```
;
        .TITLE 'STAR RAIDERS.  VERSION 25.1  STARDATE-26-JUL-79'
;
;        GAME COMPLETE 17-JUN-79
;
;        NOTES
;       RAM     0-1FFF
;       ROM     A0000-BFFF
;       SPILL OVER ROM   9800-9FFF
;       E477G    ; PROG START
;
;       ALPHA CHARACTERS IN DMA ASCII
;
;       *CAPS = ASCII EOR $20
;       NUMBERS = ASCII
;
;       40 CHAR = $CC00
;       20 CHAR (*CAPS, NUMBERS), = $CC00
;       20 CHAR (CAPS, LOWR CASE), = $CE00
;
;
;
;       UNIVERSE LOOKS LIKE     SIGN    HI BYTE         LOW BYTE
;       -INFINITY       =       00      00              00
;        0      =       01      00              00
;       +INFINITY       =       01      FF              FF
;        -1     =       00      FF              FF
;
;
;
;       KEYCODE IS ORED WITH $C0
;
;
;
;
;       STRRAM MEMORY DEFINED   STRRAM+         TYPE    NOTES
;                       0               OBJ0    ZYLON
;                       1               OBJ1    ZYLON
;                       2               OBJ2    PHOTON
;                       3               OBJ3    PHOTON
;                       4               MISSILE PHOTON
;                       5-N     PLAY.   STARS
;                       N+1-M   PLAY.   EXPLOS STARS
```

```
                ;
                ;
                ;
                ;
                        *=$0062
                ;       ****************** POWER UP CLEARED RAM ****************
0062            MISDIF          ; MISSION DIFFICULTY
                        *=*+1
0063            RESET           ; ONE SHOT CONSOL KEY
                        *=*+1
0064            ATRACT          ; GAME OVER FLAF =FF, ATRACT MODE
                        *=*+1
0065            REPMSG                  ; REPEAT MESSAGE BYTE
                        *=*+1
0066            TIMOUT          ; ATRACT MODE TIMEOUT REG
                        *=*+1
                ;       ******************************************************
0067            PAGE0
0067            PRGOST          ; WAIT FOR VBLANK= 00
                        *=*+1
                        ********************** TEMP REG RAM **********************
0068            PNTR                    ; 2 BYTE MISC. TEMPORARY REG POINTER
                        *=*+2
006A            TEMP                    ; TEMPORARY REGISTER
                        *=*+1
006B            TEMP1                   ; TEMP REG
                        *=*+1
006C            TEMP2
                        *=*+1
006D            TEMP3
                        *=*+1
006E            TEMP4
                        *=*+1
006F            NTEMP                   ; NMI TEMP REQ
                        *=*+1
                ;       ************************************************************
                ;       ******************** SHIP SPEED RAM ************************
0070            SPEED                   ; SPEED 0 CURISER
                        *=*+1
0071            WARP                    ; SPEED DESIRED AS OPPOSED TO SPEED , THE PRESENT SPEED
                        *=*+1
                ;       ************************************************************
                ;       ******************** TIMERS RAM ****************************
0072            TIMERX          ; USED FO STAR INTENSITY
```

```
                        *=*+1
0073            ETIMER                  ; EXPLOSION TIMEOUT
                        *=*+1
0074            SECOND                  ; SECOND TIMEOUT
                        *=*+1
0075            BSEQTM          ; STARBASE SEQUENCER
                        *=*+1
0076            BINTIM          ; BINARY TIMER
                        *=*+1
0077            BINNMI          ; BINARY TIMER IN NMI
                        *=*+1
0078            JMPTIM          ; TIME TO JUMP RAM LOC
                        *=*+1
                ;       ************************************************************
                ;       ******************** STAR POINTER RAM ********************
0079            NSTARS  ; LAST BYTE OF STAR RAM TO STORE, EITHER RMLAST OR STLAST
                        *=*+1
007A            CNSTAR          ; LAST BYTE OF STAR RAM TO CLEAR
                        *=*+1
007B            BASFLG          ; STARBASE FLAG
                        *=*+1
007C            TRKFLG          ; AUTOTRACKING = FF
                        *=*+1
007D            SHENER          ; SHIELD ENERGY 0 OR 8
                        *=*+1
007E            ATENER          ; ATTACK COMPUTER ENERGY
                        *=*+1
007F            ENFLAG          ; LS BYTE OF ENERGY , TELLS WHEN TO DEC ENERGY
                        *=*+1
0080            WPENER                  ; WARP ENRGY DEPENDS ON WARP
                        *=*+1
                ;       ************************************************************
                ;       ************** MISC RAM ********************************
0081            SPABAK                  ; SPACE BACKGROUND COLOR
                        *=*+1
0082            PHITS                   ; PHOTON HIT DETECT REGS
                        *=*+2
0084            PHOFLG          ; ONE SHOT PHOTON
                        *=*+1
0085            PHOTIM                  ; REPEAT TIMEOUT
                        *=*+1
0086            LOKLOC                  ; PHOTON LOCK VECTOR PNTR
                        *=*+1
0087            PHOTOG                  ; PHOTON TOGGLE FLAG
```

```
                        *=*+1
0088            LOKWAT          ; TIME BEFORE CAN LOCK AGAIN
                        *=*+1
0089            LOKTAR          ; INDEX OF LOCK ON TARGET
                        *=*+1
008A            HITME           ; SHIP HIT FLAG
                        *=*+1
008B            REDFKG          ; RED ALERT FLAG
                        *=*+1
                ;               ************************************************
                ;       ********************** GALACTIC CHART RAM ******************
008C            GVPOS           ; CRUISER VPOS ON CHART
                        *=*+1
008D            GHPOS           ; CRUISER HPOS ON CHART
                        *=*+1
008E            HYVPOS          ; CURSOR VPOS ON CHART
                        *=*+1
008F            HYHPOS          ; CURCOR HPOS ON CHART
                        *=*+1
0090            QUADRT          ; QUADRANT STAR RAIDER IS IN
                        *=*+1
0091            HYPENG          ; HYPERWARP ENERGY USED
                        *=*+1
0092            HYPQAD                  ; HYPERWARP QUADRANT
                        *=*+1
0093            KILBAS          ; QUAD OF STARBASE, ZYLONS ARE AFTER
                        *=*+1
0094            KILOCH          ; KILL LOC HPOS
                        *=*+1
0095            KILOCV                  ; KILL LOC VPOS
                        *=*+1
0096            JMPPTS                  ; GRADIENT VALUES
                        *=*+9
009F            JMPOUT          ; JUMP TIMEOUT REG
                        *=*+1
                ;               ************************************************
                ;       ******************* SCREEN MAP DRAWING RAM ******************
00A0            HTARGT          ; HORIZ TARGET POSIT
                        *=*+1
00A1            VTARGT                  ; VERT TARGET POSIT
                        *=*+1
00A2            TARPTR          ; TARGET SEQUENCER
                        *=*+1
00A3            LOKFLG                  ; COMPUTER LOCKON
```

```
                        *=*+1
00A4            NUMPTS          ; NUMBER OF POINTS TO DRAW
                        *=*+1
00A5            VDRAW           ; VERT POS OF DRAW CURSOR
                        *=*+1
00A6            HDRAW           ; HOR POS OF DRAW CURSOR
                        *=*+1
                ;       ************************************************************
                ;       ****************** THINK RAM ***************************
00A7            ZYTOGG          ; WHICH ZYLON
                        *=*+1
00A8            SEQEN                   ; SEQUENCER PNTR RAM
                        *=*+2
00AA            SEQTIM                  ; SEQUENCER TIMEOUT RAM
                        *=*+2
00AC            XINDES                  ; DESIRED XINCRE
                        *=*+2
00AE            YINDES                  ; DESIRED YINCRE
                        *=*+2
00B0            ZINDES                  ; DESIRED ZINCRE
                        *=*+2
00B2            XINPRS          ; PRESENT POINTER TO ZYWARP
                        *=*+6
00B8            BSTRAF          ; STRAF BACK 0,OR 1
                        *=*+2
00BA            ROTTIM          ; ROTATION TIMEOUT
                        *=*+4
00BE            PHEXWT                  ; PHOTON EXPLOSION WAIT
                        *=*+1
00BF            ATTARG  ; WHICH ZYLON FIRED
                        *=*+1
                ;       ************************************************************
                ;       ************************ HYPERWARP RAM **********************
00C0            HFLAG           ; HYPERWARP ENGAGED FLAG, 00,FF, OR 7F
                        *=*+1
00C1            HISPED          ; HI BYTE SPEED, 0 OR 2=HWARP
                        *=*+1
00C2            HTIMER                  ; HWARP TIMER
                        *=*+1
00C3            HPNTR           ; POINTS TO WHICH LINE STARS TO LOAD
                        *=*+1
00C4            HSTEER          ; OLD HWAR CURSOR HPOS
                        *=*+1
00C5            VSTEER                  ; OLD HWARP CURSOR VPO
```

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                        *=*+1
00C6            STERMK                  ; STEER MASK
                        *=*+1
00C7            JMPMSK  ; INIT TARGETS IN NEW QUAD, MAX DISTANCE FROM SHIP
                        *=*+1
                ;       ************************************************************
                ;       ******************** KEYS, JOYSTICK RAM ********************
00C8            HORJOY                  ; 0=NO HORIZ, 01=RIGHT, FF=LEFT
                        *=*+1
00C9            VERJOY                  ; 0=NO VERT, 01=DOWN, FF=UP
                        *=*+1
00CA            THEKEY          ; THE KEY IN KBCODE
                        *=*+1
00CB            RATING          ; YOUR RATING
                        *=*+2
00CD            ENDRAT          ; FINAL RATING
                        *=*+1
00CE            ENDCLS          ; FINAL CLASS
                        *=*+1
                ;       ************************************************************
                ;       *************** MESSAGE RAM ****************************
00CF            MESTIM                  ; MESSAGE TIMEOUT
                        *=*+1
00D0            DISFLG                  ; DISPLAY TYPE FLAG 0=FRONT,1=BACK,80=GALCHT
                        *=*+1           ; 40=SECTOR SCAN
00D1            SENPTR                  ; SENTENCE POINTER
                        *=*+1
                ;       ************************************************************
                ;       *************** AUDIO RAM ******************************
00D2            NOTSEQ          ; NOTE POINTER
                        *=*+1
00D3            REPSEQ                  ; HOW MANY TIMES TO REPEAT
                        *=*+1
00D4            NDURAT                  ; DURAT OF NOTE
                        *=*+1
00D5            SDURAT                  ; DURAT OF SPACE
                        *=*+1
00D6            NPRIOR                  ; PRIOR OF NOE TYPE
                        *=*+1
00D7            REPPTR                  ; WHERE TO REPEAT IN NOTETB
                        *=*+1
00D8            NDURTM                  ; NOTE TIMER
                        *=*+1
00D9            NOTVOL                  ; NOTE VOLUME
```

```
                        *=*+1
00DA    PHOREP                  ; REPEAT NOTE FOR PHOTON
                        *=*+1
00DB    AUDEXP                  ; EXPLOS SERVICE TIMER
                        *=*+1
00DC    ATYPE2          ; RAM FO AUDC2
                        *=*+1
00DD    ATYPE3                  ; RAM FOR AUDC3
                        *=*+1
00DE    AFREQ1                  ; RAM FO AUDF1
                        *=*+1
00DF    AFREQ2                  ; RAM FOR AUDF2
                        *=*+1
00E0    AUDADD                  ; HOW MUCH TO ADD
                        *=*+1
00E1    AUDTIM          ; AUDIO TIMEOUT 0=ALL DONE
                        *=*+1
00E2    EXPDEL                  ; EXPLOS DELAY
                        *=*+1
00E3    BIGEXP                  ; SHIELDS DOWN EXPLOS
                        *=*+1
                ;       ************************************************************
                ;       *************** OBJECT RAM *****************************
00E4    GRAPH           ; GRAPHIC FOR OBJ0-4
                        *=*+5
00E9    STFLAG          ; 0=OBJECT NOT ON (DEFINED IN THINK, OR PHOTON)
                        *=*+5
                ;       ************************************************************
                ;       ****************** COLOR RAM ***************************
00EE    COLRAM          ; PLAYER AND PLAYFIELD COLOR RAM
                        *=*+14
                ;       ************************************************************
00FC    PHASE4
                ;


                ;
                ;       ADDRESS SPACE
                ;
                ;
                ;       COLLEEN MNEMONICS
                ;
D200    POKEY   =       $D200
D200    POT0    =       POKEY+0
D201    POT1    =       POKEY+1
```

```
D202            POT2    =       POKEY+2
D203            POT3    =       POKEY+3
D204            POT4    =       POKEY+4
D205            POT5    =       POKEY+5
D206            POT6    =       POKEY+6
D207            POT7    =       POKEY+7
D208            ALLPOT  =       POKEY+8
D209            KBCODE  =       POKEY+9
D20A            RANDOM  =       POKEY+10
D20D            SERIN   =       POKEY+13
D20E            IRQST   =       POKEY+14
D20F            SKSTAT  =       POKEY+15
D200            AUDF1   =       POKEY+0
D201            AUDC1   =       POKEY+1
D202            AUDF2   =       POKEY+2
D203            AUDC2   =       POKEY+3
D204            AUDF3   =       POKEY+4
D205            AUDC3   =       POKEY+5
D206            AUDF4   =       POKEY+6
D207            AUDC4   =       POKEY+7
D208            AUDCTL  =       POKEY+8
D209            STIMER  =       POKEY+9
D20A            SKRES   =       POKET+10
D20B            POTGO   =       POKEY+11
D20D            SEROUT  =       POKEY+13
D20E            IRQEN   =       POKEY+14
D20F            SKCTL   =       POKEY+15
                ;
D000            CTIA    =       $D000
D000            HPOSP0  =       CTIA+0
D001            HPOSP1  =       CTIA+1
D002            HPOSP2  =       CTIA+2
D003            HPOSP3  =       CTIA+3
D004            HPOSM0  =       CTIA+4
D005            HPOSM1  =       CTIA+5
D006            HPOSM2  =       CTIA+6
D007            HPOSM3  =       CTIA+7
D008            SIZEP0  =       CTIA+8
D009            SIZEP1  =       CTIA+9
D00A            SIZEP2  =       CTIA+10
D00B            SIZEP3  =       CTIA+11
D00C            SIZEM   =       CTIA+12
D00D            GRAFP0  =       CTIA+13
D00E            GRAFP1  =       CTIA+14
```

```
D00F            GRAFP2  =       CTIA+15
D010            GRAFP3  =       CTIA+16
D011            GRAFM   =       CTIA+17
D012            COLPM0  =       CTIA+18
D013            COLPM1  =       CTIA+19
D014            COLPM2  =       CTIA+20
D015            COLPM3  =       CTIA+21
D016            COLPF0  =       CTIA+22
D017            COLPF1  =       CTIA+23
D018            COLPF2  =       CTIA+24
D019            COLPF3  =       CTIA+25
D01A            COLBK   =       CTIA+26
D01B            PRIOR   =       CTIA+27
D01C            VDELAY  =       CTIA+28
D01D            GRACTL  =       CTIA+29
D01E            HITCLR  =       CTIA+30
D01F            CONSOL  =       CTIA+31
D000            M0PF    =       CTIA+0
D001            M1PF    =       CTIA+1
D002            M2PF    =       CTIA+2
D003            M3PF    =       CTIA+3
D004            P0PF    =       CTIA+4
D005            P1PF    =       CTIA+5
D006            P2PF    =       CTIA+6
D007            P3PF    =       CTIA+7
D008            M0PL    =       CTIA+8
D009            M1PL    =       CTIA+9
D00A            M2PL    =       CTIA+10
D00B            M3PL    =       CTIA+11
D00C            P0PL    =       CTIA+12
D00D            P1PL    =       CTIA+13
D00E            P2PL    =       CTIA+14
D00F            P3PL    =       CTIA+15
D010            TRIG0   =       CTIA+16
D011            TRIG1   =       CTIA+17
D012            TRIG2   =       CTIA+18
D013            TRIG3   =       CTIA+19
                ;
D400            ANTIC   =       $D400
D400            DMACTL  =       ANTIC+0
D401            CHACTL  =       ANTIC+1
D402            DLISTL  =       ANTIC+2
D403            DLISTH  =       ANTIC+3
D404            HSCROL  =       ANTIC+4
```

```
D405            VSCROL  =       ANTIC+5
D407            PMBASE  =       ANTIC+7
D409            CHBASE  =       ANTIC+9
D40A            WSYNC   =       ANTIC+10
D40B            VCOUNT  =       ANTIC+11
D40C            PENH    =       ANTIC+12
D40D            PENV    =       ANTIC+13
D40E            NMIEN   =       ANTIC+14
D40F            NMIRES  =       ANTIC+15
D40F            NMIST   =       ANTIC+15
D300            PIA     =       $D300
D300            PORTA   =       PIA+0
D301            PORTB   =       PIA+1
D302            PACTL   =       PIA+2
D303            PBCTL   =       PIA+3
                ;
                ;               OPERATING SYSTEM
                ;
0216            VIMIRQ  =       $0216           ; IMMEDITATE IRQ LOCATION
0222            VVBLKI  =       $0222           ; IMMEDIATE VERT BLANK NMI VECTOR
0200            VDSLST  =       $0200           ; DISPLAY LIST NMI VECTOR
E000            ALPHA   =       $E000
                ;

                ;                       EQUATES
0282                    DISPL1  =       DISPLY+2                ; LDISP
028F                    DISPL2  =       DISPLY+15               ; LDISP
02DF                    DISPL3  =       DISPLY+95               ; LDISP
007C                    DISTOP  =       $7C             ; LDISP SUB
0032                    VOFLOW  =       50
0032                    VSTCEN  =       50
007A                    VOBCEN  =       $7A
0050                    HOFLOW  =       80
0050                    HSTCEN  =       80
007D                    HOBCEN  =       $7D
0051                    SCPTAB  =       81              ; FOR LOADING PTAB
0064                    SBCD    =       100             ; FOR LOADING BCDCON
0028                    SCVCON  =       40              ; FOR LOADING VCON TABLES
1D40                    ICON1   =       $1D40
1BFE                    ICON2   =       $1BFE
003D                    HORCHT  =       $3D             ; HOR EDGE OF CHART
003F                    VERCHT  =       $3F             ; VERT EDGE OF CHART
000C                    STRNUM  =       12              ; NUMBER OF STARS DISPLAYED
0005                    OBJNUM  =       5               ; NUMBER OF OBJECTS
```

```
0020                    EXPNUM  =       32              ; NUMBER OF EXPLOSION STARS
0031                    RAMNUM  =       OBJNUM+STRNUM+EXPNUM    ; TOTAL NUMBER OF RAM LOC.
0004                    OBLAST  =       OBJNUM-1        ; RAM LOC OF LAST OBJECT
0030                    RMLAST  =       RAMNUM-1        ; RAM LOC OF LAST STAR IN EXPLOSION
0010                    STLAST  =       OBJNUM+STRNUM-1 ; RAM LOC OF LAST STAR IN REAL STRS
0002                    OBPHOT  =       OBJNUM-3        ; LAST PHOTON LOCATION
0003                    OBCOMP  =       OBJNUM-2        ; LAST PHOTON WHIC COULD BE COMP CONT.
1B36                    INSET   =       $1B36           ; IST BYTE OF INSET
0064                    VMAX    =       100
00A0                    HMAX    =       160             ; MAX HORIZ STAR POSITION DISPLAYED
                ;
00A0                    DBLUE   =       $A0             ; DARK BLUE
0044                    RED     =       $44             ; COLOR
0092                    LTBLUE  =       $92             ; COLOR
00AF                    BRTBLU  =       $AF             ; COLOR
004F                    BRTRED  =       $4F             ; COLOR
0060                    DRKRED  =       $60             ; COLO
0042                    DIMRED  =       $42             ; COLOR
0090                    DIMBLU  =       $90             ; COLOR
0026                    YELLOW  =       $26             ; COLOR
0055                    DIM     =       $55             ; MEMMAP CODE FOR DIM STAR
00AA                    MED     =       $AA
00FF                    BRT     =       $FF
0040                    IRQMSK  =       $40             ; KEY INTERRUPT MASK
17E3                    NOSTAR  =       $17E3           ; NO STAR DUING ATRACT
                ;
                ;
                ;               CHARACTER GRAPHICS
                        *=$A000
                ;
                ;
A000            CGRAPH
A000 00 7F 47   C0      .BYTE   00,$7F,$47,$47,$47,$47,$47,$7F
A003 47 47 47
A006 47 7F
A008 00 30 10   C1      .BYTE   00,$30,$10,$10,$10,$38,$38,$38
A00B 10 10 38
A00E 38 38
A010 00 78 08   C2      .BYTE   00,$78,$08,$08,$78,$40,$40,$78
A013 08 78 40
A016 40 78
A018 00 78 08   C3      .BYTE   00,$78,$08,$08,$7C,$0C,$0C,$7C
A01B 08 7C 0C
A01E 0C 7C
```

```
A020 00 60 60   C4      .BYTE   00,$60,$60,$60,$6C,$7C,$0C,$0C
A023 60 6C 7C
A026 0C 0C
A028 00 78 40   C5      .BYTE   00,$78,$40$,40,$78,$08,$08,$78
A02B 40 78 08
A02E 08 78
A030 00 78 48   C6      .BYTE   00,$78,$48,$40,$40,$7E,$42,$7E
A033 40 40 7E
A036 42 7E
A038 00 7C 44   C7      .BYTE   00,$7C,$44,$04,$1C,$10,$10,$10
A03B 04 1C 10
A03E 10 10
A040 00 38 28   C8      .BYTE   00,$38,$28,$28,$7C,$6C,$6C,$7C
A043 28 7C 6C
A046 6C 7C
A048 00 7C 44   C9      .BYTE   00,$7C,$44,$44,$7C,$0C,$0C,$0C
A04B 44 7C 0C
A04E 0C 0C
A050 00 00 00   CBLK    .BYTE   0,0,0,0,0,0,0,0
A053 00 00 00
A056 00 00
A058 38 38 38   CEQ     .BYTE   $38,$38,$38,$00,$00,$38,$38,$38
A05B 00 00 38
A05E 38 38
A060 80 80 80   CQCBLK  .BYTE   $80,$80,$80,$80,$80,$80,$80,$FF
A063 80 80 80
A066 80 FF
A068 00 3C 20   CE      .BYTE   $00,$3C,$20,$20,$78,$60,$60,$7C
A06B 20 78 60
A06E 60 7C
A070 00 66 99   CINF    .BYTE   $00,$66,$99,$99,$99,$66,$00,$00
A073 99 99 66
A076 00 00
A078 00 00 00   CMINUS  .BYTE   $00,$00,$00,$7E,$00,$00,$00,$00
A07B 7E 00 00
A07E 00 00
A080 00 18 18   CPLUS   .BYTE   $00,$18,$18,$7E,$18,$18,$18
A083 18 7E 18
A086 18 18
A088 00 18 7E   CPHI    .BYTE   $00,$18,$7E,$DB,$99,$DB,$7E,$18
A08B DB 99 DB
A08E 7E 18
A090 66 66 66   CV      .BYTE   $66,$66,$66,$66,$66,$2C,$38,$30
A093 66 66 2C
```

```
A096 38 30
A098 00 7C 44   CRHO    .BYTE   0,$7C,$44,$44,$7C,$68,$6C,$6C
A09B 44 7C 68
A09E 6C 6C
A0A0 00 1C 3E   CTETA   .BYTE   $00,$1C,$3E,$63,$5D,$63,$3E,$1C
A0A3 63 5D 63
A0A6 3E 1C
A0A8 00 46 46   CK      .BYTE   $00,$46,$46,$44,$7C,$64,$66,$66
A08B 44 7C 64
A08E 66 66
A0B0 FE 92 10   CT      .BYTE   $FE,$92,$10,$18,$18,$18,$18,$18
A0B3 18 18 18
A0B6 18 18
A0B8 FC 8C 8C   CC      .BYTE   $FC,$8C,$8C,$80,$80,$80,$84,$FC
A0BB 80 80 80
A0BE 84 FC
A0C0 00 00 00   CHLINE  .BYTE   0,0,0,0,0,0,0,$FF
A0C3 00 00 00
A0C6 00 FF
A0C8 80 80 80   CVLINE          .BYTE   $80,$80,$80,$80,$80,$80,$80,$80
A0CB 80 80 80
A0CE 80 80
A0D0 00 00 00   CDOT            .BYTE   0,0,0,0,0,0,0,$80
A0D3 00 00 00
A0D6 00 80
A0D8 80 AA 9C   CSBASE          .BYTE   $80,$AA,$9C,$BE,$9C,$AA,$80,$FF
A0DB BE 9C AA
A0DE 80 FF
A0E0 80 8E 80   CZY2            .BYTE   $80,$98,$90,$B6,$B0,$BC,$80,$FF
A0E3 B6 80 8C
A0E6 80 FF
A0E8 80 8E 80   CZY1            .BYTE   $80,$8E,$80,$B8,$80,$9C,$80,$FF
A0EB B8 80 9C
A0EE 80 FF
A0F0 80 B0 98   CZY3            .BYTE   $80,$B0,$98,$BE,$98,$B0,$80,$FF
A0F3 BE 98 B0
A0F6 80 FF
                ;
                ;
A0F8            SESCAN
A0F8 00 00 6C           .BYTE   0,0,$6C,$6F,$6E,$67,0,$72,$61,$6E,$67,$65,0,$73,$63,$61,$6E
A0FB 6F 6E 67
A0FE 00 72 61
A101 6E 67 65
```

```
A104 00 73 63
A107 61 6E
A109            BACKUP
A109 00 00 00           .BYTE   0,0,0,0,0,0,$61,$66,$74,0,$76,$69,$65,$77,0,0,0
A10C 00 00 00
A10F 61 66 74
A112 00 76 69
A115 65 77 00
A118 00 00
                ;
A11A            GALCHT
A11A 00 00              .BYTE 0,0
A11C 00 67 61           .BYTE   0,$67,$61,$6C,$61,$63,$74,$69,$63,0,$63,$68,$61,$72,$74,0
A11F 6C 61 63
A122 74 69 63
A125 00 63 68
A128 61 72 74
A12B 00
A12C 00 00              .BYTE   0,0
                ;
                ;
                ;
A12E            GLDISP          ; GAL CHT DISPLAY LIST
A12E 60 46              .BYTE   $60,$46
A130 1A A1              .WORD   GALCHT
A132 F0 47              .BYTE   $F0,$47
A134 35 0D              .WORD   CHTDIS
A136 07 07 07           .BYTE   7,7,7,7,7,7,7,7$80,$46
A139 07 07 07
A13C 07 07 80
A13F 46
A140 14 0D              .WORD   MESAGE
A142 46                 .BYTE   $46
A143 71 09              .WORD   DGALAC
A145 06 06 41           .BYTE   6,6,$41
A148 80 02              .WORD   DISPLY
                ;
                ;
A14A            PHASE8
                ;
                ;
                ;               INIT SECTION
                ;
A14A            INIT
```

```
A14A A9 00          LDA     #$00
A14C 8D 0F D2       STA     SKCTL
A14F 85 66          STA     TIMOUT          ; RESET TIMEOUT
A151 85 66          STA     MISDIF          ; MISSIONDIFFICULTY
A153 85 63          STA     RESET           ; ONE SHOT CONSOL
A155 A9 03          LDA     #$03
A157 8D 0F D2       STA     SKCTL           ; TURN POKEY ON
                    ;
A15A                INIT3                   ; GAME SELECT, RESTART POINT ****************************
A15A A0 24          LDY     #SENATA-SENTAB
                    ;
A15C                INIT4                   ; ATTRACT MODE RESTART POINT ***************************
A15C A9 FF          LDA     #$FF            ; GAME OVER
                    ;
A15E                INIT1                   ; GAME START RESTART POINT *************************
A15E 84 65          STY     REPMSG
A160 85 64          STA     ATRACT
                    ;       CLEAR I/O
A162 A9 00          LDA     #$00
A164 AA             TAX
A165                INIT2
A165 9D 00 D0       STA     CTIA,X
A168 9D 00 D4       STA     ANTIC,X
A16B E0 0F          CPX     #$0F            ; DONT RESET POKEY
A16D B0 03          BCS     INIT5
A16F 9D 00 D2       STA     POKEY,X
A172                INIT5
A172 9D 00 D3       STA     PIA,X
A175 9D             .BYTE   $9D             ; STA ABS,X
A176 67 00          .WORD   PAGE0           ; STA PAGE0,X (ABSOLUTE)
A178 E8             INX
A179 D0 EA          BNE INIT2
                    ;                       I/O CLEARED
                    ;
                    ;
A17B CA             DEX                     ; X=FF
A17C 9A             TXS                     ; LOAD STACK PNTR
A17D DB             CLD
                    ;
A17E A9 02          LDA     #RAMMAP/256
A180 20 0F AE       JSR     CLRMP1          ; CLEAR ALL RAM
                    ;               LD VECTOR RAM
A183 A9 51          LDA     #IRQVEC
A185 8D 16 02       STA     VIMIRQ
```

```
A188 A9 A7              LDA     #IRQVEC/256
A18A 8D 17 02           STA     VIMIRQ+1
A18D A9 D1              LDA     #VBNMI
A18F 8D 22 02           STA     VVBLKI
A192 A9 18              LDA     #DISNMI
A194 8D 00 02           STA     VDSLST
A197 A9 A6              LDA     #VBNMI/256
A199 8D 23 02           STA     VVBLKI+1
A19C A9 A7              LDA     #DISNMI/256
A19E 8D 01 02           STA     VDSLST+1
                ;
                ;

                ;                       CONFIGURE PIA
                ;
A1A1 A9 04              LDA     #$04
A1A3 8D 02 D3           STA     PACTL           ; TURN ON JOYSTICK
                ;
                ;
                ;
                ;
                ;               CONFIGURE CTIA
                ;
A1A6 A9 11              LDA     #$11
A1A8 8D 1B D0           STA     PRIOR
                ;
A1AB A9 03              LDA     #$03
A1AD 8D 1D D0           STA     GRACTL
                ;
A1B0 20 BA B3           JSR     LDTABS          ; INIT TABLES
                ;
                ;
                ;                       INIT DISPLAY LIST
A1B3 A2 0A              LDX     #$0A            ; KEY F, FRONT DISPLAY
A1B5 20 45 B0           JSR     KEYS15          ; INIT FRONT VIEW
A1B8 A5 64              LDA     ATRACT
A1BA 29 80              AND     #$80
A1BC A8                 TAY
A1BD A2 5F              LDX     #DISPL3-DISPLY
A1BF A9 08              LDA     #$08
A1C1 20 F1 AD           JSR     LDISP           ; SHIP ALIVE OR DEAD
                ;
A1C4 A9 20              LDA     #$20
A1C6 85 71              STA     WARP            ; WARP 5 SPEED
```

```
                    ;
                    ;
                    ;                       CONFIGURE ANTIC
                    ;
A1C8 A9 80          LDA     #DISPLY
A1CA 8D 02 D4       STA     DLISTL
A1CD A9 02          LDA     #DISPLY/256
A1CF 8D 03 D4       STA     DLISTH
A1D2 A9 3E          LDA     #$3E
A1D4 8D 00 D4       STA     DMACTL          ; DMA ON
                    ;
A1D7 A9 00          LDA     #PGRAPH-$0300/256
A1D9 8D 07 D4       STA     PMBASE                  ; LD PLAYER / MISSLE BASE
                    ;
                    ;
                    ;
                    ;
                    ;               INIT NUMBER OF STARS
A1DC A9 10          LDA     #STLAST
A1DE 85 79          STA     NSTARS
                    ;
                    ;
A1E0 A6 62          LDX     MISDIF          ; GAME TYPE MESSAGE
A1E2 BC 0C BF       LDY     MSENTB,X
A1E5 20 23 B2       JSR     LDMESS
                    ;
                    ;
                    ;
                    ;
                    ;
                    ;               ENABLE INTERRUPTS
A1E8 A9 40          LDA     #IRQMSK
A1EA 8D 0E D2       STA     IRQEN
A1ED 58             CLI             ; IRQS READY
A1EE A9 C0          LDA     #$C0
A1F0 8D 0E D4       STA     NMIEN           ; NMIS READY
                    ;
                    ;               END INIT
                    ;
                        ;               MAIN PROGRAM
A1F3                MAIN
                    ;
                    ;               MAIN FLOW CHART
                    ;       START
```

