     NOP
3408  74403 000000  SB     NOP
3409*
3410*      SET UP EXECUTION INTERRUPT
3411*
3412  74404 000000  XINT   NOP
3413  74405 062422         LDA STPIA   GET ADDRESS OF EXU INT LINK ADDR
3414  74406 067076         LDB INTA    GET ADDRESS OF INT LINKS-1
3415  74407 044063         ADB USN     ADD USER #
3416  74410 170001         STA B,I     STORE TRANSFER ADDRESS
3417  74411 067226         LDB INCMD   GET INPUT COMMAND
3418  74412 003400         CCA         A=-1
3419  74413 043203         ADA IOSKA   GET I/O STACK ADDRESS
3420  74414 040063         ADA USN     ADD USER NUMBER
3421  74415 160000         LDA A,I     GET ACTUAL I/O STACK ADDRESS
3422  74416 040371         ADA .2      ADD CHIN INDEX
3423  74417 030536         IOR M15     ADD IN INDIRECT BIT
3424  74420 114000         JSB A,I     REQUEST INPUT
3425  74421 126404         JMP XINT,I
3426*
3427  74422 074317  STPIA  DEF XNT     LINK TO EXECUTION STOP
3428                        SKP
3429*
3430*****************************************
3431***                                  ***
```

```
3432***    LOCATION OF CALLS TO MONITOR    ***
3433***                                    ***
3434***************************************
3435*
3436*
3437***    OUTPUT CALL FROM CHANNEL # 1
3438*
3439  74423 000000  WRIT1 NOP
3440  74424 073122        STA OCNT1    SAVE COUNTER
3441  74425 077114        STB BFAD1    SAVE ADDRESS
3442  74426 060063  WCONT LDA USN      LOAD USER NUMBER
3443  74427 073211        STA DFLG     SET DRIVER BUSY FLAG
3444  74430 073077        STA USNT     INITIATE WRITE CONTINUATOR
3445  74431 016302        JSB IINT     SET INTERRUPT IS I/O
3446  74432 016745        JSB IOIN     MOVE USER IN
3447  74433 002400        CLA          CLEAR TAPE FLAG
3448  74434 073223        STA BPTR
3449  74435 017244        JSB DRIVO    INITIATE OUTPUT
3450  74436 016756  .RET. JSB IOOT
3451  74437 002400        CLA          CLEAR DRIVER BUSY FLAG
3452  74440 073211        STA DFLG     CLEAR DRIVER BUSY FLAG
3453  74441 026000        JMP MONIT    GO TO THE MONITOR
3454*
3455*     INPUT CALL FOR USER 1
3456*
3457  74442 000000  READ1 NOP
3458  74443 073122        STA OCNT1    SAVE COUNTER
3459  74444 077114        STB BFAD1    SAVE ADDRESS
3460  74445 060063  RCONT LDA USN      LOAD USER NUMBER
3461  74446 073211        STA DFLG     SET DRIVER BUSY FLAG
3462  74447 073077        STA USNT     INITIATE READ CONTINUATOR
3463  74450 016745        JSB IOIN
3464  74451 002400        CLA          RESET TAPE FLAG
3465  74452 073223        STA BPTR     RESET TAPE FLAG TO ZERO
3466  74453 016302  SIMP  JSB IINT     SET INTERRUPT IS I/O
3467  74454 017255        JSB DRIVI    START INPUT
3468  74455 026436        JMP .RET.
3469*
3470***    TAPE CALL FOR USER 1
3471*
3472  74456 000000  TAPE1 NOP
3473  74457 062456        LDA TAPE1    STORE RETURN ADDRESS IN READ NOP
3474  74460 072442        STA READ1
3475  74461 060063  TCONT LDA USN      LOAD USER NUMBER
3476  74462 073211        STA DFLG     SET DRIVER BUSY FLAG
3477  74463 073077        STA USNT     STORE USER NUMVER
3478  74464 016745        JSB IOIN     MOVE USER IN
3479  74465 060434        LDA .72      SET LENGTH = 72
3480  74466 073220        STA OCNT
3481  74467 064116        LDB .BUFA    GET I/O BUFFER
3482  74470 007004        CMB,INB      MAKE NEG
3483  74471 077223        STB BPTR     SET TAPE FLAG
3484  74472 064116        LDB .BUFA    GET I/O BUFFER
3485  74473 044415        ADB .36      COMPUTE TAPE BUFFER
3486  74474 077212        STB BUFAD    STORE IN BUFFER ADDRESS
3487  74475 026453        JMP SIMP
3488*
3489***    CHANNEL # 1 INTERRUPT PROCESSOR
3490*
3491  74476 000000  INT1  NOP
3492  74477 072516        STA &SV1     SAVE A-REGISTER
3493  74500 063211        LDA DFLG     LOAD DRIVER FLAG
3494  74501 002002        SZA          BUSY?
3495  74502 026514        JMP &INT1    YES- SET INTERRUPT FLAG
3496  74503 003400        CCA          A=-1
3497  74504 073211        STA DFLG     SET DRIVER FLAG
3498  74505 017012        JSB SAVRG    SAVE REGISTERS
3499  74506 002404        CLA,INA      A = CHANNEL 1
3500  74507 016737        JSB INT      PROCESS CHARACTER
3501  74510 002400        CLA          CLEAR DRIVER...
3502  74511 073211        STA DFLG     ... BUSY FLAG
3503  74512 062516        LDA &SV1     RESTORE A-REGISTER
3504  74513 126476        JMP INT1,I   RETURN
```

```
3505*
3506  74514 037101  &INT1 ISZ INT1F    INDEX INTERRUPT FLAG
3507  74515 026512        JMP *-3      RETURN
3508  74516 000000  &SV1  NOP


3510*
3511*
3512*
3513*
3514*
3515*       WRITE REQUEST FROM USER 2
3516*
3517  74517 000000  WRIT2 NOP
3518  74520 073135        STA OCNT2    SAVE COUNTER
3519  74521 077127        STB BFAD2    SAVE ADDRESS
3520  74522 026426        JMP WCONT    MOVE IN AND PROCESS
3521*
3522*       READ REQUEST FROM USER 2
3523*
3524  74523 000000  READ2 NOP
3525  74524 073135        STA OCNT2    SAVE COUNTER
3526  74525 077127        STB BFAD2    SAVE ADDRESS
3527  74526 026445        JMP RCONT     CONTINUE SETTING UP INPUT
3528*
3529***   TAPE CALL FOR USER 2
3530*
3531  74527 000000  TAPE2 NOP
3532  74530 062527        LDA TAPE2
3533  74531 072523        STA READ2
3534  74532 026461        JMP TCONT
3535*
3536*
3537*
3538***   CHANNEL # 2 INTERRUPT PROCESSOR
3539*
3540  74533 000000  INT2  NOP
3541  74534 072553        STA &SV2     SAVE A-REGISTER
3542  74535 063211        LDA DFLG     LOAD DRIVER FLAG
3543  74536 002002        SZA          BUSY?
3544  74537 026551        JMP &INT2    YES- SET INTERRUPT FLAG
3545  74540 003400        CCA          A=-1
3546  74541 073211        STA DFLG     SET DRIVER FLAG
3547  74542 017012        JSB SAVRG    SAVE REGISTERS
3548  74543 060371        LDA .2       A = CHANNEL 2
3549  74544 016737        JSB INT      PROCESS CHARACTER
3550  74545 002400        CLA          CLEAR DRIVER...
3551  74546 073211        STA DFLG     ... BUSY FLAG
3552  74547 062553        LDA &SV2     RESTORE A-REG
3553  74550 126533        JMP INT2,I   RETURN
3554*
3555  74551 037102  &INT2 ISZ INT2F    INDEX INTERRUPT FLAG
3556  74552 026547        JMP *-3      RETURN
3557  74553 000000  &SV2  NOP
3558*
3559*
3560*
3561*       WRITE REQUEST FOR USER 3
3562*
3563  74554 000000  WRIT3 NOP
3564  74555 073150        STA OCNT3
3565  74556 077142        STB BFAD3
3566  74557 026426        JMP WCONT    MOVE IN AND PROCESS
3567*
3568*       READ REQUEST FOR USER 3
3569*
3570  74560 000000  READ3 NOP
3571  74561 073150        STA OCNT3
3572  74562 077142        STB BFAD3
3573  74563 026445        JMP RCONT
3574*
3575*       TAPE REQUEST FOR USER 3
3576*
3577*
```

```
3578  74564 000000  TAPE3 NOP
3579  74565 062564        LDA TAPE3
3580  74566 072560        STA READ3
3581  74567 026461        JMP TCONT
3582*
3583***   CHANNEL # 3 INTERRUPT PROCESSOR
3584*
3585  74570 000000  INT3  NOP
3586  74571 072610        STA &SV3    SAVE A-REGISTER
3587  74572 063211        LDA DFLG    LOAD DRIVER FLAG
3588  74573 002002        SZA         BUSY?
3589  74574 026606        JMP &INT3   YES- SET INTERRUPT FLAG
3590  74575 003400        CCA         A=-1
3591  74576 073211        STA DFLG    SET DRIVER FLAG
3592  74577 017012        JSB SAVRG   SAVE REGISTERS
3593  74600 060372        LDA .3      A = CHANNEL 3
3594  74601 016737        JSB INT     PROCESS CHARACTER
3595  74602 002400        CLA         CLEAR DRIVER...
3596  74603 073211        STA DFLG    ... BUSY FLAG
3597  74604 062610        LDA &SV3    RESTORE A-REG
3598  74605 126570        JMP INT3,I  RETURN
3599*
3600  74606 037103  &INT3 ISZ INT3F   INDEX INTERRUPT FLAG
3601  74607 026604        JMP *-3     RETURN
3602  74610 000000  &SV3  NOP
3603*
3604***   WRITE REQUEST FROM USER 4
3605*
3606  74611 000000  WRIT4 NOP
3607  74612 073163        STA OCNT4   SAVE BUFFER LENGTH
3608  74613 077155        STB BFAD4   SAVE BUFFER ADDRESS
3609  74614 026426        JMP WCONT   MOVE IN AND PROCESS
3610*
3611***   READ REQUEST FROM USER 4
3612*
3613  74615 000000  READ4 NOP
3614  74616 073163        STA OCNT4   SAVE COUNTER
3615  74617 077155        STB BFAD4   SAVE ADDRESS
3616  74620 026445        JMP RCONT   CONTINUE SETTING UP INPUT
3617*
3618***   TAPE REQUEST FOR USER 4
3619*
3620  74621 000000  TAPE4 NOP
3621  74622 062621        LDA TAPE4
3622  74623 072615        STA READ4
3623  74624 026461        JMP TCONT
3624*
3625***   CHANNEL 4 INTERRUPT PROCESSOR
3626*
3627  74625 000000  INT4  NOP
3628  74626 072645        STA &SV4    SAVE A-REGISTER
3629  74627 063211        LDA DFLG    LOAD DRIVER FLAG
3630  74630 002002        SZA         BUSY?
3631  74631 026643        JMP &INT4   YES-SET INTERRUPT FLAG
3632  74632 003400        CCA         A=-1
3633  74633 073211        STA DFLG    SET DRIVER FLAG
3634  74634 017012        JSB SAVRG   SAVE REGISTERS
3635  74635 060373        LDA .4      A=CHANNEL 4
3636  74636 016737        JSB INT     PROCESS INTERRUPT
3637  74637 002400        CLA         CLEAR DRIVER---
3638  74640 073211        STA DFLG    ---BUSY FLAG
3639  74641 062645        LDA &SV4    RESTORE A-REGISTER
3640  74642 126625        JMP INT4,I  RETURN
3641*
3642  74643 037104  &INT4 ISZ INT4F   INDEX INTERRUPT FLAG
3643  74644 026641        JMP *-3     RETURN
3644  74645 000000  &SV4  NOP
3645*
3646  74646 000000  CLC1  NOP
3647  74647 106700        CLC 0
3648  74650 126646        JMP CLC1,I
3649*
3650  74651 000000  CLC2  NOP
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```
3651  74652 106700         CLC 0
3652  74653 126651         JMP CLC2,I
3653*
3654  74654 000000  CLC3  NOP
3655  74655 106700         CLC 0
3656  74656 126654         JMP CLC3,I
3657*
3658  74657 000000  CLC4  NOP
3659  74660 106700         CLC 0
3660  74661 126657         JMP CLC4,I
3661*
3662  74662 000000  CLCL  NOP
3663  74663 106700         CLC 0
3664  74664 126662         JMP CLCL,I
3665*
3666***   INPUT CALL FOR LOG TTY
3667*
3668  74665 000000  READL NOP
3669  74666 126665         JMP READL,I  SIMH DOES NOT HANDLE MULTIPLE TTY
3670  74667 060374         LDA .6
3671  74670 067231         LDB PTBA
3672  74671 073176         STA OCNTL   SAVE CHARS REQUESTED COUNT
3673  74672 077170         STB BFADL   SAVE BUFFER ADDRESS
3674  74673 063046         LDA .5      A = 5 : USER # 5 (LOG TTY)
3675  74674 073211         STA DFLG    SET DRIVER BUSY FLAG
3676  74675 073077         STA USNT    SAVE IN USER TEMP
3677  74676 016745         JSB IOIN    MOVE USER IN
3678  74677 017255         JSB DRIVI   INITIATE INPUT
3679  74700 016756         JSB IOOT    MOVE USER OUT
3680  74701 002400         CLA         CLEAR DRIVER ->
3681  74702 073211         STA DFLG    --> BUSY FLAG
3682  74703 126665         JMP READL,I RETURN
3683*
3684*    OUTPUT CALL FOR LOCAL TTY
3685*
3686  74704 000000  OUTL  NOP
3687  74705 126704         JMP OUTL,I   SIMH DOES NOT HANDLE MULTIPLE TTY
3688  74706 073176         STA OCNTL
3689  74707 077170         STB BFADL
3690  74710 060063         LDA USN      LOAD USER NUMBER
3691  74711 073053         STA LUSN     SAVE IN LOCAL USER NUMBER
3692  74712 063046         LDA .5       A = 5 : USER # 5 (LOG TTY)
3693  74713 073211         STA DFLG     SET DRIVER BUSY FLAG
3694  74714 073077         STA USNT     SET TO USER # 5 (LOG)
3695  74715 026432         JMP WCONT+4
3696*
3697***   LOG TTY INTERRUPT PROCESSOR
3698*
3699  74716 000000  INTL  NOP
3700  74717 072736         STA &SVL     SAVE A-REGISTER
3701  74720 063211         LDA DFLG     LOAD DRIVER FLAG
3702  74721 002002         SZA          BUSY?
3703  74722 026734         JMP &INTL    YES- SET INTERRUPT FLAG
3704  74723 003400         CCA          A=-1
3705  74724 073211         STA DFLG     SET DRIVER FLAG
3706  74725 017012         JSB SAVRG    SAVE REGISTERS
3707  74726 063046         LDA .5       A = 5 : USER # 5 (LOG TTY)
3708  74727 016737         JSB INT      PROCESS CHARACTER
3709  74730 002400         CLA          CLEAR DRIVER...
3710  74731 073211         STA DFLG     ... BUSY FLAG
3711  74732 062736         LDA &SVL     RESTORE A-REG
3712  74733 126716         JMP INTL,I   RETURN
3713*
3714  74734 037105  &INTL ISZ INTLF    INDEX INTERRUPT FLAG
3715  74735 026732         JMP *-3      RETURN
3716  74736 000000  &SVL  NOP
3717*
3718*****************************************
3719***                              ***
3720***   TIME-SHARED INTERRUPT PROCESSOR   ***
3721***                              ***
3722*****************************************
3723*
```

