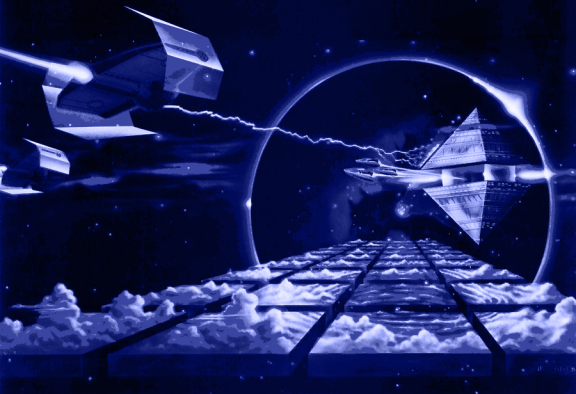


**SOURCE
CODE**

ATARI[®]400/800[™]

COMPUTER ADVENTURE

STAR RAIDERS[™]




ATARI[®] A Warner Communications Company 

Model CXL4011
Use with
ATARI[®] 400[™] or ATARI 800[™]
PERSONAL COMPUTER SYSTEMS

TITLE 'STAR RAIDERS' VERSION 25.1 STARDATE 26-JUL-79'

GAME COMPLETE 17-JUN-79

NOTES
 RAM 0-1FFF
 ROM A000-BFEF
 SPILL OVER ROM 9800-9FFF
 E477G ; PROG START

Final Listing

ALPHA CHARACTERS IN DMA ASCII

*CAPS = ASCII EQR \$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
0	=	01	00
+INFINITY	=	01	FF
-1	=	00	FF

KEYCODE IS ORED WITH \$C0

STRAM MEMORY DEFINED	STRAM+	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 FLAG =FF, ATRACT MODE
	***+1	
0065	REPMSG	; REPEAT MESSAGE BYTE
	***+1	
0066	TIMOUT	; ATRACT MODE TIMEOUT REG
	***+1	

```

*****
0067 PAGE0
0067 PRG0ST ; WAIT FOR VBLANK= 00
;
; *****
; *****
0068 PNTR ; 2 BYTE MISC. TEMPORARY REG POINTER
; *****
006A TEMP ; TEMPORARY REGISTER
; *****
006B TEMP1 ; TEMP REG
; *****
006C TEMP2
; *****
006D TEMP3
; *****
006E TEMP4
; *****
006F NTEMP ; NMI TEMP REG
; *****
; *****
0070 SPEED ; SHIP SPEED RAM
; SPEED 0 CURISER
; *****
0071 WARP ; SPEED DESIRED AS OPPOSED TO SPEED , THE PRESENT SPEED
; *****
; *****
0072 TIMERX ; TIMERS RAM
; USED FO STAR INTENSITY
; *****
0073 ETIMER ; EXPLOSION TIMEOUT
; *****
0074 SECOND ; SECOND TIMEOUT
; *****
0075 BSEQTM ; STARBASE SEQUENCER
; *****
0076 BINTIM ; BINARY TIMER
; *****
0077 BINNMI ; BINARY TIMER IN NMI
; *****
0078 JMPTIM ; TIME TO JUMP RAM LOC
; *****
; *****
0079 NSTARS ; STAR POINTER RAM
; LAST BYTE OF STAR RAM TO STORE, EITHER RMLAST OR STLAST
; *****
007A CNSTAR ; LAST BYTE OF STAR RAM TO CLEAR
; *****
; *****
007B BASFLG ; CONTROL FLAGS AND ENERGY RAM
; STARBASE FLAG
; *****
007C TRKFLG ; AUTO TRACKING = FF
; *****
007D SHENER ; SHIELD ENERGY 0 OR B
; *****
007E ATENER ; ATTACK COMPUTER ENERGY
; *****
007F ENFLAG ; LS BYTE OF ENERGY , TELLS WHEN TO DEC ENERGY
; *****
0080 WPENER ; WARP ENRGY DEPENDS ON WARP

```

```

***+1
*****
***** MISC RAM *****
***** SPACE BACKGROUND COLOR *****
0081 SPADAK ;
;
***+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 REDFLG ; 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 ; CURSOR HPOS ON CHART
***+1
0090 QUADRT ; QUADRANT STAR RAIDER IS IN
***+1
0091 HYPENG ; HYPERWARP ENERGY USED
***+1
0092 HYPGAD ; 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 HTARGET ; HORIZ TARGET POSIT
***+1
00A1 VTARGET ; VERT TARGET POSIT
***+1
00A2 TARPTR ; TARGET SEQUENCER
***+1
00A3 LOKFLG ; COMPUTER LOCKON
***+1
00A4 NUMPTS ; NUMBER OF POINTS TO DRAW

```

```

00A5      VDRAW      ***+1      ; VERT POS OF DRAW CURSOR
00A6      HDRAW      ***+1      ; HDR POS OF DRAW CURSOR
          ;          *****
00A7      ZYTGG      ***+1      ; WHICH ZYLON
          ;          ***** THINK RAM *****
00A8      SEGEN      ***+1      ; SEQUENCER PNTR RAM
          ;          ***+2
00AA      SEQTIM     ***+2      ; SEQUENCER TIMEOUT RAM
00AC      XINDES     ***+2      ; DESIRED XINCRC
00AE      YINDES     ***+2      ; DESIRED YINCRC
00B0      ZINDES     ***+2      ; DESIRED ZINCRC
00B2      XINPRS     ***+6      ; PRESENT POINTER TO ZYWARP
00B8      BSTRAF     ***+2      ; STRAF BACK 0, OR 1
00BA      ROTTIM     ***+4      ; ROTATION TIMEOUT
00BE      PHEXWT     ***+4      ; PHOTON EXPLOSION WAIT
00BF      ATTARG     ***+1      ; WHICH ZYLON FIRED
          ;          *****
00C0      HFLAG      ***+1      ; HYPERWARP ENGAGED FLAG, 00, FF, OR 7F
          ;          ***** HYPERWARP RAM *****
00C1      HISPED     ***+1      ; HI BYTE SPEED, 0 OR 2=HWARP
00C2      HTIMER     ***+1      ; HWARP TIMER
00C3      HPNTR      ***+1      ; POINTS TO WHICH LINE STARTS TO LOAD
00C4      HSTEER     ***+1      ; OLD HWAR CURSOR HPOS
00C5      VSTEER     ***+1      ; OLD HWARP CURSOR VPO
00C6      STERMK     ***+1      ; STEER MASK
00C7      JMPMSK     ***+1      ; INIT TARGETS IN NEW QUAD, MAX DISTANCE FROM SHIP
          ;          *****
00C8      HDRJOY     ***+1      ; 0=NO HORIZ, 01=RIGHT, FF=LEFT
          ;          ***** KEYS, JOYSTICK RAM *****
00C9      VERJOY     ***+1      ; 0=NO VERT, 01=DOWN, FF=UP
00CA      THEKEY     ***+1      ; THE KEY IN KBCODE
00CB      RATING     ***+2      ; YOUR RATING
00CD      ENDRAT     ***+1      ; FINAL RATING
00CE      ENDCLS     ***+1      ; FINAL CLASS