```
                ;               WAIT FOR VBLANK
                ;               CLEAR AND LOAD STARS/OBJECTS
                ;               MOVE ROUTINES
                ;               PLAYER INTERFACE SECTION                GAME ON ONLY
                ;               SERVICE SECTION                         GAME ON ONLY
                ;               HIT DETECT                              GAME ON ONLY
                ;               SERVICE CONTINUOUS RUNNING ROUTINES
                ;       JUMP TO START
                ;
                ;
A1F3 A5 67              LDA     PROGST
A1F5 F0 FC              BEQ     MAIN                    ; WAIT FOR VBLANK NMI
A1F7 A9 00              LDA     #$00                    ; RESET VBLANK STATUS REGISTER
A1F9 85 67              STA     PROGST
                ;
                ;
                ;
                ;
                ;
                ;               UPDATE MEMORY MAP RAM AND PLAYERS RAM
                ;
                ;               CLRSTR
                ;               CLEAR STAR ROUTINE
A1FB A5 7A              LDA     CNSTAR          ; THIS FLAGS SAYS OLDPS NOT DEFINED IF=00
A1FD F0 20              BEQ     CLRSR2
A1FF A2 04              LDX     #OBLAST         ; LAST LOCATION OF OBJECT IN RAM
A201            CLRSR1
A201 E8                 INX
A202 BC 5B 0C           LDY     OLDVER,X
A205 B9 00 08           LDA     VCONL,Y
A208 85 68              STA     PNTR
A20A B9 64 08           LDA     VCONH,Y
A20D 85 69              STA     PNTR+1
A20F BC 8C 0C           LDY     OLDHOR,X
A212 BD BD 0C           LDA     OLDBYT,X
A215 91 68              STA     (PNTR),Y        ; BYTE RESTORED
A217 E4 7A              CPX     CNSTAR
S219 90 E6              BCC     CLRSR1
A21B A9 00              LDA     #$00
A21D 85 7A              STA     CNSTAR          ; STARS CLEARED
A21F            CLRSR2
                ;
                ;
                ;               STOSTR
```

```
                        ;
                        ;       STORE STAR IN RAM MAP ROUTINE
                        ;
A21F A5 C0              LDA     HFLAG           ; IN HYPER JUMP ?
A221 30 2D              BMI     STOSR1                  ; YES , NO STORE.
                        ;
                        ;
                        ;
A223 A6 79              LDX     NSTARS  ; LAST BYTE OF STAR RAM TO STORE
A225 86 7A              STX     CNSTAR          ; STARS POINTERS DEFINED OK TO CLEAR NOW
A227                    STOSR2
                        ;
A227 BD F9 0B           LDA     VPOS,X
A22A 9D 5B 0C           STA     OLDVER,X
A22D A8                 TAY
A22E B9 00 08           LDA     VCONL,Y
A231 85 68              STA     PNTR
A233 B9 64 08           LDA     VCONH,Y
A236 85 69              STA     PNTR+1
A238 BD 2A 0C           LDA     HPOS,X
A23B 4A                 LSR     A
A23C 4A                 LSR     A
A23D 9D 8C 0C           STA     OLDHOR,X
A240 A8                 TAY
A241 B1 68              LDA     (PNTR),Y
A243 9D BD 0C           STA     OLDBYT,X                ; BYTE SAVED
A236 1D EE 0C           ORA     STRBYT,X
A249 91 68              STA     (PNTR),Y
                        ;
A24B CA                 DEX
A24C E0 04              CPX     #0BLAST
A24E D0 07              BNE     STOSR2          ; DO NEXT STAR
A250                    STOSR1
A250 A5 66              LDA     TIMOUT
A252 10 0E              BPL     STOSR3
A254 A9 00              LDA     #$00
A256 8D E3 17           STA     NOSTAR
A259 8D E4 17           STA     NOSTAR+1
A25C 8D BC 17           STA     NOSTAR-39
A25F 8D BB 17           STA     NOSTAR-40
A262                    STOSR3
                        ;
                        ;
```

```
                        ;               CLROBJ
                        ;               CLEAR OBJECT RAM
                        ;       OBJECT 4
A262 A9 00              CLROB1  LDA     #$00
A264 AC 5F 0C                   LDY     OLDVER+4
A267 AE C1 0C                   LDX     OLDNUM+4
A26A                    CLROB1
A26A 99 00 03                   STA     MGRAPH,Y
A26D C8                         INY
A26E CA                         DEX
A26F 10 F9                      BPL     CLROB1
                        ;               OBJECT 3
A271 AC 5E 0C                   LDY     OLDVER+3
A274 AE C0 0C                   LDX     OLDNUM+3
A277                    CLROB2
A277 99 00 07                   STA     PGRAP3,Y
A27A C8                         INY
A27B CA                         DEX
A27C 10 F9                      BPL     CLROB2
                        ;               OBJECT 2
A27E AC 5D 0C                   LDY     OLDVER+2
A281 AE BF 0C                   LDX     OLDNUM+2
A284                    CLROB3
A284 99 00 06                   STA     PGRAP2,Y
A287 C8                         INY
A288 CA                         DEX
A289 10 F9                      BPL     CLROB3
                        ;               OBJECT 1
A28B AC 5C 0C                   LDY     OLDVER+1
A28E AE BE 0C                   LDX     OLDNUM+1
A291                    CLROB4
A291 99 00 05                   ATS     PGRAP1,Y
A294                            INY
A295                            DEX
A296 10 F9                      BPL     CLROB4
                        ;               OBJECT 0
A298 AC 5B 0C                   LDX     OLDVER+0
A29B AE BD 0C                   LDX     OLDNUM+0
A29E                    CLROB5
A29E 99 00 04                   STA     PGRAP0,Y
A2A1 C8                         INY
A2A2 CA                         DEX
A2A3 10 F9                      BPL     CLROB5
                        ;
```

```
                    ;
                    ;               ST00BJ
                    ;               STORE OBJECT ROUTINE
                    ;
                    ;       OBJECT 4, ALWAYS PHOTON, OR DOCKING OBJECT
A2A5 AD 90 0C               LDA     GINDEX+4
A2A8 C9 01                  CMP     #$01            ; DEFINE CARRY
A2AA A4 E8                  LDY     GRAPH+4
A2AC AE FD 0B               LDX     VPOS+4
A2AF 8E 5F 0C               STX     OLDVER+4
A2B2 AD F2 0C               LDA     NUMBYT+4
A2B5 85 6A                  STA     TEMP
A2B7 8D C1 0C               STA     OLDNUM+4
A2BA                ST00B1
A2BA B9 E4 B8               LDA     PHGRAF,Y
A2BD B0 03                  BCS     ST00B8
A2BF 2D 0A D2               AND     RANDOM
A2C2                ST00B8
A2C2 9D 00 03               STA     MGRAPH,X
A2C5 C8                     INY
A2C6 E8                     INX
A2C7 C6 6A                  DEC     TEMP
A2C9 10 EF                  BPL     ST00B1
                    ;       OBJECT 3 , ALWAYS PHOTON
A2CB AD 8F 0C               LDA     GINDEX+3
A2CE C9 01                  CMP     #$01
A2D0 A4 E7                  LDY     GRAPH+3
A2D2 AE FC 0B               LDX     VPOS+3
A2D5 8E 5E 0C               STX     OLDVER+3
A2D8 AD F1 0C               LDA     NUMBYT+3
A2DB 85 6A                  STA     TEMP
A2DD 8D C0 0C               STA     OLDNUM+3
A2E0                ST00B2
A2E0 B9 E4 B8               LDA     PHGRAF,Y
A2E3 B0 03                  BCS     ST00B9
A2E5 2D 0A D2               AND     RANDOM
A2E8                ST00B9
A2E8 9D 00 07               STA     PGRAP3,X
A2EB E8                     INX
A2EC C8                     INY
A2ED C6 6A                  DEC     TEMP
A2EF 10 EF                  BPL     ST00B2
                    ;       OBJECT 2, (VARIABLE GRAPHIC)
```

```
A2F1 AD 8E 0C           LDA     GINDEX+2
A2F4 C9 01              CMP     #$01            ; DEFINE CARRY
A2F6 A4 E6              LDY     GRAPH+2
A2F8 AE FB 0B           LDX     VPOS+2
A2FB 8E 5D 0C           STX     OLDVER+2
A2FE AD F0 0C           LDA     NUMBYT+2
A301 85 6A              STA     TEMP
A303 8D BF 0C           STA     OLDNUM+2
A306            ST00B3
A306 B9 E4 B8           LDA     PHGRAF,Y
A309 B0 03              BCS     ST00B7
A30B 2D 0A D2           AND     RANDOM
A30E            ST00B7
A30E 9D 00 06           STA     PGRAP2,X
A311 E8                 INX
A312 C8                 INY
A313 C6 6A              DEC     TEMP
A315 10 EF              BPL     ST00B3
                ;               OBJECT 1 (VARIABLE)
A317 A4 E5              LDY     GRAPH+1
A319 AE FA 0B           LDX     VPOS+1
A31C 8E 5C 0C           STX     OLDVER+1
A31F AD EF 0C           LDA     NUMBYT+1
A322 85 6A              STA     TEMP
A324 8D BE 0C           STA     OLDNUM+1
A327            ST00B5
A327 B9 B1 B9           LDA     ZYGRAP,Y
A32A 9D 00 05           STA     PGRAP1,X
A32D E8                 INX
A32E C8                 INY
A32F C6 6A              DEC     TEMP
A331 10 F4              BPL     ST00B5
            ;                   OBJECT 0 (VARIABLE)
A333 A4 E4              LDY     GRAPH+0
A335 AE F9 0B           LDX     VPOS+0
A338 8E 5B 0C           STX     OLDVER+0
A33B AD EE 0C           LDA     NUMBYT+0
A33E 85 6A              STA     TEMP
A340 8D BD 0C           STA     OLDNUM+0
A343            ST00B6
A343 B9 B1 B9           LDA     ZYGRAF,Y
A346 9D 00 04           STA     PGRAP0,X
A349 E8                 INX
A34A C8                 INY
```

```
A34B C6 6A              DEC     TEMP
A34D 10 F4              BPL     ST00B6
                ;
                ;               UPDATE HORIZ
                ;
A34F AD 2A 0C           LDA     HPOS+0
A352 8D 00 D0           STA     HPOSP0+0
A355 AD 2B 0C           LDA     HPOS+1
A358 8D 01 D0           STA     HPOSP0+1
A35B AD 2C 0C           LDA     HPOS+2
A35E 8D 02 D0           STA     HPOSP0+2
A361 AD 2D 0C           LDA     HPOS+3
A364 8D 03 D0           STA     HPOSP0+3
A367 AD 2E 0C           LDA     HPOS+4
A36A 8D 07 D0           STA     HPOSP0+7
A36D 18                 CLC
A36E 69 02              ADC     #$02
A370 8D 06 D0           STA     HPOSP0+6
A373 69 02              ADC     #$02
A375 8D 05 D0           STA     HPOSP0+5
A378 69 02              ADC     #$02
A37A 8D 04 D0           STA     HPOSP0+4

                ;
                ;               END UPDATE MEMORY MAP RAM AND PLAYERS RAM
                ;
                ;
                ;
                ;
                ;       STARS/OBJECTS MOVE ROUTINES
A37D 24 D0              BIT     DISFLG
A37F 30 3A              BMI     MAINI           ; NO ROTATE IN GALACTIC CHART
                ;
                ;               YROTAT
                ;               ROTATE ALL LEFT AND RIGHT
A381 A5 C8              LDA     HORJOY          ; HORIZ JOYSTICK ?
A383 F0 19              BEG     YROTA1          ; NO
A385 85 6D              STA     TEMP3
A387 A4 79              LDY     NSTARS          ; LAST BYTE OF STARS
A389            YROTA2
A389 84 6E              STY     TEMP4           ; TEMP STORE
A38B 18                 CLC
A38C 9B                 TYA
A38D AA                 TAX
```

```
A38E 69 31          ADC   #RAMNUM         ; YPOS
A390 A8             TAY
A391 20 9B B6       JSR   ROHELP
A394 98             TYA
A395 AA             TAX
A396 A4 6E          LDY   TEMP4
A398 20 9B B6       JSR   ROHELP
A39B 88             DEY
A39C 10 EB          BPL   YROTA2
A39E          YROTA1
              ;
              ;
              ;
              ;           ZROTAT
              ;           ROTATE ALL UP AND DOWN
A39E A5 C9          LDA   VERJOY          ; VERT JOYSTICK ?
A3A0 F0 19          BEQ   ZROTA1          ; NO
A3A2 85 6D          STA   TEMP3
A3A4 A4 79          LDY   NSTARS
A3A6          ZROTA2
A3A8 84 6E          STY   TEMP4
A3A8 18             CLC
A3A9 98             TYA
A3AA AA             TAX
A3AB 69 62          ADC   #RAMNUM*2             ; ZOPS
A3AD A8             TAY
A3AE 20 9B B6       JSR   ROHELP
A3B1 98             TYA
A3B2 AA             TAX
A3B3 A4 6E          LDY   TEMP4
A3B5 20 9B B6       JSR   ROHELP
A3B8 88             DEY
A3B9 10 EB          BPL   ZROTA2
A3BB          ZROTA1
              ;
              ;
A3BB          MAIN1
              ;           XMOVER
              ;           UPDATE ALL XPOS DUE TO FORWARD SHIP MOTION
              ;           SUBTRACT SPEED FROM XPOS
A3BB A6 79          LDX   NSTARS          ; X=INDEX TO STARS/POBJECT TO UPDATE
A3BD          XMOVE1
A3BD E0 05          CPX   #OBJNUM         ; PHOTONS ?
A3BF B0 05          BCS   XMOVE2          ; NO.
```

```
A3C1 BD BC 0C           LDA     GINDEX,X
A3C4 F0 19              BEQ     XMOVE3
A3C6            XMOVE2
A3C6 38                 SEC
A3C7 BD D3 0A           LDA     XPOSL,X
A3CA E5 70              SBC     SPEED
A3CC 9D D3 0A           STA     XPOSL,X
A3CF BD 40 0A           LDA     XPOSH,X
A3D2 E5 C1              SBC     HISPED
A3D4 9D 40 0A           STA     XPOSH,X
A3D7 BD AD 09           LDA     XSIGN,X
A3DA E9 00              SBC     #$00            ; CARRY ONLY
A3DC 9D AD 09           STA     XSIGN,X
A3DF            XMOVE3
A3DF CA                 DEX
A3E0 10 DB              BPL     XMOVE1          ; NEXT STAR
                ;               ALL DONE
                ;
                ;

                ;               MOTION
                ;       OTHER MOTION SUCH AS DUE TO ZYLON SHIP POWER
                ;        OR PHOTONS
                ;       XINCRE,YINCRE,ZINCRE ARE ALL SIGN-MAGNITUDE TYPES
A3E2 A6 79              LDX     NSTARS
A3E4            MOTIN1
A3E4 E0 10              CPX     #STLAST         ; REG STARS ?
A3E6 D0 02              BNE     MOTIN9          ; NO
A3E8 A2 04              LDX     #0BLAST         ; LAST OBJ
A3EA            MOTIN9
A3EA 8A                 TXA
A3EB            MOTIN2
A3EB A8                 TAY
A3EC A9 00              LDA     #$00
A3EE 85 6B              STA     TEMP1
A3F0 B9 66 0B           LDA     XINCRE,Y
A3F3 10 09              BPL     MOTIN3
A3F5 49 7F              EOR     #$7F
A3F7 18                 CLC
A3F8 69 01              ADC     #$01
A3FA B0 02              BCS     MOTIN3
A3FE            MOTIN3
A3FE 18                 CLC
A3FF 79 D3 0A           ADC     XPOSL,Y
```

```
A402 99 D3 0A           STA     XPOSL,Y
A405 B9 40 0A           LDA     XPOSH,Y
A408 65 6B              ADC     TEMP1
A40A 99 40 0A           STA     XPOSH,Y
A40D B9 AD 09           LDA     XSIGN,Y
A410 65 6B              ADC     TEMP1
A412 99 AD 09           STA     XSIGN,Y
                ;
A415 98                 TYA
A416 18                 CLC
A417 69 31              ADC     #RAMNUM
A419 C9 90              CMP     #RMLAST*3       ; ALL DONE ?
A41B 90 CE              BCC     MOTIN2          ; NO
A41D CA                 DEX
A41E 10 C4              BPL     MOTIN1          ; NEXT STAR OR OBJECT
                ;
                ;
                ;               BOUNDS
                ;
A420 A0 04              LDY     #OBLAST         ; ONLY OBJECTS
A422            BOUND1
A422 98                 TYA
A423 AA                 TAX
A424 A9 02              LDA     #$02
A426 85 6A              STA     TEMP
A428            BOUND3
A428 BD AD 09           LDA     XSIGN,X
A42B C9 02              CMP     #$02
A42D 90 10              BCC     BOUND4
                ;               OUT OF BOUNDS
A42F 0A                 ASL     A
A430 A9 00              LDA     #$00
A432 9D AD 09           STA     XSIGN,X
A435 B0 05              BCS     BOUND5
A437 FE AD 09           INC     XSIGN,X
A43A 49 FF              EOR     #$FF
A43C            BOUND5
A43C 9D 40 0A           STA     XPOSH,X
A43F            BOUND4
A43F 8A                 TXA
A440 18                 CLC
A441 69 31              ADC     #RAMNUM
A443 AA                 TAX
```

```
A444 C6 6A              DEC     TEMP
A446 10 E0              BPL     BOUND3
A448 88                 DEY
A449 10 D7              BPL     BOUND1          ; NEXT STAR
                ;
                ;

                ;               CALCVH
                ;       CALCULATE V,H POS FOR ALL STARS/OBJ
A44B A5 D0              LDA     DISFLG
A44D C9 02              CMP     #$02
A44F B0 5C              BCS     CALC14          ; NOT FRONT OR BACK
                ;
A451 A6 79              LDX     NSTARS          ; X=INDEX OF STARS
A453            CALCV1                  ;STAR LOOP
A453 A9 FF              LDA     #$FF
A455 BC AD 09           LDY     XSIGN,X
A458 C4 D0              CPY     DISFLG
A45A F0 4B              BEQ     CALCV5
                ;
                ;       UPDATE VPOS
                ;
A45C BD 0F 0A           LDA     ZSIGN,X         ; 2'S COMPLE ZOPS?
A45F D0 12              BNE     CALCV8          ; NO
                ;                       2'S COMPLEMENT
A461 38                 SEC
A462 A9 00              LDA     #$00
A464 FD 35 0B           SBC     ZPOSL,X
A467 85 6A              STA     TEMP
A469 A9 00              LDA     #$00
A46B FD A2 0A           SBC     ZPOSH,X
A46E 85 6B              STA     TEMP1
A470 4C 7D A4           JMP     CALCV9
A473            CALCV8
A473 BD 35 0B           LDA     ZPOSL,X
A476 85 6A              STA     TEMP            ; STORE IN TOP REG
A478 BD A2 0A           LDA     ZPOSH,X
A47B 85 6B              STA     TEMP1
A47D            CALCV9
A47D 20 21 AA           JSR     DIVIDE          ; DIVIDE ZPOS BY XPOS
A480 20 1E B7           JSR     STVPOS          ; STOE VPO
                ;
                ;                       UPDATE HORIZ POS
                ;
```

```
                        ;
A483 BD DE 09           LDA     YSIGN,X         ; 2'S COMPLE YPOS ?
A486 D0 12              BNE     CALCV3          ; NO.
                        ;                       2'S COMPLEMENT
A488 38                 SEC
A489 A9 00              LDA     #$00
A48B FD 04 0B           SBC     YPOSL,X
A48E 85 6A              STA     TEMP            ; STORE IN TOP(NUMERATOR)REG
A490 A9 00              LDA     #$00
A492 FD 71 0A           SBC     YPOSL,X
A495 85 6B              STA     TEMP1
A497 4A A4 A4           JMP     CALCV4
A49A                    CALCV3
A49A BD 04 0B           LDA     YPOSL,X         ; SOTRE IN TOP REG
A49D 85 6A              STA     TEMP
A49F BD 71 0A           LDA     YPOSK,X
A4A2 85 6B              STA     TEMP1
A4A4                    CALCV4
A4A4 20 21 AA           JSR     DIVIDE          ; DIVIDE YPOS BY XPOS
A4A7                    CALCV5
A4A7 20 FB B6           JSR     SHTPOS          ;       STORE HPOS
                        ;
A4AA CA                 DEX
A4AB 10 A6              BPL     CALCV1          ; NEXT STAR
                        ;                       ALL DONE
A4AD                    CALC14
                        ;
                        ;

A4AD 20 62 B1           JSR     CSERVE          ; SERVICE GALACTIC CHART
                        ;
                        ;
                        ;       SSERVE
                        ;                       SECTOR SCAN SERVE
A4B0 24 D0              BIT     DISFL0
A4B2 50 31              BVC     SSERV1
A4B4 A2 31              LDX     #INSTB2-INSTAB          ; LOAD SECTOR SCAN SHIP
A4B6 20 6F A7           JSR     LDINST
A4B9 2C 96 09           BIT     DAMAGE+4                ; SECTOR SCAN DAMAGE
A4BC 70 27              BVS     SSERV1
                        ;
A4BE A6 79              LDX     NSTARS
A4C0                    SSERV2
A4C0 BD 40 0A           LDA     XPOSH,X
```

```
A4C3 BC AD 09          LDY     XSIGN,X
A4C6 D0 02             BNE     SSERV3
A4C8 49 FF             EOR     #$FF
A4CA           SSERV3
A4CA A8                TAY
               ;
A4CB B9 E9 0D          LDA     PTAB,Y
A4CE 20 1E B7          JSR     STVPOS
A4D1 BD 71 0A          LDA     YPOSH,X
A4D4 BC DE 09          LDY     YSIGN,X
A4D7 D0 02             BNE     SSERV4
A4D9 49 FF             EOR     #$FF
A4DB           SSERV4
A4DB A8                TAY
               ;
A4DC B9 E9 0D          LDA     PTAB,Y
A4DF 20 FB B6          JSR     STHPOS
A4E2 CA                DEX
A4E3 10 DB             BPL     SSERV2
A4E5           SSERV1
               ;
               ;

               ;               OBJCOL
               ;               SELECT OBJECT COLOR , GRAPHIC
A4E5 A2 05             LDX     #OBLAST+1
A4E7           OBJCL2          ; OBJCT LOOP
A4E7 CA                DEX
A4E8 10 03             BPL     OBJCL1
A4EA 4C 79 A5          JMP     OBJC12
A4ED           OBJCL1
A4ED A9 00             LDA     #$00
A4EF 95 E4             STA     GRAPH,X         ; SET GRAPH PNTR TO NULL GRAPHIC
A4F1 9D EE 0C          STA     NUMBYT,X                ; STORE 1 BYTE ONLY
A4F4 24 D0             BIT     DISFLG          ; GALACTIC CHART ?
A4F6 10 0B             BPL     OBJCL3          ; NO
A4F8 E0 03             CPX     #$03            ; OBJ 0,1,2 ?
A4FA 90 EB             BCC     OBJCL2          ; YES , NO DISPLAY
A4FC           OBJCL4
A4FC AD 0A D2          LDA     RANDOM          ; RANDOM COLOR
A4FF A0 F2             LDY     #$F2            ; SMALL SIZE
A501 30 2B             BMI     OBJCL6          ; JMP
A503           OBJCL3
A503 D5 E9             CMP     STFLAG,X                ; OBJECT ON ?
```

```
A505 F0 E0              BEQ     OBJCL2                  ; NO
A507 70 F3              BVS     OBJCL4          ; SECTOR SCAN
A509 BC 40 0A           LDY     XPOSH,X         ; INTENSITY AND GRAPHIC SIZE
A50C 24 7B              BIT     BASFLG          ; STARBASE ?
A50E 50 1E              BVC     OBJCL6          ; NO
A510 E0 02              CPX     #$02            ; SBASE OBJECTS ?
A512 B0 16              BCS OBJCL8              ; NO
A514 AD 2C 0C           LDA     HPOS+2          ; GANG OBJ 0,1,2 TOGETHER
A517 18                 CLC                     ; OBJ 2 IS REFERENCE
A518 7D DB BE           ADC     BHORTB,X        ; HORIZ OFFSET , +8,-8
A51B 9D 2A 0C           STA     HPOS,X
A51E AD FB 0B           LDA     VPOS+2          ; GANG VPOS
A521 18                 CLC
A522 69 04              ADC     #4
A524 9D F9 0B           STA     VPOS,X
A527 AC 42 0A           LDY     XPOSH+2         ; ALL USE OBJ2 POSIT.
A52A            OBJCL8
A52A A5 76              LDA     BINTIM          ; MODULATE STARBASE COLOR
A52C 29 0F              AND     #$0F
A25E            OBJCL6
A52E 85 6B              STA     TEMP1           ; COLOR MODULATE
A530 98                 TYA                     ; XPOSH
A531 BC F9 0B           LDY     VPOS,X          ; IN BOUNDS CHECK
A534 C0 CC              CPY     #$CC            ; IN BOUNDS ?
A536 B0 AF              BCS     OBJCL2          ; NO
A538 A4 D0              LDY     DISFLG          ; FRONT OR BACK ?
A53A F0 02              BEQ     OBJCL7          ; FRONT
A53C 49 FF              EOR     #$FF            ; ONES COMPLEMENT XPOSH
A53E            OBJCL7
A53E C9 20              CMP     #$20            ; TOO FAR AWAY ?
A540 B0 A5              BCS OBJCL2              ; YES
A542 C9 10              CMP     #$10            ; SMALLEST SIZE ?
A544 90 02              BCC     OBJCL5          ; NO
A546 A9 0F              LDA     #$0F            ; SMALL SIZE
A548            OBJCL5                          ; LD COLOR, GRAPHIC PNTRS
A548 85 AA              STA TEMP                ; TEMP SAVE XPOSH
A54A 1D 8C 0C           ORA GINDEX,X                    ; TYPE OF GRAPHIC
A54D 4A                 LSR     A               ; ONLY 8 VALUES PER TYPE
A54E A8                 TAY
A54F B9 2F BE           LDA     GPOINT,Y                ; OFFSET FROM PHGRAF, OR ZYGRAF
A552 95 E4              STA     GRAPH,X         ; HOLDS INDEX
A554 B9 7F BE           LDA     NBYTAB,Y
A557 9D EE 0C           STA     NUMBYT,X                ; NUMBER OF BYTES TO SAVE
A55A 98                 TYA
```

```
A55B 4A                 LSR     A
A55C 4A                 LSR     A
A55D 4A                 LSR     A
A55E A8                 TAY                     ; GINDEX ONLY
A55F B9 D1 BF           LDA     COLTAB,Y                ; CHROMA OF OBJ
A562 C0 08              CPY     #$08            ; BASE STAR ?
A564 D0 03              BNE     OBJC11          ; NO
A566 4D 0A D2           EOR     RANDOM          ; RANDOM COLOR
A569            OBJC11
A569 A4 6A              LDY     TEMP            ; DISTANCE FOR INTENSITY
A56B 59 DB BF           EOR     COLINT,Y        ; INTENSITY
A56E 45 6B              EOR     TEMP1           ; COLOR MODULATE , IF ANY
A570 BC DF B8           LDY     CLINDX,X        ; WHERE TO STORE
A573 99 EE 00           STA     COLRAM,Y        ; COLOR UPDATED
A576 4C E7 A4           JMP     OBJCL2          ; NEXT OBJ
A579            OBJC12

                ;               STRBRT
                ;               STAR BRIGHTNESS INTENSITY NEW STAR CALC
                ;
A579 A0 AF              LDY     #BRTBLU
A57B A6 81              LDX     SPABAK
A5D7 A5 8B              LDA     REDFLG
A57F F0 0C              BEQ     STRBR2
A581 C6 8B              DEC     REDFLG          ; TIME OUT RED ALERT
A583 A0 4F              LDY     #BRTRED
A585 29 20              AND     #$20
A587 F0 04              BEQ     STRBR2
A589 A2 42              LDX     #DIMRED
A58B A0 60              LDY     #DRKRED
A58D            STRBR2
A58D 84 F4              STY     COLRAM+6                ; PF2
A58F 86 F6              STX     COLRAM+8                ; BAK
A591 A6 79              LDX     NSTARS          ; X=INDWX , INIT TO LAST STAR
A593            STRBR1
A593 BD 40 0A           LDA     XPOSH,X         ; INTENSITY DETERMINED BY XPOS
A596 A4 D0              LDY     DISFLG          ; FRONT OR BACK ?
A598 C0 01              CPY     #$01            ; ALL BUT BACK VIEW WILL BRANCH
A59A D0 09              BNE     STRBR5          ; FRONT
A59C C9 F0              CMP     #$F0            ; STAR AT MINUS BOUNDS ?
A59E B0 03              BCS     STRBR6
A5A0 20 64 B7           JSR     NEWSTR
A5A3            STRBR6
A5A3 49 FF              EOR     #$FF            ; COMPLEMENT XPOS
```

```
A5A5                STRBR5
A5A5 C9 10                  CMP     #$10            ; USE DEFAULT ?
A5A7 90 02                  BCC     STRBR4          ; NO
A5A9 A9 0F                  LDA     #$0F            ; DEFAULT
A5AB                STRBR4
A5AB 0A                     ASL     A
A5AC 29 1C                  AND     #$1C
A5AE 05 72                  ORA     TIMERX                  ; MULTIPLEX     WITH FRAME OUNT
A5B0 A8                     TAY                             ; FOR 8 APPARENT LEVELS OF BRIGHT
A5B1 B9 90 BA               LDY     BRTABL,Y                ; WHICH PLAYFIELD
A5B4 85 6A                  STA     TEMP
A5B6 BD 2A 0C               LDA     HPOS,X
A5B9 20 03                  AND     #$03
A5BB A8                     TAY
A5BC B9 B0 BA               LDA     MASK,Y
A5BF 25 6A                  AND     TEMP
AC51 9D EE 0C               STA     STRBYT,X                ; DATA TO STORE IN STOSTR
A5C4 CA                     DEX
A5C5 E0 05                  CPX     #OBJNUM                 ; ALL DONE WITH STARS ?
A5C7 B0 CA                  BCS     STRBR1                  ; NEXT STAR
                            ;               ALL DONE

                    ;
                    ;       END STAR/OBJECTS MOVE ROUTINES
                    ;
                    ;
                    ;
                    ;       GAME ON ROUTINES
                    ;               PLAYER INTERFACE SECTION AND SERVICE SECTION, HIT DETECT
                    ;
A5C9 24 64                  BIT     ATRACT          ; GAME OVER LOCKOUT PLAYER
A5CB 50 03                  BVC     MAIN4           ; YES
A5CD 4C 9B A6               JMP     MAIN3
A5D0                MAIN4
                    ;
A5D0 20 FE AF               JSR     KEYSRV          ; SERVICE JEYBOARD
                    ;               JOYSTK
                    ;               JOYSTICK EVALUATION ROUTINE
A5D3 AD 00 D3               LDA     PROTA
A5D6 A8                     TAY             ; STORE TEMP
A5D7 29 03                  AND     #$03            ; VERT ONLY
A5D9 AA                     TAX
A5DA BD F5 BA               LDA     JOYTAB,X                ; CODE FOR VERT
A5DD 85 C9                  STA     VERJOY
```