```
3724*
3725  74737 000000  INT   NOP
3726  74740 073077        STA USNT
3727  74741 016745        JSB IOIN
3728  74742 017263        JSB DRIV
3729  74743 016756        JSB IOOT
3730  74744 126737        JMP INT,I
3731*
3732*
3733*
3734***   INPUT - OUTPUT UTILITY ROUTINES
3735*
3736  74745 000000  IOIN  NOP          MOVE USER IN
3737  74746 003400        CCA          A= -1
3738  74747 043203        ADA IOSKA    ADD ON USER STACK ADDRESS
3739  74750 043077        ADA USNT     INDEX BY USER NUMBER
3740  74751 160000        LDA A,I      LOAD SOURCE ADDRESS
3741  74752 067225        LDB DRVSK    LOAD DRIVER STACK
3742  74753 016774        JSB MVSTK    MOVE I/O STACK
3743  74754 000013        DEC 11
3744  74755 126745        JMP IOIN,I   RETURN
3745*
3746  74756 000000  IOOT  NOP          MOVE USER OUT
3747  74757 007400        CCB          GET I/O STACK ADDRESS
3748  74760 047203        ADB IOSKA
3749  74761 047077        ADB USNT     INDEX BY USER NUMBER
3750  74762 164001        LDB B,I      LOAD ACTUAL DESTINATION ADDRESS
3751  74763 063225        LDA DRVSK    LOAD SOURCE ADDRESS
3752  74764 016774        JSB MVSTK    MOVE USER OUT
3753  74765 000013        DEC 11
3754  74766 103101        CLO          CLEAR OVERFLOW
3755  74767 063045        LDA SAVE     GET E & O
3756  74770 000036        SLA,ELA      CHK OV AND MOVE E INTO POS
3757  74771 102101        STO          OVERFLOW SET
3758  74772 067044        LDB SAVB     LOAD B-REG
3759  74773 126756        JMP IOOT,I   RETURN
3760*
3761*
3762*
3763*
3764*
3765*     MOVE STACK SUBROUTINE
3766*
3767*
3768*
3769***   SUBROUTINE TO MOVE STACK OF VALUES
3770*
3771*     CALL:
3772*     LOAD A-REGISTER WITH ADDRESS OF ORIGIN STACK
3773*     LOAD B-REGISTER WITH ADDRESS OF DESTINATION STACK
3774*     (P)         JSB MVSTK
3775*     (P+1)       OCT<N>  N IS NUMBER OF WORDS TO MOVE
3776*     (P+2)        RETURN
3777*
3778  74774 000000  MVSTK NOP          ADDRESS OF NUMBER OF WORDS TO MOVE
3779  74775 073042        STA ORSTK    SAVE ORIGIN STACK ADDRESS
3780  74776 162774        LDA MVSTK,I  LOAD # OF WORDS TO TRANSFER
3781  74777 003007        CMA,INA,SZA,RSS
3782  75000 027010        JMP NORET
3783  75001 073043        STA TEMP     STORE AWAY COUNTER
3784  75002 163042  P1... LDA ORSTK,I  LOAD CELL FROM ORIGIN STACK
3785  75003 170001        STA B,I      TRANSFER TO DESTINATION STACK
3786  75004 006004        INB          B= NEXT ADDRESS IN D-STACK
3787  75005 037042        ISZ ORSTK    INDEX TO NEXT ADDRESS IN O-STACK
3788  75006 037043        ISZ TEMP     TEST IF FINISHED
3789  75007 027002        JMP P1...    NO, CONTINUE
3790  75010 036774  NORET ISZ MVSTK    COMPUTE RETURN ADDRESS
3791  75011 126774        JMP MVSTK,I  RETURN VIA ADDRESS IN MVSTK
3792*
3793*
3794*
3795*
3796*
```

```
3797*
3798*      SAVE REGISTER SUBROUTINE
3799*
3800  75012 000000  SAVRG NOP
3801  75013 077044        STB SAVB    SAVE B-REGISTER
3802  75014 001520        ERA,ALS     SAVE E IN BIT 15
3803  75015 102201        SOC         CHECK OVERFLOW
3804  75016 002004        INA         INDEX A IF O SET
3805  75017 073045        STA SAVE    SAVE E & O
3806  75020 127012        JMP SAVRG,I
3807*
3808*
3809*
3810*
3811  75021 000000  IMON  NOP         TURN ON STOP
3812  75022 003400        CCA
3813  75023 043203        ADA IOSKA    GET STACK ADDRESS
3814  75024 040063        ADA USN
3815  75025 160000        LDA A,I
3816  75026 040400        ADA .10      ADD INDEX TO INHIBIT FLAG
3817  75027 006400        CLB          CLEAR INHIBIT
3818  75030 174000        STB A,I
3819  75031 127021        JMP IMON,I
3820*
3821  75032 000000  IMOFF NOP         TURN OFF STOP
3822  75033 003400        CCA
3823  75034 043203        ADA IOSKA
3824  75035 040063        ADA USN
3825  75036 160000        LDA A,I
3826  75037 040400        ADA .10
3827  75040 170000        STA A,I      SET STOP INHIBIT FLAG
3828  75041 127032        JMP IMOFF,I
3829*
3830*
3831***   MAIN CONSTANTS AND TABLES FOR TSB DRIVERS
3832*
3833  75042 000000  ORSTK NOP
3834  75043 000000  TEMP  NOP
3835  75044 000000  SAVB  NOP
3836  75045 000000  SAVE  NOP
3837  75046 000005  .5    OCT 5
3838  75047 000000  &CT   NOP
3839  75050 000000  &BIAS NOP
3840  75051 000000  &MAIN NOP
3841  75052 000000  &USR  NOP
3842  75053 000000  LUSN  NOP
3843  75054 075055  DWS   DEF *+1
3844  75055 174423        DEF WRIT1,I
3845  75056 174517        DEF WRIT2,I
3846  75057 174554        DEF WRIT3,I
3847  75060 174611        DEF WRIT4,I
3848  75061 075062  DRS   DEF *+1
3849  75062 174442        DEF READ1,I
3850  75063 174523        DEF READ2,I
3851  75064 174560        DEF READ3,I
3852  75065 174615        DEF READ4,I
3853*
3854  75066 000000  FLAG1 NOP
3855  75067 000000  MAIN  NOP
3856  75070 000000  CT    NOP
3857  75071 000000  BIAS  NOP
3858  75072 072364  @CARD DEF CCARD
3859  75073 072651  @PHTO DEF CPHTO
3860  75074 000000  TEMP1 NOP
3861  75075 000070  BSKA  DEF BSK1-1
3862  75076 000030  INTA  OCT 30
3863  75077 000000  USNT  NOP
3864  74704        WRITL EQU OUTL
3865*
3866***   INTERRUPT FLAGS
3867*
3868  75100 075101  INTF  DEF *+1
3869  75101 000000  INT1F NOP
```

```
3870  75102 000000  INT2F NOP
3871  75103 000000  INT3F NOP
3872  75104 000000  INT4F NOP
3873  75105 000000  INTLF NOP
3874*
3875  75106 075106  TCNTA DEF *
3876  75107 000000        NOP
3877  75110 000000        NOP
3878  75111 000000        NOP
3879  75112 000000        NOP
3880*
3881  75113 000000  ADR1  NOP
3882*
3883***********************************
3884***                          ***
3885***   MONITOR - USER I/O STACKS   ***
3886***                          ***
3887***********************************
3888*
3889***   USER #1 I/O STACK
3890*
3891  75114 000000  BFAD1 NOP        ADDRESS OF USER BUFFER
3892  75115 000000        NOP        NEGATIVE COUNTER
3893  75116 073660        DEF CHIN1
3894  75117 073670        DEF CHOT1
3895  75120 000000  IO1   NOP
3896  75121 000000  DATA1 NOP        DATA IN-OUT-ERROR FLAG
3897  75122 000000  OCNT1 NOP        LENGTH FROM I/O CALL
3898  75123 000000        NOP        POSITIVE COUNTER
3899  75124 074646        DEF CLC1
3900  75125 000000        NOP        TAPE FLAG
3901  75126 000001        OCT 1
3902*
3903***   USER #2 I/O STACK
3904*
3905  75127 000000  BFAD2 NOP
3906  75130 000000        NOP        NEGATIVE COUNTER
3907  75131 073675        DEF CHIN2
3908  75132 073705        DEF CHOT2
3909  75133 000000  IO2   NOP
3910  75134 000000  DATA2 NOP        DATA FLAG
3911  75135 000000  OCNT2 NOP        ORIGINAL COUNTER
3912  75136 000000        NOP        POSITIVE COUNTER
3913  75137 074651        DEF CLC2
3914  75140 000000        NOP        TAPE FLAG
3915  75141 000001        OCT 1
3916*
3917***   USER #3 I/O STACK
3918*
3919*
3920  75142 000000  BFAD3 NOP
3921  75143 000000        NOP        NEGATIVE COUNTER
3922  75144 073712        DEF CHIN3
3923  75145 073722        DEF CHOT3
3924  75146 000000  IO3   NOP
3925  75147 000000  DATA3 NOP
3926  75150 000000  OCNT3 NOP
3927  75151 000000        NOP        POSITIVE COUNTER
3928  75152 074654        DEF CLC3
3929  75153 000000        NOP        TAPE FLAG
3930  75154 000001        OCT 1
3931*
3932***   USER # 4 I/O STACK
3933*
3934  75155 000000  BFAD4 NOP
3935  75156 000000        NOP        NEGATIVE COUNTER
3936  75157 073727        DEF CHIN4
3937  75160 073737         DEF CHOT4
3938  75161 000000  IO4   NOP
3939  75162 000000  DATA4 NOP
3940  75163 000000  OCNT4 NOP
3941  75164 000000        NOP        POSITIVE COUNTER
3942  75165 074657        DEF CLC4
```

```
3943  75166 000000        NOP        TAPE FLAG
3944  75167 000001        OCT 1
3945*
3946***   LOCAL TTY ( USER # 5) I/O STACK
3947*
3948  75170 000000  BFADL NOP
3949  75171 000000        NOP        NEGATIVE COUNTER
3950  75172 073744        DEF CHINL
3951  75173 073754        DEF CHOTL
3952  75174 000000  IOL   NOP
3953  75175 000000  DATAL NOP        DATA IN-OUT-ERROR FLAG
3954  75176 000000  OCNTL NOP
3955  75177 000000  PCNTL NOP
3956  75200 074662        DEF CLCL
3957  75201 000000        NOP        TAPE FLAG
3958  75202 000001        OCT 1
3959*
3960*     USER I/O STACK NAMES
3961*
3962  75203 075204  IOSKA DEF *+1
3963  75204 075114        DEF BFAD1   USER # 1 I/O STACK NAME
3964  75205 075127        DEF BFAD2   USER # 2 I/O STACK NAME
3965  75206 075142        DEF BFAD3   USER # 3 I/O STACK NAME
3966  75207 075155        DEF BFAD4   USER # 4 I/O STACK NAME
3967  75210 075170        DEF BFADL   LOG TTY STACK NAME
3968*
3969*
3970***   DRIVER BUSY FLAG
3971*
3972  75211 000000  DFLG  NOP
3973*
3974*
3975*     DRIVER DATA STACK
3976*
3977*
3978  75212 000000  BUFAD NOP           BUFFER ADDRESS
3979  75213 000000  NCNT  NOP           NEGATIVE COUNTER
3980  75214 000000  CHIN  NOP           ADDRESS OF INPUT SUBROUTINE
3981  75215 000000  CHOUT NOP           ADDRESS OF OUTPUT SUBROUTINE
3982  75216 000000  IOFLG NOP           INPUT/OUTPUT FLAG
3983  75217 000000  DATA  NOP           DATA-IN-OUT-ERROR FLAG
3984  75220 000000  OCNT  NOP           ORIGINAL COUNTER
3985  75221 000000  PCNT  NOP           POS COUNTER
3986  75222 000000  CLC   NOP
3987  75223 000000  BPTR  NOP
3988  75224 000000  STPIN OCT 0
3989*
3990  75225 075212  DRVSK DEF BUFAD    DRIVER STACK POINTER
3991  75226 160001  INCMD OCT 160001   INPUT COMMAND
3992  75227 130000  OTCMD OCT 130000
3993*
3994  75230 072713  PTPRA ABS PTPRC
3995  75231 073763  PTBA  ABS PTBUF
3996                      SKP
3997*
3998*************************************
3999***                            ***
4000***   TIME-SHARE TELETYPE DRIVER   ***
4001***                            ***
4002*************************************
4003*
4004*
4005*
4006*
4007*
4008*     INITIATE OUTPUT
4009*
4010  75232 000000  RESET NOP
4011  75233 017343        JSB CLEAR    PUT RUBOUT INTO BOARD
4012  75234 002400        CLA          CLEAR
4013  75235 073217        STA DATA     DATA FLAG
4014  75236 073221        STA PCNT     POSITIVE COUNTER
4015  75237 063220        LDA OCNT     LOAD NEGATIVE COUNTER
```

```
4016  75240 002021      SSA,RSS    CHECK IF NEGATIVE
4017  75241 003004      CMA,INA    NO - MAKE NEG
4018  75242 073213      STA NCNT   SAVE NEGATIVE COUNTER
4019  75243 127232      JMP RESET,I
4020*
4021  75244 000000  DRIVO NOP
4022  75245 017232      JSB RESET
4023  75246 067212      LDB BUFAD   CHECK BUFFER ADDRESS
4024  75247 006003      SZB,RSS    IS IT ZERO?
4025  75250 073220      STA OCNT   YES - RESET OCNT TO NEGATIVE
4026  75251 063227      LDA OTCMD  LOAD OUTPUT COMMAND
4027  75252 073216      STA IOFLG  SAVE IN I/O FLAG
4028  75253 017263      JSB DRIV   GO TO CONTINUATOR
4029  75254 127244      JMP DRIVO,I RETURN TO MONITOR*
4030*
4031*
4032*     INITIATE INPUT
4033*
4034*
4035  75255 000000  DRIVI NOP
4036  75256 017232      JSB RESET
4037  75257 067226      LDB INCMD   SET INPUT COMMAND
4038  75260 077216      STB IOFLG   IN I/O FLAG
4039  75261 117214      JSB CHIN,I   START INPUT
4040  75262 127255      JMP DRIVI,I  RETURN
4041*
4042*