```

```

;
; *****
; ***** MESSAGE RAM *****
; *****
00CF MESTIM ; MESSAGE TIMEOUT
; *****
; *****
00D0 DISFLG ; DISPLAY TYPE FLAG 0=FRONT, 1=BACK, 80=GALCHT
; *****
00D1 SENPTR ; SENTENCE POINTER
; *****
; *****
; ***** AUDIO RAM *****
; *****
00D2 NOTSEQ ; NOTE POINTER
; *****
00D3 REPSEQ ; HOW MANY TIMES TO REPEAT
; *****
00D4 NDURAT ; DURAT OF NOTE
; *****
00D5 SDURAT ; DURAT OF SPACE
; *****
00D6 NPRIOR ; PRIOR OF NOE TYPE
; *****
00D7 REPPTR ; WHERE TO REPEAT IN NOTETB
; *****
00D8 NDURTM ; NOTE TIMER
; *****
00D9 NOTVOL ; NOTE VOLUME
; *****
00DA PHOREP ; REPAT NOTE FOR PHOTON
; *****
00DB AUDEXP ; EXPLOS SERVICE TIMER
; *****
00DC ATYPE2 ; RAM FO AUDC2
; *****
00DD ATYPE3 ; RAM FOR AUDC3
; *****
00DE AFREQ1 ; RAM FO AUDF1
; *****
00DF AFREQ2 ; RAM FOR AUDF2
; *****
00E0 AUDADD ; HOW MUCH TO ADD
; *****
00E1 AUDTIM ; AUDIO TIMEOUT 0=ALL DONE
; *****
00E2 EXPDEL ; EXPLOS DELAY
; *****
00E3 BIGEXP ; SHIELDS DOWN EXPLOS
; *****
; *****
; ***** OBJECT RAM *****
; *****
00E4 GRAPH ; GRAPHIC FOR OBJO-4
; *****
00E9 STFLAG ; 0=OBJECT NOT ON (DEFINED IN THINK, OR PHOTON)
; *****
; *****
; ***** COLOR RAM *****
; *****
00EE COLRAM ; PLAYER AND PLAYFIELD COLOR RAM
; *****
; *****
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	IRGST	=	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	=	POKEY+10
D20B	POT00	=	POKEY+11
D20D	SEROUT	=	POKEY+13
D20E	IRGEN	=	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 GRACL = CTIA+29
 D01E HITCLR = CTIA+30
 D01F CONSOL = CTIA+31
 D000 MOFF = CTIA+0
 D001 M1PF = CTIA+1
 D002 M2PF = CTIA+2
 D003 M3PF = CTIA+3
 D004 POPF = CTIA+4
 D005 P1PF = CTIA+5
 D006 P2PF = CTIA+6
 D007 P3PF = CTIA+7
 D008 MOPL = CTIA+8
 D009 M1PL = CTIA+9
 D00A M2PL = CTIA+10
 D00B M3PL = CTIA+11
 D00C POPL = 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 NMIREN = 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 VIMIRG = \$0216 ; IMMEDIATE IRQ LOCATION
 0222 VVBLKI = \$0222 ; IMMEDIATE VERT BLANK NMI VECTOR
 0200 VDLSLST = \$0200 ; DISPLAY LIST NMI VECTOR
 E000 ALPHA = \$E000

STAR RAIDERS. VERSION 25.1 STARDATE 26 JUL 79



Address	Label	Value	Description
0282	DISPL1	=	EQUATES DISPLAY+2 ; LDISP
028F	DISPL2	=	DISPLAY+15 ; LDISP
02DF	DISPL3	=	DISPLAY+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	BCBCD	=	100 ; FOR LOADING BCDCDN
0028	SCVCON	=	40 ; FOR LOADING VCON TABLES
1D40	ICON1	=	\$1D40
1BF8	ICON2	=	\$1BF8
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	QBPHOT	=	OBJNUM-3 ; LAST PHOTON LOCATION
0003	QBCOMP	=	OBJNUM-2 ; LAST PHOTON WHIC COULD BE COMP CONT.
1B36	INSET	=	*1B36 ; 1ST 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 DURING ATRACT

CHARACTER GRAPHICS

*=\$A000

A000				CGRAPH		
A000	00	7F	47	C0	. BYTE	00, \$7F, \$47, \$47, \$47, \$47, \$47, \$7F
A003	47	47	47			
A005	47	7F				
A008	00	30	10	C1	. BYTE	00, \$30, \$10, \$10, \$10, \$3B, \$3B, \$3B
A00B	10	10	3B			
A00E	3B	3B				
A010	00	7B	0B	C2	. BYTE	00, \$7B, \$0B, \$0B, \$7B, \$40, \$40, \$7B
A013	0B	7B	40			
A016	40	7B				
A01B	00	7B	0B	C3	. BYTE	00, \$7B, \$0B, \$0B, \$7C, \$0C, \$0C, \$7C
A01B	0B	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				
A02B	00	7B	40	C5	. BYTE	00, \$7B, \$40, \$40, \$7B, \$0B, \$0B, \$7B
A02B	40	7B	0B			
A02E	0B	7B				
A030	00	7B	4B	C6	. BYTE	00, \$7B, \$4B, \$40, \$40, \$7E, \$42, \$7E
A033	40	40	7E			
A036	42	7E				
A03B	00	7C	44	C7	. BYTE	00, \$7C, \$44, \$04, \$1C, \$10, \$10, \$10
A03B	04	1C	10			
A03E	10	10				
A040	00	3B	2B	C8	. BYTE	00, \$3B, \$2B, \$2B, \$7C, \$6C, \$6C, \$7C
A043	2B	7C	6C			
A046	6C	7C				
A04B	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
A053	00	00	00			
A056	00	00				
A05B	3B	3B	3B	CEG	. BYTE	\$3B, \$3B, \$3B, \$00, \$00, \$3B, \$3B, \$3B
A05B	00	00	3B			
A05E	3B	3B				
A060	80	80	80	CGCBLK	. BYTE	\$80, \$80, \$80, \$80, \$80, \$80, \$80, \$FF
A063	80	80	80			
A066	80	FF				
A06B	00	3C	20	CE	. BYTE	\$00, \$3C, \$20, \$20, \$7B, \$60, \$60, \$7C
A06B	20	7B	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				
A07B	00	00	00	CMINUS	. BYTE	\$00, \$00, \$00, \$7E, \$00, \$00, \$00, \$00
A07B	7E	00	00			
A07E	00	00				

A0B0	00 1B 1B	CPLUS	BYTE	\$00, \$1B, \$1B, \$1B, \$7E, \$1B, \$1B, \$1B
A0B3	1B 7E 1B			
A0B6	1B 1B			
A0B8	00 19 7E	CPH1	BYTE	\$00, \$1B, \$7E, \$DB, \$99, \$DB, \$7E, \$1B
A0BB	DB 99 DB			
A0BE	7E 1B			
A090	66 66 66	CV	BYTE	\$66, \$66, \$66, \$66, \$66, \$2C, \$3B, \$30
A093	66 66 2C			
A096	3B 30			
A098	00 7C 44	CRHO	BYTE	0, \$7C, \$44, \$44, \$7C, \$6B, \$6C, \$6C
A09B	44 7C 6B			
A09E	6C 6C			
A0A0	00 1C 3E	CTHETA	BYTE	\$00, \$1C, \$3E, \$63, \$5D, \$63, \$3E, \$1C
A0A3	63 5D 63			
A0A6	3E 1C			
A0AB	00 46 46	CK	BYTE	\$00, \$46, \$46, \$44, \$7C, \$64, \$66, \$66
A0AB	44 7C 64			
A0AE	66 66			
A0B0	FE 92 10	CT	BYTE	\$FE, \$92, \$10, \$1B, \$1B, \$1B, \$1B, \$1B
A0B3	1B 1B 1B			
A0B6	1B 1B			
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, \$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, \$80
A0D3	00 00 00			
A0D6	00 80			
A0DB	80 AA 9C	CSBASE	BYTE	\$80, \$AA, \$9C, \$BE, \$9C, \$AA, \$80, \$FF
A0DB	BE 9C AA			
A0DE	80 FF			
A0E0	80 9B 80	CZY2	BYTE	\$80, \$9B, \$80, \$B6, \$80, \$8C, \$80, \$FF
A0E3	B6 80 8C			
A0E6	80 FF			
A0E8	80 8E 80	CZY1	BYTE	\$80, \$8E, \$80, \$8B, \$80, \$9C, \$80, \$FF
A0EB	8B 80 9C			
A0EE	80 FF			
A0F0	80 80 9B	CZY3	BYTE	\$80, \$80, \$9B, \$BE, \$9B, \$80, \$80, \$FF
A0F3	BE 9B 80			
A0F6	80 FF			

```

;
AOFB          SSCAN
AOFB 00 00 6C . BYTE 0,0,$6C,$6F,$6E,$67,0,$72,$61,$6E,$67,$65,0,$73,$63,$61,$6E
AOFB 6F 6E 67
AOFB 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,$80,$46
A139 07 07 07
A13C 07 07 80
A13F 46
A140 1F 0D . WORD MESSAGE
A142 46 . BYTE $46
A143 71 09 . WORD DGALAC
A145 06 06 41 . BYTE 6,6,$41
A148 80 02 . WORD DISPLY

```

```

;
A14A          PHASEB
;

```

INIT SECTION

```

A14A          INIT
A14A A9 00    LDA    #*00
A14C 8D 0F D2 STA    SKCTL
A14F 85 66    STA    TIMOUT      ; RESET TIMEOUT
A151 85 62    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 2F    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 D0 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 EB      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    #IRGVEC
A185 8D 16 02 STA    VIMIRG
A188 A9 A7    LDA    #IRGVEC/256
A18A 8D 17 02 STA    VIMIRG+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    #104
A1A3 BD 02 D3    STA    PACTL      ; TURN ON JOYSTICK

```

CONFIGURE CTIA

```

A1A5 A9 11      LDA    ##11
A1A8 BD 1B D0    STA    PRIOR

A1AB A9 03      LDA    ##03
A1AD BD 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
A1BB 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

```

```
↑
A1E8 A9 40      LDA      ENABLE INTERRUPTS
A1EA 8D 0E D2    STA      #IRGMSK
A1ED 5B          CLI      IRGEN
A1EE A9 C0      LDA      , IRQS READY
A1F0 8D 0E D4    STA      ##CO
                                NMIS READY
                                END INIT
```

MAIN PROGRAM

A1F3 MAIN

START
 MAIN FLOW CHART
 WAIT FOR VBLANK
 CLEAR AND LOAD STARS/OBJECTS
 MOVE ROUTINES
 PLAYER INTERFACE SECTION
 SERVICE SECTION
 HIT DETECT
 SERVICE CONTINOUS RUNNING ROUTINES
 JUMP TO START

GAME ON ONLY
 GAME ON ONLY
 GAME ON ONLY

A1F3 A5 67 LDA PROGST
 A1F5 F0 FC BEQ MAIN ; WAIT FOR VBLANK NMI
 A1F7 A9 00 LDA #*00 ; RESET VBLANK STATUS REGISTER
 A1F9 B5 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 0B LDA VCONL, Y
 A208 B5 68 STA PNTR
 A20A B9 64 0B LDA VCONH, Y
 A20D B5 69 STA PNTR+1
 A20F BC BC 0C LDY OLDHOR, X
 A212 BD BD 0C LDA OLDBYT, X
 A215 91 68 STA (PNTR), Y ; BYTE RESTORED
 A217 E4 7A CPX CNSTAR
 A219 90 E6 BCC CLRSR1
 A21B A9 00 LDA #*00
 A21D B5 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 B6 7A STX CNSTAR ; STARS POINTERS DEFINED OK TO CLEAR NOW
 A227 STOSR2

MAIN PROGRAM

A1F3 MAIN

MAIN FLOW CHART

START

WAIT FOR VBLANK
 CLEAR AND LOAD STARS/OBJECTS
 MOVE ROUTINES
 PLAYER INTERFACE SECTION
 SERVICE SECTION
 HIT DETECT
 SERVICE CONTINOUS RUNNING ROUTINES

GAME ON ONLY
 GAME ON ONLY
 GAME ON ONLY

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 B5 67 STA PROGST

UPDATE MEMORY MAP RAM AND PLAYERS RAM

CLRSTR
 CLEAR STAR ROUTINE

A1FB A5 7A LDA CNSTAR ; THIS FLAG 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 0B LDA VCONL, Y
 A208 B5 68 STA PNTR
 A20A B9 64 0B LDA VCONH, Y
 A20D B5 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
 A219 90 E6 BCC CLRSR1
 A21B A9 00 LDA #00
 A21D B5 7A STA CNSTAR ; STARS CLEARED
 A21F CLRSR2

STQSTR

STORE STAR IN RAM MAP ROUTINE

A21F A5 C0 LDA HFLAG ; IN HYPER JUMP ?
 A221 30 2D BMI STQSR1 ; YES, NO STORE.

A220 79 LDX NSTARS ; LAST BYTE OF STAR MAP TO STORE
 A221 7A STX CNSTAR ; STARS POINTERS DEFINED OK TO CLEAR NOW
 A227 STQSR2

```

A227 BD F9 0B            LDA    VPOS, X
A22A 9D 5B 0C            STA    OLDVER, X
A22D AB                  TAY
A22E B9 00 0B            LDA    VCONL, Y
A231 B5 68                  STA    PNTR
A233 B9 64 0B            LDA    VCONH, Y
A236 B5 69                  STA    PNTR+1
A238 BD 2A 0C            LDA    HPOS, X
A23B 4A                  LSR    A
A23C 4A                  LSR    A
A23D 9D BC 0C            STA    OLDHOR, X
A240 AB                  TAY
A241 B1 6B                  LDA    (PNTR), Y
A243 9D BD 0C            STA    OLDBYT, X            ; BYTE SAVED
A246 1D EE 0C            ORA    STRBYT, X
A249 91 6B                  STA    (PNTR), Y

```

```

A24B CA                  DEX
A24C E0 04                CPX    #OBLAST
A24E D0 D7                BNE    STOSR2            ; DO NEXT STAR
A250                      STOSR1
A250 A5 66                LDA    TIMOUT
A252 10 0E                BPL    STOSR3
A254 A9 00                LDA    ##00
A256 BD E3 17            STA    NOSTAR
A259 BD E4 17            STA    NOSTAR+1
A25C BD BC 17            STA    NOSTAR-39
A25F BD BB 17            STA    NOSTAR-40

```

```

A262                      STOSR3
;
;
;                        CLROBJ
;                        CLEAR OBJECT RAM
;                        OBJECT 4

```

```

A262 A9 00                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 CB                  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 CB                  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 CB                  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	STA	PGRAP1, Y
A294	C8			INY	
A295	CA			DEX	
A296	10	F9		BPL	CLROB4
					OBJECT 0
A298	AC	5B	0C	LDY	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