```
A5DF 98                 TYA             ; PORT A AGAIN
A5E0 4A                 LSR     A
A5E1 4A                 LSR     A
A5E2 29 03              AND     #$03
A5E4 AA                 TAX                     ; HORIZ ONLY
A5E5 BD F5 BA           LDA     JOYTAB,X                ; CODE FOR HORIZ
A5E8 85 C8              STA     HORJOY

A5EA 20 3D AF           JSR     HITZYL          ; HIT ZYLON
A5ED 20 29 AE           JSR     PHOTON          ; SERVICE TRIGGERS
                ;               ASERVER
                ;               ATTACK CPMPUTER SERVICE
A5F0 2C 95 09           BIT     DAMAGE+3
A5F3 70 40              BVS     ASERV2
A5F5 A5 7E              LDA     ATENER          ; ATTACK ON ?
A5F7 F0 3C              BEQ     ASERV2          ; NO
A5F9 A5 D0              LDA     DISFLG
A5FB D0 03              BNE     ASERV1
A5FD 20 BF A7           JSR     UPINST
A600            ASERV1
                ;
                ;               AUTO TARGET SELECTOR
                ;
A600 AE 5C 09           LDX     DCSTOR
A603 A5 BF              LDA     ATTARG
A605 30 05              BMI     ASERV4
A607 AA                 TAX
A608 09 80              ORA     #$80
A60A 85 BF              STA     ATTARG
A60C            ASERV4
A60C B5 E9              LDA     STFLAG,X
A60E D0 0B              BNE     ASERV3
A610 8A                 TXA
A611 49 01              EOX     #$01
A613 AA                 TAX
A614 B5 E9              LDA     STFLAG,X
A616 D0 03              BNE     ASERV3
A618 AE 5C 09           LDX     DCSTOR
A61B            ASERV3
A61B 8E 5C 09           STX     DCSTOR
                ;
                ;               COMPUTER AUTO TRACKING
A61E A5 7C              LDA     TRKFLG
A620 F0 13              BEQ     ASERV2
```

```
A622 A5 D0            LDA     DISFLG
A624 C9 02            CMP     #$02            ; FRONT OR BAK ?
A626 B0 0D            BCS     ASERV2          ; NO
A628 49 01            EOR     #$01            ; WHICH DISFLG
A62A DD AD 09         CMP     XSIGN,X         ; OBJ IN SIGHT ?
A62D F0 06            BEQ     ASERV2          ; YES
A62F AA               TAX
A630 BD CF BE         LDA     TRKTAB,X                ; WHICH KEY FOR SWITCHING DISPLAY
A633 85 CA            STA     THEKEY          ; SWITCH DISPLAY
A635            ASERV2
                ;

A635 20 E6 AC         JSR     BSERVE          ; SERVICE STARBASE
A638 20 79 AA         JSR     THINK           ; SERVICE ZYLON BRAIL
                ;             HITSHP
                ;             RAIDER HIT PHOTON HIT DETECT
A63B A5 7B            LDA     BASFLG          ; STARBASE ?
A63D D0 5C            BNE     HITSH1          ; YES
A63F A5 EB            LDA     STFLAG+2
A641 F0 58            BEQ     HITSH1
A643 AC 42 0A         LDY     XPOSH+2
A646 C8               INY
A647 C0 02            CPY     #$02
A649 B0 50            BCS     HITSH1
A64B AC 73 0A         LDY     YPOSH+2
A64E C8               INY
A64F C0 02            CPY     #$02
A651 B0 48            BCS     HITSH1
A653 AC A4 0A         LDY     ZPOSH+2
A656 C8               INY
A657 C0 02            CPY     #$02
A659 B0 40            BCS     HITSH1
                ;                             A HIT !!
A65B 20 E1 AE         JSR     DAMCTL
A65E A0 02            LDY     #$02
A660 20 6B AC         JSR     EXPLOS
A663 A2 7F            LDX     #$7F
A665 A5 81            LDA     SPABAK          ; DEAD ?
A667 D0 1E            BNE     HITSH2          ; NO
A669 A2 0A            LDX     #$0A            ; FRONT
A66B 20 45 B0         JSR     KEYS15
A66E A0 23            LDY     #SENDST-SENTAB
A670 A2 08            LDX     #$08            ; DESTROYED
A672 20 0A B1         JSR     CRATE
```

```
A675 A2 5F          LDX     #DISPL3-DISPLY
A677 A0 80          LDY     #$80
A679 A9 08          LDA     #$08
A67B 20 F1 AD       JSR     LDISP
A67E 20 0D AE       JSR     CLRMAP
A681 A2 40          LDX     #$40            ; ITS ALL OVER
A683 86 E3          STX     BIGEXP
A685 A2 FF          LDX     #$FF            ; HIT ME DEAD
A687            HITSH2
A687 86 8A          STX     HITME
A689 86 8A          LDA     #$00
A68B 85 EB          STA     STFLAG+2
A68D A9 02          LDA     #$02
A68F 85 BE          STA     PHEXWT
                ;
A691 A2 01          LDX     #$01
A693 20 6F B8       JSR     PANDS6
A696 A2 0A          LDX     #NOITB1-NOISTB
A698 20 A8 AE       JSR     NOISE
A69B            HITSH1

                ;               END GAME ON ROUTINES

A69B            MAIN3
                ;
                ;
                ;               CONTINOUS RUNNING ROUTINES
                ;               CONSRV
                ;               SERVICE CONSOL ROUTINE
A69B A4 63          LDY     RESET
A69D AD 1F D0       LDA     CONSOL
A6A0 49 FF          EOR     #$FF            ; POSITIVE LOGIC
A6A2 29 03          AND     #$03
A6A4 85 63          STA     RESET
A6A6 F0 1A          BEQ     CONSR2
A6A8 88             DEY
A6A9 10 17          BPL     CONSR2
A6AB 85 66          STA     TIMOUT          ; RESET TIMOUT
A6AD C9 02          CMP     #$02
A6AF B0 06          BCS     CONSR3          ; GAME SELECT
A6B1 A9 00          LDA     #$00
A6B3 A8             TAY
A6B4 4C 5E A1       JMP     INIT1           ; GAME START
A6B7            CONSR3
```

```
A6B7 E6 62          INC     MISDIF
A6B9 A5 62          LDA     MISDIF
A6BB 29 03          AND     #$03
A6BD 85 62          STA     MISDIF
A6BF 4C 5A A1       JMP     INIT3
AC62            CONSR2
                ;
                ;

A6C2 20 04 B8       JSR     PASDIN          ; SERVICE PANEL DISPLAY
A6C5 20 9B A8       JSR     HSERVE          ; SERVICE HYPERWARP JUMP
A6C8 20 16 B2       JSR     MSERVE          ; SERVICE MESSAGE
A6CB 20 E4 B4       JSR     TIMERS          ; EVALUATE ALL TIMERS , TIMEOUTS, ETC.
                ;               END CONTINOUS RUNNING ROUTINES
                ;
                ;
                ;
A6CE 4C F3 A1       JMP     MAIN            ; END VBLANK ROUTINE, WAIT FOR NEW VBLANK
                ;
                ;
                ;
                ;
                ;               NMI INTERRUPT SERVICE SECTION
                ;
                ;
A6D1            VBNMI
A6D1 A9 FF          LDA     #$FF
A6D3 85 67          STA     PROGST                  ; SET PROGST VBLANK NMI FLAG
A6D5 A9 E0          LDA     #ALPHA/256
A6D7 8D 09 D4       STA     CHBASE          ; USE STANDARD ALPHA CHARACTERS
A6DA A6 F6          LDX     COLRAM+8                ; BAK
A6DC AD 0A D2       LDA     RANDOM
A6DF 24 8A          BIT     HTIME
A6E1 50 07          BVC     VBLNK4
A6E3 30 04          BMI     VBLNK1
A6E5 29 72          AND     #$72
A6E7 09 40          ORA     #$40
A6E9            VBLNK1
A6E9 AA             TAX
A6EA            VBNLK4
A6EA A5 D0          LDA     DISFLG
A6EC C9 03          CMP     #$03
A6EE 90 02          BCC     VBLNK2
A6F0 A2 A0          LDX     #DBLUE
```

```
A6F2                VBLNK2
A6F2 86 F6                  STX     COLRAM+8                ; BAK
                    ;
A6F4 A2 08                  LDX     #$08
A6F6                VBLNK3
A6F6 B5 EE                  LDA     COLRAM+0,X
A6F8 9D 12 D0               STA     COLPM0,X
A6FB CA                     DEX
A6FC 10 F8                  BPL     VBLNK3
                    ;
                    ;
A6FE 8D 1E D0               STA     HITCLR          ; RESET HITS
                    ;
A701 20 AB B2               JSR     AUDIO           ; SERVICE AUDIO
                    ;
A704 E6 77                  INC     BINNMI          ; ATRACT MODE STUFF
A706 D0 0D                  BNE     VBLNK5
A708 A5 66                  LDA     TIMOUT
A70A 30 09                  BMI     VBLNK5
A70C E6 66                  INC     TIMOUT
A70E 10 05                  BPL     VBLNK5
A710 10 05                  BPL     VBLNK5
A712 A4 5C A1               JMP     INIT4
A715                VBLNK5
                    ;
                    ;
A715 4C 4B A7               JMP     POPALL
                    ;
A718                DISNMI
A718 48                     PHA             ; PUSH ALL REGISTERS FOR OP SYSTEM
A719 8A                     TXA
A71A 48                     PHA
A71B 98                     TYA
A71C 48                     PHA
A71D A9 E0                  LDA     #ALPHA/256
A71F AC 0B D4               LDY     VCOUNT
A722 C0 60                  CPY     #$60
A724 F0 02                  BEQ     DISNMI
A726 A9 A0                  LDA     #CGRAPH/256
A728                DISNM1
A728 8D 09 D4               STA     CHBASE          ; USE FUTURE TYPE CHARACTER SET
                    ;
A72B A2 04                  LDX     #$04
A72D 8D 0A D4               STA     WSYNC
```

```
A730                DISNM2
A730 B5 F7                  LDA     COLRAM+9,X
A732 9D 16 D0               STA     COLPF0,X
A735 CA                     DEX
A736 10 FB                  BPL     DISNM2
                    ;
                    ;               READ HITS
A738 AD 08 D0               LDA     M0PL
A73B 0D 09 D0               ORA     M1PL
A73E 0D 0A D0               ORA     M2PL
A741 0D 0B D0               ORA     M3PL
A744 85 83                  STA     PHITS+1         ; PHOTON 3 STORED
A746 AD 0F D0               LDA     P3PL
A749 85 82                  STA     PHITS+0         ; PHOTON 2 STORED
A748                POPALL
A748 68                     PLA
A74C A8                     TAY
A74D 68                     PLA
A74E AA                     TAX
A74F 68                     PLA
                    ;
                    ;                       END POP
                    ;
A759 40                     RTI
                    ;
                    ;
                    ;
                    ;
                    ;
                    ;               IRQ INTERRUPT SERVICE SECTION
                    ;
A751 IRQVEC
                    ;               PUSH ACCUM REGISTERS
A751 48                     PHA
                    ;                       END PUSH
A752 A9 00                  LDA     #$00
A754 8D 0E D2               STA     IRQEN           ; RESET IRQ'S
A757 A9 40                  LDA     #IRQMSK
A759 8D 0E D2               STA     IRQEN
A75C AD 09 D2               LDA     KBCODE
A75F 09 C0                  ORA     #$C0
A761 85 CA                  STA     THEKEY
A763 68                     PLA
A764 40                     RTI
```

```
                ;
                ;                       END IRQ INTERRUPT SECTION
                ;
                ;
                ;
                ;                       SUBROUTINES,
                ;
                ;
                ;
A765            LDINS6          ; LOAD UP THE LINE
A765 99 A4 00           STA     NUMPTS,Y
A768 E8                 INX
A769 88                 DEY
A76A 10 0E              BPL     LDINS4
A76C 20 82 A7           JSR     DRAWER
A76F            LDINST
                ;               LOAD INSET      RESERVE BYTE=$FE
                        ;       X= INITIAL START OF PNTR IN INSTAB
A76F A9 05              LDA     #$05
A771 85 A2              STA     TARPTR          ; DEFINE TARGET POINTER
A773 2C 95 09           BIT     DAMAGE+3                ; COMPUTER
A776 70 09              BVS     LDINS2
A778            LDINS1
A778 A0 02              LDY     #$02
A77A            LDINS4
A77A BD F9 BA           LDA     INSTAB,X
A77D C9 FE              CMP     #$FE            ; ALL DONE
A77F D0 E4              BNE     LDINS6          ; NO
A781            LDINS2
A781 60                 RTS
                ;
                ;
A782            DRAWER                  ; DRAW THE LINE
A782 A9 55              LDA     #$55
A784            DRAWR3          ; ENTRY POINT FROM UPINST ************************
A784 85 6B              STA     TEMP1
A786 A5 A4              LDA     NUMPTS
A788 85 6E              STA     TEMP4
A78A 29 7F              AND     #$7F
A78C 85 A4              STA     NUMPTS
A78E            DRAWR1
A78E A4 A5              LDY     VDRAW
A790 B9 00 08           LDA     VCONL,Y
A793 85 68              STA     PNTR
```

```
A795 B9 64 08          LDA     VCONH,Y
A798 85 69             STA     PNTR+1
A79A A5 A6             LDA     HDRAW
A79C 4A                LSR     A
A79D 4A                LSR     A
A79E 85 6A             STA     TEMP
A7A0 A5 A6             LDA     HDRAW
A7A2 29 03             AND     #$03
A7A4 A8                TAY
A7A5 B9 B0 BA          LDA     MASK,Y
A7A8 25 6B             AND     TEMP1
A7AA A4 6A             LDY     TEMP
A7AC 11 68             ORA     (PNTR),Y
A7AE 91 68             STA     (PNTR),Y
A7B0 24 6E             BIT     TEMP4
A7B2 10 04             BPL     DRAWR4
A7B4 E6 A5             INC     VDRAW
A7B6 D0 02             BNE     DRAWR5          ; JUMP, VDRAW CANNOT CROSS 0 !!
A7B8           DRAWR4
A7B8 E6 A6             INC     HDRAW
A7BA           DRAWR5
A7BA C6 A4             DEC     NUMPTS          ; POINTS ALL DRAWN ?
A7BC D0 D0             BNE     DRAWR1
A7BE           DRAWR2
A7BE 60                RTS
               ;
               ;
               ;
               ;
A7BF         UPINST
               ;               UPDATE INSET
               ;
               ;               FIRE CONTROL
A7BF AE 5C 09          LDX     DCSTOR          ; WHICH OBJECT
A7C2 A4 A2             LDY     TARPTR
A7C4 C0 05             CPY     #$05
A7C6 B0 24             BCS     UPINST2
               ;               LD TARGET DISPLAY
A7C8 A5 A0             LDA     HTARGT
A7CA 85 A6             STA     HDRAW
A7CC B9 6E BF          LDA     ZYTARG,Y
A7CF           UPINS8
A7CF 0A                ASL     A
A7D0 85 C6             STA     TEMP2
```

```
A7D2 90 0D              BCC     UPINST9
A7D4 A9 81              LDA     #$81
A7D6 85 A4              STA     NUMPTS
A7D8 A5 A1              LDA     VTARGT
A7DA 85 A5              STA     VDRAW
A7DC A9 AA              LDA     #$AA
A7DE 20 84 A7           JSR     DRAWR3
A7E1            UPINS9
A7E1 E6 A6              INC     HDRAW
A7E3 A5 6C              LDA     TEMP2
A7E5 D0 E8              BNE     UPINS8
A7E7 E6 A1              INC     VTARGT
A7E9            UPIN10
A7E9 E6 A2              INC     TARPTR
A7EB 60                 RTS
A7EC            UPINS2
A7EC C0 0A              CPY     #$0A
A7EE 90 F9              BCC     UPIN10
A7F0 B5 E9              LDA     STFLAG,X
A7F2 F0 3C              BEQ     UPINS3
A7F4 BD 71 0A           LDA     YPOSH,X
A7F7 BC DE 09           LDY     YSIGN,X
A7FA F0 08              BEQ     UPINS4
A7FC C9 0C              CMP     #$0C
A7FE 90 0A              BCC     UPINS5
A804            UPINS4
A804 C9 F5              CMP     #$F5
A806 B0 02              BCS     UPINS5
A808 A9 F5              LDA     #$F5
A80A            UPINS5
A80A 18                 CLC
A80B 69 83              ADC     #131
A80D 85 A0              STA     HTRGT
A80F BD A2 0A           LDA     ZPOSH,X
A812 49 FF              EOR     #$FF
A814 BC 0F 0A           LDA     ZSIGN,X
A817 D0 08              BNE     UPINS6
A819 C9 05              CMP     #$05
A81B 90 0A              BCC     UPINS7
A81D A9 04              LDA     #$04
A81F 10 06              BPL     UPINS7          ; JUMP
A821            UPINS6
A821 C9 FA              CMP     #$FA
A823 B0 02              BCS     UPINS7
```

```
A825 A9 FA              LDA     #$FA
A827            UPINS7
A827 18                 CLC
A828 69 4D              ADC     #77
A82A 85 A1              STA     VTARGT
A82C A9 00              LDA     #$00
A82E 85 A2              STA     TARPTR
A830            UPINS3
                ;               CLEAR INSET
A830 A9 36              LDA     #INSET
A832 85 68              STA     PNTR
A834 A9 1B              LDA     #INSET/256
A836 85 69              STA     PNTR+1
A838 A2 0E              LDX     #14
A83A            UPIN12
A38A A0 06              LDY     #$06
A83C            UPIN13
A83C B1 68              LDA     (PNTR),Y
A83E 29 55              AND     #$55
A840 91 68              STA     (PNTR),Y
A842 88                 DEY
A843 10 F7              BPL     UPIN13
A845 18                 CLC
A846 A5 68              LDA     PNTR
A848 69 28              ADC     #40
A84A 85 68              STA     PNTR
A84C 90 02              BCC     UPIN14
A84E E6 69              INC     PNTR+1
A850            UPIN14
A850 CA                 DEX
A851 1 E7       BPL     UPIN12
                ;               DONE CLEAR INSET
A853 AE 5C 09           LDX     DCSTOR
A856 C8                 INY             ; Y=0
A857 A5 88              LDA     LOKWAT
A859 F0 04              BEQ     UPIN11
A85B C6 88              DEC     LOKWAT
A85D D0 39              BNE     UPINS1
A85F            UPIN11
A85F A5 A0              LDA     HTARGT
A861 C9 81              CMP     #129
A863 90 33              BCC     UPINS1
A865 C9 85              CMP     #133
A867 B0 2F              BCS     UPINS1
```

```
A869 A9 AA              LDA     #$AA
A86B 8D FE 1B           STA     ICON2
A86E 8D 04 1C           STA     ICON2+6
A871 A5 A1              LDA     VTARGT
A873 C9 4B              CMP     #75
A875 90 21              BCC     UPINS1
A877 C9 4F              CMP     #79
A879 B0 1D              BCS     UPINS1
A87B A9 AA              LDA     #$AA
A87D 8D 9E 1C           STA     ICON2+160
A880 8D A4 1C           STA     ICON2+166
A883 BD 40 0A           LDA     XPOSH,X
A886 C9 0C              CMP     #$0C
A888 B0 0E              BCS     UPINS1
A88A A0 A0              LDY     #$A0
A88C 8C 40 1D           STY     ICON1
A88F 8C 68 1D           STY     ICON1+40
A892 8C 42 1D           STY     ICON1+2
A895 8C 6A 1D           STY     ICON1+42
A898            UPINS1
A989 84 A3              STY     LOKFLG
A89A 60                 RTS
                ;
                ;
                ;
                ;
                ;
                ;
A89B            HSERVE
                ;               HYPERWARP SERVICE ROUTINE
A89B A4 C0              LDY     HFLAG           ; HWAPR ?
A89D F0 61              BEQ     HSERV4          ; NO
A89F A5 70              LDA     SEEPD
A8A1 C9 FE              CMP     #$FE            ; UP TO SPEED ?
A8A3 B0 5C              BCS     HSERV5          ; YES
A8A5 C9 80              CMP     #$80            ; DO LINES ?
A8A7 90 03              BCC     HSERV6          ; NO
A8A9 29 B4 A9           JSR     HLINES
A8AC            HSERV6
                ;               STEERING STUFF
A8AC 90 03              LDA     #$03
A8AE 8D 5C 09           STA     DCSTOR
A8B1 A9 90              LDA     #$90
A8B3 8D 8F 0C           STA     GINDEX+3
```

```
A8B6 85 EC              STA     STFLAG+3
A8B8 A9 1F              LDA     #$1F
A8BA 8D 43 0A           STA     XPOSH+3
A8BD 38                 SEC
A8BE AD FC 0B           LDA     VPOS+3
A8C1 E9 77              SBC     #VOBCEN-3
A8C3 18                 CLC
A8C4 65 C5              ADC     VSTEER
A8C6 29 7F              AND     #$7F
A8C8 85 8E              STA     HYVPOS
A8CA 38                 SEC
A8CB AD 2D 0C           LDA     HPOS+3
A8CE E9 7D              SBC     #HOBCEN
A8D0 18                 CLC
A8D1 65 C4              ADC     HSTEER
A8D3 29 7F              AND     #$7F
A8D5 85 8F              STA     HYHPOS
A8D7 A5 62              LDA     MISDIF
A8D9 F0 11              BEQ     HSERV7
A8DB AD 0A D2           LDA     RANDOM
A8DE A4 D0              LDY     DISFLG
A8E0 F0 06              BEQ     HSERV9
A8E2 8D 2D 0C           STA     HPOS+3
A8E5 8D FC 0B           STA     VPOS+3
A8E8            HSERV9
A8C8 C9 10              CMP     #$10
A8EA B0 14              BCS     HSERV4
A8EC            HSERV7
A8EC AD 0A D2           LDA     RANDOM
A8EF 09 10              ORA     #$10
A8F1 25 C6              AND     STERMK
A8F3 8D 9A 0B           STA     YINCRE+3
A8F6 AD 0A D2           LDA     RANDOM
A8F9 09 10              ORA     #$10
A8FB 25 C6              AND     STERMK
A8FD 8D CB 0B           STA     ZINCRE+3
A900            HSERV4
A900 60                 RTS
A901            HSERV5
A901 98                 TYA             ; IN JUMP ?
A902 30 11              BMI     HSERV8          ; YES
                ;               BEGIN JUMP
A904 A9 FF              LDA     #$FF
A906 85 C0              STA     HFLAG
```

```
A908 A2 00          LDX   #CH4TB1-CH4TAB
A90A 20 A6 B3       JSR   NOTINT
A90D 20 A7 B1       JSR   CSERV8          ; JUMP ENERGY
A910 A0 1B          LDY   #SENHSP-SENTAB
A912 4C 8D A9       JMP   HABOR1
A915          HSERV8        ; IN JUMP
A915 C6 91          DEC   HYPENG          ; ALL DONE ?
A917 F0 05          BEQ   HSER10          ; YES
A919 A2 02          LDX   #$02            ; DEC ENERGY
A91B 4C 6F B8       JMP   PANDS6
A91E          HSER10
              ;             HWARP COMPLETE
A91E A0 19          LDY   #SENHWC-SENTAB
A920 20 87 A9       JSR   HABOR2
A923 A5 8F          LDA   HYHPOS
A925 85 8D          STA   GHPOS
A927 A5 8E          LDA   HYVPOS
A929 85 8C          STA   GVPOS
A92B 4A             LSR   A
A92C 29 07          AND   #$07
A92E AA             TAX
A92F BD B3 BF       LDA   JMASK,X
A932 85 C7          STA   JMPMSK
A934 A4 92          LDY   HYPGAD
A936 84 90          STY   GUADRT
A938 A9 00          LDA   #$00
A93A 85 7B          STA   BASFLG
A93C BE C9 08       LDX   CHTRAM,Y
A93F 10 2E          BPL   HSERV2
A941 A9 FF          LDA   #$FF            ; STARBASE STUFF
A943 85 7B          STA   BASFLG
A945 A0 00          LDY   #$00
A947          HSERV3
A947 A9 00          LDA   #$00
A949 99 68 0B       STA   XINCRE+2,Y
A94C A9 01          LDA   #$01
A94E 99 AF 09       STA   XSIGN+2,Y
A951 AD 0A D2       LDA   RANDOM
A954 25 C7          AND   JMPMSK
A956 99 42 0A       STA   XPOSH+2,Y
A959 98             TYA
A95A 18             CLC
A95B 69 31          ADC   #RAMNUM
A95D A8             TAY
```

```
A95E C9 93          CMP     #RAMNUM*3
A960 90 E5          BCC     HSERV3
A962 AD 42 0A       LDA     XPOSH+2
A965 09 71          ORA     #$71
A967 8D 42 0A       STA     XPOSH+2
A96A A2 02          LDX     #$02
A96C 4C BE B7       JMP     NEWST4
A96F            HSERV2
A96F F0 0E          BEQ     HSERV1
A971 A9 FF          LDA     #$FF            ; RED ALERT
A973 85 8B          STA     REDFLG
A975 A2 06          LDX     #CH4TB2-CH4TAB
A977 20 A6 B3       JSR     NOTINT
A97A A0 75          LDY     #SENRED-SENTAB
A97C 20 23 B2       JSR     LDMESS
A97F            HSERV1
A97F 60             RTS
                ;
                ;
                ;
                ;
A980            HABORT
                ;       HYPERWARP ABORT ROUTINE
A980 A2 01          LDX     #$01
A982 20 6F B8       JSR     PANDS6
A985 A0 17          LDY     #SENHWA-SENTAB          ; ABORT
A987            HABOR2          ; ENTRY POINT HWARP COMPLETE ***********************
A987 A9 00          LDA     #$00
A989 85 71          STA     WARP
A98B 85 C0          STA     HFLAG
A98D            HABOR1          ; ENTRY POINT BEGIN JUMP ***************************
A98D A9 10          LDA     #STLAST
A98F 85 79          STA     NSTARS
A991 A9 00          LDA     #$00
A993 85 C1          STA     HISPED
A995 85 73          STA     ETIMER          ; KEEP PROGRAM FROM GOING SOUTH
A997 85 8A          STA     HITME           ; CLEAR THE OTHER EXPLOS BUG
A999 8D 8F 0C       STA     GINDEX+3
A99C 85 80          STA     WPENER
A99E C0 17          CPY     #SENHWA-SENTAB
A9A0 F0 04          BEQ     HABOR3
A9A2 85 E9          STA     STFLAG+0
A9A4 85 EA          STA     STFLAG+1
A9A6            HABOR3
```

```
A9A6 85 EB          STA     STFLAG+2
A9A8 85 EC          STA     STFLAG+3
A9AA 85 ED          STA     STFLAG+4
A9AC 85 75          STA     BSEQTM
A9AE 8D 5C 09       STA     DCSTOR
A9B1 4C 23 B2       JMP     LDMESS
                    ;
                    ;
                    ;
                    ;
A9B4                HLINES
                    ;               DRW HWARP LINES
A9B4 C6 C2          DEC     HTIMER
A9B6 10 68          BPL     HLINE1
A9B8 A9 10          LDA     #$01
A9BA 85 C1          STA     HISPED
A9BC A9 30          LDA     #RMLAST         ; HWARP STARS ON
A9BE 85 79          STA     NSTARS
A9C0 A9 03          LDA     #$03
A9C2 85 C2          STA     HTIMER
                    ;                       RESET LINES
A9C4 A6 C3          LDX     HPNTR
A9C6                HLINE2
A9C6 A9 12          LDA     #$12            ; XINIT
A9C8 85 69          STA     PNTR+1
A9CA AD 0A D2       LDA     RANDOM          ; INIT Y,Z
A9CD 29 03          AND     #$03
A9CF A8             TAY
A9D0 B9 3A BB       LDA     YINIT,Y
A9D3 9D 71 0A       STA     YPOSH,X
A9D6 B9 3E BB       LDA     ZINIT,Y
A9D9 9D A2 0A       STA     ZPOSH,X
A9DC 20 BE B7       JSR     NEWST4          ; WHICH QUADRANT
A9DF 8A             TXA
A9E0 A8             TAY                     ; X GOES TO Y
A9E1 A9 05          LDA     #$05
A9E3 85 6E          STA     TEMP4
A9E5                HLINE4
                    ;
A9E5 18             CLC
A9E6 A5 68          LDA     PNTR
A9E8 69 50          ADC     #$50            ; XINCRE
A9EA 85 68          STA     PNTR
A9EC 9D D3 0A       STA     XPOSL,X
```

```
A9EF A5 69          LDA     PNTR+1
A9F1 69 00          ADC     #$00
A9F3 85 69          STA     PNTR+1
A9F5 9D 40 0A       STA     XPOSH,X
A9F8 A9 00          LDA     #$00
A9FA 9D 66 0B       STA     XINCRE,X
A9FD 9D 97 0B       STA     YINCRE,X
AA00 9D C8 0B       STA     ZINCRE,X
                ;
AA03 A9 01          LDA     #$01
AA05 9D AD 09       STA     XSIGN,X         ; AND THAT FIXES THAT
AA08 A9 63          LDA     #$99            ; OFF-SCREEN
AA0A 9D F9 0B       STA     VPOS,X
AA0D 9D 2A 0C       STA     HPOS,X
AA10 20 C1 AC       JSR     EXHLP1          ; DEFINE Y,Z
AA13 CA             DEX
AA14 E0 11          CPX     #STLAST+1
AA16 B0 02          BCS     HLINE3
AA18 A2 30          LDX     #RMLAST
AA1A            HLINE3
AA1A C6 6E          DEC     TEMP4
AA1C 10 C7          BPL     HLINE4
AA1E 86 C3          STX     HPNTR
AA20            HLINE1
AA20 60             RTS
                    ;
                ;
                ;
                ;
AA21            DIVIDE
                ;       A = (TOP/BOTTOM)X80
                ;
AA21 A9 00          LDA     #$00            ;CLEAR THE RESULT
AA23 85 6D          STA     TEMP3
AA25 A9 07          LDA     #$07            ; NUMBER OF SHIFTS
AA27 85 6E          STA     TEMP4
                ;                       SHIFT 0 INTO THE MSBIT
AA29 46 6B          LSR     TEMP1           ; TOP NUMBER
AA2B 66 6A          ROR     TEMP
AA2D A5 D0          LDA     DISFLG          ; FRONT OR BACK ?
2A2F D0 0F          BNE     DIVID1          ; BACK
AA31 BD 40 0A       LDA     XPOSH,X         ; BOTTOM NUMBER
AA34 4A             LSR     A
AA35 85 69          STA     PNTR+1
```