4044*
4045*
4046                    SKP
4047*
4048*
4049*****************************
4050***                    ***
4051***    TIME-SHARE DRIVER    ***
4052***   CONTINUATOR SECTION   ***
4053***                    ***
4054*****************************
4055*
4056*
4057*
4058  75263 000000  DRIV NOP
4059*
4060*     CHECK I/O FLAG
4061*
4062  75264 067216      LDB IOFLG   LOAD I/O FLAG
4063  75265 004010      SLB         CHECK IF INPUT
4064  75266 027353      JMP INPUT   YES - GO TO INPUT SECTION
4065*
4066*
4067***   OUTPUT SECTION   ***
4068*
4069*
4070  75267 063214      LDA CHIN    TEST FOR STOP COMMAND
4071  75270 002004      INA         COMPUTE ADDRESS OF LIA INSTR
4072  75271 160000      LDA A,I     LOAD LIA INSTRUCTION
4073  75272 073273      STA INST.    STORE FOR EXECUTION
4074  75273 000000  INST. NOP       EXECUTE LIA CHANXX
4075  75274 010443      AND M177     MASK TO LOWER 7-BITS
4076  75275 050443      CPA RBOUT    IS IT A RUBOUT
4077  75276 027300      JMP OK       YES
4078  75277 027332      JMP STOP     SET STOP FLAG
4079  75300 063213  OK  LDA NCNT
4080  75301 002021      SSA,RSS     CHECK IF DONE
4081  75302 027313      JMP OT1      YES
4082  75303 067212      LDB BUFAD    CHECK BUFFER ADDRESS
4083  75304 006003      SZB,RSS     IS IT ZERO?
4084  75305 027501      JMP LEADR    YES
4085  75306 017547  OT5 JSB ACCHR    GET NEXT CHARACTER
4086  75307 030444      IOR M200     ADD PARITY
4087  75310 067216      LDB IOFLG    LOAD I/O FLAG
4088  75311 117215      JSB CHOUT,I  OUTPUT CHARACTER
```

```
4089  75312 127263        JMP DRIV,I  RETURN
4090*
4091*     CHECK FOR CR-LF
4092*
4093  75313 063220  OT1   LDA OCNT    GET ORIGINAL COUNTER
4094  75314 002020        SSA         CHECK IF CR-LF
4095  75315 027326        JMP OT2     NO - DONE
4096  75316 060502        LDA M4      LOAD -4 CHARACTERS
4097  75317 067524        LDB CRLFA   LOAD CARRIAGE RETURN LINE FEED
4098  75320 073220        STA OCNT    SAVE COUNT
4099  75321 073213        STA NCNT    SAVE NEGATIVE COUNTER
4100  75322 077212        STB BUFAD   SAVE BUFFER
4101  75323 002400        CLA         CLEAR POSITIVE COUNTER
4102  75324 073221        STA PCNT
4103  75325 027306        JMP OT5     OUTPUT
4104*
4105  75326 060536  OT2   LDA M15      LOAD BIT 15=1
4106  75327 073217        STA DATA    SET DATA OUT FLAG
4107  75330 117222        JSB CLC,I
4108  75331 127263        JMP DRIV,I
4109*
4110*
4111***   SET STOP FLAG
4112*
4113  75332 063224  STOP  LDA STPIN    LOAD STOP INHIBIT
4114  75333 002002        SZA          INHIBITED?
4115  75334 027300        JMP OK      YES
4116  75335 017343        JSB CLEAR   CLEAR USER TTY BOARD
4117  75336 063564        LDA &EXU    SET EXU FLAG TO I/O STOP
4118  75337 043077        ADA USNT    BY SETTING IT TO -2
4119  75340 064500        LDB M2
4120  75341 174000        STB A,I
4121  75342 027300        JMP OK      STOP FLAG SET- OUTPT NEXT CHAR
4122*
4123*
4124*
4125***   PUT RUBOUT CHARACTER INTO TTY
4126*
4127  75343 000000  CLEAR NOP
4128  75344 063215        LDA CHOUT   GET CHARACTER OUTPUT ADDRESS
4129  75345 002004        INA         INDEX TO OTB INST.
4130  75346 160000        LDA A,I     LOAD INSTRUCTION
4131  75347 073351        STA INS..   STORE IT
4132  75350 064443        LDB RBOUT   LOAD RUBOUT CHARACTER
4133  75351 000000  INS.. NOP         INSTRUCTION LOCATION
4134  75352 127343        JMP CLEAR,I RETURN
4135              SKP
4136*
4137***   INPUT SECTION   ***
4138*
4139*
4140  75353 117214  INPUT JSB CHIN,I  INPUT CHAR
4141  75354 053527        CPA RT      CARRIAGE RETURN?
4142  75355 027377        JMP IN1     YES - DONE
4143  75356 067213        LDB NCNT    LOAD NEG COUNTER
4144  75357 006021        SSB,RSS     CHECK IF DONE
4145  75360 027376        JMP IN2     YES
4146  75361 002003        SZA,RSS     TEST FOR NULL RECORD
4147  75362 027512        JMP TPTST   GO SEE IF IN TAPE INPUT MODE
4148  75363 050400        CPA LF      TEST FOR LINE-FEED
4149  75364 127263        JMP DRIV,I  YES, THEN IGNORE
4150  75365 050443        CPA RBOUT   TEST FOR RUBOUT
4151  75366 127263        JMP DRIV,I  RUBOUT, IGNORE
4152  75367 053531        CPA AMODE   ALT MODE?
4153  75370 027444        JMP IN4     YES, SET DELETE FLAG
4154  75371 050405        CPA EMODE   ESCAPE MODE?
4155  75372 027444        JMP IN4     YES, SET DELETE FLAG
4156  75373 053530        CPA LFTAR   IS IT A LEFT ARROW?
4157  75374 027460        JMP DLETE   YES, DELETE PREVIOUS CHARACTER
4158  75375 017532        JSB STORC   STORE CHARACTER
4159  75376 127263  IN2   JMP DRIV,I  RETURN
4160*
4161  75377 067213  IN1   LDB NCNT    LOAD NEG COUNTER
```

```
4162  75400 002404         CLA,INA      SET A=1
4163  75401 006020         SSB          CHECK IF OK
4164  75402 027405         JMP IN3      YES
4165  75403 004010         SLB          MAYBE - CHECK BIT 0
4166  75404 003400         CCA          SET A=-1
4167  75405 073217  IN3    STA DATA     STORE DATA FLAG
4168  75406 067223         LDB BPTR     LOAD TAPE FLAG
4169  75407 006003         SZB,RSS      TAPE?
4170  75410 027442         JMP IN3.5    NO
4171  75411 006020         SSB          SET BPTR POSITIVE
4172  75412 007004         CMB,INB
4173  75413 077223         STB BPTR
4174  75414 063221         LDA PCNT     LOAD POSITIVE COUNTER
4175  75415 002003         SZA,RSS      0?
4176  75416 027456         JMP RSTRT    YES
4177  75417 002004         INA          COMPUTE # OF WORDS
4178  75420 000065         CLE,ERA      DIVIDE BY 2 AND SAVE ODD/EVEN
4179  75421 073427         STA !L!      STORE WORD COUNT
4180  75422 003045         CMA,SEZ,INA,RSS
4181  75423 002004         INA          ODD NUMBER OF CHARS
4182  75424 043212         ADA BUFAD    COMPUTE START OF TAPE BUFFER
4183  75425 073212         STA BUFAD    RESTORE TAPE BUFFER ADDRESS
4184*
4185  75426 016774         JSB MVSTK    MOVE STRING TO I/O BUFFER
4186  75427 000000  !L!    NOP
4187*
4188  75430 063221         LDA PCNT     RELOAD COUNT
4189  75431 067106         LDB TCNTA    LOAD TAPE COUNTER ADDRESS TABLE
4190  75432 047077         ADB USNT     INDEX TO USER
4191  75433 170001         STA B,I      SAVE COUNT
4192*
4193  75434 063217         LDA DATA     LOAD DATA FLAG
4194  75435 073224         STA STPIN    SAVE IN INTERRUPT INHIBIT
4195  75436 017255         JSB DRIVI    START NEW OPERATION
4196  75437 063224         LDA STPIN
4197  75440 073217         STA DATA     RESTORE DATA FLAG
4198  75441 127263         JMP DRIV,I   RETURN
4199*
4200  75442 117222  IN3.5  JSB CLC,I    TURN OFF TTY
4201  75443 127263         JMP DRIV,I   RETURN
4202*
4203  75444 060500  IN4    LDA M2       RECORD DELETED
4204  75445 067223         LDB BPTR     IN TAPE?
4205  75446 006003         SZB,RSS
4206  75447 027405         JMP IN3      NO
4207*
4208  75450 063221         LDA PCNT     YES LOAD COUNT
4209  75451 002004         INA
4210  75452 001100         ARS
4211  75453 003004         CMA,INA
4212  75454 043212         ADA BUFAD    COMPUTE TAPE BUFFER ADDRESS
4213  75455 073212         STA BUFAD    RESTORE TAPE BUFFER
4214  75456 017255  RSTRT  JSB DRIVI    RESTART INPUT
4215  75457 127263         JMP DRIV,I   RETURN
4216*
4217*
4218***   DELETE CHARACTER FROM BUFFER (_)
4219*
4220  75460 067221  DLETE  LDB PCNT     FETCH BUFFER COUNTER
4221  75461 006003         SZB,RSS      IS BUFFER EMPTY?
4222  75462 127263         JMP DRIV,I   YES, IGNORE AND RETURN
4223  75463 003400         CCA          SET A=-1
4224  75464 044000         ADB A        DECREMENT CHARACTER COUNT
4225  75465 077221         STB PCNT     RESTORE BUFFER COUNT
4226  75466 043213         ADA NCNT     DECREMENT NEGATIVE COUNTER
4227  75467 073213         STA NCNT     RESTORE IT
4228  75470 006011         SLB,RSS      TEST FOR ODD/EVEN CHARACTER
4229  75471 127263         JMP DRIV,I   EVEN, JUST DECREMENT COUNT
4230  75472 003400         CCA          RESET A =-1
4231  75473 043212         ADA BUFAD    DECREMENT ADDRESS POINTER
4232  75474 073212         STA BUFAD    AND STORE IT
4233  75475 163212         LDA BUFAD,I  LOAD LAST TWO CHARACTERS
4234  75476 010527         AND MSK1     DELETE LAST CHARACTER
```

```
4235   75477 173212         STA BUFAD,I  RESTORE CHARACTER
4236   75500 127263         JMP DRIV,I   RETURN
4237*
4238*
4239   75501 067220  LEADR LDB OCNT      LOAD ORIGINAL COUNTER
4240   75502 006003         SZB,RSS      IS IT ZERO?
4241   75503 027313         JMP OT1      YES - CR-LF
4242   75504 067216         LDB IOFLG    GET I/O FLAG
4243   75505 002400         CLA          NULL CHARACTER
4244   75506 117215         JSB CHOUT,I
4245   75507 037213         ISZ NCNT
4246   75510 127263         JMP DRIV,I
4247   75511 127263         JMP DRIV,I
4248*
4249***   SECTION TO TEST FOR LEADER / TRAILER TAPE
4250*
4251   75512 063223  TPTST LDA BPTR      LOAD TAPE FLAG
4252   75513 002003         SZA,RSS      0?
4253   75514 127263         JMP DRIV,I   YES
4254   75515 002020         SSA          LEADER?
4255   75516 127263         JMP DRIV,I   YES
4256   75517 002400         CLA          END-OF-TAPE
4257   75520 073221         STA PCNT     CLEAR COUNTER
4258   75521 073223         STA BPTR     CLEAR TAPE FLAG
4259   75522 002404         CLA,INA      SET DATA FLAG
4260   75523 027405         JMP IN3
4261   75524 075525  CRLFA DEF *+1
4262   75525 006412        OCT 6412,177777
4263   75527 000015  RT    OCT 15       CARRIAGE RETURN
4264   75530 000137  LFTAR OCT 137
4265   75531 000176  AMODE OCT 176
4266*
4267                        SKP
4268*
4269*
4270*************************************
4271***                            ***
4272***   SPECIAL SERVICE SUBROUTINES   ***
4273***                            ***
4274*************************************
4275*
4276*     SUBROUTINE TO STORE CHARACTER
4277*
4278*
4279   75532 000000  STORC NOP
4280   75533 067221        LDB PCNT     GET POSITIVE COUNTER
4281   75534 006011        SLB,RSS      CHECK UPPER/LOWER FLAG
4282   75535 001737        ALF,SLA,ALF  UPPER - ROTATE AND SKIP
4283   75536 133212        IOR BUFAD,I  LOWER - ADD TO UPPER CHAR
4284   75537 173212        STA BUFAD,I  STORE WORD
4285   75540 006014        SLB,INB      CHECK U/L AND INC COUNTER
4286   75541 037212        ISZ BUFAD    LOWER - NEW WORD
4287   75542 077221        STB PCNT     STORE POS COUNTER
4288   75543 037213        ISZ NCNT     INC NEG COUNTER
4289   75544 127532        JMP STORC,I  RETURN
4290   75545 037213        ISZ NCNT     DATA IN - SET DINF
4291   75546 127532        JMP STORC,I  RETURN
4292*
4293*
4294*     SUBROUTINE TO ACCESS ONE CHARACTER
4295*
4296*
4297   75547 000000  ACCHR NOP
4298   75550 067221        LDB PCNT     LOAD POSITIVE COUNTER
4299   75551 163212        LDA BUFAD,I  LOAD WORD
4300   75552 006011        SLB,RSS      CHECK UPPER OR LOWER
4301   75553 001727        ALF,ALF      ROTATE UPPER CHAR TO LOW BITS
4302   75554 010443        AND M177     MASK OFF UPPER BITS
4303                       IFN
4304* CSL MODIFICATIONS TO REMOVE BRACKETS.
4305*   DO NOT INCLUDE IN HP VERSION***
4306*
4307                       CPA LBRAK
```