STOOBJ
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				STOQB1	
A2BA	B9	E4	B8	LDA	PHGRAF, Y
A2BD	B0	03		BCS	STOQB8
A2BF	2D	0A	D2	AND	RANDOM
A2C2				STOQB8	
A2C2	9D	00	03	STA	MGRAPH, X
A2C5	C8			INY	
A2C6	E8			INX	
A2C7	C6	6A		DEC	TEMP
A2C9	10	EF		BPL	STOQB1

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				STOQB2	
A2E0	B9	E4	B8	LDA	PHGRAF, Y
A2E3	B0	03		BCS	STOQB9
A2E5	2D	0A	D2	AND	RANDOM
A2E8				STOQB9	
A2E8	9D	00	07	STA	PGRAP3, X
A2EB	E8			INX	
A2EC	C8			INY	
A2ED	C6	6A		DEC	TEMP
A2EF	10	EF		BPL	STOQB2

OBJECT 2, (VARIABLE GRAPHIC)

A2F1	AD	0E	0C	LDA	QINDEX+2	
A2F4	C9	01		CMP	##01	DEFINE CARRY
A2F6	A4	E6		LDY	GRAPH+2	
A2FB	AE	FB	0B	LDX	VPOS+2	
A2FB	0E	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						STO0B3
A306	B9	E4	B8	LDA	PHGRAF, Y	
A309	B0	03		BCS	STO0B7	
A30B	2D	0A	D2	AND	RANDOM	
A30E						STO0B7
A30E	9D	00	06	STA	PGRAP2, X	
A311	E8			INX		
A312	CB			INY		
A313	C6	6A		DEC	TEMP	
A315	10	EF		BPL	STO0B3	
					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						STO0B5
A327	B9	B1	B9	LDA	ZYGRAF, Y	
A32A	9D	00	05	STA	PGRAP1, X	
A32D	E8			INX		
A32E	CB			INY		
A32F	C6	6A		DEC	TEMP	
A331	10	F4		BPL	STO0B5	
					OBJECT 0 (VARIABLE)	
A333	A4	E4		LDY	GRAPH+0	
A335	AE	F9	0B	LDX	VPOS+0	
A338	8E	5B	0C	STX	OLDVER+0	
A338	AD	EE	0C	LDA	NUMBYT+0	
A33E	85	6A		STA	TEMP	
A340	8D	BD	0C	STA	OLDNUM+0	
A343						STO0B6
A343	B9	B1	B9	LDA	ZYGRAF, Y	
A346	9D	00	04	STA	PGRAP0, X	
A349	E8			INX		
A34A	CB			INY		
A34B	C6	6A		DEC	TEMP	
A34D	10	F4		BPL	STO0B6	
						UPDATE HORIZ
A34F	AD	2A	0C	LDA	HPOS+0	
A352	8D	00	D0	STA	HPOS0+0	
A355	AD	2B	0C	LDA	HPOS+1	
A358	8D	01	D0	STA	HPOS0+1	
A358	AD	2C	0C	LDA	HPOS+2	
A35E	8D	02	D0	STA	HPOS0+2	
A361	AD	2D	0C	LDA	HPOS+3	
A364	8D	03	D0	STA	HPOS0+3	
A367	AD	2E	0C	LDA	HPOS+4	
A36A	8D	07	D0	STA	HPOS0+7	
A36D	1B			CLC		

A36E 69 02	ADC	##02
A370 8D 06 D0	STA	HPOSPO+6
A373 69 02	ADC	##02
A375 8D 05 D0	STA	HPOSPO+5
A378 69 02	ADC	##02
A37A 8D 04 D0	STA	HPOSPO+4

END UPDATE MEMORY MAP RAM AND PLAYERS RAM

STARS/OBJECTS MOVE ROUTINES

A37D 24 D0	BIT	DISFLG	
A37F 30 3A	BMI	MAIN1	; NO ROTATE IN GALACTIC CHART

YROTAT
ROTATE ALL LEFT AND RIGHT
HORJOY ; HORIZ JOYSTICK ?
YROTA1 ; NO
TEMP3
NSTARS ; LAST BYTE OF STARS

A381 A5 C8	LDA	HORJOY	; HORIZ JOYSTICK ?
A383 F0 19	BEQ	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 1B	CLC		
A38C 9B	TYA		
A38D AA	TAX		
A38E 69 31	ADC	#RAMNUM	; YPOS
A390 AB	TAY		
A391 20 9B B6	JSR	ROHELP	
A394 9B	TYA		
A395 AA	TAX		
A396 A4 6E	LDY	TEMP4	
A398 20 9B B6	JSR	ROHELP	
A39B 8B	DEY		
A39C 10 EB	BPL	YROTA2	
A39E	YROTA1		

ZROTAT
ROTATE ALL UP AND DOWN
VERJOY ; VERT JOYSTICK ?
ZROTA1 ; NO
TEMP3
NSTARS

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		
A3A6 84 6E	STY	TEMP4	
A3AB 1B	CLC		
A3A9 9B	TYA		
A3AA AA	TAX		
A3AB 69 62	ADC	#RAMNUM*2	; ZPOS
A3AD AB	TAY		
A3AE 20 9B B6	JSR	ROHELP	
A3B1 9B	TYA		
A3B2 AA	TAX		
A3B3 A4 6E	LDY	TEMP4	
A3B5 20 9B B6	JSR	ROHELP	
A3BB 8B	DEY		

A3B9 10 EB		BPL	ZROTA2	
A3BB	ZROTA1			
A3BB	MAIN1			
			XMOVE	
			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		BEG	XMOVE3	
A3C6	XMOVE2			
A3C6 38		SEC		
A3C7 BD D3 0A		LDA	XPSL, X	
A3CA E5 70		SBC	SPEED	
A3CC 9D D3 0A		STA	XPSL, 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	
			XINCR, YINCR, ZINCR 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	#OBLAST	; LAST OBJ
A3EA	MOTIN9			
A3EA BA		TXA		
A3EB	MOTIN2			
A3EB A8		TAY		
A3EC A9 00		LDA	##00	
A3EE 85 6B		STA	TEMP1	
A3F0 B9 66 0B		LDA	XINCR, Y	
A3F3 10 09		BPL	MOTIN3	
A3F5 49 7F		EOR	##7F	
A3F7 18		CLC		
A3FB 69 01		ADC	##01	
A3FA B0 02		BCS	MOTIN3	
A3FC C6 6B		DEC	TEMP1	
A3FE	MOTIN3			
A3FE 18		CLC		
A3FF 79 D3 0A		ADC	XPSL, Y	
A402 99 D3 0A		STA	XPSL, Y	
A405 B9 40 0A		LDA	XPOSH, Y	

```

A408 65 6B      ADC  TEMP1
A40A 99 40 0A   STA  XPOSH, Y
A40D 19 AD 09   LDA  XSIGN, Y
A410 65 6B      ADC  TEMP1
A412 99 AD 09   STA  XSIGN, Y

A415 9B         TYA
A416 1B         CLC
A417 69 31      ADC  #RAMNUM
A419 09 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 9B         TYA
A423 AA         TAX
A424 A9 02      LDA  ##02
A426 B5 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 BA         TXA
A440 1B         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

```

A45B C4 D0
A45A F0 4B

CPY DISFLG
REQ CALCV5

UPDATE VPOS

A45C BD 0F 0A LDA ZSIGN, X ; 2'S COMPLE ZPOS?
A45F D0 12 BNE CALCV8 ; NO

2'S COMPLEMENT

A461 3B SEC
A462 A9 00 LDA #\$00
A464 FD 35 0B SBC ZPSL, X
A467 B5 6A STA TEMP
A469 A9 00 LDA #\$00
A46B FD A2 0A SBC ZPOSH, X
A46E B5 6B STA TEMP1
A470 4C 7D A4 JMP CALCV9

CALCV8

A473 BD 35 0B LDA ZPSL, X
A476 B5 6A STA TEMP ; STORE IN TOP REG
A47B BD A2 0A LDA ZPOSH, X
A47B B5 6B STA TEMP1

CALCV9

A47D 20 21 AA JSR DIVIDE ; DIVIDE ZPOS BY XPOS
A480 20 1E B7 JSR STVPOS ; STOE VPD

UPDATE HORIZ POS

A483 BD DE 09 LDA YSIGN, X ; 2'S COMPLE YPOS ?
A486 D0 12 BNE CALCV3 ; NO

2'S COMPLEMENT

A488 3B SEC
A489 A9 00 LDA #\$00
A48B FD 04 0B SBC YPSL, X
A48E B5 6A STA TEMP ; STORE IN TOP (NUMERATOR) REG
A490 A9 00 LDA #\$00
A492 FD 71 0A SBC YPOSH, X
A495 B5 6B STA TEMP1
A497 4C A4 A4 JMP CALCV4