```
AA37 BD D3 0A           LDA     XPOSL,X
AA3A 6A                 ROR     A
AA3B 85 68              STA     PNTR
AA3D 4C 52 AA           JMP     DIVID2
AA40            DIVID1
AA40 38                 SEC
AA41 A9 00              LDA     #$00
AA43 FD D3 0A           SBC     XPOSL,X
AA46 85 68              STA     PNTR
AA48 A9 00              LDA     #$00
AA4A FD 40 0A           SBC     XPOSH,X
AA4D A4                 LSR     A
AA4E 85 69              STA     PNTR+1
AA50 66 68              ROR     PNTR
                ;
AA52            DIVID2
AA52 06 6D              ASL     TEMP3           ; SHIFT RESULT
AA54 38                 SEC     ; SUBTRACT BOTTOM FROM TOP
AA55 A5 6A              LDA     TEMP
AA57 E5 68              SBC     PNTR
AA59 A8                 TAY
AA5A A5 6B              LDA     TEMP1
AA5C E5 69              SBC     PNTR+1
AA5E 90 06              BCC     DIVID3          ; BOTTOM GREATER THAN TOP
                ;               TOP LARGER
AA60 85 6B              STA     TEMP1           ; STORE REMAINDER
AA62 84 6A              STY     TEMP
AA64 E6 6D              INC     TEMP3           ; ADD 1 TO RESULT
AA66            DIVID3
AA66 06 6A              ASL     TEMP            ; SHIFT TOP
AA68 26 6B              ROL     TEMP1
AA6A 90 03              BCC     DIVID4
                ;               IF TOP IS GREATER THN BOTTOM THEN OVERFLOW
AA6C A9 FF              LDA     #$FF            ; MAX VALUE TO RESULT
AA6E 60                 RTS
AA6F            DIDIV4
AA6F C6 6E              DEC     TEMP4           ; NEXT BIT
AA71 10 DF              BPL     DIVID2
AA73 A4 6D              LDY     TEMP3           ; RESULT IN Y
AA75 B9 E9 0D           LDA     PTAB,Y          ; MULTIPLY BY 80 (PTAB)
AA78            DIVID5          ; ENTRY POINT FROM THINK ******************
AA78 60                 RTS
                ;
                ;
```

```
                        ;
                        ;
AA79                    THINK
                        ;               COMPUTER ATTACK SUBROUTINE
AA79 A5 C0                      LDA     HFLAG
AA7B 05 7B                      ORA     BASFLG
AA7D D0 F9                      BNE     DIVID5          ; BRANCH TO RTS
                        ;               CRUISER PHOTON CONVERGENCE
AA7F A5 86                      LDA     LOKLOC
AA81 F0 30                      BEQ     THIN38
AA83 A6 89                      LDX     LOKTAR
AA85 38                         SEC
AA86 BD F9 0B                   LDA     VPOS,X
AA89 ED FC 0B                   SBC     VPOS+3
AA8C 90 02                      BCC     THIN37
AA8E A9 00                      LDA     #$00
AA90                    THIN37
AA90 20 CA AE                   JSR     POHELP
AA93 8D CB 0B                   STA     ZINCRE+3
AA96 8D CC 0B                   STA     ZINCRE+4
AA99 38                         SEC
AA9A AD 2D 0C                   LDA     HPOS+3
AA9D FD 2A 0C                   SBC     HPOS,X
AAA0 20 CA AE                   JSR     POHELP
AAA3 8D 9A 0B                   STA     YINCRE+3
AAA6 38                         SEC
AAA7 AD 2E 0C                   LDA     HPOS+4
AAAA FD 2A 0C                   SBC     HPOS,X
AAAD 20 CA AE                   JSR     POHELP
AAB0 8D 9B 0B                   STA     YINCRE+4
                        ;
AAB3                    THIN38
                        ;
                        ;               HELPER FOR THINK
AAB3 A2 03                      LDX     #$03
AAB5                    THIN39
AAB5 D6 BA                      DEC     ROTTIM,X
AAB7 10 27                      BPL     THIN44
AAB9 8A                         TXA
AABA 4A                         LSR     A
AABB AB                         TAY
AABC B9 C8 00                   LDA     HORJOY,Y
AABF A4 D0                      LDY     DISFLG
AAC1 F0 05                      BEQ     THIN40
```

```
AAC3 49 FF          EOR     #$FF
AAC5 18             CLC
AAC6 69 01          ADC     #$01
AAC8            THIN40
AAC8 18             CLC
AAC9 75 B4          ADC     XINPRS+2,X
AACB 10 02          BPL     THIN41
AACD A9 00          LDA     #$00
AACF            THIN41
AACF C9 10          CMP     #$10
AAD1 90 02          BCC     THIN42
AAD3 A9 0F          LDA     #$0F
AAD5            THIN42
AAD5 95 B4          STA     XINPRS+2,X
AAD7 C9 08          CMP     #$08
AAD9 90 02          BCC     THIN43
AADB 49 0F          EOR     #$0F
AADD            THIN43
AADD 0A             ASL     A
AADE 95 BA          STA     ROTTIM,X
AAE0            THIN44
AAE0 CA             DEX
AAE1 10 D2          BPL     THIN39
                ;
AAE3 AD 8E 0C       LDA     GINDEX+2
AAE6 D0 1B          BNE     THINK2          ; NOT A PHOTON
                ;               PHOTON CONVERGENCE
AAE8 A4 62          LDY     MISDIF          ; DIFFICULTY
AAEA B9 85 BF       LDA     PHODIF,Y
AAED AE A4 0A       LDX     ZPOSH+2
AAF0 10 02          BPL     THINK3
AAF2 29 7F          AND     #$7F
AAF4            THINK3
AAF4 8D CA 08       STA     ZINCRE+2
AAF7 09 80          ORA     #$80
AAF9 AE 73 0A       LDX     YPOSH+2
AAFC 10 02          BPL     THINK4
AAFE 29 7F          AND     #$7F
AB00            THINK4
AB00 8D 99 0B       STA     YINCRE+2
AB03            THINK2
AB03 A5 76          LDA     BINTIM
AB05 29 03          AND     #$03
AB07 F0 2E          BEQ     THINK5
```

```
AB09                THINK1
AB09 A5 E6                  LDA     GRAPH+2
AB0B F0 04                  BEQ     THIN20          ; NOT ON
AB0D A5 EB                  LDA     STFLAG+2
AB0F D0 25                  BNE     THIN14
AB11                THIN20
                    ;                   METORITE
AB11 AD 0A D2               LDA     RANDOM
AB14 C9 04                  CMP     #$04
AB16 B0 1E                  BCS     THIN14
AB18 A9 60                  LDA     #$60
AB1A 8D BE 0C               STA     GINDEX+2
AB1D A2 02                  LDX     #$02
AB1F 20 64 B7               JSR     NEWSTR          ; DEFINE LIKE A STAR
AB22 A9 3C                  LDA     #60
AB24 85 EB                  STA     STFLAG+2
AB26 A9 88                  LDA     #$88
AB28 8D 68 0B               STA     XINCRE+2
AB2B A9 00                  LDA     #$00
AB2D 8D 2C 0C               STA     HPOS+2          ; METEROR FLASH
AB30 8D 99 0B               STA     YINCRE+2
AB33 8D CA 0B               STA     ZINCRE+2
AB36                THIN14
AB36 60                     RTS
AB37                THINK5
AB37 A5 A7                  LDA     ZYTOGG
AB39 49 01                  EOR     #$01
AB3B 85 87                  STA     ZYTOGG
AB3D AA                     TAX             ; WHICH ZYLON TO THINK
AB3E B5 E9                  LDA     STFLAG,X                ; ALREADY ON?
AB40 D0 42                  BNE     THINK6          ; YES
                    ;               INIT ZYLON
AB42 A5 E9                  LDA     STFLAG+0
AB44 05 EA                  ORA     STFLAG+1
AB46 29 01                  AND     #$01
AB48 A4 90                  LDY     QUADRT
AB4A D9 C9 08               CMP     CHTRAM,Y
AB4D B0 BA                  BCS     THINK1
                    ;                       OK TO INIT
AB4F A9 FF                  LDA     #$FF
AB51 95 E9                  STA     STFLAG,X
AB53 AD 0A D2               LDA     RANDOM
AB56 29 07                  AND     #$07
AB58 A8                     TAY
```

```
AB59 B9 89 BF           LDA     ZYGIND,Y
AB5C 9D 8C 0C           STA     GINDEX+0,X
AB5F A5 62              LDA     MISDIF
AB61 F0 03              BEQ     THIN45
AB63 B9 91 BF           LDA     INTSEQ,Y
AB66            THIN45
AB66 95 A8              STA     SEQEN,X
AB68 A9 01              LDA     #$01
AB6A 95 AA              STA     SEQTIM,X
AB6C 9D AD 09           STA     XSIGN,X
AB6F AD 0A D2           LDA     RANDOM
AB72 25 C7              AND     JMPMSK
AB74 9D A2 0A           STA     ZPOSH,X
AB77 69 13              ADC     #$13
AB79 9D 71 0A           STA     YPOSH,X
AB7C 09 71              ORA     #$71
AB7E 9D 40 0A           STA     XPOSH,X
AB81 20 BE B7           JSR     NEWST4          ; Y,Z RANDOM SIGN
AB84            THINK6
                ;
                ;               SEQUENCER AND TIMEOUT SECTION
                ;
AB84 BD 40 0A           LDA     XPOSH,X
AB87 C9 20              CMP     #$20
AB89 B0 11              BCS     THIN27
AB8B BD AD 09           LDA     XSIGN,X
AB8E F0 08              BEQ     THIN26
AB90 B5 E4              LDA     GRAPH,X
AB92 F0 08              BEQ     THIN27
AB94 C9 29              CMP     #ZYGRF6-ZYGRAF
AB96 F0 04              BEQ     THIN27
AB98            THIN26
AB98 A9 00              LDA     #$00
AB9A 95 A8              STA     SEQEN,X
AB9C            THIN27
AB9C D6 AA              DEC     SEQTIM,X                ; TIMEOUT
AB9E 10 24              BPL     THIN30
ABA0 A9 78              LDA     #120
ABA2 95 AA              STA     SEQTIM,X
ABA4 A5 62              LDA     MISDIF
ABA6 AC 0A D2           LDY     RANDOM
ABA9 C0 30              CPY     #$30
ABAB 90 01              BCC     THIN35
ABAD 4A                 LSR     A
```

```
ABAE            THIN35
ABAE 4A                 LSR     A
ABAF 95 B8              STA     BSTRAF,X
ABB1 B5 A8              LDA     SEQEN,X
ABB3            THIN28
ABB3 2C 0A D2           BIT     RANDOM
ABB6 10 02              BPL     THIN31
ABB8 49 0F              EOR     #$0F
ABBA            THIN31
ABBA 95 AC              STA     XINDES,X
ABBC E8                 INX
ABBD E8                 INX
ABBE E0 06              CPX     #$06
ABC0 90 F1              BCC     THIN28
ABC2 A6 A7              LDX     ZYTOGG          ; RESTORE X
ABC4            THIN30
                ;
                ;               ZYLON STRAFING SECTION
                ;
ABC4 B5 A8              LDA     SEQEN,X
ABC6 D0 32              BNE     THIN24
ABC8 A4 A7              LDY     ZYTOGG
ABCA            THIN11
ABCA C0 31              CPY     #RAMNUM
ABCC B0 13              BCS     THIN12
ABCE B9 B8 00           LDA     BSTRAF,Y
ABD1 4A                 LSR     A
ABD2 B9 40 0A           LDA     XPOSH,Y
ABD5 B0 06              BCS     THIN36
ABD7 C9 0A              CMP     #$0A
ABD9 90 0E              BCC     THIN22
ABDB B0 04              BCS     THIN12          ; JUMP
ABDD            THIN36
ABDD C9 F5              CMP     #$F5
ABDF B0 04              BCS     THIN33
ABE1            THIN12
ABE1 B9 AD 09           LDA     XSIGN,Y
ABE4 4A                 LSR     A
ABE5            THIN33
ABE5 A9 0F              LDA     #$0F
ABE7 B0 02              BCS     THIN23
ABE9            THIN22
ABE9 A9 00              LDA     #$00
ABEB            THIN23
```

```
ABEB 95 AC              STA     XINDES,X
ABED 18                 CLC
ABEE 98                 TYA
ABEF 69 31              ADC     #RAMNUM
ABF1 A8                 TAY
ABF2 E8                 INX
ABF3 E8                 INX
ABF4 E0 06              CPX     #$06
ABF6 90 D2              BCC     THIN11
ABF8 A6 A7              LDX     ZYTOGG          ; RESTORE X
ABFA            THIN24
                ;
                ;               ACCELERATION SECTION
                ;
ABFA A4 A7              LDY     ZYTOGG
ABFC            THINK8
ABFC B5 B2              LDA     XINPRS,X
ABFE D5 AC              CMP     XINDES,X
AC00 F0 08              BEQ     THINK10
AC02 B0 04              BCS     THINK9
AC04 F6 B2              INC     XINPRS,X
AC06 90 02              BCC     THIN10          ; JUMP
AC08            THINK9
AC08 D6 B2              DEC     XINPRS,X
AC0A            THIN10
AC0A 86 6A              STX     TEMP            ; SAVE X
AC0C AA                 TAX
AC0D BD 99 BF           LDA     ZYWARP,X
AC10 A6 6A              LDX     TEMP            ; RESTORE X
AC12 99 66 0B           STA     XINCRE,Y
AC15 98                 TYA
AB16 18                 CLC
AC17 69 31              ADC     #RAMNUM
AC19 A8                 TAY
AC1A E8                 INX
AC1B E8                 INX
AC1C E0 06              CPX     #$06
AC1E 90 DC              BCC     THINK8
AC20 A6 A7              LDX     ZYTOGG          ; RESTORE X
                ;
                ;
                ;               FIRE PHOTON
AC22 AD 8E 0C           LDA     GINDEX+2
AC25 D0 0B              BNE     THIN16
```

```
AC27 A5 EB            LDA     STFLAG+2
AC29 D0 06            BNE     THIN13
AC2B A5 BE            LDA     PHEXWT
AC2D F0 03            BEQ     THIN16
AC2F C6 BE            DEC     PHEXWT
AC31          THIN13
AC31 60               RTS
AC32          THIN16
AC32 18               CLC
AC33 BD A2 0A         LDA     ZPOSH,X
AC36 69 02            ADC     #$02
AC38 C9 05            CMP     #$05
AC3A B0 F5            BCS     THIN13
AC3C A0 D0            LDY     #$D0
AC3E BD AD 09         LDA     XSIGN,X
AC41 4A               LSR     A
AC42 BD 40 0A         LDA     XPOSH,X
AC45 B0 08            BCS     THIN15
AC47 49 FF            EOR     #$FF
AV49 A4 62            LDY     MISDIF
AC4B F0 E4            BEQ     THIN13
AC4D A0 50            LDY     #$50
AC4F          THIN15
AC4F C9 20            CMP     #$20
AC51 B0 DE            BCS     THIN13
AC53 8C 68 0B         STY     XINCRE+2
AC56 A9 00            LDA     #$00
AC58 8D 8E 0C         STA     GINDEX+2
AC5B 8D 2C 0C         STA     HPOS+2          ; METEOR FLASH
AC5E A9 3E            LDA     #62
AC60 85 EB            STA     STFLAG+2
AC62 A2 02            LDX     #$02
AC64 A4 A7            LDY     ZYTOGG
AC66 84 BF            STY     ATTARG
AC68 4C AF AC         JMP     EXHELP
                ;
                ;
                ;
AC6B          EXPLOS
                ;               INIT EXPLOSION
                ;               Y CONTAINS INDEX OF ZYLON HIT
AC6B A9 80            LDA     #$80            ; 2 SECONDS
AC6D 85 73            STA     ETIMER
AC6F A2 30            LDX     #RMLAST
```

```
AC71 B6 79              STX     NSTARS          ; LAST STAR FOR EXPLOSION
AC73            EXPLS1
AC73 AD 0A D2           LDA     RANDOM
AC76 29 0F              AND     #$0F
AC78 79 2A 0C           ADC     HPOS,Y
AC7B E9 30              SBC     #$30
AC7D 9D 2A 0C           STA     HPOS,X
AC80 AD 0A D2           LDA     RANDOM
AC83 29 0F              AND     #$0F
AC85 79 F9 0B           ADC     VPOS,Y
AC88 4A                 LSR     A
AC89 E9 10              SBC     #$10
AC8B 9D F9 0B           STA     VPOS,X
AC8E 20 AF AC           JSR     EXHELP
AC91 AD 0A D2           LDA     RANDOM
AC94 29 87              AND     #$87
AC96 9D 66 0B           STA     XINCRE,X
AC99 AD 0A D2           LDA     RANDOM
AC9C 29 87              AND     #$87
AC9E 9D 97 0B           STA     YINCRE,X
ACA1 AD 0A D2           LDA     RANDOM
ACA4 29 87              AND     #$87
ACA6 9D C8 0B           STA     ZINCRE,X
ACA9 CA                 DEX
ACAA E0 10              CPX     #STLAST
ACAC D0 C5              BNE     EXPLS1
ACAE 60                 RTS
                ;
                ;
ACAF            EXHELP
                        ;       EXPLOSION HELPER
ACAF B9 AD 09           LDA     XSIGN,Y
ACB2 9D AD 09           STA     XSIGN,X
ACB5 B9 40 0A           LDA     XPOSH,Y
ACB8 9D 40 0A           LDA     XPOSH,X
ACBB B9 D3 0A           LDA     XPOSL,Y
ACBE 9D D3 0A           STA     XPOSL,X
ACC1            EXHLP1          ; ENTRY POINT FROM HLINES       *************************
ACC1 B9 DE 09           LDA     XSIGN,Y
ACC4 9D DE 09           STA     XSIGN,X
ACC7 B9 71 0A           LDA     XPOSH,Y
ACCA 9D 71 0A           STA     XPOSH,X
ACCD B9 0F 0A           LDA     ZSIGN,Y
ACC0 9D 0F 0A           STA     ZSIGN,X
```

```
                        ;
ACD3 B9 A2 0A           LDA     ZPOSH,Y
ACD6 9D A2 0A           STA     ZPOSH,X
ACD9 B9 04 0B           LDA     YPOSL,Y
ACDC 9D 04 0B           STA     YPOSL,X
ACDF B9 35 0B           LDA     ZPOSL,Y
ACE2 9D 35 0B           STA     ZPOSL,X
ACE5                    EXHLP2          ; ENTRY POINT FROM BSERVE **********************
ACE5 60                 RTS
                        ;
                        ;
                        ;
                        ;
ACE6                    BSERVE
                        ;               STARBASE SERVICE ROUTINE
ACE6 A5 7B              LDA     BASFLG
ACE8 F0 FB              BEQ     EXHLP2          ; BRANCH TO RTS
ACEA A5 D0              LDA     DISFLG
ACEC D0 05              BNE     BSERV9
ACEE A9 14              LDA     #$14            ; PRIORITY FOR FRONT VIEW OF STARBASE
ACF0 8D 1B D0           STA     PRIOR
ACF3                    BSERV9
ACF3 A9 02              LDA     #$02
ACF5 8D 5C 09           STA     DCSTOR
                        ;
ACF8 A9 30              LDA     #$30
ACFA 8D 8E 0C           STA     GINDEX+2
ACFD A9 20              LDA     #$20
ACFF 8D 8D 0C           STA     GINDEX+1
AD02 A9 40              LDA     #$40
AD04 8D 8C 0C           STA     GINDEX+0
AD07 A9 FF              LDA     #$FF
                        ;
AD09 A6 90              LDX     QUADRT
AD0B BC C9 0B           LDY     CHTRAM,X
AD0E 30 02              BMI     BSER13
AD10 A9 00              LDA     #$00
AD12                    BSER13
AD12 85 E9              STA     STFLAG+0
AD14 85 EA              STA     STFLAG+1
AD16 85 5B              STA     STFLAG+2
AD18 85 7B              STA     BASFLG
AD1A 30 0A              BMI     BSERV1
AD1C A0 02              LDY     #$02
```

```
AD1E 20 6B AC           JSR     EXPLOS
AD21 A2 0A              LDX     #NOITB1-NOISTB
AD23 4B A8 AE           JMP     NOISE
AD26            BSERV1
                ;                       TOO CLOSE ?
AD26 AD 42 0A           LDA     XPOSH+2
AD29 D0 0A              BNE     BSER14
AD2B AD D5 0A           LDA     XPOSL+2
AD2E C9 20              CMP     #$20
AD30 B0 03              BCS     BSER14
AD32 EE D5 0A           INC     XPOSL+2
AD35            BSER14
                ;               ORBIT ?
AD35 AD 2C 0C           LDA     HPOS+2
AD38 38                 SEC
AD39 E9 78              SBC     #$78
AD3B C9 10              CMP     #$10
AD3D B0 22              BCS     BSERV8
AD3F AD F8 0B           LDA     VPOS+2
AD42 38                 SEC
AD43 E9 68              SBC     #$68
AD45 C9 10              CMP     #$10
AD47 B0 18              BCS     BSERV8
AD49 AD 42 0A           LDA     XPOSH+2
AD4C C9 02              CMP     #02
AD4E B0 11              BCS     BSERV8
AD50 AD AF 09           LDA     XSIGN+2
AD53 2D 11 0A           AND     ZSIGN+2
AD56 49 01              EOR     #$01
AD58 05 71              ORA     SPEED
AD5A 0D A4 0A           ORA     ZPOSH+2
AD5D 05 71              ORA     WARP
AD5F F0 10              BEQ     BSERV3          ; IN ORBIT
AD61            BSERV8
AD61 A5 75              LDA     BSEQTM          ; ORBIT ABORTED
AD63 C9 02              CMP     #$02
AD65 90 05              BCC     BSER15
AD67 A0 1F              LDY     #SENDKA-SENTAB
AD69 20 23 B2           JSR     LDMESS
AD6C            BSER15
AD6C A9 00              LDA     #$00
AD6E 85 75              STA     BSEGTM
AD70            BSER11
AD70 60                 RTS
```

```
                    ;
AD71                BSERV3
AD71 24 75                BIT     BSEGTM
AD73 70 0D                BVS     BSERV4
AD75 30 42                BMI     BSERV5
AD77 A5 75                LDA     BSEQTM          ; LD MESS
AD79 D0 F5                BNE     BSER11          ; NO
AD7B C6 75                DEC     BSEQTM          ; =FF
AD7D A0 1C                LDY     #SENORB-SENTAB
AD7F 4C 23 B2             JMP     LDMESS
AD82                BSERV4
AD82 A2 00                LDX     #$00
AD84 86 65                STX     REPMSG
AD86 A4 D1                LDY     SENPTR
AD88 D0 E6                BNE     BSER11          ; WAIT FO MESSAGE TO TIMEOUT
AD8A A9 50                LDA     #$50
AD8C 8D 90 0C             STA     GINDEX+4
AD8F A9 01                LDA     #$01
AD91 8D B1 09             STA     XSIGN+4
AD94 8D E2 09             STA     YSIGN+4
AD97 8D 13 0A             STA     ZSIGN+4
AD9A 8D A6 0A             STA     ZPOSH+4
AD9D 8D 9B 0B             STA     YINCRE+4
ADA0 A9 10                LDA     #$10
ADA2 8D 44 0A             STA     XPOSH+4
ADA5 A9 00                LDA     #$00
ADA7 8D 75 0A             STA     YPOSH+4
ADAA A9 87                LDA     #$87
ADAC 8D 6A 0B             STA     XINCRE+4
ADAF A9 81                LDA     #$81
ADB1 85 75                STA     BSEQTM
ADB3 8D CC 0B             STA     ZINCRE+4
ADB6 85 ED                STA     STFLAG+4
ADB8                BSERV7
ADB8 60                   RTS
ADB9                BSERV5
ADB9 AD B1 09             LDA     XSIGN+4         ; SHIP DOCKED ?
ADBC D0 FA                BNE     BSERV7          ; NO
ADBE A2 0C                LDX     #CH4TB3-CH4TAB          ; SOUND
ADC0 20 A6 B3             JSR     NOTINT
ADC3 A0 21                LDY     #SENETC-SENTAB
ADC5 20 23 B2             JSR     LDMESS
                    ;               CLEAR   DAMAGE
ADC8 A2 05                LDX     #$05
```

```
ADCA                BSER12
ADCA BD 8B BB       LDA     STINIT+73,X
ADCD 9D 92 09       STA     DAMAGE,X
ADD0 CA             DEX
ADD1 10 F7          BPL     BSER12
                    ;
                    ;       NEW ENERGY
ADD3 A9 89          LDA     #$89
ADD5 A2 03          LDX     #$03
ADD7                BSER20
ADD7 9D 55 09       STA     DENERG+0,X
ADDA CA             DEX
ADDB 10 FA          BPL     BSER20
ADDD A9 07          LDA     #$07
ADDF 8D 6A 0B       STA     XINCRE+4
ADE2 A9 81          LDA     #$81
ADE4 8D 9B 0B       STA     YINCRE+4
ADE7 A9 01          LDA     #$01
ADE9 8D CC 0B       STA     ZINCRE+4
ADEC 85 75          STA     BSEQTIM
ADEE 4C 7B B0       JMP     KEYSR7          ; RE-LOAD INSET
                    ;
                    ;
                    ;
                    ;
ADF1                LDISP
                    ;       LOAD DISPLAY LISTS
                    ;       A=#OF BYTES TO STORE, X=POSIT IN DSPLY, Y=PNTR IN LISTAB
ADF1 78             SEI             ; WE DONT WANT NO INTERUPTS !!
ADF2 85 6A          STA     TEMP
ADF4                LDISP3
ADF4 AD 0B D4       LDA     VCOUNT          ; CHECK IF ANTIC IS IN SAFE AREA
ADF7 C9 7C          CMP     #DISTOP
ADF9 90 F9          BCC     LDISP3
ADFB                LDISP2
ADFB B9 62 BA       LDA     LISTAB,Y
ADFE C8             INY
ADFF 10 02          BPL     LDISP1
AE01 A9 0D          LDA     #$0D
AE03                LDISP1
AE03 9D 80 02       STA     DISPLY,X
AE06 E8             INX
AE07 C6 6A          DEC     TEMP
AE09 D0 F0          BNE     LDISP2
```

```
AE0B 58                 CLI                     ; IRQS BACK ON !!
AE0C 60                 RTS
                ;
                ;
                ;
                ;
                ;
                ;
                ;
AE0D            CLRMAP
                ;               CLEAR MEMORY MAP SUBROUTINE
AE0D A9 10              LDA     #MEMMAP/256
AE0F            CLRMP1          ; ENTRY POINT CLEAR ALL RAM ************************
AE0F 85 69              STA     PNTR+1
AE11 A9 00              LDA     #$00
AE13 A8                 TAY
AE14 85 68              STA     PNTR
AE16 85 A3              STA     LOKFLG          ; LOCK FLAG IS CLEARED
AE18 85 7A              STA     CNSTAR          ; RAM HAS BEEN CLEARED
AE1A            CLRMP2
AE1A 91 68              STA     (PNTR),Y
AE1C C8                 INY
AE1D D0 FB              BNE     CLRMP2
AE1F E6 69              INC     PNTR+1
AE21 A4 69              LDY     PNTR+1
AE23 C0 20              CPY     #$20
AE25 A8                 TAY             ; RE-ZERO Y REG
AE26 90 F2              BCC     CLRMP2
AE28 60                 RTS
                ;
                ;
AE29            PHOTON
                ;               PHOTON TORPEDO FIRE
AE29 A5 84              LDA     PHOFLG          ; REPEAT FLAG
AE2B AC 10 D0           LDY     TRIGO           ; SHOOT ?
AE2E 84 84              STY     PHOFLG
AE30 D0 0E              BNE     PHOTN2          ; NO
AE32 84 66              STY     TIMOUT          ; RESET ATRACT TIMEOUT
AE34 A6 C0              LDX     HFLAG           ; HWARP ?
AE36 D0 08              BNE     PHOTN2          ; YES, NO FIRE
AE38 A6 87              LDX     PHOTOG
AE3A C9 01              CMP     #$01
AE3C F0 03              BEQ     PHOTN8
```

```
AE3E B0 18              BCS     PHOTN4
AE40            PHOTN2
AE40 60                 RTS
AE41            PHOTN8
                ;               ONE-SHOT
AE41 B5 EC              LDA     STFLAG+3,X              ; ONE-SHOT TIMEOUT
AE43 C9 E8              CMP     #$E8            ; ALL DONE ?
AE45 B0 F9              BCS     PHOTN2          ; NO
AE47 AC 5C 09           LDY     DCSTOR
AE4A 84 89              STY     LOKTAR
AE4C A9 0C              LDA     #12
AE4E A4 A3              LDY     LOKFLG
AE50 84 86              STY     LOKLOC
AE52 F0 02              BEQ     PHOTN3
AE54 A9 00              LDA     #$00
AE56            PHOTN3
AE56 85 88              STA     LOKWAT
AE58            PHOTN4
AE58 84 84              STY     PHOFLG
                ;
AE5A 2C 92 09           BIT     DAMAGE+0
AE5D 70 E1              BVS     PHOTN2
AE5F 30 05              BMI     PHOTN7
AE61 8A                 TXA
AE62 49 01              EOR     #$01
AE64 85 87              STA     PHOTOG
AE66            PHOTN7
AE66 8A                 TXA
AE67 9D E1 09           STA     YSIGN+3,X               ; NEW YSIGN
AE6A BD 73 BF           LDA     PHOYPS,X                ; NEW YPOSH
AE6D 9D 74 0A           STA     YPOSH+3,X
AE70 A9 FF              LDA     #$FF
AE72 95 EC              STA     STFLAG+3,X              ; INIT PHOTON TIME
AE74 9D A5 0A           STA     ZPOSH+3,X
AE77 A9 00              LDA     #$00
AE79 9D 8F 0C           STA     GINDEX+3,X              ; INIT PHOTON GRAPHIC
AE7C 9D 43 0A           STA     XPOSH+3,X
AE7F 9D 07 0B           STA     YPOSL+3,X
AE82 9D 12 0A           STA     ZSIGN+3,X
AE85 9D 38 0B           STA     ZPOSL+3,X
AE88 A9 01              LDA     #$01
AE8A 9D B0 09           STA     XSIGN+3,X
AE8D 9D D9 0A           STA     XPOSL+3,X
AE90 A5 D0              LDA     DISFLG
```

```
AE92 4A              LSR     A
AE93 6A              ROR     A
AE94 09 66           ORA     #$66
AE96 9D 69 0B        STA     XINCRE+3,X
AE99 A9 00           LDA     #$00
AE9B 9D 9A 0B        STA     YINCRE+3,X
AE9E 9D CB 0B        STA     ZINCRE+3,X
AEA1 A2 02           LDX     #$02
AEA3 20 6F B8        JSR     PANDS6                  ; PHOTON ENERGY
AEA6 A2 00           LDX     #$00
                     ;
                     ;       FALL THROUGH TO NOISE ************************
                     ;
AEA8                 NOISE
                     ;       NOISE INIT, X=NOISTB PNTR
AEA8 8A              TXA             ; PHOTONS
AEA9 D0 06           BNE     NOISE1          ; NO
                     ;       PHOTONS HAVE LOWER PRIORITY THAN EXPLOSIONS

AEAB A5 E1           LDA     AUDTIM
AEAD C9 18           CMP     #$18
AEAF B0 18           BCS     NOISE2
AEB1                 NOISE1
AEB1 A0 07           LDY     #$07
AEB3                 NOISE3
AEB3 BD 20 BF        LDA     NOISTB,X
AEB6 99 DA 00        STA     PHOREP,Y
AEB9 E8              INX
AEBA 88              DEY
AEBB 10 FB           BPL     NOISE3
AEBD BD 20 BF        LDA     NOISTB,X
AEC0 8D 08 D2        STA     AUDCTL
AEC3 BD 21 BF        LDA     NOISTB+1,X
AEC6 8D 04 D2        STA     AUDF3
AEC9                 NOISE2
AEC9 60              RTS

                     ;
                     ;
AECA                 POHELP
                     ;       PHOTON HELPER
AECA A0 80           LDY     #$80
AECC B0 04           BCS     POHLP1
AECE 49 FF           EOR     #$FF
```