```
4308                     LDA LPREN
4309                     CPA RBRAK
4310                     LDA RPREN
4311*
4312*
4313                     XIF
4314   75555 006014      SLB,INB    CHECK IF NEW WORD NEEDED
4315   75556 037212      ISZ BUFAD  YES - INCREMENT ADDRESS
4316   75557 077221      STB PCNT   SAVE POS COUNTER
4317   75560 037213      ISZ NCNT   INCREMENT NEG COUNTE
4318   75561 127547      JMP ACCHR,I RETURN
4319   75562 127547      JMP ACCHR,I RETURN
4320   75563 000065 EXUA DEF EXU1
4321   75563        EXUA. EQU EXUA
4322   75564 000064 &EXU DEF EXU1-1
4323                     IFN
4324*
4325*
4326*    BRACKET TEST   UNNECESSARY IN HP VERSION
4327*
4328                     LBRAK EQU 442B
4329                     LPREN EQU 417B
4330                     RPREN EQU 420B
4331                     RBRAK OCT 135
4332                     XIF
4333                     SKP
4334*
4335***   THIS SECTION OF TIME-SHARE DRIVERS AND MONITOR
4336***   IS DESIGNED TO SAVE ALL RUNNING CONDITION
4337***   POINTERS WHEN A POWER FAIL OCCURS AND TO RE-
4338***   INITIATE THE COMPUTER WHEN POWER RETURNS.
4339*
4340*
4341***   THIS SECTION STOPS THE COMPUTER
4342*
4343   75565 000000 !FAIL NOP       ENTRY POINT FROM INTERRUPT
4344   75566 103100      CLF 0      TURN OFF INTERRUPT
4345   75567 102204      SFC PFL    UP OR DOWN?
4346   75570 027604      JMP UP^^^  GO TO RESTERT SECTION
4347   75571 073647      STA ASTR   SAVE A - REGISTER
4348   75572 077650      STB BSTR   SAVE B - REGISTER
4349   75573 001520      ERA,ALS
4350   75574 102201      SOC
4351   75575 002004      INA        SAVE E & O REGISTERS
4352   75576 073651      STA EO
4353   75577 063565      LDA !FAIL  LOAD RETURN ADDRESS
4354   75600 073652      STA RETAD  SAVE FOR RETURN
4355   75601 106704      CLC PFL    TURN ON RESTART
4356   75602 102004      HLT PFL    STOP COMPUTER
4357   75603 027604      JMP UP^^^
4358*
4359***   THIS SECTION RE-INITIATES THE COMPUTER
4360*
4361   75604 103101 UP^^^ CLO
4362   75605 063651      LDA EO
4363   75606 000036      SLA,ELA    RESTORE E & O REGISTERS
4364   75607 102101      STO
4365   75610 064443      LDB RBOUT
4366   75611 106600 LTTY4 OTB 0     SET RUBOUT CHAR IN LOG TTY
4367   75612 000000      NOP        (OTB USER #1)
4368   75613 000000      NOP        (OTB USER #2)
4369   75614 000000      NOP        (OTB USER #3)
4370   75615 000000      NOP        (OTB USER #4)
4371   75616 067120      LDB IO1    LOAD CHAN 1 I/O FLAG
4372   75617 000000      NOP        OTB CHAN 1
4373   75620 067133      LDB IO2    LOAD CHAN 2 I/O FLAG
4374   75621 000000      NOP
4375   75622 067146      LDB IO3    LOAD CHANNEL 3 I/O FLAG
4376   75623 000000      NOP        OTB CHAN3
4377   75624 067161      LDB IO4    LOAD CHANNEL 4 I/O FLAG
4378   75625 000000      NOP        OTB CHAN4
4379   75626 067174      LDB IOL    LOCAL TTY I/O FLAG
4380   75627 000000 ZT[  NOP
```

```
4381*
4382*
4383  75630 060373        LDA .4
4384  75631 102600  CL4   OTA 0
4385  75632 063647        LDA ASTR     RESET A - REGISTER
4386  75633 067650        LDB BSTR     RESET B-REGISTER
4387  75634 103700  LTTY5 STC 0,C
4388  75635 000000        NOP          (STC,C CHAN 1)
4389  75636 000000        NOP          (STC,C CHAN 2)
4390  75637 000000        NOP          (STC,C CHAN 3)
4391  75640 000000        NOP          (STC,C CHAN 4)
4392  75641 000000  ?PFLI NOP          (CLC RDR IF IN SYSTEM)
4393  75642 000000        NOP          (CLC CARD IF IN SYSTEM)
4394  75643 103700  CL3   STC 0,C
4395  75644 102704        STC PFL      SET UP FOR NEXT FAILURE
4396  75645 102100        STF 0        TURN ON INTERRUPT
4397  75646 127652        JMP RETAD,I  RETURN TO INTERRUPTED SEQUENCE
4398*
4399***   STORAGE FOR POWER FAIL PROGRAM
4400*
4401  75647 000000  ASTR  NOP
4402  75650 000000  BSTR  NOP
4403  75651 000000  EO    NOP
4404  75652 000000  RETAD NOP
4405  75653          LWAMS EQU *
4406*
4407*
4408*
4409                      SKP
4410*
4411*********************************
4412***                        ***
4413***   BASE PAGE LINKAGE AREA   ***
4414***                        ***
4415*********************************
4416  00003              ORG 3B
4417  00003 066000       DEF PTSBS
4418  00004 114040       JSB PFAIL,I  POWER FAIL INTERRUPT LOCATION
4419  00005 102005       HLT 5B
4420*
4421*    I/O CHANNELS
4422*
4423  00004       PFL   EQU 4B        POWER FAIL CHANNEL
4424  00010              ORG 10B
4425                     REP 9
4426  00010 000000       NOP          INTERRUPT NOP'S
4426  00011 000000       NOP          INTERRUPT NOP'S
4426  00012 000000       NOP          INTERRUPT NOP'S
4426  00013 000000       NOP          INTERRUPT NOP'S
4426  00014 000000       NOP          INTERRUPT NOP'S
4426  00015 000000       NOP          INTERRUPT NOP'S
4426  00016 000000       NOP          INTERRUPT NOP'S
4426  00017 000000       NOP          INTERRUPT NOP'S
4426  00020 000000       NOP          INTERRUPT NOP'S
4427  00030              ORG 30B
4428*
4429*     INTERRUPT LINKS
4430*
4431*
4432  00030 073477  I/O1  ABS TIMR
4433  00031 074476  I/O2  ABS INT1
4434  00032 074533  I/O3  ABS INT2
4435  00033 074570  I/O4  ABS INT3
4436  00034 074625  I/O5  ABS INT4
4437  00035 074716  I/O6  ABS INTL
4438  00036 072544  I/O7  ABS RDINT
4439  00037 072077  I/O8  ABS CRINT
4440  00040 075565  PFAIL DEF !FAIL    LINK TO POWER FAIL ROUTINE
4441*
4442***   BASE PAGE LINKS TO BASIC AND MONITOR
4443*
4444  00060              ORG 60B
4445  00060 072062       DEF CARDS    LINK TO CARD READER INITIATE
```

```
4446   00061             PTAP  BSS  1
4447   00062 072535            DEF  .HSPR
4448   00063             USN   BSS  1
4449   00064             ASTK  BSS  1
4450   00065             EXU1  EQU  *
4451   00066             EXU2  EQU  *+1
4452   00067             EXU3  EQU  *+2
4453   00070             EXU4  EQU  *+3
4454   00071                   ORG  71B
4455   00071 013203      BSK1  DEF  SK1
4456   00072 013333      BSK2  DEF  SK2
4457   00073 013463      BSK3  DEF  SK3
4458   00074 013613      BSK4  DEF  SK4
4459   00101                   ORG  101B
4460   00101 073313            DEF  LOGOF
4461   00102 073023            DEF  MSSG
4462   00103 074000      &MON& DEF  MONIT
4463   00104 074365            DEF  SEXU
4464   00105 075021            DEF  IMON
4465   00106 075032            DEF  IMOFF
4466   00107             XECUT BSS  1
4467   00110             I.STP BSS  1
4468   00111             ACTIV EQU  *
4469   00112             WRITE EQU  ACTIV+1
4470   00113             REED  EQU  ACTIV+2
4471   00114             FWAM  EQU  ACTIV+3
4472   00115             LWAM  EQU  ACTIV+4
4473   00116             .BUFA EQU  ACTIV+5
4474   00117             SYMTA EQU  .BUFA+1
4475   00121             PBUFF EQU  SYMTA+2
4476   00122             PBPTR EQU  PBUFF+1
4477   00124             .LNUM EQU  PBPTR+2
4478   00120             SBUFA EQU  ACTIV+7
4479   00125             BADDR EQU  ACTIV+12
4480   00126             CCNT  EQU  ACTIV+13
4481   00133             SBPTR EQU  ACTIV+18
4482   00205                   ORG  205B
4483   00205             TEMPS EQU  *
4484   00227             INFO1 EQU  TEMPS+18
4485   00230             INFO2 EQU  TEMPS+19
4486   00231             INFO3 EQU  TEMPS+20
4487   00100             ONADR EQU  100B
4488   00255             RDYDA EQU  255B
4489   00262             TSRCH EQU  RDYDA+5
4490   00254             PEXMA EQU  RDYDA-1
4491   00272             OUTIA EQU  RDYDA+13
4492   00272             OUTIN EQU  OUTIA
4493   00277             DIGCK EQU  RDYDA+18
4494   00300             LETCK EQU  DIGCK+1
4495   00276             GETCR EQU  DIGCK-1
4496   00275             OUTCR EQU  DIGCK-2
4497   00370                   ORG  370B
4498   00370             .1    EQU  *
4499   00371             .2    EQU  *+1
4500   00372             .3    EQU  *+2
4501   00373             .4    EQU  *+3
4502   00374             .6    EQU  *+4
4503   00375             .7    EQU  *+5
4504   00400             .10   EQU  *+8
4505   00401             .12   EQU  *+9
4506   00400             LF    EQU  .10
4507   00411             BLANK EQU  *+17
4508   00411             .32   EQU  BLANK
4509   00402             .15   EQU  *+10
4510   00415             .36   EQU  *+21
4511   00420             .41   EQU  *+24
4512   00425             .48   EQU  *+29
4513   00430             .63   EQU  *+32
4514   00434             .72   EQU  *+36
4515   00405             EMODE EQU  *+13
4516   00443             M177  EQU  .72+7
4517   00443             RBOUT EQU  M177
4518   00444             M200  EQU  M177+1
```

```
4519   00445            M377  EQU M177+2
4520   00477                  ORG 477B
4521   00477            M1    EQU *
4522   00500            M2    EQU *+1
4523   00501            M3    EQU *+2
4524   00502            M4    EQU *+3
4525   00503            M5    EQU *+4
4526   00504            M6    EQU *+5
4527   00505            M7    EQU *+6
4528   00506            M8    EQU *+7
4529   00507            M9    EQU *+8
4530   00510            M10   EQU *+9
4531   00511            M11   EQU *+10
4532   00513            M16   EQU *+12
4533   00514            M19   EQU *+13
4534   00515            M21   EQU *+14
4535   00516            M25   EQU *+15
4536   00521            D72   EQU *+18
4537   00522            D100  EQU *+19
4538   00527            MSK1  EQU *+24
4539   00531            D1000 EQU *+26
4540   00536            M15   EQU D1000+5
4541   67114            [SEX[ EQU .SEX.-1
4542   00443            B177  EQU M177
4543   00104            SEXUA EQU &MON&+1
4544   00430            .77   EQU .72-4
4545   00127            TFLAG EQU CCNT+1
4546   00431            AT    EQU .63+1
4547   00407            .30   EQU .10+7
4548   00416            .37   EQU .10+14
4549   00411            SP    EQU .32
4550   00123            BLNK  EQU PBPTR+1
4551   00124            LNUM  EQU PBPTR+2
4552   00252            RUNA  EQU PEXMA-2
4553   00256            DRQST EQU PEXMA+2
4554   00176            STK19 EQU TEMPS-7
4555   00544            ERROR EQU 544B
4556   00545            ..ERR EQU 545B        LINK TO ERROR+1 IN BASIC
4557   02141            RN.$. EQU 2141B       LINK TO "RUN" ADDRESS IN BASIC
4558   00252            $RUN$ EQU PEXMA-2
4559   00257            $LST$ EQU PEXMA+3
4560   00253            $FS3$ EQU PEXMA-1
4561   00053                  ORG 53B
4562   00053 072000     X1    DEF Y1
4563   00054 072011     X2    DEF Y2
4564   00055 002012     X3    ABS 2012B
4565   00056 072033     X4    DEF Y3
4566   00057 072054     X6    DEF Y6        LINK TO Y6 FROM LIST, ETC.
4567*
4568***   SET UP USER STACKS
4569*
4570   13203                  ORG 13203B
4571   13203            STCKS EQU *
4572   13203 074456     SK1   ABS TAPE1
4573   13204 074423           ABS WRIT1
4574   13205 074442           ABS READ1
4575   13206 000000     FWAM1 NOP
4576   13207 000000     LWAM1 NOP
4577   13210                  BSS 83
4578   13333 074527     SK2   ABS TAPE2
4579   13334 074517           ABS WRIT2
4580   13335 074523           ABS READ2
4581   13336 000000     FWAM2 NOP
4582   13337 000000     LWAM2 NOP
4583   13340                  BSS 83
4584   13463 074564     SK3   ABS TAPE3
4585   13464 074554           ABS WRIT3
4586   13465 074560           ABS READ3
4587   13466 000000     FWAM3 NOP
4588   13467 000000     LWAM3 NOP
4589   13470                  BSS 83
4590   13613 074621     SK4   ABS TAPE4
4591   13614 074611           ABS WRIT4
```