CALCV3

A49A BD 04 0B LDA YPSL, X ; SOTRE IN TOP REG
A49D B5 6A STA TEMP
A49F BD 71 0A LDA YPOSH, X
A4A2 B5 6B STA TEMP1

CALCV4

A4A4 20 21 AA JSR DIVIDE ; DIVIDE YPOS BY XPOS
A4A7 CALCV5

A4A7 20 FB B6 JSR STHPOS ; STORE HPOS

A4AA CA DEX
A4AB 10 A6 BPL CALCV1 ; NEXT STAR

ALL DONE

A4AD CALCV14

A4AD 20 62 B1 JSR CSERVE ; SERVICE GALACTIC CHART

SSERVE

A510	E0	02	CPX	#*02	; SBASE OBJECTS ?
A512	B0	16	BCS	OBJCL8	; NO
A514	AD	2C	LDA	HPOS+2	; GANG OBJ 0, 1, 2 TOGETHER
A517	1B		CLC		; OBJ 2 IS REFERENCE
A518	7D	DB	ADC	BHORTB, X	; HORIZ OFFSET, +B, -B
A51B	9D	2A	STA	HPOS, X	
A51E	AD	FB	LDA	VPOS+2	; GANG VPOS
A521	1B		CLC		
A522	69	04	ADC	#4	
A524	9D	F9	STA	VPOS, X	
A527	AC	42	LDY	XPOSH+2	; ALL USE OBJ2 POSIT.
A52A			OBJCLB		
A52A	A5	76	LDA	BINTIM	; MODULATE STARBASE COLOR
A52C	29	0F	AND	#*0F	
A52E			OBJCL6		
A52E	85	6B	STA	TEMP1	; COLOR MODULATE
A530	9B		TYA		; XPOSH
A531	BC	F9	LDY	VPOS, X	; IN BOUNDS CHECK
A534	C0	CC	CPY	#*CC	; IN BOUNDS ?
A536	B0	AF	BCS	OBJCL2	; NO
A53B	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		
A548	B5	6A	STA	TEMP	; LD COLOR, GRAPHIC PNTRS
A54A	1D	BC	ORA	GINDEX, X	; TEMP SAVE XPOSH
A54D	4A		LSR	A	; TYPE OF GRAPHIC
A54E	A8		TAY		; ONLY B VALUES PER TYPE
A54F	B9	2F	LDA	GPOINT, Y	; OFFSET FROM PHGRAF, OR ZYGRAF
A552	95	E4	STA	GRAPH, X	; HOLDS INDEX
A554	B9	7F	LDA	NBYTAB, Y	
A557	9D	EE	STA	NUMBYT, X	; NUMBER OF BYTES TO SAVE
A55A	9B		TYA		
A55B	4A		LSR	A	
A55C	4A		LSR	A	
A55D	4A		LSR	A	
A55E	AB		TAY		; GINDEX ONLY
A55F	B9	D1	LDA	COLTAB, Y	; CHROMA OF OBJ
A562	C0	0B	CPY	#*0B	; BASE STAR ?
A564	D0	03	BNE	OBJC11	; NO
A566	4D	0A	EOR	RANDOM	; RANDOM COLOR
A569			OBJC11		
A569	A4	6A	LDY	TEMP	; DISTANCE FOR INTENSITY
A56B	59	DB	EOR	COLINT, Y	; INTENSITY
A56E	45	6B	EOR	TEMP1	; COLOR MODULATE, IF ANY
A570	BC	DF	LDY	CLINDX, X	; WHERE TO STORE
A573	99	EE	STA	COLRAM, Y	; COLOR UPDATED
A576	4C	E7	JMP	OBJCL2	; NEXT OBJ
A579			OBJC12		
				STRBRT	
				STAR BIRGHTNESS INTENSITY NEW STAR CALC	
A579	A0	AF	LDY	#BRTBLU	


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                                JOYSTICK EVALUATION ROUTINE
A5D3 AD 00 D3                    LDA     PORTA
A5D6 AB                            TAY                    ; STORE TEMP
A5D7 29 03                        AND     #*03            ; VERT ONLY
A5D9 AA                            TAX
A5DA BD F5 BA                    LDA     JOYTAB, X        ; CODE FOR VERT
A5DD B5 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 B5 C8                        STA     HORJOY

A5EA 20 3D AF                    JSR     HITZYL           ; HIT ZYLON
A5ED 20 29 AE                    JSR     PHOTON          ; SERVICE TRIGGERS

                                ASERVE
                                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 B5 BF                        STA     ATTARG
A60C                                ASERV4
A60C B5 E9                        LDA     STFLAG, X
A60E D0 0B                        BNE     ASERV3
A610 BA                            TXA
A611 49 01                        EOR     #*01
A613 AA                            TAX
A614 B5 E9                        LDA     STFLAG, X
A616 D0 03                        BNE     ASERV3
A618 AE 5C 09                    LDX     DCSTOR
A61B                                ASERV3
A61B BE 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 SWITHING DISPLAY
A633 B5 CA                        STA     THEKEY          ; SWITCH DISPLAY

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A635 ASERV2

A635 20 E6 AC JSR BSERVE ; SERVICE STARBASE
 A63B 20 79 AA JSR THINK ; SERVICE ZYLON BRAIN

HITSH1
 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 5B BEQ HITSH1

A643 AC 42 0A LDY XPOSH+2

A646 CB INY
 A647 C0 02 CPY ##02

A649 B0 50 BCS HITSH1
 A64B AC 73 0A LDY YPOSH+2

A64E CB INY
 A64F C0 02 CPY ##02

A651 B0 4B BCS HITSH1
 A653 AC A4 0A LDY ZPOSH+2

A656 CB 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 0B LDX ##0B ; DESTROYED

A672 20 0A B1 JSR CRATE
 A675 A2 5F LDX #DISPL3-DISPLY

A677 A0 B0 LDY ##B0
 A679 A9 0B LDA ##0B

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 A9 00 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 BB JSR PANDS6

A696 A2 0A LDX #NOITB1-NOISTB
 A698 20 AB AE JSR NOISE

A69B HITSH1

END GAME ON ROUTINES

A69B ; MAIN3
 ;
 ;

NMI INTERRUPT SERVICE SECTION

A6D1	VBNMI		
A6D1 A9 FF		LDA	##FF
A6D3 B5 67		STA	PROGST ; SET PROGST VBLANK NMI FLAG
A6D5 A9 E0		LDA	#ALPHA/256
A6D7 BD 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	HITME
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	VBLNK4		
A6EA A5 D0		LDA	DISFLG
A6EC C9 03		CMP	##03
A6EE 90 02		BCC	VBLNK2
A6F0 A2 A0		LDX	#DBLUE
A6F2	VBLNK2		
A6F2 B6 F6		STX	COLRAM+8 ; BAK
A6F4 A2 08		LDX	##08
A6F6	VBLNK3		
A6F6 B5 EE		LDA	COLRAM+0, X
A6FB 9D 12 D0		STA	COLPM0, X
A6FB CA		DEX	
A6FC 10 FB		BPL	VBLNK3
A6FE BD 1E D0		STA	HITCLR ; RESET HITS
A701 20 AB B2		JSR	AUDI0 ; SERVICE AUDIO
A704 E6 77		INC	BINNMI ; ATTRACT 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 A0 00		LDY	##00
A712 4C 5C A1		JMP	INIT4
A715	VBLNK5		
A715 4C 4B A7		JMP	POPALL
A718	DISNMI		
A718 48		PHA	; PUSH ALL REGISTERS FOR OP SYSTEM
A719 BA		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          BEG      DISNM1
A726 A9 A0          LDA      #CGRAPH/256
A728 BD 09 D4      DISNM1   STA      CHBASE          ; USE FUTURE TYPE CHARACTER SET
;
A72B A2 04          LDX      #*04
A72D BD 0A D4      STA      WSYNC
A730              DISNM2
A730 B5 F7          LDA      COLRAM+9, X
A732 9D 16 D0      STA      COLPFO, X
A735 CA            DEX
A736 10 FB          BPL      DISNM2
;
;                      READ HITS
A738 AD 08 D0      LDA      MOPL
A73B 0D 09 D0      ORA      M1PL
A73E 0D 0A D0      ORA      M2PL
A741 0D 0B D0      ORA      M3PL
A744 B5 B3          STA      PHITS+1          ; PHOTON 3 STORED
A746 AD 0F D0      LDA      P3PL
A749 B5 B2          STA      PHITS+0          ; PHOTON 2 STORED
A74B              POPALL
A74B 68            PLA
A74C AB            TAY
A74D 68            PLA
A74E AA            TAX
A74F 68            PLA

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END POP

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A750 40          RTI

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SUBROUTINES:

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A765          LDINS6          ; LOAD UP THE LINE
A765 99 A4 00          STA      NUMPTS, Y
A766 EB          INX
A767 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      $$05
A771 85 A2          STA      TARPTR          ; DEFINE TARGET POINTER
A773 2C 95 09          BIT      DAMAGE+3          ; COMPUTER
A776 70 09          BVS      LDINS2
A77B          LDINS1
A77B A0 02          LDY      $$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

;
;          DRAWER          ; DRAW THE LINE
A782          DRAWER
A782 A9 55          LDA      $$55
A784          DRAWR3
A784 85 6B          STA      TEMP1
A786 A5 A4          LDA      NUMPTS
A788 85 6E          STA      TEMP4
A78A 29 7F          AND      $$7F
A78C 85 A4          STA      NUMPTS
A78E          DRAWR1
A78E A4 A5          LDY      VDRAW
A790 B9 00 0B          LDA      VCONL, Y
A793 85 6B          STA      PNTR
A795 B9 64 0B          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 A5          LDA      HDRAW
A7A2 29 03          AND      $$03
A7A4 AB          TAY
A7A5 B9 B0 BA          LDA      MASK, Y
A7A8 25 6B          AND      TEMP1
A7AA A4 6A          LDY      TEMP
A7AC 11 6B          ORA      (PNTR), Y
A7AE 91 6B          STA      (PNTR), Y
A7B0 24 6E          BIT      TEMP4
A7B2 10 04          BPL      DRAWR4
A7B4 E6 A5          INC      VDRAW
A7B5 D0 02          BNE      DRAWR5          ; JUMP, VDRAW CANNOT CROSS 0 !!
A7BB          DRAWR4
A7BB E6 A6          INC      HDRAW
A7BA          DRAWR5

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A7BA 06 A4 DEC NUMPTS ; POINTS ALL DRAWN ?
 A7BC 00 D0 BNE DRAWR1
 A7BE DRAWR2
 A7BF 60 RTS

A7BF UPINST UPDATE INSE1

A7BF AE 5C 09 LDX FIRE CONTROL
 A7C2 A4 A2 LDY DCBTOR ; WHICH OBJECT
 A7C4 C0 05 CPY TARPTR
 A7C6 B0 24 BCS ##05
 UPINS2
 LD TARGET DISPLAY

A7C8 A5 A0 LDA HTARGET
 A7CA B5 A6 STA HDRAW
 A7CC B9 6E BF LDA ZYTARG, Y

A7CF UPINSB
 A7CF 0A ASL A
 A7D0 B5 6C STA TEMP2
 A7D2 90 0D BCC UPINS9
 A7D4 A9 B1 LDA ##B1
 A7D6 B5 A4 STA NUMPTS
 A7D8 A5 A1 LDA VTARGET
 A7DA B5 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 VTARGET

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
 A800 A9 0B LDA ##0B
 A802 10 06 BPL UPINS5 ; JUMP

A804 UPINS4
 A804 C9 F5 CMP ##F5
 A806 B0 02 BCS UPINS5
 A808 A9 F5 LDA ##F5

A80A UPINS5
 A80A 18 CLC
 A80B 69 B3 ADC #131
 A80D B5 A0 STA HTARGET
 A80F BD A2 0A LDA ZPOSH, X
 A812 49 FF EOR ##FF

AB14	BC	0F	0A	LDY	ZSIGN,X
AB17	D0	08		BNE	UPINS6
AB19	C9	05		CMP	##05
AB1B	90	0A		BCC	UPINS7
AB1D	A9	04		LDA	##04
AB1F	10	06		BPL	UPINS7
AB21			UPINS6		JUMP
AB21	C9	FA		CMP	##FA
AB23	B0	02		BCS	UPINS7
AB25	A9	FA		LDA	##FA
AB27			UPINS7		
AB27	18			CLC	
AB28	69	4D		ADC	#77
AB2A	85	A1		STA	VTARGET
AB2C	A9	00		LDA	##00
AB2E	85	A2		STA	TARPTR
AB30			UPINS3		
					CLEAR INSET
AB30	A9	36		LDA	#INSET
AB32	85	6B		STA	PNTR
AB34	A9	1B		LDA	#INSET/256
AB36	85	69		STA	PNTR+1
AB38	A2	0E		LDX	#14
AB3A			UPIN12		
AB3A	A0	06		LDY	##06
AB3C			UPIN13		
AB3C	B1	68		LDA	(PNTR),Y
AB3E	29	55		AND	##55
AB40	91	68		STA	(PNTR),Y
AB42	88			DEY	
AB43	10	F7		BPL	UPIN13
AB45	18			CLC	
AB46	A5	68		LDA	PNTR
AB48	69	28		ADC	#40
AB4A	85	68		STA	PNTR
AB4C	90	02		BCC	UPIN14
AB4E	E6	69		INC	PNTR+1
AB50			UPIN14		
AB50	CA			DEX	
AB51	10	E7		BPL	UPIN12
					DONE CLEAR INSET
AB53	AE	5C	09	LDX	DCSTQR
AB56	C8			INY	Y=0
AB57	A5	88		LDA	LOKWAT
AB59	F0	04		BEG	UPIN11
AB5B	C6	88		DEC	LOKWAT
AB5D	D0	39		BNE	UPINS1
AB5F			UPIN11		
AB5F	A5	A0		LDA	HTARGET
AB61	C9	81		CMP	#129
AB63	90	33		BCC	UPINS1
AB65	C9	85		CMP	#133
AB67	B0	2F		BCS	UPINS1
AB69	A9	AA		LDA	##AA
AB6B	8D	FE	1B	STA	ICON2
AB6E	8D	04	1C	STA	ICON2+6
AB71	A5	A1		LDA	VTARGET
AB73	C9	4B		CMP	#75
AB75	90	21		BCC	UPINS1
AB77	C9	4F		CMP	#79