```
AED0 A0 00            LDY     #$00
AED2            POHLP1
AED2 84 6A            STY     TEMP
AED4 C0 08            CMP     #$08
AED6 90 02            BCC     POHLP2
AED8 A9 07            LDA     #$07
AEDA            POHLP2
AEDA A8               TAY
AEDB A5 6A            LDA     TEMP
AEDD 19 C9 BF         ORA     PHVECT,Y
AEE0 60               RTS
                ;
                ;
                ;
AEE1            DAMCTL
                ;             DAMAGE CONTROL ROUTINE
AEE1 24 64            BIT     ATRACT
AEE3 30 57            BMI     DAMCT1          ; GAME OVER NO DAMAGE
AEE5 A6 62            LDX     MISDIF
AEE7            DAMCT2
AEE7 AD 0A D2         LDA     RANDOM
AEEA DD 10 BF         CMP     DPRBTB,X
AEED B0 4D            BCS     DAMCT1
AEEF 29 07            AND     #$07
AEF1 C9 06            CMP     #$06
AEF3 B0 47            BCS     DAMCT1
AEF5 AA               TAX
AEF6 BD 92 09         LDA     DAMAGE,X
AEF9 0A               ASL     A
AEFA 30 EB            BMI     DAMCT2
AEFC A5 EB            LDA     STFLAG+2
AEFE C9 1E            CMP     #30
AF00 A9 80            LDA     #$80
AF02 BC 14 BF         LDY     DAMGTB,X
AF05 90 17            BCC     DAMCT3
AF07 E0 03            CPX     #$03
AF09 D0 05            BNE     DAMCT5
AF0B 2C 96 09         BIT     DAMAGE+4
AF0E 70 0E            BVS     DAMCT3
AF10            DAMCT5
AF10 E0 04            CPX     #$04
AF12 D0 05            BNE     DAMCT6
AF14 2C 95 09         BIT     DAMAGE+3
AF17 70 05            BVS     CAMCT3
```

```
AF19                DAMCT6
AF19 A9 C0                  LDA     #$C0
AF1B BC 1A BF               LDY     DESTTB,X
AF1E                DAMCT3
AF1E 1D 92 09               ORA     DAMAGE,X
AF21 9D 92 09               STA     DAMAGE,X
AF24 84 65                  STY     REPMSG
AF26 2C 95 09               BIT     DAMAGE+3
AF29 50 07                  BVC     DAMCT4
AF2B A9 00                  LDA     #$00
AF2D 85 7E                  STA     ATENER
AF2F 20 0D AE               JSR     CLRMAP
AF32                DAMCT4
AF32 A0 52                  LDY     #SENDMC-SENTAB
AF34 20 23 B2               JSR     LDMESS
AF37 A2 12                  LDX     #CH4TB4-CH4TAB          ; DAMAGE
AF39 20 A6 B3               JSR     NOTINT
AF3C                DAMCT1
AF3C 60                     RTS
                    ;
                    ;
AF3D                HITZYL
                    ;               PHOTON HIT ZYLON CHECK
AF3D A2 02                  LDX     #$02            ; 2 PLAY PHOTONS
AF3F                HITZY2
AF3F CA                     DEX
AF40 10 01                  BPL     HITZY1
AF42 60                     RTS
AF43 BD BF 0C       HITZY1  LDA     GINDEX+3,X              ; PHOTON ?
AF46 D0 F7                  BNE     HITZY2                  ; NO
AF48 B5 EC                  LDA     STFLAG+3,X              ; PHOTON ON ?
AF4A F0 F3                  BEQ     HITZY2          ; NO
AF4C B5 82                  LDA     PHITS+0,X               ; ANY HIT ?
AF4E 29 07                  AND     #$07            ; LOOK AT 0,1 ONLY
AF50 F0 ED                  BEQ     HITZY2          ; NO HIT
AF52 4A                     LSR     A               ; 0 OR 1 ONLY
AF53 C9 03                  CMP     #$03
AF55 D0 01                  BNE     HITZY9
AF57 4A                     LSR     A
AF58                HITZY9
AF58 A8                     TAY                     ; OBJECT INDEX IN Y
AF59 B9 E9 00               LDA     STFLAG,Y                ; SHIP ON ?
AF5C F0 E1                  BEQ     HITZY2                  ; NO
AF5E A5 D0                  LDA     DISFLG
```

```
AF60 F0 02              BEQ     HITZY8
AF62 A9 FF              LDA     #$FF
AF64            HITZY8
AF64 85 6C              STA     TEMP2
AF66 59 40 0A           EOR     XPOSH,Y
AF69 C9 10              CMP     #$10
AF6B 90 02              BCC     HITZY3
AF6D A9 0F              LDA     #$0F
AF6F            HITZY3
AF6F 4A                 LSR     A
AF70 84 6B              STY     TEMP1
AF72 A8                 TAY
AF73 A5 6C              LDA     TEMP2
AF75 5D 43 0A           EOR     XPOSH+3,X
AF78 D9 75 BF           CMP     PHPOST,Y                ; TOP BOUND
AF7B B0 C2              BCS     HITZY2
AF7D D9 7D BF           CMP     PHPOSB,Y                ; BOTTOM BOUND
AF80 90 BD              BCC     HITZY2
AF82 A4 6B              LDY     TEMP1
                ;               A HIT !!!
AF84 38                 SEC
AF85 A9 FF              LDA     #$FF
AF87 F5 EC              SBC     STFLAG+3,X
AF89 85 E2              STA     EXPDEL          ; AUDIO
AF8B C9 0F              CMP     #15
AF8D 90 05              BCC     HITZ11
AF8F B9 8C 0C           LDA     GINDEX,Y
AF92 C9 80              CMP     #$80
AF94            HITZ11
AF94 A9 00              LDA     #$00
AF96 85 88              STA     LOKWAT
AF98 95 EC              STA     STFLAG+3,X              ; PHOTON OFF
AF9A B0 4B              BCS     HITZ10
AF9C 99 E9 00           STA     STFLAG,Y                ; ZYLON OFF
AF9F B9 8C 0C           LDA     GINDEX,Y
AFA2 F0 43              BEQ     HITZ10          ; PHOTON
AFA4 C9 60              CMP     $#60            ; METORER
AFA6 F0 3F              BEQ     HITZ10          ; YES
AFA8 A9 00              LDA     #$00
AFAA 85 86              STA     LOKLOC          ; TURN OFF PHOTONS TRACKING
AFAC A6 90              LDX     QUADRT          ; WHICH QUAD KILL IN
AFAE DE C9 08           DEC     CHTRAM,X                ; REMOVE FROM CHART
AFB1 10 13              BPL     HITZY4
AFB3 A9 00              LDA     #$00            ; JUST BLASTED A STARBASE ELSE IMPOSSIBLE
```

```
                        ;                                       TO GET HERE
AFB5 9D C9 08                   STA     CHTRAM,X
AFB8 38                         SEC
AFB9 A5 CB                      LDA     RATING
AFBB E9 03                      SBC     #3
AFBD 85 CB                      STA     RATING
AFBF A5 CC                      LDA     RATING+1
AFC1 E9 00                      SBC     #$00
AFC3 85 CC                      STA     RATING+1
AFC5 60                         RTS
AFC6                    HITZY4
                        ;
                        ;               INCKIL
                        ;               INCRE KILL COUNT DISPLAY
AFC6 18                         CLC
AFC7 A5 CB                      LDA     RATING
AFC9 69 06                      ADC     #$06
AFCB 85 CB                      STA     RATING
AFCD A5 CC                      LDA     RATING+1
AFCF 69 00                      ADC     #$00
AFD1 85 CC                      STA     RATING+1
AFD3 A2 01                      LDX     #$01
AFD5                    INCKL1
AFD5 FE 50 09                   INC     DKILL,X         ; KILL BYTE INCRE
AFD8 BD 50 09                   LDA     DKISLL,X
AFDB C9 4A                      CMP     #$4A            ; BCD OBERFFLOW
AFDD 90 08                      BCC     INCKL2          ; NO.
AFDF A9 40                      LDA     #$40            ; BCD 0
AFE1 9D 50 09                   STA     DKILL,X
AFE4 CA                         DEX
AFE5 10 EE                      BPL     INCKL1          ; NEXT BYTE
AFE7                    INCKL2
                        ;
AFE7                    HITZ10
AFE7 20 6B AC                   JSR     EXPLOS
AFEA A2 7F                      LDX     #127
AFEC                    HITZY5
AFEC BD C9 08                   LDA     CHTRAM,X
AFEF 30 02                      BMI     HITZY6
AFF1 D0 0A                      BNE     HITZY7
AFF3                    HITZY6
AFF3 CA                         DEX
AFF4 10 F6                      BPL     HITZY5
                        ;               WIN
```

```
AFF6 A0 3F          LDY   #SENWIN-SENTAB
AFF8 A2 00          LDX   #$00
AFFA 20 21 B1       JSR   CRATE1
AFFD          HITZY7
AFFD 60             RTS
                    ;
                    ;
                    ;
                    ;
                    ;
AFFE          KEYSERV
                    ;             KEYBOARD SERVICE ROUTINE
AFFE A5 CA          LDA   THEKEY          ; ANY KEY
B000 F0 3E          BEQ   KESR3           ; NO
B002 A2 14          LDX   #$14            ; LAST KEY
B004 85 6A          STA   TEMP
B006 A9 00          LDA   #$00
B008 85 66          STA   TIMOUT          ; RESET ATRACT TIMEOUT
B00A 85 CA          STA   THEKEY          ; TURN OFF KEY
B00C A9 11          LDA   #$11
B00E 8D 1B D0       STA   PRIOR           ; RESET PRIORITY , FROM STARBASE
B011          KEYSR1
B011 BD BE BA       LDA   CODCON,X                ; KEY CODES
B014 C5 6A          CMP   TEMP
B016 F0 08          BEQ   KEYSR2
B018 CA             DEX
B019 10 F6          BPL   KEYSR1          ; NEXT KEY
                    ;                   NO KEY
B01B A0 10          LDY   #SENWHT-SENTAB          ; WHAT
B01D 4C 23 B2       JMP   LDMESS
B020          KEYSR2                ; KEY FOUND
B020 E0 0A          CPX   #$0A            ; IMPULSE ENGINE ?
B022 B0 1D          BCS   KEYSR4          ; NO
B024 A5 C0          LDA   HFLAG           ; HWARP ?
B026 F0 03          BEQ   KEYS20          ; NO
B028 4C 80 A9       JMP   HABORT
B02B          KEYS20
B02B 2C 93 09       BIT   DAMAGE+1                ; ENGINES
B02E 50 06          BVC   KEYS23
B030 E0 06          CPX   #$06
B032 90 02          BCC   KEYS23
B034 A2 05          LDX   #$05
B036          KEYS23
B036 BD D3 BA       LDA   WENTAB,X
```

```
B039 85 80          STA     WPENER          ; IMPULSE ENGINE ENERGY
B03B BD B4 BA       LDA     WARPTB,X                ; SPEED
B03E 85 71          STA     WARP            ; SPEED DESIRED
B040            KEYSR3
B040 60             RTS
B041            KEYSR4
B041 E0 0E          CPX     #$0E            ; DISPLAY TYPE KEY ?
B043 B0 1B          BCS     KEYSR5          ; NO
                ;
B045            KEYS15          ; ENTRY POINT TO INIT DISPLAY, **********
                ;               X MUST BE DEFINED TO THE KEY CODE IN CODCON
B045 BD 18 8E       LDA     DISTYP-10,X
B048 85 D0          STA     DISFLG
B04A BC 82 BA       LDY     DISDIS-10,X
B04D A2 02          LDX     #DISPL1-DISPLY
B04F A9 08          LDA     #$08
B051 20 F1 AD       JSR     LDISP
                ;
B054 A2 10          LDX     #STLAST
B056            KEYSR6
B056 20 64 B7       JSR     NEWSTR
B059 CA             DEX
B05A E0 05          CPX     #OBJNUM
B05C B0 F8          BCS     KEYSR6
B05E 90 1B          BCC     KEYSR7          ; JUMP
B060            KEYSR5
B060 E0 11          CPX     #$11            ; TOGGLE TYPE ?
B062 B0 35          BCS     KEYSR8          ; NO
B064 BC 18 BE       LDY     TOFFMG-$0E,X
B067 B5 6E          LDA     TRKFLG-$0E,X
B069 5D 1B BE       EOR     TOGTAB-$0E,X
B06C 95 6E          STA     TRKFLG-$0E,X
B06E F0 03          BEQ     KEYSR9
B070 BC 1E BE       LDY     TONMSG-$0E,X
B073            KEYSR9
B073 20 23 B2       JSR     LDMESS
B076 A2 0C          LDX     #CH4TB3-CH4TAB          ; KEYS
B078 20 A6 B3       JSR     NOTINT
B07B            KEYSR7          ; ENTRY POINT FOR RE-LOADING INSET **********
B07B A2 16          LDX     #$16
B07D A4 7C          LDY TRKFLG
B07F F0 01          BEQ     KEYS18
B081 E8             INX
B082            KEYS18
```

```
B082 8E 5A 09           STX     DCSTOR-2
B085 20 0D AE           JSR     CLRMAP
B088 A5 7E              LDA     ATENER
B08A F0 B4              BEQ     KEYSR3
B08C A6 D0              LDX     DISFLG
B08E F0 06              BEQ     KEYS10
B090 E0 01              CPX     #$01
B092 D0 AC              BNE     KEYSR3
B094 A2 2A              LDX     #INSTB1-INSTAB
B096            KEYS10
B096 4C 6F A7           JMP     LDINST
B099            KEYSR8
B099 E0 11              CPX     #$11            ; HYPERWARP ?
B09B D0 50              BNE     KEYS13
B09D A5 C0              LDA     HFLAG           ; HWARP ALREADY ON ?
B09F D0 5A              BNE     KEYS14
B0A1 A9 7F              LDA     #$7F
B0A3 85 C0              STA     HFLAG
B0A5 A9 FF              LDA     #$FF
B0A7 85 71              STA     WARP
B0A9 A9 1E              LDA     #30
B0AB 85 80              STA     WPENER
B0AD A9 30              LDA     #RMLAST
B0AF 85 C3              STA     HPNTR
                ;               H STEERING STUFF
B0B1 A9 00              LDA     #$00
B0B3 85 C2              STA     HTIMER
B0B5 8D 74 0A           STA     YPOSH+3
B0B8 8D 07 0B           STA     YPOSL+3
B0BB 8D 38 0B           STA     ZPOSL+3
B0BE 8D 69 0B           STA     XINCRE+3
B0C1 A9 01              LDA     #$01
B0C3 8D B0 09           STA     XSIGN+3
B0C6 8D E1 09           STA     YSIGN+3
B0C9 8D 12 0A           STA     ZSIGN+3
B0CC 8D A5 0A           STA     ZPOSH+3
B0CF A5 8F              LDA     HYHPOS
B0D1 85 C4              STA     HSTEER
B0D3 A5 8E              LDA     HYVPOS
B0D5 85 C5              STA     VSTEER
B0D7 A5 62              LDA     MISDIF
B0D9 F0 0B              BEQ     KEYS24
B0DB A5 91              LDA     HYPENG
B0DD 2A                 ROL     A
```

```
B0DE 2A                 ROL     A
B0DF 2A                 ROL     A
B0E0 29 03              AND     #$03
B0E2 A8                 TAY
B0E3 B9 D7 BE           LDA     STERTB,Y                ; DIFFICULTY
B0E6            KEYS24
B0E6 85 C6              STA     STERMK
                ;               END STUFF
B0E8 A0 11              LDY     #SENHYP-SENTAB          ; MESSAGE HYPER WARP ENGAGED
B0EA 4A 23 B2           JMP     LDMESS
B0ED            KEYS13
B0ED E0 13              CPX     #$13
B0EF B0 0B              BCS     KEYS27          ; PAUSE
B0F1 AD 5C 09           LDA     DCSTOR
B0F4 49 01              EOR     #$01
B0F6 29 01              AND     #$01
B0F8 8D 5C 09           STA     DCSTOR
B0FB            KEYS14
B0FB 60                 RTS
B0FC            KEYS27
B0FC D0 08              BNE     KEYS28
B0FE AD 00 D3           LDA     PORTA           ; PAUSE UNTIL MOVE JOYSTICK
B101 C9 FF              CMP     #$FF
B103 F0 F7              BEQ     KEYS27
B105 60                 RTS
B106            KEYS28
                ;               MISSION ABORTED
B106 A0 76              LDY     #SENABR-SENTAB
B108 A2 04              LDX     #$04
                ;
                ;               FALL THROUGH TO CRATE ************************
                ;
                ;
B10A            CRATE
                ;               CALCULATE RATING, X=0 MISSION COMPLETE, 4=ABORTED, 8-DESTROYED
                ;       Y=MESSAGE TYPE
                ;               GAME OVER, CALCULATE RATING

B10A A9 00              LDA     #$00
B10C 85 EC              STA     STFLAG+3                ; NO HWARP CURSOR
B10E 85 D6              STA     NPRIOR
B110 85 D1              STA     SENPTR
B112 85 8B              STA     REDFLG
B114 8D 07 D2           STA     AUDC4
```

```
B117 85 71            STA     WARP
B119 85 81            STA     SPABAK
B11B 85 7D            STA     SHENER
B11D 85 C0            STA     HFLAG
B11F 85 C1            STA     HISPED
B121            CRATE1        ; ENTRY POINT FOR A GOOD MISSION **********************
B121 A9 FF            LDA     #$FF
B123 85 64            STA     ATRACT
B125 84 65            STY     REPMSG          ; REPEAT MESSAGE
B127 8A               TXA
B128 05 62            ORA     MISDIF          ; MISSION DIFF GAME RESULT
B12A AA               TAX
B12B BD DD BE         LDA     DIFTAB,X
B12E 1B               CLC
B12F 65 CB            ADC     RATING
B131 AA               TAX
B132 A9 00            LDA     #$00
B134 85 C9            STA     VERJOY
B136 85 C8            STA     HORJOY
B13A 65 CC            ADC     RATING+1
B13C 4A               LSR     A
B13D 8A               TXA
B13E 6A               ROR     A
B13F 4A               LSR     A
B140 4A               LSR     A
B141 4A               LSR     A
B142 C9 13            CMP     #$13
B144 90 04            BCC     CRATE2
B146 A9 12            LDA     #$12
B148 A2 0F            LDX     #$0F
B14A            CRATE2
B14A 85 CD            STA     ENDRAT
B14C A8               TAY
B14D 8A               TXA
B14E C0 00            CPY     #$00
B150 F0 0B            BEQ     CRATE4
B152 C0 0B            CPY     #$0B
B154 90 04            BCC     CRATE5
B156 C0 0F            CPY     #$0F
B158 90 03            BCC     CRATE4
B15A            CRATE5
B15A 4A               LSR     A
B15B 49 08            EOR     #$08
B15D            CRATE4
```

```
B15D 29 0F          AND     #$0F
B15F 85 CE          STA     ENDCLS
B161            CRATE3
B161 60             RTS

                ;
                ;
                ;
B162            CSERVE
                ;           SERVICE GALACTIC CHART
B162 A5 C0          LDA     HFLAG           ; HWARP ON ?
B164 D0 04          BNE     CSERV9          ; YES
B166 A5 D0          LDA     DISFLG          ; DOING GALACTIC CHART ?
B168 30 01          BMI     CSERV1          ; NO
B16A            CSERV9
B16A 60             RTS
B16B            CSERV1
B16B 2C 97 09       BIT     DAMAGE+5                ; COMMUNICATIONS
B16E 30 03          BMI     CSER10
B170 20 B9 B4       JSR     LDGALT          ; LD UP THE CHART
B173            CSER10
B173 A5 72          LDA     TIMERX          ; SLOW DOWN CURSOR MOVE
B175 29 01          AND     #$01
B177 D0 2E          BNE     CSERV8
B179 18             CLC             ; UPDATE HORIZ CURSOR POS
B17A A5 BF          LDA     HYHPOS
B17C 65 C8          ADC     HORJOY
B17E 29 7F          AND     #$7F
B180 85 8F          STA     HYHPOS
B182 18             CLC
B183 69 3D          ADC     #HORCHT         ; OFFSET TO POSITION ON SCREEN
B185 8D 2E 0C       STA     HPOS+4          ; PLAYER FOUR IS CURSOR
B188 18             CLC                     ; UPDATE VERT CURSOR POSITION
B189 A5 8E          LDA     HYVPOS
B18B 65 C9          ADC     VERJOY
B18D 29 7F          AND     #$7F
B18F 85 8E          STA     HYVPOS
B191 18             CLC                     ; OFF SET TO POSITION ON SCREEN
B192 69 3F          ADC     #VERCHT
B194 8D FD 0B       STA     VPOS+4
                ;                           SHIP POS TO OBJ3
B197 A5 8C          LDA     GVPOS
B199 18             CLC
B19A 69 3F          ADC     #VERCHT
```

```
B19C 8D FC 08            STA     VPOS+3
B19F A5 8D               LDA     GHPOS
B1A1 18                  CLC
B1A2 69 3D               ADC     #HORCHT
B1A4 8D 2D 0C            STA     HPOS+3
                 ;               CLACULATE CURSORS QUADRANT
                 ;
B1A7             CSERV8          ; ENTRY POINT FOR CALCULATING NEW ENERGY AND QUADRANT ******
B1A7 A5 8F               LDA     HYHPOS          ; HPOS
B1A9 4A                  LSR     A
B1AA 4A                  LSR     A
B1AB 4A                  LSR     A
B1AC 85 6A               STA     TEMP            ;TEMP STORE H COMP
B1AE A5 8E               LDA     HYVPOS          ; VPOS
B1B0 29 70               AND     #$70            ; VCOMP
B1B2 05 6A               ORA     TEMP            ; ADD HCOMP
B1B4 85 92               STA     HYPQAD          ; QUADRANT CALCULATED
                 ;                       CALCULATE NUMBER OF ZYLONS IN TARGET
B1B6 AA                  TAX
B1B7 BD C9 08            LDA     CHTRAM,X                ; WHATS IN QUAD
B1BA 10 02               BPL     CSERV2          ; STARBASE ?
B1BC A9 00               LDA     #$00            ; YES
B1BE             CSERV2
B1BE 09 90               ORA     #$90            ; COLOR AND ASCII CODE
B1C0 2C 97 09            BIT     DAMAGE+5
B1C3 70 03               BVS     CSER11
B1C5 8D 8D 09            STA     DTARG           ; DISPLAY NUMBER OF ZYLONS
B1C8             CSER11
                 ;               CALCULATE WARP ENERGY
B1C8 38                  SEC
B1C9 A5 8F               LDA     HYHPOS
B1CB E5 8D               SBC     GHPOS
B1CD B0 04               BCS     CSERV3
B1CF 49 FF               EOR     #$FF
B1D1 69 01               ADC     #$01
B1D3             CSERV3
B1D3 85 AA               STA     TEMP
                 ;
B1D5 38                  SEC
B1D6 A5 8E               LDA     HYVPOS
B1D8 E5 8C               SBC     GVPOS
B1DA B0 04               BCS     CSERV4
B1DC 49 FF               EOR     #$FF
B1DE 69 01               ADC     #$01
```

```
B1E0                CSERV4
B1E0 4A                     LSR     A
B1E1 18                     CLC
B1E2 65 6A                  ADC     TEMP
B1E4 A8                     TAY
B1E5 4A                     LSR     A
B1E6 4A                     LSR     A
B1E7 4A                     LSR     A
B1E8 AA                     TAX
B1E9 98                     TYA
B1EA 29 03                  AND     #$03
B1EC 18                     CLC
B1ED 7D DD DA               ADC     ENGTAB,X
                    ;
B1F0 85 91                  STA     HYPENG
B1F2 A8                     TAY
B1F3 A9 10                  LDA     #$10
B1F5 8D 7D 09               STA     DWENER+0
B1F8 8D 7E 09               STA     DWENER+1
B1FB 8D 7F 09               STA     DWENER+2
B1FE                CSERV6
B1FE A2 02                  LDX     #$02
B200                CSERV5
B200 FE 7D 09               INC     DWENER,X
B203 BD 7D 09               LDA     DWENER,X
B206 C9 1A                  CMP     #$1A
B208 90 08                  BCC     CSERV7
B20A A9 10                  LDA     #$10
B20C 9D 7D 09               STA     DWENER,X
B20F CA                     DEX
B210 10 EE                  BPL     CSERV5
B212                CSERV7
B212 88                     DEY
B213 D0 E9                  BNE     CSERV6
B215 60                     RTS
                    ;
                    ;
                    ;
B216                MSERVE
                    ;               SERVICE MESSAGE
B216 A5 D1                  LDA     SENPTR          ; MESSAGE ON ?
B218 F0 05                  BEQ     LDMS14          ; NO
B21A C6 CF                  DEC     MESTIM          ; TIMED OUT ?
B21C F0 10                  BEQ     LDMES1          ; YES
```

```
B21E                LDMES2
B21E 60                     RTS
B21F                LDMES14
B21F A4 65                  LDY     REPMSG          ; REPEAT THE MESSAGE ?
B221 F0 FB                  BEQ     LDMES2          ; NO
B223                LDMESS          ; ENTRY POINT TO INIT MESSAGE **********************
B223 84 D1                  STY     SENPTR
B225 A0 23                  LDY     #LISTB6-LISTAB
B227 A2 0F                  LDX     #DISPL2-DISPLY
B229 A9 07                  LDA     #$07
B22B 20 F1 AD               JSR     LDISP           ; REVISE DISPLAY LIST FOR MESSAGE
B22E                LDMES1
B22E A2 13                  LDX     #19             ; CLEAR MESSAGE RAM
B230 A9 00                  LDA     #$00
B232 85 6B                  STA     TEMP1           ; CLEAR DISPLAY POINTER
B234                LDMES3
B234 9D 1F 0D               STA     MESAGE,X
B237 CA                     DEX
B238 10 FA                  BPL     LDMES3
B23A                LDMES4          ; MESSAGE LOOP POINT
B23A A6 D1                  LDX     SENPTR          ; NEW WORD PNTR
B23C E6 D1                  INC     SENPTR          ; ADVANCE TO NEXT WORD
B23E D0 09                  BNE     LDMES5
                    ;               MESSAGE DONE
B240 A2 0F                  LDX     #DISPL2-DISPLY
B242 A0 80                  LDY     #$80
B244 A9 07                  LDA     #$07
B246 4C F1 AD               JMP     LDISP           ; RESTORE DISPLAY LIST
B249                LDMES5
B249 BD AA BB               LDA     SENTAB,X                ; A =NEW WORD
B24C C9 FC                  CMP     #$FC            ; CLASS ?
B24E D0 0F                  BNE     LDMES6          ; NO
B250 A4 CE                  LDY     ENDCLS
B252 B9 FC BE               LDA     CLASTB,Y        ; VALUE 1-5, IN DMA ASCII
B255 A6 6B                  LDX     TEMP1           ; WHERE TO STORE
B257 9D 1F 0D               STA     MESAGE,X
B25A A9 3C                  LDA     #60             ; END OF LINE
B25C 85 CF                  STA     MESTIM          ; WAIT 1 SECOND
B25E 60                     RTS
B25F                LDMES6
B25F C9 FD                  CMP     #$FD            ; RANK ?
B261 D0 05                  BNE     LDMS12          ; NO
B263 A4 CD                  LDY     ENDRAT
B265 B9 E9 BE               LDA     RANKTAB,Y               ; RANK WORD
```

```
B268                LDMS12
B268 85 6C                  STA     TEMP2           ; STORE FOR BITS 7,6
B26A 29 3F                  AND     #$3F
B26C 85 6A                  STA     TEMP            ; WORD LOC IN #WRDTAB
B26E A9 2A                  LDA     #WRDTAB-1
B270 85 68                  STA     PNTR
B272 A9 BC                  LDA     #WRDTAB-1/256
B274 85 69                  STA     PNTR+1          ; WHERE TO START SEARCH
B276                LDMES7
B276 E6 68                  INC     PNTR            ; ADVANCE WORD POINTER
B278 D0 02                  BNE     LDMES8
B27A E6 69                  INC     PNTR+1
B27C                LDMES8
B27C A0 00                  LDY     #$00
B27E B1 68                  LDA     (PNTR),Y
B280 10 F4                  BPL     LDMES7          ; NOT START OF A WORD
B282 C6 6A                  DEC     TEMP            ; IS IT THE RIGHT WORD?
B284 D0 F0                  BNE     LDMES7          ; NO
B286                LDMES9
B286 29 3F                  AND     #$3F            ; REMOVE ANY FLAG BITS
B288 49 A0                  EOR     #$A0            ; PLAYFIELD AND DMA ASCII
B28A A6 6B                  LDX     TEMP1           ; DISPLAY POINTER
B28C E6 6B                  INC     TEMP1           ; ADVANCE DISPLAY POINTER
B28E 9D 1F 0D               STA     MESAGE,X
B291 C8                     INY                     ; NEXT LETTER
B292 B1 68                  LDA     (PNTR),Y        ; A=LETTER
B294 10 F0                  BPL     LDMES9
B296 E6 6B                  INC     TEMP1           ; A SPACE
                    ;               END OF WORD FOUND
B298 A9 3C                  LDA     #60             ; WAIT 1 SECOND
B29A 24 6C                  BIT     TEMP2           ; WHAT TO DO NEXT
B29C 10 04                  BPL     LDMS11          ; NOT END OF LINE
B29E 50 08                  BVC     LDMS10          ; END OF LINE ONLY
B2A0 A9 FE                  LDA     #FE             ; WAIT 4 SECOND, END OF SENTENCE
B2A2                LDMS11
B2A2 50 96                  BVC     LDMES4          ; CONTINUE WITH LINE
B2A4 A0 FF                  LDY     #$FF            ; END OF SENTENCE
B2A6 84 D1                  STY     SENPTR
B2A8                LDMS10
B228 85 CF                  STA     MESTIM          ; STORE WAIT
B2AA 60                     RTS
                    ;
                    ;
                    ;
```

```
                        ;
                        ;
B2AB                    AUDIO
                        ;               AUDIO SERVICE ROUTINE
                        ;
                        ;               CH4 NOTE SECTION
B2AB A5 D6                      LDA     NPRIOR
B2AD F0 37                      BEQ     AUDIO1
B2AF C6 D8                      DEC     NDURTM          ; TIMING OUT ?
B2B1 10 33                      BPL     AUDIO1          ; YES
B2B3 A5 D9                      LDA     NOTVOL
B2B5 F0 0A                      BEQ     AUDIO2          ; NEXT NOTE
B2B7 A5 D5                      LDA     SDURAT          ; SPACE BETWEEN NOTE
B2B9 30 06                      BMI     AUDIO2
B2BB 85 D8                      STA     NDURTIM
B2BD A0 00                      LDY     #$00
B2BF F0 20                      BEQ     AUDIO3          ; JUMP
B2C1                    AUDIO2
B2C1 A5 D4                      LDA     NDURAT
B2C3 85 D8                      STA     NDURTM
B2C5 A6 D2                      LDX     NOTSEQ
B2C7 E6 D2                      INC     NOTSEQ
B2C9 BD 5C BF                   LDA     NOTTAB,X
B2CC 8D 06 D2                   STA     AUDF4
B2CF A0 A8                      LDY     #$A8
B2D1 C9 FF                      CMP     #$FF
B2D3 D0 0C                      BNE     AUDIO3
B2D5 A5 D7                      LDA     REPPTR
B2D7 85 D2                      STA     NOTSEQ
B2D9 C6 D3                      DEC     REPSEQ
B2DB 10 E4                      BPL     AUDIO2
B2DD A0 00                      LDY     #$00
B2DF 84 D6                      STY     NPRIOR
B2E1                    AUDIO3
B2E1 8C 07 D2                   STY     AUDC4
B2E4 84 D9                      STY     NOTVOL
B2E6                    AUDIO1
B2E6 A5 E2                      LDA     EXPDEL          ; ZYLON HIT SERVICE
B2E8 F0 09                      BEQ     AUD11
B2EA C6 E2                      DEC     EXPDEL
B2EC D0 05                      BNE     AUD11
B2EE A2 14                      LDX     #NOITB2-NOISTB
B2F0 20 A8 AE                   JSR     NOISE
B2F3                    AUD11
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```
B2FE A6 70              LDX     SPEED
B2F5 8A                 TXA
B2F6 4A                 LSR     A
B2F7 4A                 LSR     A
B2F8 4A                 LSR     A
B2F9 4A                 LSR     A
B2FA 4A                 LSR     A
B2FB C5 E1              CMP     AUDTIM
B2FD 90 2C              BCC     AUDI0
B2FF A9 00              LDA     #$00
B301 85 E1              STA     AUDTIM
                ;                       ENGINES
B303 E8                 INX
B304 8A                 TAX
B305 49 FF              EOR     #$FF
B307 8D 04 D2           STA     AUDF3
B30A AA                 TAX
B30B 0A                 ASL     A
B30C 0A                 ASL     A
B30D 0A                 ASL     A
B30E 0A                 ASL     A
B30F 0A                 ASL     A
B310 8D 00 D2           STA     AUDF1
B313 8A                 TXA
B314 4A                 LSR     A
B315 4A                 LSR     A
B316 4A                 LSR     A
B317 8D 02 D2           STA     AUDF2
B31A 4A                 LSR     A
B31B 49 8F              EOR     #$8F
B31D 8D 03 D2           STA     AUDC2
B320 29 87              AND     #$87
B322 8D 05 D2           STA     AUDC3
B325 A9 70              LDA     #$70
B327 8D 08 D2           STA     AUDCTL
B32A 60                 RTS
B32B            AUD10
B32B A5 DB              LDA     AUDEXP          ; EXPLOSION SERVICE
B32D F0 08              BEQ     AUDI04
B32F C6 DB              DEC     AUDEXP
B331 D0 04              BNE     AUDI04
B333 A9 8F              LDA     #$8F
B335 85 DC              STA     ATYPE2
B337            AUDI04
```