```
4592   13615 074615          ABS READ4
4593   13616 000000  FWAM4 NOP
4594   13617 000000  LWAM4 NOP
4595   13620              BSS 83
4596*
4597   13743        FINIS EQU *
4598                     END
!FAIL    075565    01/4343 -- 01/4353 01/4440
!L!      075427    01/4186 -- 01/4179
#MOT#    073017    01/2490 -- 01/2433
#PT#     067102    01/1452 -- 01/1256
#USRS    073646    01/2948 -- 01/1414 01/2852
$FS3$    000253    01/4560 -- 01/1103
$LST$    000257    01/4559 -- 01/1095
$RUN$    000252    01/4558 -- 01/1092
$SEX$    061570    01/0776 -- 01/0618
&#USR    061621    01/0801 -- 01/0206 01/0275 01/0342
&&USR    067634    01/1855 -- 01/1561 01/1631
&BAD&    073011    01/2483 -- unreferenced
&BIAS    075050    01/3839 -- 01/3181 01/3187 01/3196
&CNT&    073012    01/2484 -- unreferenced
&CT      075047    01/3838 -- 01/3179 01/3189
&EXE&    074141    01/3193 -- 01/3186
&EXU     075564    01/4322 -- 01/3372 01/4117
&INT&    074131    01/3184 -- 01/3190
&INT1    074514    01/3506 -- 01/3495
&INT2    074551    01/3555 -- 01/3544
&INT3    074606    01/3600 -- 01/3589
&INT4    074643    01/3642 -- 01/3631
&INTL    074734    01/3714 -- 01/3703
&MAIN    075051    01/3840 -- 01/3183 01/3184 01/3188 01/3194
&MON&    000103    01/4462 -- 01/1976 01/2293 01/2442 01/2450 01/2455 01/2458 01/2468 01/4543
&MSTK    074263    01/3315 -- 01/3299 01/3309 01/3317 01/3326 01/3327
&NEX&    074134    01/3187 -- 01/3199
&ORST    074300    01/3329 -- 01/3316 01/3320 01/3323
&SV1     074516    01/3508 -- 01/3492 01/3503
&SV2     074553    01/3557 -- 01/3541 01/3552
&SV3     074610    01/3602 -- 01/3586 01/3597
&SV4     074645    01/3644 -- 01/3628 01/3639
&SVL     074736    01/3716 -- 01/3700 01/3711
&T1      061444    01/0648 -- 01/0129
&TEMP    074301    01/3330 -- 01/3319 01/3324
&USR     075052    01/3841 -- 01/0801 01/1413 01/1855 01/3120 01/3138
..ERR    000545    01/4556 -- 01/1454
.1       000370    01/4498 -- 01/0431 01/0931 01/1013
.10      000400    01/4504 -- 01/1096 01/2107 01/2605 01/3816 01/3826 01/4506 01/4547 01/4548
.11      066652    01/1388 -- 01/0916
.11.     072531    01/2265 -- 01/2095
.12      000401    01/4505 -- 01/2406
.13      073054    01/2525 -- 01/2517
.14      073631    01/2935 -- 01/2690 01/2743
.15      000402    01/4509 -- 01/0495 01/1786
.16      073632    01/2936 -- 01/2794
.2       000371    01/4499 -- 01/0259 01/0564 01/0584 01/0613 01/0671 01/1001 01/1093 01/1294 01/1477
01/1494 01/1516 01/1540 01/1548 01/3422 01/3548
.20      072526    01/2262 -- 01/2103
.200     061727    01/0842 -- 01/0730
.24      066655    01/1391 -- 01/1189
.3       000372    01/4500 -- 01/0692 01/1100 01/2565 01/3593
.30      000407    01/4547 -- 01/2099
.32      000411    01/4508 -- 01/0284 01/0541 01/0963 01/1600 01/1774 01/1926 01/4549
.34      061564    01/0772 -- 01/0643
.36      000415    01/4510 -- 01/0498 01/3485
.37      000416    01/4548 -- 01/2004
.4       000373    01/4501 -- 01/0579 01/0632 01/0946 01/1474 01/1491 01/1513 01/1537 01/1639 01/3220
01/3635 01/4383
.41      000420    01/4511 -- unreferenced
.48      000425    01/4512 -- 01/0282 01/0961 01/2514 01/2671 01/2677 01/2790
.5       075046    01/3837 -- 01/3123 01/3674 01/3692 01/3707
.6       000374    01/4502 -- 01/0290 01/1030 01/1534 01/2557 01/3670
.60      073633    01/2937 -- 01/2854
.63      000430    01/4513 -- 01/0863 01/4546
.7       000375    01/4503 -- unreferenced
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.72     000434   01/4514 -- 01/0421 01/1194 01/1944 01/2551 01/2584 01/3479 01/4516 01/4544
.77     000430   01/4544 -- 01/2074
.BSKA   073021   01/2492 -- 01/2431
.BUFA   000116   01/4473 -- 01/1591 01/1906 01/1921 01/1945 01/2552 01/2558 01/2564 01/2585 01/2632
01/3481 01/3484 01/4474
.D.     074150   01/3204 -- 01/3126
.HSPR   072535   01/2287 -- 01/0083 01/1440 01/2389 01/2402 01/2410 01/4447
.LD.    074030   01/3100 -- 01/1412 01/3094
.LNUM   000124   01/4477 -- 01/1603
.NEXT   067544   01/1796 -- 01/1775 01/1777 01/1781 01/1784
.RDR1   072673   01/2403 -- 01/0079
.RET.   074436   01/3450 -- 01/3468
.SEX.   067115   01/1465 -- 01/1451 01/4541
.X.     074213   01/3251 -- 01/3144
/E      067023   01/1422 -- 01/1198
?24     073561   01/2914 -- 01/2884
?ACCT   061740   01/0851 -- 01/0373 01/0482
?CARD   067035   01/1432 -- 01/1112
?CRD?   067037   01/1434 -- 01/1114
?CT     067563   01/1814 -- 01/1562 01/1614
?DBUF   067575   01/1824 -- 01/1526
?FL1    067557   01/1810 -- 01/1630
?I1     067117   01/1470 -- 01/1479 01/1483
?I2     067136   01/1487 -- 01/1496 01/1500 01/1502 01/1505
?I3     067162   01/1509 -- 01/1518 01/1521
?I5     067202   01/1530 -- 01/1539 01/1543 01/1547 01/1552 01/1556
?LDR    072611   01/2337 -- 01/0082 01/2316
?LP1    067243   01/1567 -- 01/1615
?MON    067566   01/1817 -- unreferenced
?MOUT   067564   01/1815 -- 01/1608
?MOVE   067565   01/1816 -- 01/1221 01/1237 01/1246 01/1586
?OMIT   072602   01/2328 -- 01/0081 01/2305 01/2307 01/2320 01/2335 01/2339 01/2343 01/2355 01/2359
01/2364
?ON     067562   01/1813 -- 01/1567 01/1644
?PFLI   075641   01/4392 -- 01/1436 01/1437
?PHO?   067040   01/1435 -- 01/1143
?PHTO   067036   01/1433 -- 01/1141
?PTCR   072742   01/2443 -- 01/2439
?SAVA   072642   01/2372 -- 01/2298 01/2329
?SAVB   072643   01/2373 -- 01/2299 01/2330
?TBL    061737   01/0850 -- 01/0549
?USNT   067560   01/1811 -- 01/1565 01/1613
@CARD   075072   01/3858 -- 01/3110
@PHTO   075073   01/3859 -- 01/3111
A       000000   01/1355 -- 01/0910 01/0911 01/0917 01/0918 01/0975 01/0979 01/0986 01/1002 01/1003
01/1014 01/1015 01/1031 01/1032 01/1079 01/1080 01/1165 01/1166 01/1583 01/1584 01/1792 01/2228 01/2357
01/2464 01/2466 01/2749 01/3210 01/3228 01/3285 01/3337 01/3373 01/3421 01/3424 01/3740 01/3815 01/3818
01/3825 01/3827 01/4072 01/4120 01/4130 01/4224
ACCHR   075547   01/4297 -- 01/4085 01/4318 01/4319
ACCT#   073066   01/2533 -- 01/0851 01/2569
ACT     074223   01/3266 -- 01/2493 01/3103 01/3205 01/3254 01/3271 01/3288
ACT.    073022   01/2493 -- 01/2225 01/2397 01/2470
ACTIV   000111   01/4468 -- 01/4469 01/4470 01/4471 01/4472 01/4473 01/4478 01/4479 01/4480 01/4481
ADR1    075113   01/3881 -- unreferenced
ADTA    074116   01/3167 -- 01/3164
ADTBL   072432   01/2253 -- 01/2070
ADTMP   072532   01/2266 -- 01/2076 01/2079 01/2086
AMDE    072646   01/2377 -- 01/2309
AMODE   075531   01/4265 -- 01/4152
AROW    072647   01/2378 -- 01/2313
ASTK    000064   01/4449 -- 01/1585 01/3298 01/3308
ASTR    075647   01/4401 -- 01/4347 01/4385
AT      000431   01/4546 -- 01/2083
B       000001   01/1356 -- 01/0272 01/0308 01/0309 01/0317 01/0318 01/0353 01/0354 01/0359 01/0360
01/0407 01/0864 01/0888 01/0903 01/0980 01/0993 01/1006 01/1007 01/1018 01/1022 01/1023 01/1026 01/1027
01/1035 01/1073 01/1094 01/1097 01/1099 01/1101 01/1105 01/1107 01/1160 01/1217 01/1264 01/1277 01/1280
01/1317 01/1570 01/1571 01/1576 01/1577 01/1606 01/1607 01/2031 01/2432 01/2577 01/2800 01/2835 01/2839
01/3124 01/3156 01/3197 01/3198 01/3207 01/3221 01/3232 01/3238 01/3239 01/3245 01/3246 01/3278 01/3321
01/3340 01/3362 01/3368 01/3400 01/3416 01/3750 01/3785 01/4191
B177    000443   01/4542 -- 01/2082 01/2157
B7777   072525   01/2261 -- 01/2006
BADDR   000125   01/4479 -- 01/0197 01/0246 01/0475 01/0501 01/2445 01/2608 01/2706 01/2746 01/2797
01/3163
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BFAD1   075114   01/3891 -- 01/3441 01/3459 01/3963
BFAD2   075127   01/3905 -- 01/3519 01/3526 01/3964
BFAD3   075142   01/3920 -- 01/3565 01/3572 01/3965
BFAD4   075155   01/3934 -- 01/3608 01/3615 01/3966
BFADL   075170   01/3948 -- 01/3673 01/3689 01/3967
BIAS    075071   01/3857 -- 01/2491 01/3102 01/3117 01/3128 01/3141 01/3146 01/3209 01/3226 01/3237
01/3244 01/3268 01/3281
BIAS.   073020   01/2491 -- 01/2224 01/2227 01/2396 01/2462 01/2469
BLANK   000411   01/4507 -- 01/0447 01/0451 01/1601 01/2792 01/4508
BLNK    000123   01/4550 -- 01/1927
BLNTH   072640   01/2370 -- 01/2289 01/2323 01/2324 01/2326 01/2360 01/2361 01/2363
BPTR    075223   01/3987 -- 01/3448 01/3465 01/3483 01/4168 01/4173 01/4204 01/4251 01/4258
BSK1    000071   01/4455 -- 01/1851 01/2492 01/3861
BSK2    000072   01/4456 -- 01/1852
BSK3    000073   01/4457 -- 01/1853
BSK4    000074   01/4458 -- 01/1854
BSKA    075075   01/3861 -- 01/3155 01/3276 01/3284
BSTK4   067615   01/1840 -- 01/1574
BSTK5   067622   01/1845 -- 01/1568
BSTK6   067627   01/1850 -- 01/1581 01/1604
BSTR    075650   01/4402 -- 01/4348 01/4386
BTEM    074250   01/3289 -- 01/3267 01/3287
BTMFL   072425   01/2247 -- 01/2011 01/2109
BUF     061657   01/0830 -- 01/0669 01/0670 01/0679 01/0688 01/0690 01/0694
BUF1    061660   01/0831 -- 01/0666
BUFAD   075212   01/3978 -- 01/3486 01/3990 01/4023 01/4082 01/4100 01/4182 01/4183 01/4212 01/4213
01/4231 01/4232 01/4233 01/4235 01/4283 01/4284 01/4286 01/4299 01/4315
BUFF    061717   01/0834 -- 01/0727 01/0739 01/0745 01/0753 01/0756
BUFFR   061661   01/0833 -- 01/0830 01/0831
BUSY    073564   01/2918 -- 01/2419 01/2424 01/2501 01/2505 01/2522 01/2592 01/2596 01/2636 01/2730
01/2734 01/2780
C..C    067360   01/1663 -- 01/1673
CA      073016   01/2489 -- 01/1434 01/2440 01/2472 01/2477
CARDS   072062   01/1969 -- 01/2235 01/4445
CBUFD   072415   01/2239 -- 01/1970 01/2160 01/2161 01/2163
CCARD   072364   01/2214 -- 01/2217 01/3858
CCNT    000126   01/4480 -- 01/0195 01/0200 01/0244 01/0249 01/0471 01/0499 01/0504 01/2448 01/2606
01/2703 01/2744 01/2751 01/2769 01/2795 01/2802 01/3160 01/4545
CCONT   072414   01/2238 -- 01/1905 01/1909 01/1920 01/1940 01/1973 01/2050 01/2052 01/2059 01/2090
01/2231
CCWT    067112   01/1461 -- 01/1171
CDATA   072412   01/2236 -- 01/2199 01/2204 01/2215 01/2219
CDTBL   061057   01/0371 -- 01/0552 01/1461
CFLG$   066671   01/1403 -- 01/1044 01/1108 01/1144
CFRDR   067042   01/1437 -- 01/1081
CHC1    061725   01/0840 -- 01/0734 01/0747
CHIFL   074122   01/3177 -- 01/3070 01/3149 01/3191
CHIN    075214   01/3980 -- 01/4039 01/4070 01/4140
CHIN1   073660   01/2969 -- 01/0088 01/0089 01/0090 01/2973 01/2976 01/3893
CHIN2   073675   01/2987 -- 01/0098 01/0099 01/0100 01/2991 01/2994 01/3907
CHIN3   073712   01/3005 -- 01/0108 01/0109 01/0110 01/3009 01/3012 01/3922
CHIN4   073727   01/3023 -- 01/0118 01/0119 01/0120 01/3027 01/3030 01/3936
CHINL   073744   01/3040 -- 01/0060 01/0061 01/0062 01/3044 01/3047 01/3950
CHN     073626   01/2932 -- 01/2853 01/2868
CHOT1   073670   01/2979 -- 01/0091 01/0092 01/0093 01/2983 01/3894
CHOT2   073705   01/2997 -- 01/0101 01/0102 01/0103 01/3001 01/3908
CHOT3   073722   01/3015 -- 01/0111 01/0112 01/0113 01/3019 01/3923
CHOT4   073737   01/3032 -- 01/0121 01/0122 01/0123 01/3036 01/3937
CHOTL   073754   01/3050 -- 01/0064 01/0065 01/0066 01/3054 01/3951
CHOUT   075215   01/3981 -- 01/4088 01/4128 01/4244
CHTBA   074357   01/3382 -- 01/1411 01/3360 01/3366
CIN     000000   01/2250 -- unreferenced
CKCN1   072275   01/2127 -- 01/2001
CKCON   072271   01/2123 -- 01/2005
CKDF    074046   01/3122 -- 01/3131
CKL     074010   01/3083 -- 01/1410 01/3150 01/3166
CKPTR   074036   01/3110 -- 01/1432 01/1433 01/3091
CKSUM   061724   01/0839 -- 01/0667 01/0677 01/0678 01/0686
CL1     067340   01/1640 -- 01/0071
CL2     067342   01/1642 -- 01/0072
CL3     075643   01/4394 -- 01/0073
CL4     075631   01/4384 -- 01/0074
CLC     075222   01/3986 -- 01/4107 01/4200
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CLC1    074646   01/3646 -- 01/0094 01/3648 01/3899
CLC2    074651   01/3650 -- 01/0104 01/3652 01/3913
CLC3    074654   01/3654 -- 01/0114 01/3656 01/3928
CLC4    074657   01/3658 -- 01/0124 01/3660 01/3942
CLCC    074356   01/3381 -- 01/3356
CLCL    074662   01/3662 -- 01/0067 01/3664 01/3956
CLEAR   075343   01/4127 -- 01/4011 01/4116 01/4134
CLTM    073465   01/2831 -- 01/1812 01/2660 01/2776 01/2840
CLTMA   067561   01/1812 -- unreferenced
CMSG    073064   01/2530 -- 01/2516
COL56   072175   01/2056 -- 01/2038
COLC    072416   01/2240 -- 01/1974 01/2002 01/2003 01/2032 01/2135
CONCD   072530   01/2264 -- 01/2123 01/2131
CONDT   072417   01/2241 -- 01/1975 01/1997 01/2125 01/2136 01/2173
CONTA   073572   01/2921 -- 01/2752 01/2770
COPY    061401   01/0612 -- 01/0630 01/0649
COUNX   072420   01/2242 -- 01/1971 01/2155
CPHTO   072651   01/2385 -- 01/2388 01/3859
CR.LF   067376   01/1680 -- 01/1657
CR2     072336   01/2176 -- 01/2172
CRDR1   072110   01/1996 -- 01/0137
CRIN    072606   01/2333 -- 01/0084 01/2303 01/2349
CRINT   072077   01/1986 -- 01/1977 01/2148 01/4439
CRLF    061617   01/0799 -- 01/0188 01/0252 01/0280 01/0334 01/0378 01/0379 01/0383 01/0384 01/0399
01/0416 01/0460 01/0494 01/0557 01/0575 01/0587 01/0631 01/0642
CRLFA   075524   01/4261 -- 01/4097
CRLND   067475   01/1756 -- 01/0799 01/0881 01/0895 01/0896 01/0923 01/0924 01/0933 01/0955 01/0959
01/1045 01/1046 01/1066 01/1120 01/1121 01/1153 01/1187 01/1188 01/1193 01/1204 01/1255 01/1297 01/1301
01/1466 01/1470 01/1487 01/1509 01/1530 01/1557 01/1759
CRSTA   074364   01/3384 -- 01/3370
CRUSN   072413   01/2237 -- 01/1978 01/2223 01/2473
CRUST   072533   01/2267 -- 01/1979 01/2201 01/3384
CSAVA   072421   01/2243 -- 01/1987 01/2145
CSAVB   072422   01/2244 -- 01/1988 01/2146
CSAVE   072423   01/2245 -- 01/1993 01/2142
CT      075070   01/3856 -- 01/1814 01/3121 01/3130 01/3139 01/3147
CTBL$   066701   01/1411 -- 01/0973
D100    000522   01/4537 -- 01/0479 01/1278
D1000   000531   01/4539 -- 01/4540
D500    073065   01/2531 -- 01/2507 01/2508
D72     000521   01/4536 -- unreferenced
D97     067555   01/1808 -- 01/1593
DATA    075217   01/3983 -- 01/4013 01/4106 01/4167 01/4193 01/4197
DATA1   075121   01/3896 -- 01/1841
DATA2   075134   01/3910 -- 01/1842
DATA3   075147   01/3925 -- 01/1843
DATA4   075162   01/3939 -- 01/1844
DATAL   075175   01/3953 -- 01/3089 01/3092
DATE    073560   01/2913 -- 01/1821 01/2890 01/3167
DATE?   067572   01/1821 -- 01/1523
DAYCH   074077   01/3152 -- 01/3085
DBUF    073562   01/2915 -- unreferenced
DDBUF   074121   01/3170 -- 01/3162
DFLG    075211   01/3972 -- 01/3443 01/3452 01/3461 01/3476 01/3493 01/3497 01/3502 01/3542 01/3546
01/3551 01/3587 01/3591 01/3596 01/3629 01/3633 01/3638 01/3675 01/3681 01/3693 01/3701 01/3705 01/3710
DIGCK   000277   01/4493 -- 01/2451 01/4494 01/4495 01/4496
DLET    073305   01/2717 -- 01/2555
DLET.   072623   01/2353 -- 01/2314
DLETE   075460   01/4220 -- 01/4157
DRIV    075263   01/4058 -- 01/3728 01/4028 01/4089 01/4108 01/4149 01/4151 01/4159 01/4198 01/4201