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A879 B0 1D      BCS  UPINS1
A87B A9 AA      LDA  #*AA
A87D B0 9E 1C   STA  ICON2+160
A880 B0 A4 1C   STA  ICON2+166
A883 B0 10 0A   LDA  XPOSH, X
A886 C9 0C      CMP  #*0C
A88B B0 0E      BCS  UPINS1
A88A A0 A0      LDY  #*A0
A88C BC 40 1D   STY  ICON1
A88F BC 6B 1D   STY  ICON1+40
A892 BC 42 1D   STY  ICON1+2
A895 BC 6A 1D   STY  ICON1+42
A898                UPINS1
A89B B4 A3      STY  LOKFL0
A89A 60         RTS
    
```

```

A89B                HSERVE
                ;
                ; HYPERWARP SERVICE ROUTINE
A89B A4 C0      LDY  HFLAG      ; HWARP ?
A89D F0 61      BEQ  HSERV4      ; NO
A89F A5 70      LDA  SPEED
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 20 B4 A9   JSR  HSERV6
A8AC                HSERV6
    
```

```

                ; STEERING STUFF
A8AC A9 03      LDA  #*03
A8AE B0 5C 09   STA  DCSTOR
A8B1 A9 90      LDA  #*90
A8B3 B0 8F 0C   STA  @INDEX+3
A8B6 B5 EC      STA  STFLAG+3
A8BB A9 1F      LDA  #*1F
A8BA B0 43 0A   STA  XPOSH+3
A8BD 3B         SEC
A8BE AD FC 0B   LDA  VPOS+3
A8C1 E9 77      SBC  #VOBCEN-3
A8C3 1B         CLC
A8C4 65 C5      ADC  VSTEER
A8C6 29 7F      AND  #*7F
A8C8 B5 8E      STA  HYVPOS
A8CA 3B         SEC
A8CB AD 2D 0C   LDA  HPOS+3
A8CE E9 7D      SBC  #HOBCE
A8D0 1B         CLC
A8D1 65 C4      ADC  HSTEER
A8D3 29 7F      AND  #*7F
A8D5 B5 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 B0 2D 0C   STA  HPOS+3
    
```

A8E9	BD	FC	OB	STA	VPOS+3
A8EB				HSERV9	
A8EB	C9	10		CMP	##10
A8EA	B0	14		BCS	HSERV4
A8EC				HSERV7	
A8EC	AD	0A	D2	LDA	RANDOM
A8EF	09	10		DRA	##10
A8F1	25	C6		AND	STERMK
A8F3	BD	9A	OB	STA	YINCRE+3
A8F6	AD	0A	D2	LDA	RANDOM
A8F9	09	10		DRA	##10
A8FB	25	C6		AND	STERMK
A8FD	BD	CB	OB	STA	ZINCRE+3
A900				HSERV4	
A900	60			RTS	
A901				HSERV5	
A901	98			TYA	; IN JUMP ?
A902	30	11		BMI	HSERVB ; 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	CSERVB ; JUMP ENERGY
A910	A0	1B		LDY	#SENHSP-SENTAB
A912	4C	BD	A9	JMP	HABOR1
A915				HSERVB	; IN JUMP
A915	C6	91		DEC	HYPENG ; ALL DONE ?
A917	F0	05		BEG	HSER10 ; YES
A919	A2	02		LDX	##02 ; DEC ENERGY
A91B	4C	6F	B8	JMP	PANDS6
A91E				HSER10	
A91E	A0	19		LDY	HWARP COMPLETE #SENHWC-SENTAB
A920	20	87	A9	JSR	HABOR2
A923	A5	BF		LDA	HYHPOS
A925	85	BD		STA	GHPOS
A927	A5	BE		LDA	HYVPOS
A929	85	8C		STA	GVPDS
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	QUADRT
A938	A9	00		LDA	##00
A93A	85	7B		STA	BASFLG
A93C	BE	C9	0B	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	6B	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 68            TAY
A95E 09 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      #102
A96C 4C BE B7     JMP      NEWST4
A96F              HSERV2
A96F F0 0E        BEQ      HSERV1
A971 A9 FF        LDA      #$FF          ; RED ALERT
A973 85 B8        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      PAND86
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 BA        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
A9AB 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

```

```

A9B4 C6 C2          DEC      DRW HWARP LINES
A9B6 10 6B          BPL      HTIMER
A9B8 A9 01          LDA      HLINE1
A9BA B5 C1          STA      #01
A9BC A9 30          LDA      HISPED
A9BE B5 79          LDA      #RMLAST      ; HWARP STARS ON
A9C0 A9 03          STA      NSTARS
A9C2 B5 C2          LDA      #03
A9C4 A6 C3          STA      HTIMER

A9C4 A6 C3          LDX      HPNTR      RESET LINES
A9C6                HLINE2
A9C6 A9 12          LDA      #012      ; XINIT
A9C8 B5 69          STA      PNTR+1
A9CA AD 0A D2       LDA      RANDOM      ; INIT Y, Z
A9CD 29 03          AND      #03
A9CF AB            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 BA            TXA
A9E0 AB            TAY
A9E1 A9 05          LDA      #05      ; X GOES TO Y
A9E3 B5 6E          STA      TEMP4      ; 8 STARS
A9E5                HLINE4

A9E5 18            CLC
A9E6 A5 6B          LDA      PNTR
A9E8 69 50          ADC      #050      ; XINCRE
A9EA B5 6B          STA      PNTR
A9EC 9D D3 0A       STA      XPOSL, X
A9EF A5 69          LDA      PNTR+1
A9F1 69 00          ADC      #00
A9F3 B5 69          STA      PNTR+1
A9F5 9D 40 0A       STA      XPOSH, X
A9FB 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 B6 C3          STX      HPNTR
AA20                HLINE1
AA20 60            RTS
    
```

AA21

DIVIDE

A = (TOP/BOTTOM)X80

AA21	A9 00	LDA	##00	; CLEAR THE RESULT
AA23	B5 6D	STA	TEMP3	
AA25	A9 07	LDA	##07	; NUMBER OF SHIFTS
AA27	B5 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 ?
AA2F	D0 0F	BNE	DIVID1	; BACK
AA31	BD 40 0A	LDA	XPOSH, X	; BOTTOM NUMBER
AA34	4A	LSR	A	
AA35	B5 69	STA	PNTR+1	
AA37	BD D3 0A	LDA	XPOSL, X	
AA3A	6A	ROR	A	
AA3B	B5 6B	STA	PNTR	
AA3D	4C 52 AA	JMP	DIVID2	
AA40				DIVID1
AA40	3B	SEC		
AA41	A9 00	LDA	##00	
AA43	FD D3 0A	SBC	XPOSL, X	
AA46	B5 6B	STA	PNTR	
AA48	A9 00	LDA	##00	
AA4A	FD 40 0A	SBC	XPOSH, X	
AA4D	4A	LSR	A	
AA4E	B5 69	STA	PNTR+1	
AA50	66 6B	ROR	PNTR	
				DIVID2
AA52	06 6D	ASL	TEMP3	; SHIFT RESULT
AA54	3B	SEC		; SUBTRACT BOTTOM FROM TOP
AA55	A5 6A	LDA	TEMP	
AA57	E5 6B	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	B5 6B	STA	TEMP1	; STORE REMAINDER
AA62	B4 6A	STY	TEMP	
AA64	E5 6D	INC	TEMP3	; ADD 1 TO RESULT
AA66				DIVID3
AA66	06 6A	ASL	TEMP	; SHIFT TOP
AA6B	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				DIVID4
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)
AA7B				DIVID5
AA7B	60	RTS		; ENTRY POINT FROM THINK *****

AAD9 90 02		BCC	THIN43	
AADB 49 0F		EOR	##0F	
AADL	THIN43			
AADD 0A		ASL	A	
AADL 55 BA		STA	ROTTIM, X	
AAE0	THIN44			
AAE0 CA		DEX		
AAE1 10 D2		BPL	THIN39	
AAE3 AD BE OC		LDA	GINDEX+2	
AAE6 D0 1B		BNE	THINK2	; NOT A PHOTON
			PHOTON CONVERGENCE	
AAE8 A4 62		LDY	MIGDIF	; DIFFICULTY
AAEA B9 B5 BF		LDA	PHODIF, Y	
AAED AE A4 0A		LDX	ZPOSH+2	
AAF0 10 02		BPL	THINK3	
AAF2 29 7F		AND	##7F	
AAF4	THINK3			
AAF4 BD CA 0B		STA	ZINCRE+2	
AAF7 09 80		ORA	##80	
AAF9 AE 73 0A		LDX	YPOSH+2	
AAF0 10 02		BPL	THINK4	
AAFE 29 7F		AND	##7F	
AB00	THINK4			
AB00 BD 99 0B		STA	YINCRE+2	
AB03	THINK2			
AB03 A5 76		LDA	BINTIM	
AB05 29 03		AND	##03	
AB07 F0 2E		BEG	THINK5	
AB09	THINK1			
AB09 A5 E6		LDA	GRAPH+2	
AB0B F0 04		BEG	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 OC		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 8B		LDA	##8B	
AB28 8D 6B 0B		STA	XINCRE+2	
AB2B A9 00		LDA	##00	
AB2D 8D 2C OC		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 A7		STA	ZYTOGG	
AB3D AA		TAX		; WHICH ZYLON TO THINK
AB3E B5 E9		LDA	STFLAG, X	; ALREADY ON?
AB40 D0 42		BNE	THINK6	; YES

```

AB42 A5 E9      LDA      INIT ZYLOH
AB44 05 EA      ORA      STFLAG+0
AB46 29 01      AND      STFLAG+1
AB48 A4 90      LDY      #01
AB4A D9 C9 08   CMP      QUADRT
AB4D B0 BA      BCS      CHTRAM, Y
                        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 AB         TAY
AB59 B9 B9 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 AB      STA      SEGEN, X
AB68 A9 01      LDA      #01
AB6A 95 AA      STA      SEGTIM, 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
AB84            THINK6
                        Y, Z RANDOM SIGN