```
B337 A6 DA            LDX     PHOREP
B339 F0 1C            BEQ     AUDI05
B33B C6 DA            DEC     PHREP
B33D D0 0A            BNE     AUD12
B33F A9 AF            LDA     #$AF
B341 85 DC            STA     ATYPE2
B343 A9 02            LDA     #$02
B345 85 DE            STA     AFREQ1
B347 85 DF            STA     AFREQ2
B349            AUDI12
B349 BD EA BF         LDA     PHOTB2-1,X
B34C 85 DD            STA     ATYPE3
B34E BD F2 BF         LDA     PHOTB4-1,X
B351 8D 04 D2         STA     AUDF3
B354 8D 09 D2         STA     STIMER
B357            AUDI05
B357 A5 E3            LDA     BIGEXP          ; FINAL EXPLOS SERVICE
B359 F0 0E            BEQ     AUDI06
B35B C6 E3            DEC     BIGEXP
B35D AD 0A D2         LDA     RANDOM
B360 8D 04 D2         STA     AUDF3
B363 29 20            AND     #$20
B365 45 DD            EOR     ATYPE3
B367 85 DD            STA     ATYPE3
B369            AUDI06
B369 18               CLC             ; SWEEP DOWN CH1-2
B36A A5 DE            LDA     AFREQ1
B36C 65 E0            ADC     AUDADD
B36E 85 DE            STA     AFREQ1
B370 8D 00 D2         STA     AUDF1
B373 A5 DF            LDA     AFREQ2
B375 69 00            ADC     #$00
B377 85 DF            STA     AFREQ2
B379 8D 02 D2         STA     AUDF2
                ;                       VOLUME CONTROL
B37C A6 DC            LDX     ATYPE2
B37E A4 DD            LDY     ATYPE3
B380 A5 72            LDA     TIMERX
B382 4A               LSR     A
B383 90 1A            BCC     AUDI07
B385 A5 E1            LDA     AUDTIM
B387 F0 16            BEQ     AUDI07
B389 C6 E1            DEC     AUDTIM
B38B C9 11            CMP     #$11
```

```
B38D B0 10              BCS     AUDI07
B38F 8A                 TXA
B390 29 0F              AND     #$0F
B392 F0 03              BEQ     AUDI08
B394 CA                 DEX
B395 86 DC              STX     ATYPE2
B397            AUDI08
B397 98                 TYA
B398 29 0F              AND     #$0F
B39A F0 03              BEQ     AUDI07
B39C 88                 DEY
B39D 84 DD              STY     ATYPE3
B39F            AUDI07
B39F 8E 03 D2           STX     AUDC2
B3A2 8C 05 D2           STY     AUDC3
B3A5 60                 RTS
                ;
                ;
                ;
B3A6            NOTINT
                ;               AUDIO NOTE INIT, X=CH4TAB PNTR
B3A6 BD 3E BF           LDA     CH4TAB,X
B3A9 C5 D6              CMP     NPRIOR
B3AB 90 0C              BCC     NOTIN2
B3AD A0 05              LDY     #$05
B3AF            NOTIN1
B3AF BD 3E BF           LDA     CH4TAB,X
B3B2 99 D2 00           STA     NOTSEQ,Y
B3B5 E8                 INX
B3B6 88                 DEY
B3B7 10 F6              BPL     NOTIN1
B3B9            NOTIN2
B3B9 60                 RTS

                ;
                ;
                ;
                ;
                ;
B3BA            LDTABS
                ;               INIT PTAB,BCDCON,VCONL,VCONH,DISCTL,CHTRAM
                ;
B3BA A2 59              LDX     #89
B3BC            LDTB10
```

```
B3BC A9 0D              LDA     #$0D
B3BE 9D 85 02           STA     DISPLY+5,X
B3C1 E0 0A              CPX     #$0A
B3BC B0 05              BCS     LDTAB8
                ;               LD PF COLORS
B3C5 BD A9 BF           LDA     CLITAB,X
B3C8 95 F2              STA     COLRAM+4,X
B3CA            LDTAB8
B3CA CA                 DEX
B3CB 10 EF              BPL     LDTB10
B3CD A9 70              LDA     #$70
B3CF 8D 80 02           STA     DISPLY+0
B3D2 8D 81 02           STA     DISPLY+1
B3D5 A9 41              LDA     #$41
B3D7 8D E7 02           STA     DISPLY+103
B3DA A9 80              LDA     #DISPLY
B3DC 8D E8 02           STA     DISPLY+104
B3DF A9 02              LDA     #DISPLY/256
B3E1 8D E9 02           STA     DISPLY+105
                ;
                ;
                ;
                ;
                ;
B3E4 A2 00              LDX     #$00
B3E6 86 68              STX     PNTR
B3E8 86 69              STX     PNTR+1
B3EA 86 6A              STX     TEMP
B3EC 86 6B              STX     TEMP1
B3EE            LDTAB1
B3EE 18                 CLC
B3EF A5 68              LDA     PNTR
B3F1 69 51              ADC     #SCPTAB
B3F3 85 68              STA     PNTR
B3F5 A5 69              LDA     PNTR+1
B3F7 9D E9 0D           STA     PTAB,X
B3FA 69 00              ADC     #$00
B3FC 85 69              STA     PNTR+1
B3FE 18                 CLC
B3FF A5 6A              LDA     TEMP
B401 69 6A              ADC     #SCBCD
B403 85 6B              STA     TEMP
B405 A5 6B              LDA     TEMP1
B407 9D E9 0E           STA     BCDCON,X
```

```
B40A F8                 SED
B40B 69 00              ADC     #$00
B40D D8                 CLD
B40E 85 6B              STA     TEMP1
B410 E8                 INX
B411 D0 DB              BNE     LDTAB1
                ;
B413 A2 00              LDX     #$00
B415 86 68              STX     PNTR
B417 A9 10              LDA     #MEMMAP/256
B419 85 69              STA     PNTR+1
B41B            LDTAB2
B41B 18                 CLC
B41C A5 68              LDA     PNTR
B41E 9D 00 08           STA     VCONL,X
B421 69 28              ADC     #SCVCON
B423 85 68              STA     PNTR
B425 A5 69              LDA     PNTR+1
B427 9D 64 08           STA     VCONH,X
B42A 69 00              ADC     #$00
B42C 85 69              STA     PNTR+1
B42E BD 42 BB           LDA     STINIT,X
B431 9D 49 09           STA     DISCTL,X
B434 E8                 INX
B435 E0 64              CPX     #100
B437 90 E2              BCC     LDTAB2
B439 CA                 DEX             ; X=99, DONT JUMP IMMEDIATELY
B43A 86 78              STX     JMPTIM
                ;
B43C A2 03              LDX     #$03
B43E 8E 11 09           STX     CHTRAM+72       ; NOTHING IN SHIPS INIT QUAD
B441            LDTAB3
B441 BD A6 BB           LDA     CHRTAB,X
B444 85 6A              STA     TEMP
B446 A4 62              LDY     MISDIF
B448 C8                 INY
B449 C8                 INY
B44A 84 6B              STY     TEMP 1
B44C            LDTAB4
B44C AD 0A D2           LDA     RANDOM
A44F 29 7F              AND     #$7F
B451 A8                 TAY
B452 B9 C9 08           LDA     CHTRAM,Y
B455 D0 F5              BNE     LDTAB4
```

```
B457 A5 6A              LDA     TEMP
                        ;               STARBASES NOT ON EDGES
B459 10 21              BPL     LDTAB7
B45B C0 10              CPY     #$10
B45D 90 ED              BCC     LDTAB4
B45F C0 70              CPY     #$70
B461 B0 E9              BCS     LDTAB4
B463 98                 TYA
B464 29 0F              AND     #$0F
B466 F0 E4              BEQ     LDTAB4
B468 C9 0F              CMP     #$0F
B46A F0 E0              BEQ     LDTAB4
B46C B9 C8 08           LDA     CHTRAM-1,Y
B46F 19 CA 08           ORA     CHTRAM+1,Y
B472 19 D9 08           ORA     CHTRAM+16,Y
B475 19 B9 08           ORA     CHTRAM-16,Y
B478 D0 D2              BNE     LDTAB4
B47A A5 6A              LDA     TEMP
B47C            LDTAB7
B47C 99 C9 08           STA     CHTRAM,Y
B47F C6 6B              DEC     TEMP1
B481 10 C9              BPL     LDTAB4
B483 CA                 DEX
B484 10 BB              BPL     LDTAB3
                ;               LOAD HORIZ WALL OF CHART
B486 A2 B4              LDX     #180
B488            LDTAB5
B488 A9 0A              LDA     #$0A
B48A 9D 34 0D           STA     CHTDIS-1,X
B48D CA                 DEX
B48E D0 F8              BNE     LDTAB5
B490 A2 0F              LDX     #$0F            ; LD HORIZ LINE
B492            LDTAB6
B492 A9 18              LDA     #$18
B494 9D 37 0D           STA     CHTDIS+2,X
B497 CA                 DEX
B498 10 F8              BPL     LDTAB6
                ;
B49A A9 1A              LDA     #$1A            ; FILL IN THE DOT ON THE CHART
B49C 8D 47 0D           STA     CHTDIS+18
                ;
B49F A9 00              LDA     #$00
B4A1 8D 11 09           STA     CHTRAM+72
B4A4 A9 48              LDA     #72
```

```
B4A6 85 90              STA     QUADRT
B4A8 A9 43              LDA     #67
B4AA 85 8D              STA     GHPOS
B4AC 85 8F              STA     HYHPOS
B4AE A9 47              LDA     #$47
B4B0 85 8E              STA     HYVPOS
B4B2 85 8C              STA     GVPOS
B4B4 A9 EA              LDA     #$EA
B4B6 8D E8 0F           STA     BCDCON+255              ; INFIINITY SIGN
                ;
                ;               FALL THROUGH TO LDGALT
                ;
B4B9            LDGALT
                ;
                ;               LD UP THE GALACTIC CHART
                ;               TRANSFER CHTRAM TO CHTDIS
                ;
B4B9 A0 00              LDY     #$00            ; CHTDIS PNTR
B4BB 84 6A              STY     TEMP            ; CHTRAM PNTR
B4BD            LDGAL1
B4BD A6 6A              LDX     TEMP
B4BF BD C9 08           LDA     CHTRAM,X                ; WHATS IN QUAD
B4C2 10 02              BPL     LDGAL2          ; NO
B4C4 A9 05              LDA     #$05            ; STARBASE DEFAULT
B4C6            LDGAL2
B4C6 AA                 TAX
B4C7 BD D1 BE           LDA     CHTABL,X                ; CODE FOR CHTDIS
B4CA 99 4B 0D           STA     CHTDIS+22,Y
B4CD C8                 INY
B4CE E6 6A              INC     TEMP
B4D0 A5 6A              LDA     TEMP
B4D2 29 0F              AND     #$0F            ; END OF LINE ?
B4D4 D0 E7              BNE     LDGAL1          ; NO
B4D6 A9 19              LDA     #$19            ; VERT LINE
B4D8 99 4B 0D           STA     CHTDIS+22,Y
B4DB C8                 INY
B4DC C8                 INY
B4DD C8                 INY             ; ADVANCE TO NEXT LINE
B4DE C8                 INY
B4DF C0 A0              CPY     #160            ; ALL DONE ?
B4E1 90 DA              BCC     LDGAL1          ; NO
B4E3 60                 RTS
                ;
                ;
```

```
                        ;
                        ;
B4E4                    TIMERS
                        ;               SERVICE TIMERS, STARDATE AND ZYLON JUMP
                        ;       UPDATE TIMEX, USED FOR STAR INTENSITY MULTIPLEX
                        ;
B4E4 E6 76                      INC     BINTIM          ; UPDATE BINARY TIMER
B4E6 A2 90                      LDX     #DIMBLU
B4E8 A5 76                      LDA     BINTIM
B4EA 10 09                      BPL     TIME46
B4EC AC 55 09                   LDY     DENERG+0
B4EF C0 80                      CPY     #$80
B4F1 D0 02                      BNE     TIME46
B4F3 A2 44                      LDX     #RED
B4F5                    TIME46
B4F5 29 03                      AND     #$03
B4F7 85 72                      STA     TIMERX
B4F9 D0 1F                      BNE     TIME33
                        ;       SHIELDS SECTION
B4FB A4 7D                      LDY     SHENER
B4FD F0 17                      BEQ     TIME31
B4FF A0 A0                      LDY     #DBLUE
B501 2C 94 09                   BIT     DAMAGE+2
B504 10 0B                      BPL     TIME47
B506 70 07                      BVS     TIME32
B508 AD 0A D2                   LDA     RANDOM
B50B C9 C8                      CMP     #200
B50D 90 07                      BCC     TIME31
B50F                    TIME32
B50F A0 00                      LDY     #$00
B511                    TIME47
B511 98                         TYA
B512 D0 02                      BNE     TIME31
B514 A2 26                      LDX     #YELLOW
B516                    TIME31
B516 84 81                      STY     SPABAK
B518 86 FB                      STX     COLRAM+13
B51A                    TIME33
                        ;               END UPDATE TIMERX
                        ;
                        ;               PHOTON TIMEOUT
B51A A2 02                      LDX     #402
B51C                    TIMER6
B51C BD 8E 0C                   LDA     GINDEX+2,X              ; PHOTON ?
```

```
B51F D0 06              BNE     TIMER7
B521 B5 EB              LDA     STFLAG+2,X              ; PHOTON TIMEOUT ?
B523 F0 02              BEQ     TIMER7          ; YES
B525 D6 EB              DEC     STFLAG+2,X              ; DEC PHOTON TIMER
B527            TIMER7
B527 CA                 DEX
B528 10 F2              BPL     TIMER6
                ;
                ;               EXPLOSION TIMEOUT
                ;
B52A A5 73              LDA     ETIMER
B52C F0 16              BEQ     TIME10
B52E C6 73              DEC     ETIMER
B530 D0 04              BNE     TIMER9
B532 A2 11              LDX     #STLAST+1               ; 1 FOR FALL THROUGH
B534 86 79              STX     NSTARS
B536            TIMER9
B536 C9 70              CMP     #$70
B538 B0 04              BCS     TIME30
B53A A2 00              LDX     #$00
B53C 86 8A              STX     HITME
B53E            TIME30
B53E C9 18              CMP     #$18
B540 B0 02              BCS     TIME10
B542 C6 79              DEC     NSTARS
B544            TIME10
B544 C6 74              DEC     SECOND
B546 10 21              BPL     TIMER1
B548 A9 28              LDA     #$28
B54A 85 74              STA     SECOND
B54C A2 04              LDX     #$04
B54E            TIMER2
B54E FE A3 09           INC     DSDATE,X
B551 BD A3 09           LDA     DSDATE,X
B554 C9 DA              CMP     #$DA
B556 90 0D              BCC     TIMER3
B558 A9 D0              LDA     #$D0
B55A 9D A3 09            STA    DSDATE,X
B55D E0 03              CPX     #$03
B55F D0 01              BNE     TIMER4
B561 CA                 DEX
B562            TIMER4
B562 CA                 DEX
B563 10 E9              BPL     TIMER2
```

```
B565                TIMER3
B565 C6 78                  DEC     JMPTIM
B567 30 01                  BMI     TIMER5
B569                TIMER1
B569 60                     RTS
B56A                TIMER5
B56A A9 31                  LDA     #49
B56C 85 78                  STA     JMPTIM
                    ;               RATING DUE TO TIME
B56E A5 CB                  LDA     RATING
B570 D0 02                  BNE     TIME61
B572 C6 CC                  DEC     RATING+1
B574                TIME61
B574 C6 CB                  DEC     RATING
B576 A6 64                  LDX     ATRACT          ; GAME OVER ?
B578 D0 EF                  BNE     TIMER1          ; YES
                    ;                       ZYLONS JUMP
                            ; CHECK ALL STARBASES TO SEE IF DESTROYED
                            ; X=0 FROM ABOVE
B57A 86 6A                  STX     TEMP
B57C                TIME12
B57C BD C9 08               LDA     CHTRAM,X                ; STARBASE ?
B57F 10 19                  BPL     TIME11                  ; NO
B581 20 F1 B7               JSR     TIMHLP
B584 F0 14                  BEQ     TIME11
                    ;                       STARBASE DESTROUED
B586 A9 02                  LDA     #$02            ; 4 ZYLONS
B588 9D C9 08               STA     CHTRAM,X
B58B 85 6A                  STA     TEMP
B58D 38                     SEC
B58E A5 CB                  LDA     RATING
B590 E9 12                  SBC     #18
B592 85 CB                  STA     RATING
B594 A5 CC                  LDA     RATING+1
B596 E9 00                  SBC     #$00
B598 85 CC                  STA     RATING+1
                    ;
B59A                TIME11
B59A E8                     INX
B59B 10 DF                  BPL     TIME12
B59D A5 6A                  LDA     TEMP            ; ANY STARBASES DESTROYED ?
B59F F0 0F                  BEQ     TIME13          ; NO
B5A1 C2 97 09               BIT     DAMAGE+5                ; COMMUNICATIONS
B5A4 70 0A                  BVS     TIME13
```

```
B5A6 A0 15          LDY   #SENDES-SENTAB
B5A8 20 23 B2       JSR   LDMESS
B5AB A2 18          LDX   #CH4TB5-CH4TAB        ; MESSAGE
B5AD 20 A6 B3       JSR   NOTINT
B5B0          TIME13
B5B0 C6 9F          DEC   JMPOUT          ; JUMP TIMEOUT
B5B2 30 07          BMI   TIME28
B5B4 A6 93          LDX   KILBAS
B5B6 BD C9 08       LDA   CHTRAM,X              ; NEED A NEW BASE ?
B5B9 30 1F          BMI   TIME14          ; NO
B5BB          TIME28
B5BB A9 07          LDA   #$07            ; JUMP TIMEOUT RESTORED
B5BD 85 9F          STA   JMPOUT
B5BF A0 7F          LDY   #127
B5C1          TIME15
B5C1 AD 0A D2       LDA   RANDOM
B5C4 29 7F          AND   #$7F
B5C6 AA             TAX
B5C7 BD C9 08       LDA   CHTRAM,X
B5CA 30 0E          BMI   TIME14          ; NEW BASE
B5CC 88             DEY
B5CD 10 F2          BPL   TIME15          ; TRY AGAIN
B5CF A2 7F          LDX   #127
B5D1          TIME16
B5D1 BD C9 08       LDA   CHTRAM,X
B5D4 30 04          BMI   TIME14
B5D6 CA             DEX
B5D7 10 FB          BPL   TIME16
B5D9 60             RTS
                    ;
B5DA          TIME14
B5DA 86 93          STX   KILBAS          ; STORE STXRBASE
B5DC 8A             TXA
B5DD 29 0F          AND   #$0F
B5DF 85 94          STA   KILOCH
B5E1 8A             TXA
B5E2 4A             LSR   A
B5E3 4A             LSR   A
B5E4 4A             LSR   A
B5E5 4A             LSR   A
B5E6 85 95          STA   KILOCV
B5E8 A2 FF          LDX   #$FF
B5EA          TIME18                ; MAIN LOOP
B5EA E8             INX
```

```
B5EB 10 30              BPL     TIME40
                ;               END ZYLON JUMP ROUTINE
B5ED A2 00              LDX     #$00
B5EF            TIME20
B5EF BD C9 08           LDA     CHTRAM,X
B5F2 29 DF              AND     #$DF
B5F4 9D C9 08           STA     SHTRAM,X
B5F7 E8                 INX
B5F8 10 F5              BPL     TIME20
B5FA 2C 97 09           BIT     DAMAGE+5
B5ED 70 1D              BVS     TIME44
B5FF A2 00              LDX     #$00            ; ANY STARBASES SURROUNDED ?
B601            TIME21
B601 BD C9 08           LDA     CHTRAM,X
B604 10 13              BPL     TIME19
B606 20 F1 B7           JSR     TIMHLP
B609 F0 0E              BEQ     TIME19
                ;               STAR    BASE SURROUNDED
B60B A9 63              LDA     #99
B60D 85 78              STA     JMPTIM          ; 99 CENTONS BEFORE DESTROY
B60F A0 13              LDY     #SENSUR-SENTAB
B611 20 23 B2           JSR     LDMESS
B614 A2 18              LDX     #CH4TB5-CH4TAB
B616 4C A6 B3           JMP     NOTINT
B619            TIME19
B619 E8                 INX
B61A 10 E5              BPL     TIME21
B61C            TIME44
B61C 60                 RTS
B61D            TIME40
B61D BC C9 08           LDY     CHTRAM,X
B620 C0 0A              CPY     #$0A            ; STARBASE , OR ALREADY CALCULATED
B622 B0 C6              BCS     TIME18
B624 AD 0A D2           LDA     RANDOM
B627 D9 BB BF           CMP     JMPWHN,Y
B62A B0 BE              BCS     TIME18
B62C E4 90              CPX     QUADRT
B62E F0 BA              BEQ     TIME18
                ;               CALCULATE GRADIENT
B630 A0 08              LDY     #$08
B632            TIME27
B632 18                 CLC
B633 8A                 TXA
B634 79 C0 BF           ADC     JMPTAB,Y
```

```
B637 B5 6A              STA     TEMP
B639 29 0F              AND     #$0F
B63B 38                 SEC
B63C E5 94              SBC     KILOCH
B63E B0 04              BCS     TIME26
B640 49 FF              EOR     #$FF
B642 69 01              ADC     #$01
B644            TIME26
B644 85 6B              STA     TEMP1
B646 A5 6A              LDA     TEMP
B648 4A                 LSR     A
B649 4A                 LSR     A
B64A 4A                 LSR     A
B64B 4A                 LSR     A
B64C 38                 SEC
B64D E5 95              SBC     KILOCV
B64F B0 04              BCS     TIME22
B651 49 FF              EOR     #$FF
B653 69 01              ADC     #$01
B655            TIME22
B655 18                 CLC
B656 65 6B              ADC     TEMP1
B658 99 96 00           STA     JMPPTS,Y
B65B 88                 DEY
B65C 10 D4              BPL     TIME27
                ;               ZYLON CONVERGENCE
B65E A9 01              LDA     #$01
B660 85 6B              STA     TEMP1
B662            TIME23
B662 A0 07              LDY     #$07
B664            TIME24
B664 B9 96 00           LDA     JMPPTS,Y
B667 C5 9E              CMP     JMPPTS+8
B669 B0 24              BCS     TIME42
B66B 18                 CLC
B66C 8A                 TXA
B66D 79 C0 BF           ADC     JMPTAB,Y
B670 30 1D              BMI     TIME42
B672 84 6A              STY     TEMP
B674 A8                 TAY
B675 B9 C9 08           LDA     CHTRAM,Y
B678 D0 13              BNE     TIME25
B67A BD C9 08           LDA     CHTRAM,X
B67D C4 90              CPY     QUADRT
```

```
B67F F0 0C              BEQ     TIME25
B681 09 20              ORA     #$20
B683 99 C9 08           STA     CHTRAM,Y
B686 A9 00              LDA     #$00
B688 9D C9 08           STA     CHTRAM,X
B68B F0 0B              BEQ     TIME45
B68D            TIME25
B68D A4 6A              LDY     TEMP
B68F            TIME42
B68F 88                 DEY
B690 10 D2              BPL     TIME24
B692 E6 9E              INC     JUMPPTS+8
B694 C6 6B              DEC     TEMP1
B696 10 CA              BPL     TIME23
B698            TIME45
B698 4C EA B5           JMP     TIME18
                ;
                ;
                ;
B69B            ROHELP
                ;       HELPER SUB FOR YROTAT, ZROTAT
B69B BD AD 09           LDA     XSIGN,X
B69E 49 01              EOR     #$01
B6A0 F0 02              BEQ     ROHLP1
B6A2 A9 FF              LDA     #$FF
B6A4            ROHLP1
B6A4 85 6B              STA     TEMP1
B6A6 85 6C              STA     TEMP2
B6A8 BD 40 0A           LDA     XPOSH,X
B6AB 85 6A              STA     TEMP
B6AD AD 0A D2           LDA     RANDOM
B6B0 09 BF              ORA     #$BF
B6B2 5D D3 0A           EOR     XPOSL,X
B6B5 0A                 ASL     A
B6B6 26 6A              ROL     TEMP
B6B8 26 6B              ROL     TEMP1
B6BA 0A                 ASL     A
B6BB 26 6A              ROL     TEMP
B6BD 26 6B              ROL     TEMP1
                ;
B6BF A5 6D              LDA     TEMP3           ; JOYSTICK
B6C1 49 FF              EOR     #$FF            ; TOGGLES EVERY TIME THROUGH, CALL TWICE/STAR
B6C3 85 6D              STA     TEMP3           ; THEN OK, THIS CAN BE TRICKY SO WATCH OUT !!
                ;
```

```
B6C5 30 1A              BMI     ROHLP2
B6C7 18                 CLC
B6C8 B9 D3 0A           LDA     XPOSL,Y
B6CB 65 6A              ADC     TEMP
B6CD 99 D3 0A           STA     XPOSL,Y
B6D0 B9 40 0A           LDA     XSIGN,Y
B6D3 65 6A              ASC     TEMP
B6CD 99 D3 0A           STA     XPOSL,Y
B6D0 B9 40 0A           LDA     XSIGN,Y
B6D3 65 6B              ADC     TEMP1
B6D5 99 40 0A           STA     XPOSH,Y
B6D8 B9 AD 09           LDA     XSIGN,Y
B6DB 65 6C              ADC     TEMP2
B6DD 99 AD 09           STA     XSIGN,Y
B6E0 60                 RTS
B6E1            ROHLP2
B6E1 38                 SEC
B6E2 B9 D3 0A           LDA     XPOSL,Y
B6E5 E5 6A              SBC     TEMP
B6E7 99 D3 0A           STA     XPOSL,Y
B6EA B9 40 0A           LDA     XPSH,Y
B6ED E5 6B              SBC     TEMP1
B6EF 99 40 0A           STA     XPOSH,Y
B6F2 B9 AD 09           LDA     XSIGN,Y
B6F5 E5 6C              SBC     TEMP2
B6F7 99 AD 09           STA     XSIGN,Y
B6FA 60                 RTS
                ;
                ;
                ;
B6FB            STHPOS
                ;               STORE HPOS, X=STR INDEX
B6FB C9 50              CMP     #HOFLOW
B6FD B0 5B              BCS     STVPS1
B6FF 85 6D              STA     TEMP3
B701 A9 50              LDA     #HSTCEN
B703 E0 05              CPX     #OBJNUM
B705 B0 02              BCS     STHPS2
B707 A9 7D              LDA     #HOBCEN
B709            STHPS2
B709 BC DE 09           LDY     YSIGN,X
B70C D0 09              BNE     STHPS3
B70E 38                 SEC
B70F E6 6D              INC     TEMP3
```

```
B711 E6 6D              SBC     TEMP3
B713 9D 2A 0C           STA     HPOS,X
B716 60                 RTS
B717            STHPS3
B717 18                 CLC
B718 65 6D              ADC     TEMP3
B71A 9D 2A 0C           STA     HPOS,X
B71D 60                 RTS
                ;
B71E            S1VPOS
                ;               STORE VPOS, X=STAR INDEX
B71E C9 32              CMP     #VOFLOW
B720 B0 38              BCS     STVPS1
B722 85 6D              STA     TEMP3
B724 A9 32              LDA     #VSTCEN
B726 E0 05              CPX     #OBJNUM
B728 B0 04              BCS     STVPS2
B72A 06 6D              ASL     TEMP3
B72C A9 7A              LDA     #VOBCEN
B72E            STVPS2
B72E 24 D0              BIT     DISFLG          ; SECTOR SCAN ?
B730 50 13              BVC     STVPS5          ; NO
B732 2C 96 09           BIT     DAMAGE+4
B735 10 07              BPL     STVPS7
B737 2C 0A D2           BIT     RANDOM
B73A 50 0E              BVC     STVPS6
B73E 70 15              BVS     STVPS3
B73E            STVPS7
B73E BC AD 09           LDY     XSIGN,X
B741 D0 07              BNE     STVPS6
B743 F0 0E              BEQ     STVPS3
B745            STVPS5
B745 BC 0F 0A           LDY     ZSIGN,X
B748 F0 09              BEQ     STVPS3
B74A            STVPS6
B74A 38                 SEC
B74B E6 6D              INC     TEMP3
B74D E5 6D              SBC     TEMP3
B74F 9D F9 0B           STA     VPOS,X
B752 60                 RTS
B753            STVPS3
B753 18                 CLC
B754 65 6D              ADC     TEMP3
B756 9D F9 0B           STA     VPOS,X
```

```
B759 60                 RTS
B75A            STVPS1          ; ENTRY POINT FROM STHPOS **************
B75A E0 05              CPX     #OBJNUM
B75C B0 06              BCS     STVPS4
B75E A9 FB              LDA     #$FB
B760 9D F9 0B           STA     VPOS,X
B763            STVPS8          ; ENTRY POINT FROM NEWSTR ***************
B763 60                 RTS
B764            STVPS4
                ;
                ;               FALL THROUGH TO NEWSTR ***************************
                ;
B674            NEWSTR
                ;               NEW STAR POSITION
B764 A9 63              LDA     #99             ; RESET TO BOTTOM OF SCREEN
B766 9D F9 0B           STA     VPOS,X
B769 9D 2A 0C           STA     HPOS,X
B76C E0 11              CPX     #STLAST+1               ; EXPLOSION STARS
B76E B0 F3              BCS     STVPS8          ; YES
B770 AD 0A D2           LDA     RANDOM          ; UPDATE Z
B773 29 0F              AND     #$0F
B775 85 6A              STA     TEMP
B777 9D A2 0A           STA     ZPOSH,X
B77A AD 0A D2           LDA     RANDOM          ; UPDATE Y
B77D 29 0F              AND     #$0F
B77F C5 6A              CMP     TEMP
B781 90 02              BCC     NEWST3
B783 85 6A              STA     TEMP
B785            NEWST3
B785 9D 71 0A           STA     YPOSH,X
                ;
B788 A9 0F              LDA     #$0F
B78A 9D 40 0A           STA     XPOSH,X
B78D A5 D0              LDA     DISFLG          ; UPDATE X
B78F 49 01              EOR     #$01
B791 29 01              AND     #$01
B793 9D AD 09           STA     XSIGN,X
B796 D0 11              BNE     NEWST5
B798 9D 04 0B           STA     YPOSL,X
B79B 9D 35 0B           STA     ZPOSL,X
B79E 38                 SEC
B79F E5 6A              SBC     TEMP
B7A1 9D 40 0A           STA     XPOSH,X
                ;               TRY THIS FIX, BELOW
```