01/4215 01/4222 01/4229 01/4236 01/4246 01/4247 01/4253 01/4255
DRIVI   075255   01/4035 -- 01/3467 01/3678 01/4040 01/4195 01/4214
DRIVO   075244   01/4021 -- 01/3449 01/4029
DRQST   000256   01/4553 -- 01/1930
DRS     075061   01/3848 -- 01/2486 01/3236
DRS.    073014   01/2486 -- 01/2463
DRVSK   075225   01/3990 -- 01/3741 01/3751
DTMP    073245   01/2683 -- 01/2667 01/2674
DVERT   067501   01/1761 -- 01/0786 01/0857 01/0940 01/1482 01/1499 01/1520 01/1542 01/1551 01/1803
01/1804
DVRT    061602   01/0786 -- 01/0294
DWS     075054   01/3843 -- 01/3243
EMODE   000405   01/4515 -- 01/2311 01/4154
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ENBUF   073766   01/3061 -- unreferenced
EO      075651   01/4403 -- 01/4352 01/4362
ERRO.   067103   01/1454 -- 01/1084
ERROR   000544   01/4555 -- 01/1935 01/1947
ESCP    073311   01/2721 -- 01/2718
ETBL    071710   01/1876 -- 01/2251
ETBLA   072430   01/2251 -- 01/2054
EVENC   072173   01/2054 -- 01/2041
EXU.    072527   01/2263 -- 01/2226
EXU1    000065   01/4450 -- 01/2263 01/4320 01/4322
EXU2    000066   01/4451 -- unreferenced
EXU3    000067   01/4452 -- unreferenced
EXU4    000070   01/4453 -- unreferenced
EXUA    075563   01/4320 -- 01/4321
EXUA.   075563   01/4321 -- 01/3135 01/3208 01/3398
FINIS   013743   01/4597 -- 01/1326
FINSH   072235   01/2088 -- 01/2084
FLAG1   075066   01/3854 -- 01/1810 01/2411 01/3072 01/3087 01/3116 01/3136
FLAG2   074120   01/3169 -- 01/2909 01/3083 01/3159
FLG1    072703   01/2411 -- 01/2222 01/2394
FLG2A   073554   01/2909 -- 01/2891
FWAFC   067043   01/1438 -- 01/0798 01/0987 01/1179 01/1250
FWAM    000114   01/4471 -- 01/1597 01/1923
FWAM1   013206   01/4575 -- 01/0788
FWAM2   013336   01/4581 -- 01/0789
FWAM3   013466   01/4587 -- 01/0790
FWAM4   013616   01/4593 -- 01/0791
FWFC    061616   01/0798 -- 01/0189 01/0266 01/0344 01/0372 01/0551 01/0615
GCRIO   066220   01/1046 -- 01/1058 01/1064
GETCR   000276   01/4495 -- 01/0476 01/2449 01/2707
GPI/O   066321   01/1121 -- 01/1109 01/1132 01/1138
GTBSA   073606   01/2928 -- 01/2759
GTBSL   073605   01/2927 -- 01/2620 01/2628 01/2758
HELLO   073300   01/2714 -- 01/2560
HEWPY   061563   01/0771 -- 01/0647
HOUR    073557   01/2912 -- 01/1819 01/2609 01/2883 01/2885 01/2889
HR?     067570   01/1819 -- 01/1544
HSPTR   072641   01/2371 -- 01/2291 01/2318 01/2327 01/2348 01/2353 01/2398
HSRDT   072645   01/2375 -- 01/2334 01/2342 01/2386 01/2391
HSROC   072637   01/2369 -- 01/2288 01/2319
I.STP   000110   01/4467 -- 01/2230 01/3212 01/3257
I/O1    000030   01/4432 -- 01/1428
I/O2    000031   01/4433 -- 01/1358
I/O3    000032   01/4434 -- 01/1359
I/O4    000033   01/4435 -- 01/1360
I/O5    000034   01/4436 -- 01/1361
I/O6    000035   01/4437 -- 01/1429
I/O7    000036   01/4438 -- 01/1430
I/O8    000037   01/4439 -- 01/1431
IINT    074302   01/3334 -- 01/3341 01/3445 01/3466
IINTA   074312   01/3343 -- 01/3335
IMOFF   075032   01/3821 -- 01/3828 01/4465
IMON    075021   01/3811 -- 01/3819 01/4464
IN.FL   067602   01/1829 -- 01/1745
IN1     075377   01/4161 -- 01/4142
IN2     075376   01/4159 -- 01/4145
IN3     075405   01/4167 -- 01/4164 01/4206 01/4260
IN3.5   075442   01/4200 -- 01/4170
IN4     075444   01/4203 -- 01/4153 01/4155
INC.    073514   01/2863 -- 01/2869
INCMD   075226   01/3991 -- 01/3417 01/4037
INFO1   000227   01/4484 -- 01/2556 01/2566 01/2646 01/2657
INFO2   000230   01/4485 -- 01/2591 01/2631 01/2648 01/2652 01/2655
INFO3   000231   01/4486 -- 01/2601 01/2617 01/2625 01/2650 01/2653 01/2656 01/2737 01/2766
INPUT   075353   01/4140 -- 01/4064
INS..   075351   01/4133 -- 01/4131
INST.   075273   01/4074 -- 01/4073
INT     074737   01/3725 -- 01/3500 01/3549 01/3594 01/3636 01/3708 01/3730
INT1    074476   01/3491 -- 01/3344 01/3504 01/4433
INT1F   075101   01/3869 -- 01/3506
INT2    074533   01/3540 -- 01/3345 01/3553 01/4434
INT2F   075102   01/3870 -- 01/3555
INT3    074570   01/3585 -- 01/3346 01/3598 01/4435
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INT3F   075103   01/3871 -- 01/3600
INT4    074625   01/3627 -- 01/3347 01/3640 01/4436
INT4F   075104   01/3872 -- 01/3642
INTA    075076   01/3862 -- 01/3195 01/3338 01/3414
INTF    075100   01/3868 -- 01/3182
INTL    074716   01/3699 -- 01/3712 01/4437
INTLF   075105   01/3873 -- 01/3714
INVA    073254   01/2695 -- 01/2691
INVAL   073246   01/2688 -- 01/2563 01/2572 01/2702 01/2708
IO1     075120   01/3895 -- 01/4371
IO2     075133   01/3909 -- 01/4373
IO3     075146   01/3924 -- 01/4375
IO4     075161   01/3938 -- 01/4377
IOFLG   075216   01/3982 -- 01/4027 01/4038 01/4062 01/4087 01/4242
IOIN    074745   01/3736 -- 01/3446 01/3463 01/3478 01/3677 01/3727 01/3744
IOL     075174   01/3952 -- 01/4379
IOOT    074756   01/3746 -- 01/3450 01/3679 01/3729 01/3759
IOSKA   075203   01/3962 -- 01/3118 01/3419 01/3738 01/3748 01/3813 01/3823
JMP$1   067106   01/1457 -- 01/1083
JMP$2   067107   01/1458 -- 01/1086
JMP$3   067110   01/1459 -- 01/1089
JMP$4   067111   01/1460 -- 01/1091
LCCWT   066376   01/1171 -- 01/1146 01/1151
LCLIN   073657   01/2957 -- 01/2422 01/2520 01/2634 01/2778
LCLOT   073656   01/2955 -- 01/2421 01/2519 01/2624 01/2627 01/2630 01/2633 01/2765 01/2768 01/2771
01/2775
LEADR   075501   01/4239 -- 01/4084
LEPIG   067666   01/1872 -- 01/0774
LETCK   000300   01/4494 -- unreferenced
LF      000400   01/4506 -- 01/2304 01/4148
LFTAR   075530   01/4264 -- 01/4156
LGOM1   073404   01/2805 -- 01/2618 01/2626 01/2738 01/2767 01/2807 01/2808
LGOM2   073416   01/2807 -- 01/2793
LGOM3   073417   01/2808 -- 01/2796
LGOM4   073420   01/2809 -- 01/1823 01/1824 01/1825 01/2621 01/2629 01/2811 01/2915 01/3170
LGOM5   073436   01/2811 -- 01/2607
LNUM    000124   01/4551 -- 01/1929
LOGGR   073013   01/2485 -- 01/2467
LOGOF   073313   01/2728 -- 01/4460
LOGON   073073   01/2551 -- 01/1813 01/2485 01/2693 01/2720 01/2781
LTG     061516   01/0711 -- 01/0612 01/0626 01/0714
LTTY1   073146   01/2597 -- 01/0056
LTTY2   073322   01/2735 -- 01/0057
LTTY3   073032   01/2506 -- 01/0063
LTTY4   075611   01/4366 -- 01/0058 01/1369 01/1370 01/1371 01/1372 01/1381 01/1382 01/1383 01/1384
LTTY5   075634   01/4387 -- 01/0059 01/1375 01/1376 01/1377 01/1378
LUSN    075053   01/3842 -- 01/3101 01/3691
LWACR   067045   01/1440 -- 01/1115
LWAFC   067044   01/1439 -- 01/0797 01/1116 01/1150
LWAM    000115   01/4472 -- 01/1589 01/1596
LWAM1   013207   01/4576 -- 01/0793
LWAM2   013337   01/4582 -- 01/0794
LWAM3   013467   01/4588 -- 01/0795
LWAM4   013617   01/4594 -- 01/0796
LWAMS   075653   01/4405 -- 01/0775
LWFC    061615   01/0797 -- 01/0192 01/0268 01/0478 01/0622
LWM     061567   01/0775 -- 01/0624
LWPRD   067046   01/1441 -- 01/1149
LWTSB   071710   01/1875 -- 01/1439
M1      000477   01/4521 -- 01/0235 01/0314 01/0356 01/0458 01/1595 01/1943 01/2461 01/3216
M10     000510   01/4530 -- 01/1104 01/1782 01/2060 01/2063 01/2066 01/2341 01/2400 01/2668
M11     000511   01/4531 -- 01/0256 01/0417 01/0561 01/1050 01/1125 01/1184 01/2092 01/2581
M15     000536   01/4540 -- 01/0629 01/1573 01/2465 01/2478 01/3093 01/3218 01/3423 01/4105
M16     000513   01/4532 -- 01/0385
M177    000443   01/4516 -- 01/0446 01/0450 01/1262 01/1669 01/1751 01/1773 01/2301 01/2971 01/2989
01/3007 01/3025 01/3042 01/4075 01/4302 01/4517 01/4518 01/4519 01/4542
M19     000514   01/4533 -- 01/0287 01/0882
M2      000500   01/4522 -- 01/2036 01/3095 01/3214 01/3231 01/3252 01/3371 01/4119 01/4203
M200    000444   01/4518 -- 01/1670 01/4086
M21     000515   01/4534 -- unreferenced
M25     000516   01/4535 -- 01/1154 01/1545
M27     061726   01/0841 -- 01/0663
M3      000501   01/4523 -- 01/0232 01/2203 01/2409
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M33     061565   01/0773 -- 01/0576
M377    000445   01/4519 -- 01/0742
M4      000502   01/4524 -- 01/0606 01/0752 01/4096
M5      000503   01/4525 -- 01/0639 01/0889 01/2033 01/2185 01/2456 01/3178
M6      000504   01/4526 -- 01/1917 01/2567
M7      000505   01/4527 -- 01/0433 01/0995
M72     067556   01/1809 -- 01/1590
M8      000506   01/4528 -- unreferenced
M9      000507   01/4529 -- 01/0875 01/2012
MAIN    075067   01/3855 -- 01/3119 01/3122 01/3129 01/3137 01/3142 01/3145
MBUF    067574   01/1823 -- 01/1507
MES1A   073647   01/2952 -- 01/2582
MIN     073624   01/2930 -- 01/2860 01/2867 01/2902
MINA    073634   01/2938 -- 01/2747 01/2837 01/2858
MINTS   073556   01/2911 -- 01/1818 01/2611 01/2877 01/2878 01/2882
MINUT   073551   01/2902 -- 01/2865
MNTS?   067567   01/1818 -- 01/1553
MON1    074053   01/3128 -- 01/3077
MON2    074071   01/3145 -- 01/3076 01/3253
MON3    074066   01/3142 -- 01/3148
MONIT   074000   01/3070 -- 01/1817 01/3453 01/4462
MSGA    073055   01/2526 -- 01/2518
MSK1    000527   01/4538 -- 01/0299 01/2362 01/4234
MSSG    073023   01/2499 -- 01/1441 01/4461
MVSTK   074774   01/3778 -- 01/1816 01/3742 01/3752 01/3780 01/3790 01/3791 01/4185
MVUIN   074256   01/3307 -- 01/3286 01/3311
MVUOT   074251   01/3297 -- 01/1815 01/2490 01/3157 01/3279 01/3301
NAME    073126   01/2581 -- 01/2588 01/2590 01/2818
NCNT    075213   01/3979 -- 01/4018 01/4079 01/4099 01/4143 01/4161 01/4226 01/4227 01/4245 01/4288
01/4290 01/4317
NEXTC   072224   01/2079 -- 01/2087
NEXTU   073517   01/2866 -- 01/2904
NMLST   072433   01/2254 -- 01/2075
NOCRD   066312   01/1111 -- 01/1061
NOGO1   073437   01/2813 -- 01/2594
NOGO2   073445   01/2819 -- 01/2503 01/2732
NOGOA   073452   01/2824 -- 01/2815 01/2819
NOGOL   073451   01/2823 -- 01/2816 01/2820
NORET   075010   01/3790 -- 01/3782
NWLNE   072620   01/2347 -- 01/2310 01/2312
OCNT    075220   01/3984 -- 01/3480 01/4015 01/4025 01/4093 01/4098 01/4239
OCNT1   075122   01/3897 -- 01/3440 01/3458
OCNT2   075135   01/3911 -- 01/3518 01/3525
OCNT3   075150   01/3926 -- 01/3564 01/3571
OCNT4   075163   01/3940 -- 01/3607 01/3614
OCNTL   075176   01/3954 -- 01/3672 01/3688
OCT60   067636   01/1857 -- 01/1779
OINK    061566   01/0774 -- 01/0620
OK      075300   01/4079 -- 01/4077 01/4115 01/4121
OKCRD   072213   01/2070 -- 01/2062 01/2065
ONADR   000100   01/4487 -- 01/2661
ONOFF   073364   01/2788 -- 01/2600 01/2736 01/2803
ORSTK   075042   01/3833 -- 01/3779 01/3784 01/3787
OT.FL   067601   01/1828 -- 01/1654
OT1     075313   01/4093 -- 01/4081 01/4241
OT2     075326   01/4105 -- 01/4095
OT5     075306   01/4085 -- 01/4103
OTBL    071734   01/1878 -- 01/2252
OTBLA   072431   01/2252 -- 01/2045
OTBLZ   071771   01/1889 -- 01/2253
OTCMD   075227   01/3992 -- 01/4026
OUTCR   000275   01/4496 -- 01/2672 01/2678
OUTIA   000272   01/4491 -- 01/4492
OUTIM   073226   01/2666 -- 01/2610 01/2612 01/2681 01/3168
OUTIN   000272   01/4492 -- 01/0199 01/0248 01/0503 01/2680 01/2750 01/2801
OUTL    074704   01/3686 -- 01/2955 01/3687 01/3864
OUTM    074117   01/3168 -- 01/3165
OVFLW   067554   01/1804 -- 01/1795
P1      061452   01/0663 -- 01/0700
P1&&&   074270   01/3320 -- 01/3325
P1..    067512   01/1770 -- 01/1801
P1...   075002   01/3784 -- 01/3789
P2      061464   01/0673 -- 01/0684
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P3       061500   01/0686 -- 01/0682
PAGE     072050   01/1948 -- 01/1918
PAU      072352   01/2198 -- 01/2133
PBPTR    000122   01/4476 -- 01/1599 01/1925 01/4477 01/4550 01/4551
PBUFF    000121   01/4475 -- 01/1598 01/1924 01/4476
PCNT     075221   01/3985 -- 01/4014 01/4102 01/4174 01/4188 01/4208 01/4220 01/4225 01/4257 01/4280
01/4287 01/4298 01/4316
PCNTL    075177   01/3955 -- 01/3097
PEXMA    000254   01/4490 -- 01/1931 01/2822 01/4552 01/4553 01/4558 01/4559 01/4560
PFAIL    000040   01/4440 -- 01/4418
PFL      000004   01/4423 -- 01/1641 01/4345 01/4355 01/4356 01/4395
PFRDR    067041   01/1436 -- 01/1167
PNCH&    061555   01/0764 -- 01/0126 01/0127 01/0128 01/0743 01/0755 01/0769
PNCHA    061446   01/0659 -- 01/0616 01/0621 01/0625 01/0699
PNCMD    073563   01/2916 -- 01/2504 01/2595 01/2733
PP02     061533   01/0739 -- 01/0748
PP03     061545   01/0752 -- 01/0731
PT       073015   01/2488 -- 01/1435 01/2438 01/2474
PTAP     000061   01/4446 -- 01/2480
PTBA     075231   01/3995 -- 01/3671
PTBA?    067571   01/1820 -- 01/1475 01/1481 01/1484 01/1492 01/1498 01/1506 01/1514 01/1519 01/1524
01/1535 01/1541 01/1549
PTBFA    073762   01/3058 -- 01/2443
PTBUF    073763   01/3059 -- 01/1820 01/2436 01/3058 01/3995
PTINS    066700   01/1410 -- 01/1147
PTPRA    075230   01/3994 -- 01/3098
PTPRC    072713   01/2417 -- 01/3994
PTSBS    066000   01/0861 -- 01/0871 01/4417
PTUSN    072650   01/2381 -- 01/2395 01/2475
PUNCH    061522   01/0726 -- 01/0695 01/0713 01/0760
R1       072135   01/2017 -- 01/2100 01/2104
R2       072142   01/2022 -- 01/2026 01/2108 01/2115
R3       072157   01/2039 -- 01/2096
R4       072163   01/2046 -- 01/2055
RBOUT    000443   01/4517 -- 01/1621 01/2306 01/4076 01/4132 01/4150 01/4365
RCOL     072344   01/2185 -- 01/0135 01/0136 01/1981 01/2137 01/2180
RCOLI    072332   01/2171 -- 01/1999
RCONT    074445   01/3460 -- 01/3527 01/3573 01/3616
RCTRX    072426   01/2248 -- 01/2013 01/2025 01/2112
RDINT    072544   01/2297 -- 01/0080 01/2331 01/4438
RDYDA    000255   01/4488 -- 01/1952 01/2523 01/4489 01/4490 01/4491 01/4493
READ1    074442   01/3457 -- 01/3474 01/3849 01/4574
READ2    074523   01/3524 -- 01/3533 01/3850 01/4580
READ3    074560   01/3570 -- 01/3580 01/3851 01/4586
READ4    074615   01/3613 -- 01/3622 01/3852 01/4592
READL    074665   01/3668 -- 01/2957 01/3106 01/3669 01/3682
REDL     074035   01/3106 -- 01/3096
REED     000113   01/4470 -- 01/2553 01/2586
RESET    075232   01/4010 -- 01/4019 01/4022 01/4036
RESSR    074377   01/3404 -- 01/3402
RETAD    075652   01/4404 -- 01/4354 01/4397
RN.$.    002141   01/4557 -- 01/1455 01/1456
RRED     074203   01/3236 -- 01/3215 01/3217 01/3229
RRET     072307   01/2141 -- 01/2008 01/2053 01/2068 01/2091 01/2094 01/2102 01/2106 01/2110 01/2126
01/2129 01/2175 01/2190 01/2202 01/2207
RSTRT    075456   01/4214 -- 01/4176
RT       075527   01/4263 -- 01/4141
RTA      073761   01/3057 -- 01/2302 01/2972 01/2990 01/3008 01/3026 01/3043
RUN1     067104   01/1455 -- 01/1087
RUN2     067105   01/1456 -- 01/1090
RUNA     000252   01/4552 -- 01/1904 01/1910
SA       074402   01/3407 -- 01/3395 01/3404
SAVAC    073627   01/2933 -- 01/2850 01/2896
SAVB     075044   01/3835 -- 01/3758 01/3801
SAVBC    073630   01/2934 -- 01/2851 01/2897
SAVE     075045   01/3836 -- 01/3755 01/3805
SAVRG    075012   01/3800 -- 01/3498 01/3547 01/3592 01/3634 01/3706 01/3806
SB       074403   01/3408 -- 01/3396 01/3405