```

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 AB      STA      SEGEN, X
AB9C            THIN27
AB9C D6 AA      DEC      SEGTIM, X
AB9E 10 24      BPL      THIN30
AB9E 10 24      BPL      THIN30
ABAA A9 78      LDA      #120
ABA2 95 AA      STA      SEGTIM, 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 BB      STA      BSTRAF, X

```

```

ABB1 B5 AB                    LDA    SEQEN, X
ABB3                            THIN28
ABB3 2C 0A D2                 BIT    RANDOM
ABB4 10 02                     BPL    THIN31
ABB8 49 0F                     EOR    #*OF
ABBA                            THIN31
ABBA 95 AC                     STA    XINDES, X
ABBC EB                         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 AB                    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    #*OF
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
ABFB 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    THIN10

```

AC02	B0	04	BCS	THINK9	
AC04	F6	B2	INC	XINPRS, X	
AC06	70	02	BCC	THIN10	; JUMP
AC08			THINK9		
AC08	06	B2	DEC	XINPRS, X	
AC0A			THIN10		
AC0A	B6	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		TVA		
AC16	18		CLC		
AC17	69	31	ADC	#RAMNUM	
AC19	A8		TAY		
AC1A	EB		INX		
AC1B	EB		INX		
AC1C	E0	06	CPX	##06	
AC1E	90	DC	BCC	THINK8	
AC20	A6	A7	LDX	ZYTOGG	; RESTORE X
; ;					
FIRE PHOTON					
AC22	AD	BE 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	BEG	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	
AC3B	C9	05	CMF	##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	0B	BCS	THIN15	
AC47	49	FF	EDR	##FF	
AC49	A4	62	LDY	MISDIF	
AC4B	F0	E4	BEG	THIN13	
AC4D	A0	50	LDY	##50	
AC4F			THIN15		
AC4F	C9	20	CMF	##20	
AC51	B0	DE	BCS	THIN13	
AC53	8C	68 0B	STY	XINCRE+2	
AC56	A9	00	LDA	##00	
AC58	BD	8E 0C	STA	GINDEX+2	
AC5B	BD	2C 0C	STA	HPOS+2	; METEROR FLASH
AC5E	A9	3E	LDA	##62	
AC60	B5	EB	STA	STFLAG+2	
AC62	A2	02	LDX	##02	
AC64	A4	A7	LDY	ZYTOGG	
AC66	B4	BF	STY	ATTARG	
AC6B	4C	AF AC	JMP	EXHELP	

AC6B	EXPLOS	INIT EXPLOSION
		Y CONTAINS INDEX OF ZYLON HIT
AC6B A9 B0	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 B7	AND	##87
AC96 9D 66 0B	STA	XINCR, X
AC99 AD 0A D2	LDA	RANDOM
AC9C 29 B7	AND	##87
AC9E 9D 77 0B	STA	YINCR, X
ACA1 AD 0A D2	LDA	RANDOM
ACA4 29 B7	AND	##87
ACA6 9D C8 0B	STA	ZINCR, 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	STA	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	YSIGN, Y
ACC4 9D DE 09	STA	YSIGN, X
ACC7 B9 71 0A	LDA	YPOSH, Y
ACCA 9D 71 0A	STA	YPOSH, X
ACCD B9 0F 0A	LDA	ZSIGN, Y
ACD0 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
 ACEB 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
 ACFO BD 1B D0 STA PRIOR

ACF3 BSERV9
 ACF3 A9 02 LDA ##02
 ACF5 BD 5C 09 STA DCSTOR

ACF8 A9 30 LDA ##30
 ACFA BD BE 0C STA GINDEX+2
 ACFD A9 20 LDA ##20
 ACFF BD BD 0C STA GINDEX+1
 AD02 A9 40 LDA ##40
 AD04 BD BC 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 EB STA STFLAG+2
 AD1B 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 4C AB AE JMP NOISE
 AD26 BSERV1

AD26 AD 42 0A ; TOO CLOSE ?
 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

AD35 AD 2C 0C ; ORBIT ?
 LDA HPOS+2
 AD38 3B SEC
 AD39 E9 7B SBC ##7B
 AD3B C9 10 CMP ##10
 AD3D B0 22 BCS BSERV8
 AD3F AD FB 0B LDA VPOS+2
 AD42 3B SEC
 AD43 E9 6B SBC ##6B
 AD45 C9 10 CMP ##10
 AD47 B0 1B BCS BSERV8

AD49	AD 42 0A	LDA	XPOSH+2	
AD4C	C9 02	CMP	##02	
AD4E	80 11	BCS	BSEVB8	
AD50	AD AF 09	LDA	XSIGN+2	
AD53	2D 11 0A	AND	ZSIGN+2	
AD56	49 01	EOR	##01	
AD58	05 70	DRA	SPEED	
AD5A	0D A4 0A	ORA	ZPOSH+2	
AD5D	05 71	ORA	WARP	
AD5F	F0 10	BEQ	BSEVB3	; IN ORIBT
AD61				
	BSEVB8			
AD61	A5 75	LDA	BSEQTM	; ORBIT ABORTED
AD63	C9 02	CMP	##02	
AD65	90 05	BCC	BSEB19	
AD67	A0 1F	LDY	#SENDKA-SENTAB	
AD69	20 23 B2	JSR	LDMESS	
AD6C				
	BSEB15			
AD6C	A9 00	LDA	##00	
AD6E	85 75	STA	BSEQTM	
AD70				
	BSEB11			
AD70	60	RTS		
AD71				
	BSEB3			
AD71	24 75	BIT	BSEQTM	
AD73	70 0D	BVS	BSEB4	
AD75	30 42	BMI	BSEB5	
AD77	A5 75	LDA	BSEQTM	; LD MESS
AD79	D0 F5	BNE	BSEB11	; NO
AD7B	C6 75	DEC	BSEQTM	; =FF
AD7D	A0 1C	LDY	#SENB8B-SENTAB	
AD7F	4C 23 B2	JMP	LDMESS	
AD82				
	BSEB4			
AD82	A2 00	LDX	##00	
AD84	86 65	STX	REPMSG	
AD86	A4 D1	LDY	SENPTR	
AD88	D0 E6	BNE	BSEB11	; WAIT FO MESSAGE TO TIMEOUT
AD8A	A9 50	LDA	##50	
AD8C	8D 90 0C	STA	QINDEX+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 B7	LDA	##87	
ADAC	8D 6A 0B	STA	XINCRE+4	
ADAF	A9 B1	LDA	##81	
ADB1	85 75	STA	BSEQTM	
ADB3	8D CC 0B	STA	ZINCRE+4	
ADB6	85 ED	STA	STFLAG+4	
ADB8				
	BSEB7			
ADB8	60	RTS		
ADB9				
	BSEB5			
ADB9	AD B1 09	LDA	XSIGN+4	; SHIP DOCKED ?
ADBC	D0 FA	BNE	BSEB7	; NO
ADBE	A2 0C	LDX	#CH4TB3-CH4TAB	; SOUND


```

;
; CLEAR MEMORY MAP SUBROUTINE
AE0D A9 10      LDA      #MEMMAP/256
AE0F            CLRMP1   ; ENTRY POINT CLEAR ALL RAM *****
AE0F B5 69      STA      PNTR+1
AE11 A9 00      LDA      #*00
AE13 A8         TAY
AE14 B5 68      STA      PNTR
AE16 B5 A3      STA      LOKFLG      ; LOCK FLAG IS CLEARED
AE18 B5 7A      STA      CNSTAR      ; RAM HAS BEEN CLEARED
AE1A            CLRMP2
AE1A 71 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 B4      LDA      PHOFLG      ; REPEAT FLAG
AE2B AC 10 D0   LDY      TRIG0      ; SHOOT ?
AE2E B4 B4      STY      PHOFLG
AE30 D0 0E      BNE      PHOTN2      ; NO
AE32 B4 66      STY      TIMOUT      ; RESET ATTRACT TIMEOUT
AE34 A6 C0      LDX      HFLAG      ; HWARP ?
AE36 D0 08      BNE      PHOTN2      ; YES, NO FIRE
AE38 A6 87      LDX      PHOTQ0
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 B4 89      STY      LOKTAR
AE4C A9 0C      LDA      #12
AE4E A4 A3      LDY      LOKFLG
AE50 B4 86      STY      LOKLOC
AE52 F0 02      BEQ      PHOTN3
AE54 A9 00      LDA      #*00
AE56            PHOTN3
AE56 B5 88      STA      LOKWAT
AE58            PHOTN4
AE58 B4 B4      STY      PHOFLG
;

```

```

AE5A 2C 92 09   BIT      DAMAGE+0
AE5D 70 E1      BVS      PHOTN2
AE5F 30 05      BMI      PHOTN7
AE61 BA         TXA
AE62 49 01      EOR      #*01
AE64 B5 87      STA      PHOTQ0
AE66            PHOTN7

```

```

AE66 BA          TXA
AE67 9D E1 09   STA  YSIGN+3, X      ; NEW YSIGN
AE6A 8D 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 3B 0B   STA  ZPOSL+3, X
AE88 A9 01      LDA  ##01
AE8A 9D B0 09   STA  XSIGN+3, X
AE8D 9D D6 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 BB   JSR  PANDS6      ; PHOTON ENERGY
AEA5 A2 00      LDX  ##00
    
```

FALL THROUGH TO NOISE *****

```

AEAB          NOISE
AEAB BA          TXA          NOISE INIT, X=NOISTB PNTR
AEA9 D0 06      BNE          ; PHOTONS
                       ; 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 EB        INX
AEBA 8B        DEY
AEBB 10 F6     BPL  NOISE3
AEBD BD 20 BF   LDA  NOISTB, X
AEC0 BD 08 D2   STA  AUDCTL
AEC3 BD 21 BF   LDA  NOISTB+1, X
AEC6 BD 04 D2   STA  AUDF3
AEC9          NOISE2
AEC9 60        RTS
    