```
B7A4 A9 80              LDA     #$80
B7A6 9D D3 0A           STA     XPOSL,X
                ;
B7A9            NEWST5
                ;
B7A9 24 D0              BIT     DISFLG          ; SECTOR SCAN ?
B7AB 50 11              BVC     NEWST2          ; NO
B7AD AD 0A D2           LDA     RANDOM
B7B0 9D 71 0A           STA     YPOSH,X
B7B3 AD 0A D2           LDA     RANDOM
B7B6 9D 40 0A           STA     XPOSH,X
B7B9 29 01              AND     #$01
B7BB 9D AD 09           STA     XSIGN,X
B7BE            NEWST2
                ;
B7BE            NEWST4          ; ENTRY POINT FROM HLINES SUB *****************
                ;               DETERMINE SIGN Y,Z
B7BE AD 0A D2           LDA     RANDOM
B7C1 29 01              AND     #$01
B7C3 9D 0F 0A           STA     ZSIGN,X
B7C6 D0 0F              BNE     NEWST1
B7C8 38                 SEC
B7C9 FD 35 0B           SBC     ZPOSL,X
B7CC 9D 35 0B           STA     ZPOSL,X
B7CF A9 00              LDA     #$00
B7D1 FC A2 0A           SBC     ZPOSH,X
B7D4 9D A2 0A           STA     ZPOSH,X
B7D7            NEWST1
B7D7 AD 0A D2           LDA     RANDOM
B7DA 29 01              AND     #$01
B7DC 9D DE 09           STA     YSIGN,X
B7DF D0 0F              BNE     NEWST6
B7E1 38                 SEC
B7E2 FD 04 0B           SBC     YPOSL,X
B7E5 9D 04 0B           STA     YPOSL,X
B7E8 A9 00              LDA     #$00
B7EA FD 71 0A           SBC     YPOSH,X
B7ED 9D 71 0A           STA     YPOSH,X
B7F0            NEWST6
B7F0 60                 RTS
                ;
                ;
                ;
                ;
```

```
B7F1                    TIMHLP
                        ;               HELPER ROUTINE FOR TIMERS
B7F1 BD C8 08           LDA     CHTRAM-1,X
B7F4 F0 0D              BEQ     TIMHP1
B7F6 BD CA 08           LDA     CHTRAM+1,X
B7F9 F0 08              BEQ     TIMHP1
B7FB BD B9 08           LDA     CHTRAM-16,X
B7FE F0 03              BEQ     TIMHP1
B800 BD D9 08           LDA     CHTRAM+16,X
B803                    TIMHP1
B803 60                 RTS
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
B804                    PANDIS
                        ;               PANNEL DISPLAY ROUTINE
                        ;               ONE ENTRY POINT AT PANDS6
                        ;       UPDATE VELOCITY DISPLAY
B804 A6 70              LDX     SPEED
B806 E4 71              CPX     WARP
B808 F0 08              BEQ     PANDS2
B80A 90 04              BCC     PANDS3
B80C C6 70              DEC     SPEED
B80E B0 12              BCS     PANDS1
B810                    PANDS3
B810 E6 70              INC     SPEED
B812                    PANDS2
B812 A5 C0              LDA     HFLAG
B814 D0 0C              BNE     PANDS1
B816 2C 93 09           BIT     DAMAGE+1
B819 10 07              BPL     PANDS1
B81B A5 71              LDA     WARP
B81D 2D 0A D2           AND     RANDOM
B820 85 70              STA     SPEED
                        ;
                        ;
B822                    PANDS1                  ; ALL DONE VELOCITY DISPLAY
B822 A0 01              LDY     #DVELOC-DISCTL-1
B824 20 CD B8           JSR     TWOCM3
B827 2C 95 09           BIT     DAMAGE+3                ; COMPUTER DAMAGE
```

```
B82A 30 30              BMI     PANDS4
                ;               UPDATE COORDINATES DISPLAY
B82C A9 31              LDA     #RAMNUM         ; DISPLAY Y COORD
B82E A0 17              LDY     #DTHETA-DISCTL  ; DISPLAY IN THETA
B830 20 A7 B8           JSR     TWOCOM          ; UPDATE THETA
B833 A9 62              LDA     #RAMNUM*2               ; DISPLAY Z COORD
B835 A0 1D              LDY     #DPHI-DISCTL            ; DISPLAY IN PHI
B837 20 A7 B8           JSR     TWOCOM          ; UPDATE PHI
B83A A9 00              LDA     #$00            ; DISPLAY X COORD
B83C A0 23              LDY     #DRHO-DISCTL            ; DISPLAY IN RHO
B83E 20 A7 B8           JSR     TWOCOM          ; UPDATE RHO
                ;               LOW BYTE OF RHO
B841 AD 6E 09           LDA     DRHO+2          ; PUT BLANK IN LSB IF INFINITE
B844 8D 6D 09           STA     DHRO+3
B847 C9 0A              CMP     #$0A            ; INFINITE ?
B849 B0 11              BCS     PANDS4          ; YES
B84B AE 5C 09           LDX     DCSTOR          ; WHICH OBJ TRACKING
B84E BD D3 0A           LDA     XPOSL,X         ; LOW BYTE
B851 4A                 LSR     A
B852 4A                 LSR     A
B853 4A                 LSR     A
B854 4A                 LSR     A
B855 AA                 TAX
B856 BD E9 0E           LDA     BCDCON,X                ; CONVERT TO BCD
B859 8D 6F 09           STA     DRHO+3          ; LSB UPDATED
B85C            PANDS4                          ; ALL DONE COORD DISP
                ;                               UPDATE ENERGY DISPLAY
                ;               UPDATE ENERGY DUE TO SHIELDS WARPS ATTACK COMPUTER
B85C 18                 CLC
B85D A5 7F              LDA     ENFLAG          ; LSRB OF ENERGY, DEC ENERGY WHEN CARRY
B85F 65 7D              ADC     SHENER          ; DRAIN FROM SHIELDS
B861 65 80              ADC     WPENER          ; DRAIN FROM WARP
B863 65 7E              ADC     ATENER          ; DRAIN FROM ATTACK COMPUTER
B865 69 01              ADC     #$01            ; LIFE SUPPORT
B867 C5 7F              CMP     ENFLAG          ; SET CARRY FLAG
B869 85 7F              STA     ENFLAG
B86B B0 39              BCS     PANDS5
                ;                       DECRE ENERGY
B86D A2 03              LDA     #$03            ; DECRE BIT 3 OF ENERGY
B84F            PANDS6          ; ENTRY POINT TO DECRE ENERGY **************************
B86F 24 64              BIT     ATRACT          ; GAME OVER ?
B871 70 33              BVS     PANDS5          ; YES
                ;       X MUST BE DEFINED = BIT TO DECRE FROM
B873 DE 55 09           DEC     DENERG,X
```

```
B876 BD 55 09           LDA     DENERG,X
B879 C9 80              CMP     #$80            ; CHECK IF BORROW
B87B B0 29              BCS     PANDS5          ; NO BORROW
B87D A9 89              LDA     #$89
B87F 9D 55 09           STA     DENERG,X
B882 E0 02              CPX     #$02
B884 D0 08              BNE     PANDS7
B886 A5 CB              LDA     RATING
B888 D0 02              BNE     PANDS8
B88A C6 CC              DEC     RATING+1
B88C            PANDS8
B88C C6 CB              DEC     RATING
B88E            PANDS7
B88E CA                 DEX
B88F 10 DE              BPL     PANDS6          ; NEXT DIGIT
                ;                       OUT OF ENERGY !!
B891 A2 0A              LDX     #$0A            ; KEY F
B893 8A                 TXA
B894 A0 03              LDY     #$03
B896            PAND10
B896 99 55 09           STA     DENERG+0,Y
B899 88                 DEY
B89A 10 FA              BPL     RAND10
B89C 20 45 B0           JSR     KEYS15
B89F A0 31              LDY     #SENOUT-SENTAB
B8A1 A2 04              LDX     #$04
B8A3 20 0A B1           JSR     CRATE
B8A6            PANDS9
B8A6            PANDS5
B8A6 60                 RTS
                ;
                ;


                ;
B8A7            TWOCOM
                ;               TWOS OMPLEMENT AND CONVERT TO B CD HELPER ROUTINE
                ;       A=OFFSET(X,Y,Z), Y=WHERE TO STORE
B8A7 18                 CLC
B8A8 6D 5C 09           ADC     DCSTOR          ; WHICH OBJ TRACKING
B8AB AA                 TAX
B8AC A9 10              LDA     #$10            ; + SIGN
B8AE 85 6A              STA     TEMP
B8B0 BD AD 09           LDA     XSIGN,X         ; SIGN OF OBJ
B8B3 4A                 LSR     A
```

```
B8B4 BD 40 0A           LDA     XPOSH,X
B8B7 B0 04              BCS     TWOCM1
                ;               NEGATIVE VALUE, TWOS COMPLEMENT
B8B9 49 FF              EOR     #$FF
B8BB C6 6A              DEC     TEMP            ; - SIGN
B8BD            TWOCM1
B8BD AA                 TAX
B8BE A5 6A              LDA     TEMP
B8C0 99 49 09           STA     DISCTL+0,Y              ; STORE SIGN
                ;
                ;               NO INFINITY FOR THETA OR PHI
B8C3 98                 TYA
B8C4 29 10              AND     #$10            ; THETA OR PHI ?
B8C6 F0 05              BEQ     TWOCM3          ; NO
B8C8 E0 FF              CPX     #$FF            ; INFINITY ?
B8CA D0 01              BNE     TWOCM3          ; NO
B8CC CA                 DEX                     ; X=FE, NOT FF
                ;
                ;
B8CD            TWOCM3                  ; ENTRY POINT TO LOAD ONLY **************
                ;
B8CD BD E9 0E           LDA     BCDCON,X                ; BCD CONVERT
B8D0 AA                 TAX
B8D1 29 0F              AND     #$0F
B8D3 99 4B 09           STA     DISCTL+2,Y              ; LOW BYTE STOED
B8D6 8A                 TXA
B8D7 4A                 LSR     A
B8D8 4A                 LSR     A
B8D9 4A                 LSR     A
B8DA 4A                 LSR     A
B8DB 99 4A 09           STA     DISCTL+1,Y              ; HIGHT BYTE STORED
B8DE 60                 RTS
                ;
                ;
                ;
                ;
                ;
                ;
                ;               TABLES;
B8DF            CLINDX          ; COLOR INDEX TABLE USED IN OBJCOL SUBROUTINE
B8DF 00 01 02           .BYTE   0,1,2,3,7
B8E2 03 07
                ;
```

```
                        ;
B8E4                    PHGRAF          ; PHOTON GRAPHIC
B8E4 00                         .BYTE   0
B8E5 18 3C 7E                   .BYTE   $18,$3C,$7E,$7E,$76,$F7,$DF,$DF,$FF,$FF,$F7,$76,$7E,$7E,$3C,$18
B8E8 7E 76 F7
B8EB DF DF FF
B8EE FF F7 76
B8F1 7E 7E 3C
B8F4 18
B8F5                    PHGRF1
B8F5 10 38 76                   .BYTE   $10,$38,$7C,$7C,$FE,$DE,$DA,$FA,$EE,$EE,$7C,$7C,$38,$10
B8F8 7C FE DE
B8FB DA FA EE
B8FE EE 7C 7C
B901 38 10
B903                    PHGRF2
B903 18 3C 3C                   .BYTE   $18,$3C,$3C,$7E,$6E,$7A,$7E,$76,$7E,$3C,$3C,$18
B906 7E 6E 7A
B909 7E 76 7E
B90C 3C 3C 18
B90F                    PHGRF3
B90F 10 38 38                   .BYTE   $10,$38,$38,$7C,$74,$7C,$6C,$38,$38,$10
B912 7C 74 7C
B915 6C 38 38
B918 10
B919                    PHGRF4
B919 10 18 3C                   .BYTE   $10,$18,$3C,$2C,$3C,$3C,$18,$08
B91C 2C 3C 3C
B91F 18 08
B921                    PHGRF5
B921 10 38 38                   .BYTE   $10,$38,$38,$28,$38,$10
B924 28 38 10
                        ;
B927                    DKGRAF          ; DOCKING SHIP GRAPHIC
B927 3C 3C 24                   .BYTE   $3C,$3C,$24,$3C,$7E,$7E,$7E,$5A,$FF,$FF,$42,$42,$42,$42,$42,$42
B92A 3C 7E 7E
B92D 7E 5A FF
B930 FF 42 42
B933 42 42 42
B936 42
B937                    DKGRF1
B937 1C 1C 14                   .BYTE   $1C,$1C,$14,$3E,$3E,$3E,$2A,$7F,$7F,$22,$22,$22,$22,$22
B93A 3E 3E 3E
B93D 2A 7F 7F
```

```
B940 22 22 22
B943 22 22
B945            DKGRF2
B945 18 18 3C           .BYTE   $18,$18,$3C,$3C,$3C,$3C,$7E,$24,$24,$24,$24
B948 3C 3C 3C
B94B 7E 24 24
B94E 24 24
B950            DKGRF3
B950 10 10 38           .BYTE   $10,$10,$38,$38,$38,$7C,$28,$28,$28
B953 38 38 7C
B956 28 28 28
B959            DKGRF4
B959 18 18 3C           .BYTE   $18,$18,$3C,$18,$18
B95C 18 18
B95E            DKGRF5
B95E 10                 .BYTE   $10
B95F            GBASM6
B95F 10 38 10           .BYTE   $10,$38,$10
                ;
                ;
                ;
B962            GBASEM
B962 18 7E FF           .BYTE   $18,$7E,$FF,$FF,$FF,$FF,$FF,$E7,$E7,$FF,$FF,$FF,$FF,$FF,$7E,$7E
B965 FF FF FF
B968 FF E7 E7
B96B FF FF FF
B96E FF FF 7E
B971 7E
B972            GBASM1
B972 00                 .BYTE   0
B973 18 3C 7E           .BYTE   $18,$3C,$7E,$FF,$FF,$FF,$E7,$66,$FF,$FF,$FF,$FF,$7E,$7E
B976 FF FF FF
B979 E7 66 FF
B97C FF FF FF
B97F 7E 7E
B981            GBASM2
B981 00                 .BYTE   0
B982 18 3C 7E           .BYTE   $18,$3C,$7E,$FF,$FF,$E7,$66,$FF,$FF,$FF,$FF,$3C
B985 FF FF E7
B988 66 FF FF
B98B FF FF 3C
B98E            GBASM3
B98E 18 3C FF           .BYTE   $18,$3C,$FF,$FF,$E7,$66,$FF,$FF,$7E,$3C
B991 FF E7 66
```

```
B994 FF FF 7E
B997 3C
B998                    GBASM4
B998 00                         .BYTE   0
B999 18 3C FF                   .BYTE   $18,$3C,$FF,$FF,$FF,$3C,$18
B99C FF FF 3C
B99F 18
B9A0                    GBASM5
B9A0 18 3C FF                   .BYTE   $18,$3C,$FF,$3C,$18
                        ;
B9A5                    HWARTG          ; HWARP TARGET GRAPHIC
B9A5 28 28 28                   .BYTE   $28,$28,$28,$28,$EE,0,0,$EE,$28,$28,$28,$28
B9A8 28 EE 00
B9AB 00 EE 28
B9AE 28 28 28
                        ;
                        ;
                        ;
                        ;
B9B1                    ZYGRAF          ; GRAFIC OF ZYLON SHIP BASED ON XPOS
B9B1 00                         .BYTE   0               ; BLANK
B9B2 81 81 81                   .BYTE   $81,$81,$81,$81,$BD,$FF,$FF,$BD,$81,$81,$81,$81
B9B5 81 BD FF
B9B8 FF BD 81
B9BB 81 81 81
B9BE                    ZYGRF1
B9BE 82 82 BA                   .BYTE   $82,$82,$BA,$FE,$FE,$BA,$82,$82
B9C1 FE FE BA
B9C4 82 82
B9C6                    ZYGRF2
B9C6 42 5A 7E                   .BYTE   $42,$5A,$7E,$7E,$5A,$42
B9C9 7E 5A 42
B9CC                    ZYGRF3
B9CC 44 54 7C                   .BYTE   $44,$54,$7C,$7C,$54,$44
B9CF 7C 54 44
B9D2                    ZYGRF4
B9D2 24 3C 3C                   .BYTE   $28,$38,$38,$28
B9D9 24
B9DA                    ZYGRF6
B9DA 18 18                      .BYTE   $18,$18
                        ;
                        ;
B9DC                    ZYGRF7
B9DC 10 10                      .BYTE   $10,$10
```

```
B9DE                GBASER
B9DE E0 F8 F8               .BYTE   $E0,$F8,$F8,$FE,$57,$FE,$F8,$F8,$C0
B9E1 FE 57 FE
B9E4 F8 F8 C0
B9E7                GBASR3
B9E7 C0 F0                  .BYTE   $C0,$F0
B9E9                GBASR1
B9E9 C0 F0 F0               .BYTE   $C0,$F0,$F0,$FC,$BE,$FC,$F0,$80,$80
B9EC FC BE FC
B9EF F0 80 80
B9F2                GBASR2
B9F2 C0 C0 F0               .BYTE   $C0,$C0,$F0,$BC,$F0,$C0
B9F5 BC F0 C0
                    ;
                    ;
                    ;
B9F8                GBASEL
B9F8 07 1F 1F               .BYTE   7,$1F,$1F,$7F,$EA,$7F,$1F,$1F,$3
B9FB 7F EA 7F
B9FE 1F 1F 03
BA01                GBASL3
BA01 03 0F                  .BYTE   3,$F
BA03                GBASL1
BA03 03 0F 0F               .BYTE   3,$F,$F,$3F,$7D,$3F,$F,1,1
BA06 3F 7D 3F
BA09 0F 01 01
BA0C                GBASL2
BA0C 03 03 0F               .BYTE   3,3,$F,$3D,$F,3
BA0F 3D 0F 03
                    ;
                    ;
                    ;
                    ;
BA12                ROGRAF
BA12 18 3C 7E               .BYTE   $18,$3C,$7E,$7E,$DB,$C3,$81,$81,$81
BA15 7E DB C3
BA18 81 81 81
BA1B                ROGRF1
BA1B 10 38 7C               .BYTE   $10,$38,$7C,$7C,$D6,$C6,$82,$82
BA1E 7C D6 C6
BA21 82 82
BA23                ROGRF2
BA23 18 3C 3C               .BYTE   $18,$3C,$3C,$66,$66,$42,$42
BA26 66 66 42
```

```
BA29 42
BA2A            ROGRF3
BA2A 10 38 38           .BYTE   $10,$38,$38,$6C,$44,$44
BA2D 6C 44 44
BA30            ROGRF4
BA30 18 3C 24           .BYTE   $18,$3C,$24,$24
BA33 24
                ;
                ;
BA34            ROGRF5
BA34 10 38 28           .BYTE   $10,$38,$28
                ;
                ;
BA37            KLGRAF
BA37 18 3C 7E           .BYTE   $18,$3C,$7E,$FF,$18,$18,$FF,$7E,$3C,$18
BA3A FF 18 18
BA3D FF 7E 3C
BA40 18
BA41            KLGRF1
BA41 10 38 7C           .BYTE   $10,$38,$7C,$FE,$38,$38,$FE,$7C,$38,$10
BA44 FE 38 38
BA47 FE 7C 38
BA4A 10
BA4B            KLGRF2
BA4B 18 3C 7E           .BYTE   $18,$3C,$7E,$18,$7E,$3C,$18
BA4E 18 7E 3C
BA51 18
BA52            KLGRF3
BA52 10 38 7C           .BYTE   $18,$3C,$18,$3C,$18
BA55 10 7C 38
BA5C 3C 18
BA5E            KLGRF5
BA5E 10 38 38           .BYTE   $10,$38,$38,$10
BA61 10
                ;
                ;
                ;
                ;
BA62            LISTAB          ; DISPLAY LIST TABLE LDISP
                ;       SHIP ALIVE
BA62 82 00 46           .BYTE   $8D,0,$46
BA65 49 09              .WORD   DISCTL
BA67 20 06 00           .BYTE   $20,6,0
BA6A            LISTB2          ; GAL CHT
```

```
BA6A 01              .BYTE   1
BA6B 2E A1           .WORD   GLDISP
BA6D           LISTB3        ; SECT SCAN
BA6D 00 00 46        .BYTE   0,0,$46
BA70 F8 A0           .WORD   SESCAN
BA72 4D              .BYTE   $4D
BA73 C8 10           .WORD   MEMMAP+200
BA75           LISTB4        ; BACK VIEW
BA75 00 00 46        .BYTE   0,0,$46
BA78 09 A1           .WORD   BACKUP
BA7A 4D              .BYTE   $4D
BA7B C8 10           .WORD   MEMMAP+200
BA7D           LISTB5        ; FRONT VIEW
BA7D 4D              .BYTE   $4D
BA7E 00 10           .WORD   MEMMAP
BA80 0D 0D 0D        .BYTE   $0D,$0D,$0D,$0D,$0D
BA83 0D 0D
BA85           LISTB6        ; MESSAGE ON
BA85 30 46           .BYTE   $30,$46
BA87 1F 0D           .WORD   MESAGE
BA89 4D              .BYTE   $4D
BA8A A8 12           .WORD   MEMMAP+680
               ;
               ;
BA8C           DISDIS        ; FOR KEYSRV , DISPLAY LIST POINTERS
BA8C 1B 13 0B        .BYTE   LISTB5-LISTAB,LISTB4-LISTAB,LISTB3-LISTAB,LISTB2-LISTAB
BA8F 08
               ;
               ;
BA90           BRTABL        ; BRIGHTNESS SELECT TABLE
BA90 FF FF FF        .BYTE   BRT,BRT,BRT,BRT
BA93 FF
BA94 AA FF AA        .BYTE   MED,BRT,MED,BRT
BA97 FF
BA98 AA AA AA        .BYTE   MED,MED,MED,BRT
BA9B FF
BA9C AA AA AA        .BYTE   MED,MED,MED,MED
BA9F AA
BAA0 AA AA AA        .BYTE   MED,MED,MED,DIM
BAA3 55
BAA4 55 AA 55        .BYTE   DIM,MED,DIM,MED
BAA7 AA
BAA8 55 55 55        .BYTE   DIM,DIM,DIM,MED
BAAB AA
```

```
BAAC 55 55 55           .BYTE   DIM,DIM,DIM,DIM
BAAF 55
                        ;
                        ;
BAB0                    MASK            ; MASK FOR RAM MAP BYTE DUE TO HPOS
BAB0 C0 30 0C           .BYTE   $C0,$30,$0C,$03
BAB3 03
                        ;
                        ;
BAB4                    WARPTB          ; SELECT WARP ACCEL FROM KEY 0-9
BAB4 00 01 02           .BYTE   0,$01,$02,$04,$08,$10,$20,$40,$60,$70
BAB7 04 08 10
BABA 20 40 60
BABD 70
                        ;
                        ;
BABE                    CODCON          ; USED IN KEYSRV SUBROUTINE FOR KEY CONVERT
BABE F2 DF DE           .BYTE   $F2,$DF,$DE,$DA,$D8,$DD,$DB,$F3,$F5,$F0
BAC1 DA DB DD
BAC4 DB F3 F5
BAC7 F0
BAC8 F8 FF C0           .BYTE   $F8,$FF,$C0,$FD,$EF,$FE,$D2,$F9,$E5,$CA
BACB FD ED FE
BACE D2 F9 E5
BAD1 CA
BAD2 E7                 .BYTE   $E7
                        ;
BAD3                    WENTAB                  ; ENERGY USED PER WARP
BAD3 00 04 06           .BYTE   0,4,6,8,10,12,14,30,45,60
BAD6 08 0A 0C
BAD9 0E 1E 2D
BADC 3C
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
BADD                    ENGTAB                  ; ENERGY USED PER DISTANCE WARP JUMP
BADD 0A 0D 10           .BYTE   10,13,16,20,23,50,70,80,90,120,125,130,135,140,155,170,184,200
BAE0 14 17 32
BAE3 46 50 5A
```

```
BAE6 78 7D 82
BAE9 87 8C 9B
BAEC AA B8 C8
BAEF D0 D8 DF           .BYTE   208,216,223,232,241,250
BAF2 E8 F1 FA
                ;
                ;
                ;
                ;
                ;
BAF5            JOYTAB          ; CODE FOR EACH POSITION ON JOYSTICK
BAF5 00 01 FF           .BYTE   0,$1,$FF,0
BAF8 00
                ;
                ;
                ;
BAF9            INSTAB          ; INSET LINES TABLE HDRAW,VDRAW,NUMPTS
BAF9 50 28 87           .BYTE   $50,$28,$87,$50,$36,$87
BAFC 50 36 87
BAFF 77 46 1E           .BYTE   119,70,30,119,86,30,119,70,$91,148,70,$91
BB02 77 56 1E
BB05 77 46 91
BB08 94 46 91
BB0B 78 4E 06           .BYTE   120,78,6,126,75,15,126,81,15,141,78,7
BB0E 7E 4B 0F
BB11 7E 51 0F
BB14 8D 4E 07
BB17 85 47 84           .BYTE   133,71,$84,126,76,$85,140,76,$85,133,82,$84
BB1A 7E 4C 85
BB1D 8C 4C 85
BB20 85 52 84
                ;
                ;
BB23            INSTB1          ; HORIZ CROSS HAIRS
BB23 3E 32 0F           .BYTE   $3E,$32,15,$54,$32,15
BB26 54 32 0F
BB29 FE                 .BYTE   $FE                     ; ALL DONE
                ;
BB2A            INSTB2                  ; SECTOR SCAN SHIP
BB2A 4E 35 82           .BYTE   $4E,$35,$82,$4F,$34,$82,$50,$32,$85,$51,$34,$82,$52,$35,$82
BB2D 4F 34 82
BB30 50 32 85
BB33 51 34 82
BB36 52 35 82
```

```
BB39 FF                 .BYTE   $FF                      ; ALL DONE
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
BB3A                    YINIT           ; HLINES
BB3A 04 04 03           .BYTE   4,4,3,2
BB3E 02
BB3E                    ZINIT           ; HLINES
BB3E 02 03 04           .BYTE   2,3,4,4
BB41 04
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
BB42                    STINT           ; STATUS INIT TABLE (LDTABS)
BB42 12 0B 00           .BYTE   18,11,0,0,10,$55,$4B,$40,$40,10,$8D,$8B,$89,$89,$89,$89
BB45 00 0A 55
BB48 4B 40 40
BB4B 0A 8D 8B
BB4E 89 89 89
BB51 89
BB52 0A 16 0B           .BYTE   10,$16,11,0
BB55 00
BB56 0A                 .BYTE   10
BB57 14 0B 0F           .BYTE   $14,$0B,$04,0,0,10,$51,$4B,$0F,0,0,10,$93,$8B,$0F,0,0,0
BB5A 00 00 0A
BB5D 51 4B 0F
BB60 00 00 0A
BB63 93 8B 0F
BB66 00 00 00
BB69 0A                 .BYTE   10
BB6A 37 21 32           .BYTE   $37,$21,$32,$30,0,$25,$2E,$25,$32,$27,$39,$1A,0,0,0
BB6D 30 00 25
BB70 2E 25 32
```

```
BB73 27 39 1A
BB76 00 00 00
BB79 10 00 00           .BYTE   $10,0,0,0,0
BB7C 00 00
BB7E B4 A1 B2           .BYTE   $B4,$A1,$B2,$A7,$A5,$B4,$B3,$9A,0,0
BB81 A7 A5 B4
BB84 B3 9A 00
BB87 00
BB88 24 23 1A           .BYTE   $24,$23,$1A,$30,$25,$33,$23,$2C,$32
BB8B 30 25 33
BB8E 23 2C 32
BB91 00                 .BYTE   0
BB92 F3 F4 E1           .BYTE   $F3,$F4,$E1,$F2,0,$E4,$F4,$E5,$DA,$D0,$D0,$CE,$D0
BB95 F2 00 E4
BB98 E1 F4 E5
BB9B DA D0 D0
BB9E CE D0
BBA0 D0 00 00           .BYTE   $D0,0,0,0,0,0
BBA3 00 00 00
                ;
BBA6            CHRTAB          ; TABLE FOR LDTABS ROUTINE
BBA6 CF 04 03           .BYTE   $CF,4,3,2
BBA9 02
                ;
                ;
                ;
                ;
                ;
                ;
BBAA            SENTAB          ; TABLE OF SENTENSES
BBAA 00                 .BYTE   0               ; BUFFER
BBAB            SENACN                          ; ATTACK COMPUTER ON
BBAB 05 06 42           .BYTE   5,6,$42
BBAE            SENACF                          ; ATTACK COMPUTER OFF
BBAE 05 06 43           .BYTE   5,6,$43
BBB1            SENSON                          ; SHIELDS ON
BBB1 04 42              .BYTE   4,$42
BBB3            SENSOF                          ; SHIELDS OFF
BBB3 04 43              .BYTE   4,$43
BBB5            SENCTN                          ; COMPUTER TRACKING ON
BBB5 06 07 42           .BYTE   6,7,$42
BBB8            SENCTF                          ; COMPUTER TRACKING OFF
BBB8 07 43              .BYTE   7,$43
BBBA            SENWHT                          ; WHAT?
```

```
BBBA 48                 .BYTE   $48
BBBB            SENHYP                          ; HYPERWARP ENGAGED
BBBB 09 4A              .BYTE   9,$4A
BBBD            SENSUR
BBBD 0B CD              .BYTE   11,$CD          ; STARBASE SURROUNDED
BBBF            SENDES
BBBF 0B CC              .BYTE   11,$CC          ; STARBASE DESTROYED
BBC1            SENHWA                  ; HYPERWARP ABORTE
BBC1 09 4E              .BYTE   9,$4E
BBC3            SENHWC                          ; HYPERWARD COMPLETE
BBC3 09 4F              .BYTE   9,$4F
BBC5            SENHSP                          ; HYPERSPACE
BBC5 D0                 .BYTE   $D0
BBC6            SENORB          ; ORBIT ESTABLISHED
BBC6 11 92 56           .BYTE   17,$92,$56
BBC9            SENDKA          ; DOCKING ABORTED
BBC9 13 4E              .BYTE   19,$4E
BBCB            SENETC                  ; ENERGY TRANSFER COMPLETE
BBCB 15 4F              .BYTE   21,$4F
BBCD            SENDST          ; YOU ARE DESTROYED
BBCD B8 97 99           .BYTE   $B8,$97,$99,$98,$8C,$9D,30,$9F,$FD,37,$FC,$78
BBD0 98 8C 9D
BBD3 1E 9F FD
BBD6 25 FC 78
BBD9            SENATA          ; TITLE
BBD9 9B 60              .BYTE   $9B,$60
                ;
                ;
BBDB            SENOUT          ; OUT OF ENERGY
BBDB B8 97 98           .BYTE   $B8,$97,$98,26,$8E,28,$94,36,$9F,$FD,37,$FC,$A7,$68
BBDE 1A 8E 1C
BBE1 94 24 9F
BBE4 FD 25 FC
BBE7 A7 68
BBE9            SENWIN          ; YOU WIN
BBE9 B8 97 98           .BYTE   $B8,$97,$98,26,$8F,36,$9F,$FD,37,$FC,$66
BBEC 1A 8F 24
BBEF 9F FD 25
BBF2 FC 66
BBF4            SENNOV          ; NOVICE MISSION
BBF4 2C 5A              .BYTE   44,$5A
BBF6            SENPIL          ; PILOT MISSION
BBF6 2E 5A              .BYTE   46,$5A
BBF8            SENWAR          ; WARRIOR MISSION
```