SBPTR    000133   01/4481 -- 01/0480 01/0481 01/2710 01/2711
SBUFA    000120   01/4478 -- 01/1594 01/2709
SCNUM    074355   01/3380 -- 01/3355 01/3357 01/3363
SEC      073625   01/2931 -- 01/2857 01/2863 01/2864 01/2866 01/2903
SECA     073641   01/2943 -- 01/2833 01/2855
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SEKS     073555   01/2910 -- 01/1822 01/2871 01/2872 01/2876
SEKS?    067573   01/1822 -- 01/1628
SET10    072256   01/2105 -- 01/2020
SET11    072252   01/2101 -- 01/2018
SET12    072246   01/2097 -- 01/2016
SET19    072262   01/2109 -- 01/2024
SETM2    072357   01/2203 -- 01/0134 01/2178 01/2181
SETUP    073264   01/2700 -- 01/2559 01/2568 01/2712
SEXU     074365   01/3394 -- 01/3406 01/4463
SEXUA    000104   01/4543 -- 01/1954
SIMP     074453   01/3466 -- 01/3487
SINA     073071   01/2536 -- 01/1449 01/2649
SK1      013203   01/4572 -- 01/4455
SK2      013333   01/4578 -- 01/1323 01/4456
SK3      013463   01/4584 -- 01/1324 01/4457
SK4      013613   01/4590 -- 01/1325 01/4458
SLENA    073072   01/2537 -- 01/1448 01/2647
SP       000411   01/4549 -- 01/2077 01/2088
SRITB    067315   01/1621 -- 01/0052 01/1426
STCHR    072317   01/2154 -- 01/2051 01/2078 01/2085 01/2089 01/2156 01/2164
STCKS    013203   01/4571 -- 01/1438
STK19    000176   01/4554 -- 01/1936
STM      073547   01/2898 -- 01/0075 01/2874 01/2880 01/2887
STNO     072241   01/2092 -- 01/2035
STOP     075332   01/4113 -- 01/4078
STORC    075532   01/4279 -- 01/4158 01/4289 01/4291
STPIA    074422   01/3427 -- 01/3413
STPIN    075224   01/3988 -- 01/4113 01/4194 01/4196
STTYI    061431   01/0637 -- 01/0583
SYIN#    073070   01/2535 -- 01/1447 01/2645
SYMTA    000117   01/4474 -- 01/1592 01/4475
SYST     073215   01/2652 -- 01/2658
T1       061720   01/0835 -- 01/0661 01/0665 01/0673 01/0675 01/0680 01/0697
T2       061721   01/0836 -- 01/0662 01/0681 01/0698
T3       061722   01/0837 -- 01/0664 01/0683
T4       061723   01/0838 -- 01/0672 01/0674 01/0676 01/0687
TAPE1    074456   01/3472 -- 01/3473 01/4572
TAPE2    074527   01/3531 -- 01/3532 01/4578
TAPE3    074564   01/3578 -- 01/3579 01/4584
TAPE4    074621   01/3620 -- 01/3621 01/4590
TBL      073067   01/2534 -- 01/0850 01/2570
TCNTA    075106   01/3875 -- 01/3225 01/4189
TCONT    074461   01/3475 -- 01/3534 01/3581 01/3623
TEM      072247   01/2098 -- 01/2111 01/2114
TEM3     073010   01/2482 -- 01/2220 01/2232 01/2234 01/2392 01/2399 01/2417 01/2446 01/2453 01/2459
01/2471
TEMP     075043   01/3834 -- 01/3783 01/3788
TEMP1    075074   01/3860 -- 01/3204 01/3213 01/3251 01/3255
TEMPS    000205   01/4483 -- 01/4484 01/4485 01/4486 01/4554
TFLAG    000127   01/4545 -- 01/1902 01/1914 01/1937 01/1950 01/2437 01/2460 01/2479
TIME1    073604   01/2924 -- 01/2745
TIMR     073477   01/2848 -- 01/2899 01/4432
TLRDR    072704   01/2412 -- 01/2407
TOPFL    072424   01/2246 -- 01/2010 01/2097 01/2101 01/2105
TOUT3    061553   01/0759 -- 01/0125
TPFLG    072644   01/2374 -- 01/2317 01/2337 01/2405
TPTST    075512   01/4251 -- 01/4147
TRYCT    072427   01/2249 -- 01/2179 01/2186
TSRCH    000262   01/4489 -- 01/0486 01/2562 01/2571
UL52     061730   01/0843 -- 01/0735
UP^^^    075604   01/4361 -- 01/4346 01/4357
USAC#    073565   01/2919 -- 01/2575 01/2798
USER     074040   01/3116 -- 01/3074
USN      000063   01/4448 -- 01/1564 01/1569 01/1575 01/1582 01/1605 01/1612 01/1633 01/2428 01/2435
01/2513 01/2576 01/2748 01/2789 01/2799 01/2834 01/2838 01/3152 01/3161 01/3270 01/3272 01/3277 01/3283
01/3399 01/3415 01/3420 01/3442 01/3460 01/3475 01/3690 01/3814 01/3824
USNT     075077   01/3863 -- 01/1811 01/3336 01/3339 01/3444 01/3462 01/3477 01/3676 01/3694 01/3726
01/3739 01/3749 01/4118 01/4190
WCONT    074426   01/3442 -- 01/3520 01/3566 01/3609 01/3695
WRIT1    074423   01/3439 -- 01/1846 01/3844 01/4573
WRIT2    074517   01/3517 -- 01/1847 01/3845 01/4579
WRIT3    074554   01/3563 -- 01/1848 01/3846 01/4585
WRIT4    074611   01/3606 -- 01/1849 01/3847 01/4591
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WRITE   000112   01/4469 -- 01/1907 01/1919 01/1922 01/1946 01/2408 01/2500 01/2583 01/2599 01/2619
01/2622 01/2654 01/2689 01/2692 01/2719 01/2729 01/2739 01/2753 01/2760 01/2814 01/2817 01/2821
WRITL   074704   01/3864 -- 01/3104
WRRET   074207   01/3243 -- 01/3219
X/E     061744   01/0855 -- 01/0395
X1      000053   01/4562 -- 01/1458
X2      000054   01/4563 -- 01/1459
X20     061622   01/0802 -- 01/0389 01/0558 01/0588
X21     061645   01/0821 -- 01/0380
X22     061623   01/0803 -- 01/0253 01/0400
X3      000055   01/4564 -- 01/1916
X4      000056   01/4565 -- 01/1457
X6      000057   01/4566 -- 01/1102 01/1460
XA1     061742   01/0853 -- 01/0440 01/0454 01/0457
XBUF    061745   01/0856 -- 01/0390 01/0394 01/0404 01/0422 01/0441 01/0472 01/0526
XCHN%   061743   01/0854 -- 01/0493 01/0502
XCODE   061627   01/0807 -- 01/0374 01/0515 01/0516 01/0533 01/0534 01/0542 01/0543 01/0550
XECUT   000107   01/4466 -- 01/3258
XFCR    061643   01/0819 -- 01/0273 01/0298 01/0313
XFWC    061640   01/0816 -- 01/0267 01/0305 01/0320 01/0345 01/0350 01/0362
XI/O    061574   01/0780 -- 01/0600 01/0604 01/0605 01/0638
XINT    074404   01/3412 -- 01/2268 01/3403 01/3425
XINTA   072534   01/2268 -- 01/1980
XLCHN   061571   01/0777 -- 01/0637
XLNTH   061626   01/0806 -- 01/0376 01/0517 01/0535 01/0539
XLWC    061641   01/0817 -- 01/0269 01/0324
XNBER   061573   01/0779 -- 01/0595 01/0602
XNO     061632   01/0810 -- 01/0570
XNT     074317   01/3350 -- 01/3377 01/3427
XNTRY   061741   01/0852 -- 01/0377 01/0483 01/0518 01/0546
XRETX   067553   01/1803 -- 01/1763
XSETI   061572   01/0778 -- 01/0608 01/0641
XSTND   061030   01/0342 -- 01/0264
XSVA    074353   01/3378 -- 01/3352 01/3374
XSVB    074354   01/3379 -- 01/3353 01/3375
XTMP    067635   01/1856 -- 01/1778 01/1785
XVERT   061746   01/0857 -- 01/0405
XYES    061631   01/0809 -- 01/0263 01/0572
XZG2    061633   01/0811 -- 01/0589
Y1      072000   01/1902 -- 01/4562
Y2      072011   01/1914 -- 01/4563
Y3      072033   01/1935 -- 01/4565
Y5      072031   01/1930 -- 01/1955
Y6      072054   01/1950 -- 01/4566
YBUF    067576   01/1825 -- 01/1485
Z#USR   066704   01/1414 -- 01/0950
Z&USR   066703   01/1413 -- 01/0951
Z129    066662   01/1396 -- 01/1098
Z13     066653   01/1389 -- 01/0934
Z14     061732   01/0845 -- 01/0461
Z18     066656   01/1392 -- 01/1205
Z20     066654   01/1390 -- 01/0928 01/1053 01/1128 01/1290 01/1298
Z21     066657   01/1393 -- unreferenced
Z22     066660   01/1394 -- 01/1047
Z23     066661   01/1395 -- 01/1122
Z30     061646   01/0822 -- 01/0194 01/0243
Z39     061624   01/0804 -- 01/0335
Z5      066651   01/1387 -- 01/0909
Z?ADR   067077   01/1449 -- 01/1242
Z?LNT   067075   01/1447 -- 01/1231
Z?TBL   067076   01/1448 -- 01/1236
ZA1     067600   01/1827 -- 01/1653 01/1663 01/1666 01/1692 01/1718 01/1719 01/1721 01/1732 01/1765
01/1800
ZA12    066612   01/1347 -- 01/1155
ZA2     067610   01/1835 -- 01/1693 01/1731 01/1767 01/1787 01/1790 01/1793 01/1802
ZA5     066605   01/1342 -- 01/0966
ZA6     066606   01/1343 -- 01/0964
ZA7     066607   01/1344 -- 01/0883
ZA8     066610   01/1345 -- 01/1123
ZA9     066611   01/1346 -- 01/1051 01/1126
ZABSD   061341   01/0575 -- 01/0591
ZABST   061317   01/0557 -- 01/0568 01/0574 01/1452
ZACNT   061735   01/0848 -- 01/0411 01/0510
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ZAG1     066601    01/1338 -- 01/0898
ZAG10    060225    01/0149 -- 01/0386
ZAG11    060236    01/0151 -- 01/0401
ZAG12    060252    01/0153 -- 01/0418
ZAG14    060276    01/0156 -- 01/0381
ZAG15    061634    01/0812 -- 01/0201
ZAG16    061635    01/0813 -- 01/0250
ZAG17    061647    01/0823 -- 01/0254
ZAG18    060367    01/0161 -- 01/0163 01/0288
ZAG19    060402    01/0163 -- 01/0285
ZAG2     066602    01/1339 -- 01/1299
ZAG20    066613    01/1348 -- 01/1190
ZAG21    066614    01/1349 -- 01/1206
ZAG22    060430    01/0166 -- 01/0336
ZAG23    060455    01/0168 -- 01/0496
ZAG24    060512    01/0173 -- 01/0500
ZAG25    060466    01/0170 -- 01/0505
ZAG26    060513    01/0174 -- 01/0462
ZAG27    061576    01/0782 -- 01/0577
ZAG28    061577    01/0783 -- 01/0633
ZAG29    061600    01/0784 -- 01/0644
ZAG3     066603    01/1340 -- 01/0926
ZAG30    061601    01/0785 -- 01/0559
ZAG31    066615    01/1350 -- 01/1048
ZAG32    066616    01/1351 -- 01/1068
ZAG4     066604    01/1341 -- 01/0935
ZANS     061652    01/0826 -- 01/0187
ZBF      061734    01/0847 -- 01/0442 01/0444 01/0449 01/0453 01/0527 01/0532 01/0536 01/0538
ZBTB1    066617    01/1357 -- 01/0977
ZBTB2    066624    01/1363 -- 01/0991
ZBTB3    066631    01/1368 -- 01/1020
ZBTB4    066636    01/1374 -- 01/1004
ZBTB5    066643    01/1380 -- 01/1024
ZBUF     066712    01/1420 -- 01/0856 01/0929 01/0939 01/1054 01/1059 01/1129 01/1133 01/1195 01/1197
01/1219 01/1291 01/1304 01/1312
ZBUFF    066707    01/1417 -- 01/1275 01/1276 01/1281
ZCCT     061642    01/0818 -- 01/0276 01/0328 01/0343 01/0365
ZCFDE    061204    01/0468 -- 01/0456 01/0459
ZCHN#    066672    01/1404 -- 01/0957 01/0960 01/0974 01/0978 01/0985 01/0992 01/1005 01/1017 01/1021
01/1025 01/1034 01/1037 01/1185 01/1202
ZCHNX    061644    01/0820 -- 01/0278 01/0281 01/0307 01/0316 01/0327 01/0348 01/0352 01/0358 01/0364
ZCIT1    066377    01/1175 -- 01/1140 01/1208 01/1230
ZCIT2    066416    01/1193 -- 01/1201 01/1226
ZCIT3    066454    01/1228 -- 01/1199
ZCLCZ    067332    01/1634 -- 01/1427
ZCLIN    061630    01/0808 -- 01/0261 01/0292 01/0391 01/0423 01/0566 01/0581
ZCLOT    061620    01/0800 -- 01/0202 01/0251 01/0255 01/0258 01/0289 01/0337 01/0382 01/0387 01/0402
01/0419 01/0463 01/0497 01/0506 01/0560 01/0563 01/0578 01/0590 01/0634 01/0645
ZCNT     066676    01/1408 -- 01/1183 01/1212 01/1228 01/1232 01/1240 01/1243 01/1249 01/1274 01/1282
ZCODE    066706    01/1416 -- 01/0994 01/1000 01/1012 01/1029 01/1180 01/1215 01/1218 01/1235 01/1239
01/1241 01/1248
ZCRET    067605    01/1832 -- 01/1680 01/1703
ZCT1     067603    01/1830 -- 01/1660 01/1672 01/1690 01/1709 01/1714 01/1730
ZCT2     067607    01/1834 -- 01/1691 01/1729
ZCTE     067614    01/1839 -- unreferenced
ZDEL     067447    01/1727 -- 01/1706 01/1708
ZDL10    060101    01/0134 -- 01/1334
ZDLS1    060000    01/0044 -- 01/1330
ZDLS2    060011    01/0056 -- 01/1331
ZDLS3    060025    01/0071 -- 01/1332
ZDLS4    060032    01/0079 -- 01/1333
ZDLS5    060040    01/0088 -- 01/1364
ZDLS6    060047    01/0098 -- 01/1365
ZDLS7    060056    01/0108 -- 01/1366
ZDLS8    060065    01/0118 -- 01/1367
ZDLS9    060074    01/0125 -- 01/0781
ZEND     061310    01/0546 -- 01/0396
ZER2     066073    01/0933 -- 01/0941 01/0944 01/0948
ZER3     061111    01/0399 -- 01/0406 01/0414
ZER6     061354    01/0587 -- 01/0596 01/0598 01/0603
ZERR     061177    01/0460 -- 01/0432 01/0435 01/0448
ZERRR    066543    01/1297 -- 01/1307 01/1309 01/1315
```

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ZESCP    067613    01/1838 -- 01/1705
ZFCOR    067100    01/1450 -- 01/1252
ZFRC     060631    01/0185 -- 01/0330 01/0367 01/1450
ZFWTB    061603    01/0787 -- 01/0306 01/0351
ZG.15    061636    01/0814 -- 01/0196
ZG.16    061637    01/0815 -- 01/0245
ZG.6     066650    01/1386 -- 01/1161
ZGADR    066535    01/1289 -- 01/0885 01/0900 01/0968 01/1070 01/1157 01/1302 01/1318
ZGNU     066062    01/0924 -- 01/0937
ZGO      066012    01/0873 -- 01/0868
ZI/O     066675    01/1407 -- 01/0780 01/0873 01/0886 01/0901 01/0969 01/1071 01/1158 01/1279 01/1311
01/1316
ZI/O6    067032    01/1429 -- 01/0902
ZI/O7    067033    01/1430 -- 01/1159
ZI/O8    067034    01/1431 -- 01/1072
ZINS1    067031    01/1428 -- 01/0887
ZL1      067577    01/1826 -- 01/1652 01/1677 01/1764 01/1770 01/1799
ZL2      067611    01/1836 -- 01/1696 01/1715 01/1722 01/1725 01/1768 01/1769 01/1796 01/1797
ZLAST    061301    01/0538 -- 01/0530
ZLCHN    066705    01/1415 -- 01/0777 01/0874
ZLIN     067403    01/1688 -- 01/0808 01/0930 01/1055 01/1130 01/1196 01/1292 01/1476 01/1493 01/1515
01/1536 01/1726
ZLNFD    067606    01/1833 -- 01/1682 01/1701
ZLNTH    066710    01/1418 -- 01/1176 01/1213 01/1224
ZLNTT    067062    01/1445 -- 01/1175 01/1234
ZLOP2    066120    01/0959 -- 01/1039
ZLOP3    061073    01/0383 -- 01/0393 01/0403 01/0544 01/0548
ZLOP4    061131    01/0416 -- 01/0426 01/0464 01/0470 01/0477 01/0507
ZLOP5    061267    01/0528 -- 01/0537
ZLOP6    061157    01/0444 -- 01/0455
ZLOT     067345    01/1651 -- 01/0800 01/0884 01/0899 01/0927 01/0936 01/0967 01/1049 01/1052 01/1069
01/1124 01/1127 01/1156 01/1191 01/1207 01/1300 01/1473 01/1490 01/1512 01/1533 01/1679 01/1684 01/1728
01/1758
ZLP1     066524    01/1276 -- 01/1283
ZLS10    066600    01/1334 -- 01/1075 01/1078
ZLST1    066574    01/1330 -- 01/0876
ZLST2    066575    01/1331 -- 01/0905 01/0908 01/0915
ZLST3    066576    01/1332 -- 01/0890
ZLST4    066577    01/1333 -- 01/1162 01/1164
ZLST9    061575    01/0781 -- 01/0607 01/0640
ZLWTB    061610    01/0792 -- 01/0315 01/0357
ZM12     066663    01/1397 -- 01/0904
ZM13     067637    01/1858 -- 01/1503
ZM20     066664    01/1398 -- 01/0925
ZM22     066665    01/1399 -- 01/0897
ZM24     066666    01/1400 -- unreferenced
ZM25     067113    01/1462 -- 01/1067
ZM27     066667    01/1401 -- 01/0965
ZM4      067114    01/1463 -- 01/1074
ZM61     067640    01/1859 -- 01/1554
ZM64     061733    01/0846 -- 01/0412
ZMODE    067612    01/1837 -- 01/1707
ZN60     066670    01/1402 -- 01/1263
ZNBER    066510    01/1261 -- 01/0779 01/1268 01/1269 01/1306 01/1313
ZNO      067024    01/1423 -- 01/1060 01/1136
ZNTRY    066711    01/1419 -- unreferenced
ZNUSR    066673    01/1405 -- 01/0945 01/0949 01/1038
ZNXTC    067413    01/1698 -- 01/1700 01/1702 01/1713 01/1723 01/1733
ZOK1     061116    01/0404 -- 01/0398
ZONE     061650    01/0824 -- 01/0205 01/0208 01/0213 01/0214 01/0222 01/0223
ZPEIT    061250    01/0509 -- 01/0485 01/0487
ZPNU     066674    01/1406 -- 01/0942
ZPRCS    066100    01/0939 -- 01/0932
ZPRIO    066357    01/1153 -- 01/1135
ZPTZ     066702    01/1412 -- 01/1148
ZRERD    060750    01/0280 -- 01/0295 01/0297 01/0301 01/0329
ZRERE    060734    01/0266 -- 01/0338
ZRPLY    061653    01/0827 -- 01/0186 01/0260 01/0262 01/0291 01/0293 01/0565 01/0569 01/0580 01/0593
01/0601
ZSETI    066521    01/1273 -- 01/0778 01/0877 01/0891 01/0906 01/0996 01/1076 01/1163 01/1284
ZSEXZ    067101    01/1451 -- 01/1253
ZSTOR    066677    01/1409 -- 01/1178 01/1216 01/1220 01/1225
ZSVA     061731    01/0844 -- 01/0427 01/0436 01/0468 01/0509 01/0519 01/0523 01/0529
```