```

```

AECA          POHELP
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 C9 08          CMP      #$08
AED6 90 02          BCC     POHLP2
AED8 A9 07          LDA      #$07
AEDA                POHLP2
AEDA AB            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      #$04
AF12 D0 05          BNE     DAMCT6
AF14 2C 95 09      BIT      DAMAGE+3
AF17 70 05          BVS     DAMCT3
AF19                DAMCT6
AF19 A9 C0          LDA      #$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		
AF3D A2 02	LDX	PHOTON HIT ZYLON CHECK	
AF3F	HITZY2	**02	; 2 PLAY PHOTONS
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	BEG	HITZY2	; NO
AF4C B5 B2	LDA	PHITS+0, X	; ANY HIT ?
AF4E 29 07	AND	**07	; LOOK AT 0, 1 ONLY
AF50 F0 ED	BEG	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 AB	TAY		; OBJECT INDEX IN Y
AF59 B9 E9 00	LDA	STFLAG, Y	; SHIP ON ?
AF5C F0 E1	BEG	HITZY2	; NO
AF5E A5 D0	LDA	DISFLG	
AF60 F0 02	BEG	HITZYB	
AF62 A9 FF	LDA	**FF	
AF64	HITZYB		
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 BC 0C	LDA	GINDEX, Y	
AF92 C9 80	CMP	**80	
AF94	HITZ11		
AF94 A9 00	LDA	**00	
AF96 85 8B	STA	LOKWAT	
AF98 95 EC	STA	STFLAG+3, X	; PHOTON OFF

AF9A	B0	4B	BCS	HITZ10	
AF9C	79	E9 00	STA	STFLAG, Y	; ZYOLON OFF
AF9F	B9	8C 0C	LDA	GINDEX, Y	
AFA2	F0	43	BEG	HITZ10	; PHOTON
AFA4	C9	50	CMP	#160	; METORER
AFA6	F0	3F	BEG	HITZ10	; YES
AFA8	A9	00	LDA	#\$00	
AFAA	B5	B6	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	3B		SEC		
AFB9	A5	CB	LDA	RATING	
AFBB	E9	03	SBC	#3	
AFBD	B5	CB	STA	RATING	
AFBF	A5	CC	LDA	RATING+1	
AFC1	E9	00	SBC	#\$00	
AFC3	B5	CC	STA	RATING+1	
AFC5	60		RTS		
AFC6			HITZY4		
				INCKIL	
				INCRE KILL COUNT DISPLAY	
AFC6	1B		CLC		
AFC7	A5	CB	LDA	RATING	
AFC9	69	06	ADC	#\$06	
AFCB	B5	CB	STA	RATING	
AFCD	A5	CC	LDA	RATING+1	
AFCF	69	00	ADC	#\$00	
AFD1	B5	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	DKILL, 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

KEYSRV

KEYBOARD SERVICE ROUTINE

```

AFFE A5 CA          LDA   THEKEY          ; ANY KEY
B000 F0 3E          BEG   KEYSR3          ; NO
B002 A2 14          LDX   ##14           ; LAST KEY
B004 85 6A          STA   TEMP
B006 A9 00          LDA   ##00
B008 85 66          STA   TIMEOUT          ; RESET ATTRACT 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 8D BE BA       LDA   CODCON, X          ; KEY CODES
B014 C5 6A          CMP   TEMP
B016 F0 08          BEG   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 80 1D          BCS   KEYSR4          ; NO
B024 A5 C0          LDA   HFLAQ          ; HWARP ?
B026 F0 03          BEG   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 04          CPX   ##04
B032 90 02          BCC   KEYS23
B034 A2 05          LDX   ##05
B036                KEYS23
B036 8D D3 BA       LDA   WENTAB, X
B039 85 80          STA   WPENER          ; IMPULSE ENGINE ENERGY
B03B 8D 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 80 1B          BCS   KEYSR5          ; NO
B045                KEYS15          ; ENTRY POINT TO INIT DISPLAY, *****
                                X MUST BE DEFINED TO THE KEY CODE IN CODCON
B045 8D 18 BE       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

```

```

B055 20 64 B7      JSR      NEWSTR
B059 CA            DEX
B05A E0 05         CPX      #0BJNUM
B05C B0 FB         BCS      KEYSR6
B05E 70 1B         BCC      KEYSR7      ; JUMP
B060              KEYSR5
B060 E0 11         CPX      #11          ; TOGGLE TYPE ?
B062 B0 35         BCS      KEYSRB      ; NO
B064 BC 1B BE      LDY      TOFFMG-$0E, X
B067 B5 6E         LDA      TRKFLG-$0E, X
B069 5D 1B BE      EOR      TOGTAB-$0E, X
B06C 75 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
B07B 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 BE 5A 09      STX      DCSTQR-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
BOA1 A9 7F         LDA      #7F
BOA3 B5 C0         STA      HFLAG
BOA5 A9 FF         LDA      #FF
BOA7 B5 71         STA      WARP
BOA9 A9 1E         LDA      #30
BOAB B5 B0         STA      WPENER
BOAD A9 30         LDA      #RMLAST
BOAF B5 C3         STA      HPNTR
                    H STEERING STUFF
BOB1 A9 00         LDA      #00
BOB3 B5 C2         STA      HTIMER
BOB5 BD 74 0A      STA      YPOSH+3
BOB8 BD 07 0B      STA      YPOSL+3
BOBB BD 3B 0B      STA      ZPOSL+3
BOBE BD 69 0B      STA      XINCR+3
BOC1 A9 01         LDA      #01
BOC3 BD B0 09      STA      XSIGN+3
BOC6 BD E1 09      STA      YSIGN+3
BOC9 BD 12 0A      STA      ZSIGN+3
BOCC BD A5 0A      STA      ZPOSH+3
    
```

```

BOCF A5 8F          LDA    HYHPOS
BOD1 85 C4          STA    HSTEER
BOD3 A5 8E          LDA    HYVPOS
BOD5 85 C5          STA    VSTEER
BOD7 A5 62          LDA    MISDIF
BOD9 F0 08          BEG    KEYS24
BODB A5 91          LDA    HYPENG
BODD 2A            ROL    A
BODE 2A            ROL    A
BODF 2A            ROL    A
BOE0 29 03          AND    #$03
BOE2 A8            TAY
BOE3 B9 D7 BE      LDA    STERTB, Y          ; DIFFICULTY
BOE6                KEYS24
BOE6 85 C6          STA    STERMK
                        END STUFF
BOEB A0 11          LDY    #SENHYP-SENTAB          ; MESSAGE HYPER WARP ENGAGED
BOEA 4C 23 B2      JMP    LDMESS
BOED                KEYS13
BOED E0 13          CPX    ##13
BOEF B0 08          BCS    KEYS27          ; PAUSE
BOF1 AD 5C 09      LDA    DCSTOR
BOF4 49 01          EOR    #$01
BOF6 29 01          AND    #$01
BOFB BD 5C 09      STA    DCSTOR
BOFB                KEYS14
BOFB 60            RTS
BOFC                KEYS27
BOFC D0 08          BNE    KEYS28
BOFE AD 00 D3      LDA    PORTA          ; PAUSE UNTIL MOVE JOYSTICK
B101 C9 FF          CMP    ##FF
B103 F0 F7          BEG    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    REDFLQ
B114 8D 07 D2      STA    AUDC4
B117 85 71          STA    WARP
B119 85 B1          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    ATTRACT
B125 84 65          STY    REPMSG          ; REPEAT MESSAGE
B127 8A            TXA
    
```