```
BBF8 31 5A              .BYTE   49,$5A
                ;
                ;
BBFA            SENCOM                  ; COMMANDER MISSION
BBFA 33 5A              .BYTE   51,$5A
BBFC            SENDMC  ; DAMAGE CONTROL
BBFC B8 34 76           .BYTE   $B8,52,$76
BBFF            SENPDM          ; PHOTONS DAMAGED
BBFF 37 B5 78           .BYTE   55,$B5,$78
BC02            SENPDS          ; PHOTONS DESTROYED
BC02 37 8C 78           .BYTE   55,$8C,$78
BC05            SENEDM          ; ENGINES DAMAGED
BC05 23 B5 78           .BYTE   35,$B5,$78
BC0B            SENSDM          ; SHIELDS DAMAGED
BC0B 04 B5 78           .BYTE   4,$B5,$78
BC0E            SENSDS          ; SHIELDS DESTROYED
BC0E 04 8C 78           .BYTE   4,$8C,$78
BC11            SENCDM  ; COMPUTER DAMAGED
BC11 06 B5 78           .BYTE   6,$B5,$78
BC14            SENCDS          ; COMPUTER DESTROYED
BC14 06 8C 78           .BYTE   6,$8C,$78
BC17            SENTDM          ; SECTOR SCAN DAMAGED
BC17 A2 75              .BYTE   $A2,$75
BC19            SENTDS          ; SECTOR SCAN DESTROYED
BC19 A2 4C              .BYTE   $A2,$4C
BC1B            SENMDM          ; COMMUNICATIONS DAMAGED
BC1B A1 75              .BYTE   $A1,$75
BC1D            SENMDS          ; COMMUNICATIONS DESTROYED
BC1D A1 4C              .BYTE   $A1,$4C
BC1F            SENRED          ; RED ALERT
BC1F C1                 .BYTE   $C1
BC20            SENABR          ; MISSION ABORTED KEY
BC20 B8 97 98           .BYTE   $B8,$97,$98,26,$8E,36,$9F,$FD,37,$FC,$66
BC23 1A 8E 24
BC26 9F FD 25
BC29 FC 66
                ;
                ;
                ;
BC2B            WRDTAB                  ; TABLE OF WORDS
BC2B A0 20 20           .BYTE   $A0," RED ALERT"
BC2E 20 20 52
BC31 45 44 20
BC34 41 4C 45
```

```
BC37 52 54
BC39 CF 4E              .BYTE   $CF,"N"
BC3B CF 46 46           .BYTE   $CF,"FF"
BC3E D3 48 49           .BYTE   $D3,"HIELDS"
BC41 45 4C 44
BC44 53
BC45 C1 54 54           .BYTE   $C1,"TTACK"
BC48 41 43 4B
BC4B C3 4F 4D           .BYTE   $C3,"OMPUTER"
BC4E 50 55 54
BC51 45 52
BC53 D4 52 41           .BYTE   $D4,"RACKING"
BC56 43 4B 49
BC59 4E 47
BC5B D7 48 41           .BYTE   $D7,"HATS WRONG?"
BC5E 54 53 20
BC61 57 52 4F
BC64 4E 47 3F
BC67 C8 59 50           .BYTE   $C8,"YPERWARP"
BC6A 45 52 57
BC6D 41 52 50
BC70 C5 4E 47           .BYTE   $C5,"NGAGED"
BC73 41 47 45
BC76 44
                ;
                ;
BC77 D3 54 41           .BYTE   $D3,"TARBASE"
BC7A 52 42 41
BC7D 53 45
BC7F C4 45 53           .BYTE   $C4,"ESTROYED"
BC82 54 52 4F
BC85 59 45 44
BC88 D3 55 52           .BYTE   $D3,"URROUNDED"
BC8B 52 4F 55
BC8E 4E 44 45
BC91 44
BC92 C1 42 4F           .BYTE   $C1,"BORTED"
BC95 52 54 45
BC98 44
BC99 C3 4F 4D           .BYTE   $C3,"COMPLETE"
BC9C 50 4C 45
BC9F 54 45
BCA1 C8 59 50           .BYTE   $C8,"YPERSPACE"
BCA4 45 52 53
```

```
BCA7 50 41 43
BCAA 45
BCAB CF 52 42           .BYTE   $CF,"RBIT"
BCAE 49 54
BCB0 C5 53 54           .BYTE   $C5,"STABLISHED"
BCB3 41 42 4C
BCB6 49 53 48
BCB9 45 44
BCBB C4 4F 43           .BYTE   $C4,"OCKING"
BCBE 4B 49 4E
BCC1 47
BCC2 C5 4E 45           .BYTE   $C5,"NERGY"
BCC5 52 47 59
BCC8 D4 52 41           .BYTE   $D4,"RANSFER"
BCCB 4E 53 46
BCCE 45 52
BCD0 D3 54 41           .BYTE   $D3,"TANDBY"
BCD3 4E 44 42
BCD6 59
BCD7 D3 54 41           .BYTE   $D3,"TAR FLEET TÖ
BCDA 52 20 46
BCDD 4C 45 45
BCE0 54 20 54
BCE3 4F
BCE4 D3 54 41           .BYTE   $D3,"TAR CRUISER 7"
BCE7 52 20 43
BCEA 52 55 49
BCED 53 45 52
BCF0 20 37
                ;
                ;
BCF2 C1 4C 4C           .BYTE   $C1,"LL UNITS"
BCF5 20 55 4E
BCF8 49 54 53
BCFB CD 49 53           .BYTE   $CD,"ISSION"
BCFE 53 49 4F
BD01 4E
BD02 A0 20 20           .BYTE   $A0," STAR RAIDERS"
BD05 20 53 54
BD08 41 52 20
BD0E 44 45 52
BD11 53
BD12 DA 45 52           .BYTE   $DA,"ERÖ
BD15 4F
```

```
BD16 C2 59 20           .BYTE   $C2,"Y ZYLON FIRE"
BD19 5A 59 4C
BD1C 4F 4E 20
BD1F 46 49 52
BD22 45
BD23 D0 4F 53           .BYTE   $D0,"OSTHUMOUS"
BD26 54 48 55
BD29 4D 4F 55
BD2C 53
BD2D D2 41 4E           .BYTE   $D2,"AND IS:"
BD30 4B 20 49
BD33 53 3A
BD35 C3 4F 50           .BYTE   $C3,"OPYRIGHT ATARI 1979"
BD38 59 52 49
BD38 59 52 49
BD3E 47 48 54
BD3E 20 41 54
BD41 41 52 49
BD44 20 31 39
BD47 37 39
BD49 D3 55 42           .BYTE   $D3,"UB-SPACE RADIO"
BD4C 2D 53 50
BD4F 41 43 45
BD52 44 49 4F
BD58 D3 45 43           .BYTE   $D3,"ECTOR SCAN"
BD5B 54 4F 52
BD5E 20 53 43
BD61 41 4E
BD63 C5 4E 47           .BYTE   $C5,"NGINES"
BD66 79 4E 45
BD69 53
BD6A CE 45 57           .BYTE   $CE,"EW"
BD6D C3 4C 41           .BYTE   $C3,"LASS"
BD70 53 53
BD72 C3 4F 4E           .BYTE   $C3"ONGRATULATIONS"
BD75 47 52 41
BD78 54 55 4C
BD7B 41 54 49
BD7E 4F 4E 53
                ;
                ;
BDB1 D2 45 50           .BYTE   $D2,"EPORT TO BASE"
BDB4 4F 52 54
BDB7 20 54 4F
```

```
BDBA 20 42 41
BDBD 53 45
BD8F C6 4F 52           .BYTE   $C6,"OR TRAINING"
BD92 20 54 52
BD95 41 49 4E
BD98 49 4E 47
BD9B C7 41 4C           .BYTE   $C7,"ALACTIC COOK"
BD9E 41 43 54
BDA1 49 43 20
BDA4 43 4F 4F
BDA7 4B
BDA8 C7 41 52           .BYTE   $C7,"ARBAGE SCOW CAPTAIN"
BDAB 42 41 47
BDAE 45 20 53
BDB1 43 4F 57
BDBA 49 4E
BDBC D2 4F 4F           .BYTE   $D2,"OOKIE"
BDBF 4B 49 45
BDC2 CE 4F 56           .BYTE   $CE,"OVICE"
BDC5 49 43 45
BDC8 C5 4E 53           .BYTE   $C5,"NSIGN"
BDCB 49 47 4E
BDCE D0 49 4C           .BYTE   $D0,"ILOT"
BDD1 4F 54
BDD3 C1 43 45           .BYTE   $C1,"CE"
BDD6 CC 49 45           .BYTE   $CC,"IEUTENANT"
BDD9 55 54 45
BDDC 4E 41 4E
BDDF 54
BDE0 D7 41 52           .BYTE   $D7,"ARRIOR"
BDE3 52 49 4F
BDE6 52
BDE7 C3 41 50           .BYTE   $C3,"APTAIN"
BDEA 54 41 49
BDED 4E
                ;
                ;
BDEE C3 4F 4D           .BYTE   $C3,"OMMANDER"
BDF1 4D 41 4E
BDF4 44 45 52
BDF7 C4 41 4D           .BYTE   $C4,"AMAGE"
BDFA 41 47 45
BDFD C4 41 4D           .BYTE   $C4,"AMAGED"
BE00 41 47 45
```

```
BE03 44
BE04 C3 4F 4E           .BYTE   $C3,"ONTROL"
BE07 54 52 4F
BE0A 4C
BE0B D0 48 4F           .BYTE   $D0,"HOTONS"
BE0E 54 4F 4E
BE11 53
                ;
BE12 A0                 .BYTE   $A0             ; BLANK
BE13 D3 54 41           .BYTE   $D3,"TAR COMMANDER"
BE16 52 20 43
BE19 4F 4D 4D
BE1C 41 4E 44
BE1E 45 52
BE21 80                 .BYTE   $80             ; END TABLE
                ;
                ;
                ;
                ;
BE22            DISTYP                  ; CODE TO LOAD IN DISFLG
BE22 00 01 40           .BYTE 0,1,$40,$80
BE25 80
BE26            TOFFMG          ; POINTER TO TOGLE OFF MESSAGE
BE26 0E 09 04           .BYTE   SENCTF-SENTAB,SENSOF-SENTAB,SENACF-SENTAB
BE29            TOGTAB                  ; BYTE TO TOGGLE RAM BYTE WITH
BE29 FF 08 02           .BYTE   $FF,8,2
BE2C          TONMSG            ; POINTER TO TOGGLE ON MESSAGE
BE2C 0B 07 01           .BYTE   SENCTN-SENTAB,SENSON-SENTAB,SENACN-SENTAB
                ;
                ;
                ;
                ;
                ;
BE2F            GPOINT          ; TABLE OF GRAPHIC POINTERS FOR THE OBJ (OBJCOL)
BE2F 01 11 1F           .BYTE   1,PHGRF1-PHGRAF,PHGRF2-PHGRAF,PHGRF3-PHGRAF,PHGRF4-PHGRAF
BE32 2B 35
BE34 3D 75 7A           .BYTE   PHGRF5-PHGRAF,DKGRF4-PHGRAF,DKGRF5-PHGRAF
BE37 01 0D 15           .BYTE   1,ZYGRF1-ZYGRAF,ZYGRF2-ZYGRAF,ZYGRF3-ZYGRAF,ZYGRF4-ZYGRAF
BE3A 1B 21
BE3C 25 29 2B           .BYTE   ZYGRF5-ZYGRAF,ZYGRF6-ZYGRAF,ZYGRF7-ZYGRAF
BE3F 2D                 .BYTE   GBASER-ZYGRAF
BE40 38 41 36           .BYTE   GBASR1-ZYGRAF,GBASR2-ZYGRAF,GBASR3-ZYGRAF,GBASR3-ZYGRAF,0,0,0
BE43 36 00 00
BE46 00
```

```
BE47 7E                 .BYTE   GBASEM-PHGRAF
BE48 8E 9D AA           .BYTE   GBASM1-PHGRAF,GBASM2-PHGRAF,GBASM3-PHGRAF,GBASM4-PHGRAF
BE4B B4
BE4C BC 7B 7A           .BYTE   GBASM5-PHGRAF,GBASM6-PHGRAF,DKGRF5-PHGRAF
BE4F 47                 .BYTE   GBASEL-ZYGRAF
BE50 52 5B 50           .BYTE   GBASL1-ZYGRAF,GBASL2-ZYGRAF,GBASL3-ZYGRAF,GBASL3-ZYGRAF,0,0,0
BE53 50 00 00
BE56 00
BE57 43                 .BYTE   DKGRAF-PHGRAF
BE58 53 61 6C           .BYTE   DKGRF1-PHGRAF,DKGRF2-PHGRAF,DKGRF3-PHGRAF,DKGRF4-PHGRAF
BE5B 75
BE5C 7A 75 7A           .BYTE   DKGRF5-PHGRAF,DKGRF4-PHGRAF,DKGRF5-PHGRAF
BE5F 01 11 1F           .BYTE   1,PHGRF1-PHGRAF,PHGRF2-PHGRAF,PHGRF3-PHGRAF,PHGRF4-PHGRAF
BE62 2B 35
BE64 3D 75 7A           .BYTE   PHGRF5-PHGRAF,DKGRF4-PHGRAF,DKGRF5-PHGRAF
                ;
                ;
                ;
                ;
BE67 61                 .BYTE   ROGRAF-ZYGRAF
BE68 6A 72 79           .BYTE   ROGRF1-ZYGRAF,ROGRF2-ZYGRAF,ROGRF3-ZYGRAF,ROGRF4-ZYGRAF
BE6B 7F
BE6C 83 29 2B           .BYTE   ROGRF5-ZYGRAF,ZYGRF6-ZYGRAF,ZYGRF7-ZYGRAF
BE6F 86                 .BYTE   KLGRAF-ZYGRAF
BE70 90 9A A1           .BYTE   KLGRF1-ZYGRAF,KLGRF2-ZYGRAF,KLGRF3-ZYGRAF,KLGRF4-ZYGRAF
BE73 A8
BE74 AD 29 2B           .BYTE   KLGRF5-ZYGRAF,ZYGRF6-ZYGRAF,ZYGRF7-ZYGRAF
BE77 C1 C1 C1           .BYTE   HWARTG-PHGRAF,HWARTG-PHGRAF,HWARTG-PHGRAF,HWARTG-PHGRAF
BE7A C1
BE7B C1 C1 75           .BYTE   HWARTG-PHGRAF,HWARTG-PHGRAF,DKGRF4-PHGRAF,HWARTG-PHGRAF
BE7C C1
                ;
BE7F            NBYTAB          ; NUMBER OF BYTES TO STORE ( OBJCOL)
BE7F 0F 0D 0B           .BYTE   15,13,11,9,7,5,1,1
BE82 09 07 05
BE85 01 01
BE87 0B 07 05           .BYTE   11,7,5,5,3,3,1,1
BE8A 05 03 03
BE8D 01 01
BE8F 09 08 05           .BYTE   9,8,5,2,0,0,0,0
BE92 02 00 00
BE95 00 00
BE97 0F 0E 0C           .BYTE   15,14,12,9,7,4,2,1
BE9A 09 07 04
```

```
BE9D 02 01
BE9F 09 08 05           .BYTE   9,8,5,2,0,0,0,0
BEA2 02 00 00
BEA5 00 00
BEA7 0F 0D 0B           .BYTE   15,13,10,8,4,3,1,1
BEAA 08 04 03
BEAD 01 01
BEAF 0F 0D 0B           .BYTE   15,13,11,9,7,5,1,1
BEB2 09 07 05
BEB5 01 01
BEB7 08 07 06           .BYTE   8,7,6,5,3,2,1,1
BEBA 05 03 02
BEBD 01 01
BEBF 09 09 06           .BYTE   9,9,6,6,4,3,1,1
BEC2 06 04 03
BEC5 01 01
BEC7 0B 0B 0B           .BYTE   11,11,11,11,11,11,1,11
BECA 0B 0B 0B
BECD 01 0B
                ;
                ;
                ;
                ;
                ;
BECF            TRKTAB          ; KEY FOR SWITCHING DISPLAY, ASERVE
BECF F8 FF              .BYTE   $F8,$FF
BED1            CHTABL  ; FOR LDGALT, CODES FOR CHTDIS
BED1 0C 1E 1E           .BYTE   $0C,$1E,$1E,$1D,$1C,$1B
BED4 1D 1C 1B
                ;
                ;
                ;
BED7            STERTB          ; USED IN HWARP STEERING , OBJCOL
BED7 9F BF DF           .BYTE   $9F,$BF,$DF,$FF
BEDA FF
                ;
                ;
                ;
BEDB            BHORTB          ; STAR BASE HORIZ OFFSET TABLE
BEDB F8 08              .BYTE   $F8,08
                ;
                ;
BEDD            DIFTAB          ; RATING,$DIFFICULTY TABLE
BEDD 50 4C 3C           .BYTE   80,76,60,111,60,60,50,100,40,50,40,90
```

```
BEE0 6F 3C 3C
BEE3 32 64 28
BEE6 32 28 5A
BEE9                RANKTB          ; RAND WORD VS. RATING HI NIBBLE
BEE9 A9 AA AA               .BYTE   $A9,$AA,$AA,$AB,$AB,$AC,$AC,$AD,$AD,$AE,$AE,$AF,$B0,$B1,$B2,$B3
BEEC AB AB AC
BEEF AC AD AD
BEF2 AE AE AF
BEF5 B0 B1 B2
BEF8 B3
BEF9 B3 B9 B9               .BYTE   $B3,$B9,$B9
                    ;
                    ;
BEFC                CLASTB          ; DMA ASCII CLASS VS RATING LO NIBBLE
BEFC 95 95 95               .BYTE   $95,$95,$95,$94,$94,$94,$94,$93,$93,$93,$92,$92,$92,$91
BEFF 94 94 94
BF02 94 93 93
BF05 93 92 92
BF08 92 91
BF0A 91 91                  .BYTE   $91,$91
                    ;
BF0C                MSENTB          ; MISSION TYPE TABLE
BF0C 4A 4C 4E               .BYTE   SENNOV-SENTAB,SENPIL-SENTAB,SENWAR-SENTAB,SENCOM-SENTAB
BF0F 50
BF10                DPRBTB          ; DAMAGE PROB BASED ON MISDIF
BF10 00 50 B4               .BYTE   0,80,180,$FE
BF13 FE
BF14                DAMGTB          ; SENTENCES FO DAMAGE (DAMCTL)
BF14 55 5B 61               .BYTE   SENPDM-SENTAB,SENEDM-SENTAB,SENSDM-SENTAB,SENCDM-SENTAB
BF17 67
BF18 6D 71                  .BYTE   SENTDM-SENTAB,SENMDM-SENTAB
BF1A                DESTTB          ; SENTENCES FO DESTROY (DAMCTL)
BF1A 58 5E 64               .BYTE   SENPDS-SENTAB,SENEDS-SENTAB,SENSDS-SENTAB,SENCDS-SENTAB
BF1D 6A
BF1E 6F 73                  .BYTE   SENTDS-SENTAB,SENMDS-SENTAB
                    ;
                    ;
BF20                NOISTB  ; NOISE ROUTINE, INIT AUDTIM,AUDADD,AFREQ2,AFREQ1,ATYPE3
                            ; ATYPE2,AUDEXP,PHOREP,AUDCTL,AUDF3
                    ;       FOR PHOTONS
BF20 18 FF 02               .BYTE   $18,$FF,2,0,$8A,$A0,0,8,$50,$00
BF23 00 8A A0
BF26 00 08 50
BF29 00
```

```
BF2A                NOITB1          ; FOR SHIELD EXPLOSION
BF2A 40 40 01               .BYTE   $40,$40,1,3,$88,$AF,8,0,$50,4
BF2D 03 88 AF
BF30 08 00 50
BF33 04
BF34                NOITB2          ; FOR ZYLON EXPLOS
BF34 30 40 01               .BYTE   $30,$40,1,3,$84,$A8,4,0,$50,4
BF37 03 84 A8
BF3A 04 00 50
BF3D 04
                    ;
                    ;
                    ;
BF3E                CH4TAB          ; NOTINT,       INIT REPPTR,NPRIOR,SDURAT,NDURAT,REPSEQ,NOTSEQ
BF3E                CH4TB1          ; HYPERSPACE
BF3E 02 02 02               .BYTE   2,2,2,3,12,2
BF41 03 0C 02
BF44                CH4TB2          ; RED ALERT
BF44 04 03 FF               .BYTE   4,3,$FF,$10,7,4
BF47 10 07 04
BF4A                CH4TB3          ; KEYS
BF4A 07 04 02               .BYTE   7,4,2,2,0,7
BF4D 02 00 07
BF50                CH4TB4          ; DAMAGE
BF50 0B 05 FF               .BYTE   11,5,$FF,$20,2,11
BF53 20 02 0B
BF56                CH4TB5          ; MESSAGE
BF56 0E 06 08               .BYTE   14,6,8,$20,0,14
BF59 20 00 0E
                    ;
                    ;
                    ;
BF5C                NOTTAB          ; TABL O NOTES, FF=RESERVED BYTE
BF5C 10 FF                  .BYTE   $10,$FF                 ; TRACKING
BF5E 18 FF                  .BYTE   $18,$FF                 ; HYPERSPACE
BF60 40 60 FF               .BYTE   $40,$60,$FF             ; RED ALERT
BF63 10 10 10               .BYTE   $10,$10,$10,$FF         ; KEYS
BF66 FF
BF67 40 20 FF               .BYTE   $40,$20,$FF             ; DAMAGE
BF6A 48 40 51               .BYTE   $48,$40,$51,$FF         ; STARFLEET MESSAGE
BF6D FF
                    ;
                    ;
BF6E                ZYTARG                  ; GRAPHIC OF ZYLON TARGET
```

```
BF6E 84 B4 FC           .BYTE   $84,$B4,$FC,$B4,$84
BF71 B4 84
                        ;
                        ;
                        ;
                        ;
BF73                    PHOYPS          ; YPOSH FOR PHOTON
BF73 FF 01              .BYTE   $FF,1
                        ;
BF75                    PHPOST          ; BOUNDS IN HITZYL
BF75 0C 0C 0C           .BYTE   $C,$C,$C,$C,$E,$E,$E,$20
BF78 0C 0E 0E
BF7B 0E 20
                        ;
                        ;
                        ;
BF7D                    PHPOSB          ; BOUNDS IN HITZYL
BF7D 00 00 00           .BYTE   0,0,0,2,4,6,8,$C
BF80 02 04 06
BF83 08 0C
                        ;
                        ;
                        ;
                        ;
BF85                    PHODIF          ; THINK
BF85 81 84 88           .BYTE   $81,$84,$88,$94
BF88 94
BF89                    ZYGIND          ; THINK
BF89 80 10 10           .BYTE   $80,$10,$10,$10,$70,$70,$70,$10
BF8C 10 70 70
BF8F 70 10
BF91                    INTSEQ          ; THINK
BF91 04 04 00           .BYTE   4,4,0,0,0,1,0,0
BF94 00 00 01
BF97 00 00
                        ;
BF99                    ZYWARP          ; THINK
BF99 3E 1E 10           .BYTE   $3E,$1E,$10,8,4,2,1,0,0,$81,$82,$84,$88,$90,$9E,$BE
BF9C 08 04 02
BF9F 01 00 00
BFA2 81 82 84
BFA5 88 90 9E
BFA8 BE
                        ;
```

```
                        ;
                        ;
BFA9                    CLITAB          ; LDTABS
BFA9 A6 AA AF                   .BYTE   $A6,$AA,$FA,0,0,$B8,$5A,$FC,$5E,$90
BFAC 00 00 B8
BFAF 5A FC 5E
BFB2 90
                        ;
                        ;
BFB3                    JMASK           ; HWARP SUB, USED FOR INITING TARG POSITIONS
BFB3 FF FF 3F                   .BYTE   $FF,$FF,$3F,$0F,$3F,$7F,$FF,$FF
BFB6 0F 3F 7F
BFB9 FF FF
                        ;
                        ;
BFBB                    JMPWHN          ; TIMERS, WHEN EACH ZYLON TYPE SHOULD JUMP
BFBB 00 FF FF                   .BYTE   0,$FF,$FF,$C0,$20
BFBE C0 20
                        ;
BFC0                    JMPTAB          ; TIMERS , JUMP VECTORS FOR ZYLONS
BFC0 F0 EF FF                   .BYTE   $F0,$EF,$FF,15,16,17,1,$F1,0
BFC3 0F 10 11
BFC6 01 F1 00
                        ;
BFC9                    PHVECT  ; POHELP
BFC9 00 08 10                   .BYTE   0,8,$10,$18,$28,$30,$38,$40
BFCC 18 28 30
BFCF 38 40
                        ;
                        ;
                        ;
BFD1                    COLTAB          ; OBJCOL, CHROMA FOR EACH TYPE GRAPHIC
BFD1 50 00 20                   .BYTE   $50,0,$20,$20,$20,0,$A0,0,0,$9F
BFD4 20 20 00
BFD7 A0 00 00
BFDA 9F
                        ;
BFDB                    COLINT          ; OBJCOL, INTENSITY PER XPOSH
BFDB 0E 0E 0E                   .BYTE   $E,$E,$E,$C,$C,$C,$A,$A,$A,$8,$8,$8,$6,$6,$4,$4
BFDE 0C 0C 0C
BFE1 0A 0A 0A
BFE4 08 08 08
BFE7 06 06 04
BFEA 04
```

```
                        ;
                        ;
BFEB                    PHOTB2          ; AUDIO, ATYPE3
BFEB 8A 8F 8D                   .BYTE   $8A,$8F,$8D,$8B,$89,$87,$85,$83
BFEE 8B 89 87
BFF1 85 83
BFF3                    PHOTB4          ; AUDIO, AFREQ3
BFF3 00 04 01                   .BYTE   0,4,1,4,1,4,1,4
BFF6 04 01 04
BFF9 01 04
BFFB                    PHASE5
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;               CARTRIDGE OPERATING CODES
                        ;
                                *=$BFFC
BFFC 00                         .BYTE   0               ; CARTRIDGE IN FLAG
BFFD 80                         .BYTE   $80             ; RUN CARTRIDGE IMMEDIATELY
BFFE 4A A1                      .WORD   INIT            ; START ADDR POINTER
                        ;
C000                    PHASE9
                        ;
                        ;
                        ;
                        ;
                        ;                       RAM MAP
                                *=$280
0280                    RAMMAP                  ; MISC RAM STORAGE
0280                    DISPLY                  ; DISPLAY LIST RAM
                                *=*+128         ; SEE EQUATES FOR INTERNAL LABELS
                        ;
0300                    PHASE2
                        ;
                                *=$300
0300                    PGRAPH
0300                    MGRAPH                  ; MISSLE GRAPHICS RAM
                                *=*+256
0400                    PGRAP0
                                *=*+256
0500                    PGRAP1
                                *=*+256
```

```
0600            PGRAP2
                        *=*+256
0700            PGRAP3
                        *=*+256
                ;
0800            VCONL           ; VERT CONVERT TABLE LO BYTE
                        *=*+100
0864            VCONH           ; VERT CONVERT TABLE HI BYTE
                        *=*+100
                        *=*+1           ; BUFFER BYTE
08C9            CHTRAM          ; CHART RAM, MOW MANY ZYLONS IN EACH QUAD
                        *=*+128
0949            DISCTL          ; DISPLAY OF CONTRAL STATUS PANNEL
                        *=*+2
094B            DVELOC          ; DISP OF VELOC
                        *=*+2
                        *=*+3
0950            DKILL           ; DISP OF KILL
                        *=*+2
                        *=*+3
0955            DENERG          ; DISPLAY OF ENERGY
                        *=*+4
                        *=*+3
095C            DCSTOR          ; WHICH OBJ TRACKING
                        *=*+1
                ;                       NEXT LINE
                        *=*+3
0960            DTHETA          ; DISPLAY OF THETA
                        *=*+3
                        *=*+3
0966            DPHI                    ; DISPLAY OF PHI
                        *=*+3
                        *=*+3
096C            DRHO                    ; DISPLAY OF RHO
                        *=*+4
                        *=*+1
                ;               NEXT LINE
0971            DGALAC                  ; GALACTIC CHART INFO
                        *=*+12
097D            DWENER                  ; DISPLAY WARP ENERGY
                        *=*+3
                        *=*+5
                ;               NEXT LINE
                        *=*+8
```

```
098D            DTARG                   ; DISP OF TARGETS IN QUAD
                *=*+1
                *=*+4
0992            DAMAGE          ; DAMAGE CONTROL RAM, +0=PHOTONS,+1=ENGINES
                *=*+6           ; +2=SHIELDS,+3=COM,PUTER,+4=SECTOR SCAN
                                ; +5=SUB-SPACE RADIO
                *=*+1
                ;               NEXT LINE
                *=*+10
09A3            DSDATE                  ; DISP OF STAR DATE
                *=*+5
                *=*+5
09AD            STRRAM          ; RAM FOR STARS , OBJECTS POSITIONS, ETC.
09AD            XSIGN           ; SIGN OF XPOS
                *=*+RAMNUM
09DE            YSIGN
                *=*+RAMNUM
0A0F            ZSIGN
                *=*+RAMNUM
0A40            XPOSH           ; XPOS IN SPACE HI BYTE
                *=*+RAMNUM
0A71            YPOSH
                *=*+RAMNUM
0AA2            ZPOSH
                *=*+RAMNUM
0AD3            XPOSL           ; XPOS IN SPACE LO BYTE
                *=*+RAMNUM
0B04            YPOSL
                *=*+RAMNUM
0B35            ZPOSL
                *=*+RAMNUM
0B66            XINCRE          ; OBJECTS X DIRECTION VELOCITY
                *=*+RAMNUM
0B97            YINCRE
                *=*+RAMNUM
0BC8            ZINCRE
                *=*+RAMNUM
0BF9            VPOS            ; VERT POS ON SCREEN
                *=*+RAMNUM
0C2A            HPOS            ; HORIZ POS ON SCREEN
                *=*+RAMNUM
0C5B            OLDVER          ; OLD VERT POSIT
                *=*+RAMNUM
0C8C            GINDEX          ; TYPE OF GRAPHIC,              OBJECT
```

```
0C8C            OLDHOR          ; OLD HORIZ POSIT               STARS
                        *=*+RAMNUM
0CBD            OLDNUM          ; PREVIOUS NUMBER OF BYTES STORED               OBJECT
0CBD            OLDBYT          ; OLD BYTE IN RAM MAP                           STARS
                        *=*+RAMNUM
0CEE            NUMBYT          ; HOW MANY BYTES TO STORE               OBJECT
0CEE            STRBYT          ; THE BYTE TO STORE             STARS
                        *=*+RAMNUM
0D1F            MESAGE          ; DISPLAY OF MESSAGE RAM
                        *=*+20
                        *=*+2           ; BUFFER ZONE
                ;
0D35            CHTDIS          ; CHAR GRAPHICS PNTR FO GALCHT
                        *=*+180
                ;
0DE9            PTAB            ; X80 SCALER TABLE
                        *=*+256
0EE9            BCDCON          ; BINARY TO BCD TABLE
                        *=*+256
                ;
0FE9            PHASE7
                ;
                        *=$1000
1000            MEMMAP                  ; SCREEN MAP RAM
                        *=*+4096
2000            MEMEND
2000            PHASE3
                ;
                ;                       END PROGRAM
                        .END
```

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