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ZTA1     067642    01/1861 -- 01/1472
ZTA2     067647    01/1864 -- 01/1489
ZTA3     067655    01/1867 -- 01/1511
ZTA4     067662    01/1870 -- 01/1532
ZTI1     067641    01/1860 -- 01/1471
ZTI2     067646    01/1863 -- 01/1488
ZTI3     067654    01/1866 -- 01/1510
ZTI4     067661    01/1869 -- 01/1531
ZTTYB    067027    01/1426 -- 01/0912 01/1016
ZTTYC    067030    01/1427 -- 01/0919 01/1033
ZTTY[    067026    01/1425 -- 01/0913
ZTWO     066551    01/1304 -- 01/1295
ZT[      075627    01/4380 -- 01/1425
ZULFL    067604    01/1831 -- 01/1661
ZWCNT    061736    01/0849 -- 01/0525 01/0528 01/0531
ZWRT     060705    01/0242 -- 01/0212 01/0221 01/0225
ZX       061651    01/0825 -- 01/0193 01/0198 01/0203 01/0229 01/0242 01/0247 01/0355
ZX1      067351    01/1655 -- 01/0044
ZX2      067457    01/1738 -- 01/0045 01/0046 01/0047 01/0048 01/0049 01/0050 01/0051
ZX9      061625    01/0805 -- 01/0257 01/0562
ZXLIN    067464    01/1744 -- 01/1698 01/1752
ZXLOT    067456    01/1737 -- 01/1671 01/1681 01/1683 01/1742
ZYES     067025    01/1424 -- 01/1062 01/1134
ZZ12     060261    01/0155 -- 01/1347
ZZDNE    067445    01/1725 -- 01/1704
ZZFWA    066567    01/1322 -- 01/0984
ZZG1     060105    01/0141 -- 01/1338
ZZG15    060312    01/0158 -- 01/0812 01/0814
ZZG16    060333    01/0159 -- 01/0813 01/0815
ZZG17    060354    01/0160 -- 01/0823
ZZG2     060120    01/0142 -- 01/0811 01/1339
ZZG20    060403    01/0164 -- 01/1348
ZZG21    060417    01/0165 -- 01/1349
ZZG27    060523    01/0176 -- 01/0782
ZZG28    060544    01/0177 -- 01/0783
ZZG29    060546    01/0178 -- 01/0784
ZZG3     060132    01/0143 -- 01/1340
ZZG30    060567    01/0179 -- 01/0785
ZZG31    060601    01/0180 -- 01/1350
ZZG32    060614    01/0181 -- 01/1351
ZZG4     060144    01/0144 -- 01/1341
ZZG5     060153    01/0145 -- 01/1342 01/1343
ZZG7     060171    01/0146 -- 01/1344
ZZG8     060203    01/0147 -- 01/1345
ZZG9     060217    01/0148 -- 01/0805 01/1346
[SEX[    067114    01/4541 -- 01/0776
870 symbols 21 unreferenced
4598 lines assembled, 3866 words generated
0 errors, 0 warnings
```