B128 05 62		ORA	MISDIF	; MISSION DIFF GAME RESULT
B12A AA		TAX		
B12B DD 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 CB		STA	HORJOY	
B138 65 CC		ADC	RATING+1	
B13A 30 25		BMI	CRATE3	
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 OF		LDX	##0F	
B14A	CRATE2			
B14A 85 CD		STA	ENDRAT	
B14C AB		TAY		
B14D 8A		TXA		
B14E C0 00		CPY	##00	
B150 F0 0B		BEG	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 0B		EOR	##0B	
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 1B		CLC		; UPDATE HORIZ CURSOR POS

```

B17A A5 8F          LDA    HYHPOS
B17C 65 CB          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 0B       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 QUATRANT *****
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    HYPGAD     ; QUADRANT CALCULATED
                                CALCULATE NUMBER OF ZYLONS IN TARGET
B1B6 AA             TAX
B1B7 8D C9 0B       LDA    CHTRAM, X      ; WHATS IN QUAD
B1B8 10 02          BPL    CSERV2      ; STARBASE ?
B1BC A9 00          LDA    #$00      ; YES
B1BE                CSERV2
B1BE 09 90          ORA    #$90      ; COLOR AND ASCII CODE
B1C0 2C 97 09       BIT    DAMAGE+5
B1C3 70 03          BVS    CSER11
B1C5 8D 8D 09       STA    DTARG      ; DISPLAY NUMBER OF ZYLONS
B1C8                CSER11
                                CALCULATE WARP ENERGY
B1C8 38             SEC
B1C9 A5 8F          LDA    HYHPOS
B1CB E5 8D          SBC    GHPOS
B1CD 80 04          BCS    CSERV3
B1CF 49 FF          EOR    #$FF
B1D1 69 01          ADC    #$01
B1D3                CSERV3
B1D3 85 6A          STA    TEMP
B1D5 3B             SEC
B1D6 A5 8E          LDA    HYVPOS
B1D8 E5 8C          SBC    GVPOS

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B1DA	80 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	AB	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	AB	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	
B216	A5 D1	LDA	SERVICE MESSAGE SENPTR ; MESSAGE ON ?
B218	F0 05	BEG	LDMS14 ; NO
B21A	C6 CF	DEC	MESTIM ; TIMED OUT ?
B21C	F0 10	BEG	LDMES1 ; YES
B21E		LDMES2	
B21E	60	RTS	
B21F		LDMS14	
B21F	A4 65	LDY	REPMSG ; REPEAT THE MESSAGE ?
B221	F0 FB	BEG	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 DIPLAY LIST FOR MESSAGE
B22E		LDMES1	
B22E	A2 13	LDX	#19 ; CLEAR MESSAGE RAM

B230	A9 00	LDA	##00	
B232	B5 6B	STA	TEMP1	; CLEAR DISPLAY POINTER
B234		LDMES3		
B234	9D 1F 0D	STA	MESSAGE, 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	MESSAGE, X	
B25A	A9 3C	LDA	#60	; END OF LINE
B25C	B5 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	RANKTB, Y	; RANK WORD
B268		LDMS12		
B268	B5 6C	STA	TEMP2	; STORE FOR BITS 7,6
B26A	29 3F	AND	##3F	
B26C	B5 6A	STA	TEMP	; WORD LOC IN #WRDTAB
B26E	A9 2A	LDA	#WRDTAB-1	
B270	B5 6B	STA	PNTR	
B272	A9 BC	LDA	#WRDTAB-1/256	
B274	B5 69	STA	PNTR+1	; WHERE TO START SEARCH
B276		LDMES7		
B276	E6 6B	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 6B	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	MESSAGE, X	
B291	C8	INY		; NEXT LETTER
B292	B1 6B	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 SECONDS, END OF SENTENCE
B2A2	LDMS11			
B2A2 50 96		BVC	LDMS4	; CONTINUE WITH LINE
B2A4 A0 FF		LDY	##FF	; END OF SENTENCE
B2A6 B4 D1		STY	SENPTR	
B2A8	LDMS10			
B2A8 B5 CF		STA	MESTIM	; STORE WAIT
B2AA 60		RTS		

B2AB

AUDIO

AUDIO SERVICE ROUTINE

			CH4 NOTE SECTION	
B2AB A5 D6		LDA	NPRIOR	
B2AD F0 37		BEG	AUDIO1	
B2AF C6 D8		DEC	NDURTM	; TIMING OUT ?
B2B1 10 33		BPL	AUDIO1	; YES
B2B3 A5 D9		LDA	NOTVOL	
B2B5 F0 0A		BEG	AUDIO2	; NEXT NOTE
B2B7 A5 D5		LDA	SDURAT	; SPACE BETWEEN NOTE
B2B9 30 06		BMI	AUDIO2	
B2BB B5 D8		STA	NDURTM	
B2BD A0 00		LDY	##00	
B2BF F0 20		BEG	AUDIO3	; JUMP
B2C1	AUDIO2			
B2C1 A5 D4		LDA	NDURAT	
B2C3 B5 D8		STA	NDURTM	
B2C5 A6 D2		LDX	NOTSEQ	
B2C7 E6 D2		INC	NOTSEQ	
B2C9 BD 5C BF		LDA	NOTTAB, X	
B2CC BD 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 B5 D2		STA	NOTSEQ	
B2D9 C6 D3		DEC	REPSEQ	
B2DB 10 E4		BPL	AUDIO2	
B2DD A0 00		LDY	##00	
B2DF B4 D6		STY	NPRIOR	
B2E1	AUDIO3			
B2E1 BC 07 D2		STY	AUDC4	
B2E4 B4 D9		STY	NOTVOL	
B2E6	AUDIO1			
B2E6 A5 E2		LDA	EXPDEL	; ZYLON HIT SERVICE
B2E8 F0 09		BEG	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			
B2F3 A6 70		LDX	SPEED	

B2F5	BA		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	AUD10	
B2FF	A9 00		LDA	#\$00	
B301	B5 E1		STA	AUDTIM	
ENGINES					
B303	EB		INX		
B304	BA		TXA		
B305	49 FF		EDR	#\$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	BA		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		EDR	#\$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		BEG	AUD104	
B32F	C6 DB		DEC	AUDEXP	
B331	D0 04		BNE	AUD104	
B333	A9 8F		LDA	#\$8F	
B335	B5 DC		STA	ATYPE2	
B337		AUD104			
B337	A6 DA		LDX	PHOREP	PHOTON SERVICE
B339	F0 1C		BEG	AUD105	
B33B	C6 DA		DEC	PHOREP	
B33D	D0 0A		BNE	AUD12	
B33F	A9 AF		LDA	#\$AF	
B341	B5 DC		STA	ATYPE2	
B343	A9 02		LDA	#\$02	
B345	B5 DE		STA	AFREQ1	
B347	B5 DF		STA	AFREQ2	
B349		AUD12			
B349	BD EA BF		LDA	PHOTB2-1, X	
B34C	B5 DD		STA	ATYPE3	
B34E	BD F2 BF		LDA	PHOTB4-1, X	
B351	8D 04 D2		STA	AUDF3	
B354	8D 09 D2		STA	STIMER	
B357		AUD105			
B357	A5 E3		LDA	BIGEXP	FINAL EXPLOS SERVICE

B359	F0	0E	BEG	AUDIO6	
B35B	C6	E3	DEC	BIGEXP	
B35D	AD	04	LDA	RANDOM	
B360	BD	04	STA	AUDF3	
B363	29	20	AND	##20	
B365	45	DD	EOR	ATYPE3	
B367	85	DD	STA	ATYPE3	
B369				AUDIO6	
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	STA	AUDF1	
B373	A5	DF	LDA	AFREQ2	
B375	69	00	ADC	##00	
B377	85	DF	STA	AFREQ2	
B379	8D	02	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	AUDIO7	
B385	A5	E1	LDA	AUDTIM	
B387	F0	16	BEG	AUDIO7	
B389	C6	E1	DEC	AUDTIM	
B38B	C9	11	CMP	##11	
B38D	B0	10	BCS	AUDIO7	
B38F	8A		TXA		
B390	29	0F	AND	##0F	
B392	F0	03	BEG	AUDIO8	
B394	CA		DEX		
B395	86	DC	STX	ATYPE2	
B397				AUDIO8	
B397	98		TYA		
B398	29	0F	AND	##0F	
B39A	F0	03	BEG	AUDIO7	
B39C	88		DEY		
B39D	84	DD	STY	ATYPE3	
B39F				AUDIO7	
B39F	8E	03	STX	AUDC2	
B3A2	8C	05	STY	AUDC3	
B3A5	60		RTS		
B3A6				NOTINT	
					AUDIO NOTE INIT, X=CH4TAB PNTR
B3A6	BD	3E	LDA	CH4TAB, X	
B3A9	C5	D6	CMP	NPRIDR	
B3AB	90	0C	BCC	NOTIN2	
B3AD	A0	05	LDY	##05	
B3AF				NOTIN1	
B3AF	BD	3E	LDA	CH4TAB, X	
B3B2	99	D2	STA	NOTSEQ, Y	
B3B5	E8		INX		
B3B6	88		DEY		
B3B7	10	F6	BPL	NOTIN1	
B3B9				NOTIN2	
B3B9	60		RTS		

Address	Label	Operation	Operand
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
B3C3 B0 05		BCS	LDTABB
			LD PF COLORS
B3C5 BD A9 BF		LDA	CLITAB, X
B3C8 95 F2		STA	COLRAM+4, X
B3CA	LDTABB		
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 64		ADC	#SCBCD
B403 85 6A		STA	TEMP
B405 A5 6B		LDA	TEMP1
B407 9D E9 0E		STA	BCDCON, X
B40A FB		SED	
B40B 69 00		ADC	##00
B40D DB		CLD	
B40E 85 6B		STA	TEMP1
B410 E8		INX	
B411 D0 DB		BNE	LDTAB1

B413	A2 00	LDX	#400	
B415	B6 6B	STX	PNTR	
B417	A9 10	LDA	#MEMMAP/256	
B419	B5 69	STA	PNTR+1	
B41B		LDTAB2		
B41B	18	CLC		
B41C	A5 68	LDA	PNTR	
B41E	9D 00 0B	STA	VCONL, X	
B421	69 28	ADC	#SCVCON	
B423	B5 68	STA	PNTR	
B425	A5 69	LDA	PNTR+1	
B427	9D 64 0B	STA	VCONH, X	
B42A	69 00	ADC	##00	
B42C	B5 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	B6 7B	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	B5 6A	STA	TEMP	
B446	A4 62	LDY	MISDIF	
B448	C8	INY		
B449	C8	INY		
B44A	84 6B	STY	TEMP1	
B44C		LDTAB4		
B44C	AD 0A D2	LDA	RANDOM	
B44F	29 7F	AND	##7F	
B451	AB	TAY		
B452	B9 C9 0B	LDA	CHTRAM, Y	
B455	D0 F5	BNE	LDTAB4	
B457	A5 6A	LDA	TEMP	
B459	10 21	BPL	LDTAB7	STARBASES NOT ON EDGES
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	BEG	LDTAB4	
B468	C9 0F	CMP	##0F	
B46A	F0 E0	BEG	LDTAB4	
B46C	B9 C8 0B	LDA	CHTRAM-1, Y	
B46F	19 CA 0B	DRA	CHTRAM+1, Y	
B472	19 D9 0B	DRA	CHTRAM+16, Y	
B475	19 B9 0B	DRA	CHTRAM-16, Y	
B478	D0 D2	BNE	LDTAB4	
B47A	A5 6A	LDA	TEMP	
B47C		LDTAB7		
B47C	99 C9 0B	STA	CHTRAM, Y	
B47F	C6 6B	DEC	TEMP1	
B481	10 C9	BPL	LDTAB4	

B4B3	CA		DEX		
B4B4	10	BB	BPL	LDTAB3	
					LOAD HORIZ WALL OF CHART
B4B5	A2	B4	LDX	#180	; CLEAR ALL CHART FIRST
B4BB				LDTAB5	
B4BB	A9	OA	LDA	##0A	
B4BA	9D	34	STA	CHTDIS-1, X	
B4BD	CA		DEX		
B4BE	D0	F8	BNE	LDTAB5	
B490	A2	0F	LDX	##0F	; LD HORIZ LINE
B492				LDTAB6	
B492	A9	18	LDA	##18	
B494	9D	37	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	STA	CHTDIS+1B	
B49F	A9	00	LDA	##00	
B4A1	8D	11	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	EB	STA	BCDCON+255	; INFIINITY SIGN
					FALL THROUGH TO LDGALT
B4B9					LDGALT
					LD UP THE GALACTIC CHART
					TRANSE 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	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	LDA	CHTABL, X	; CODE FOR CHTDIS
B4CA	99	4B	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	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 B4 B1   STY      SPABAK
B518 B6 FB   STX      COLRAM+13
B51A          TIME33
                END UPDATE TIMERX
                PHOTON TIMEOUT
B51A A2 02   LDX      ##02
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 FO 16          BEQ    TIME10
B52E C6 73          DEC    ETIMER
B530 D0 04          BNE    TIMER9
B532 A2 11          LDX    #STLAST+1          ; 1 FOR FALL THROUGH
B534 B6 79          STX    NSTARS
B536                TIMER9
B536 C9 70          CMP    ##70
B538 B0 04          BCS    TIME30
B53A A2 00          LDX    ##00
B53C B6 BA          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 B5 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 B5 78          STA    JMPTIM
B56E A5 CB          LDA    RATING DUE TO TIME
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 B6 6A          STX    TEMP
B57C                TIME12
B57C BD C9 0B       LDA    CHTRAM, X          ; STARBASE ?
B57F 10 19          BPL    TIME11          ; NO
B581 20 F1 B7       JSR    TIMHLP
B584 FO 14          BEQ    TIME11

```

STARBASE DESTROYED

B586	A9	02	LDA	##02	; 4 ZYLONS
B588	9D	C9 08	STA	CHTRAM, X	
B58E	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	BEG	TIME13	; NO
B5A1	2C	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	JMPDUT	; 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	JMPDUT	
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	

BSEA		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	CHTRAM, X
B5F7 E8			INX	
B5F8 10 F5			BPL	TIME20
B5FA 2C 97 09			BIT	DAMAGE+5
B5FD 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			BEG	TIME19
				STAR BASE SURROUNDED
B60B A9 63			LDA	#99
B60D 85 78			STA	JMPTIM
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
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			BEG	TIME18
				CALCULATE GRADIENT
B630 A0 08			LDY	#*0B
B632		TIME27		
B632 18			CLC	
B633 BA			TXA	
B634 79 C0 BF			ADC	JMPTAB, Y
B637 B5 6A			STA	TEMP
B639 29 0F			AND	#*0F
B63B 38			SEC	
B63C E5 74			SBC	KILOCH
B63E B0 04			BCS	TIME26
B640 49 FF			EOR	#*FF
B642 69 01			ADC	#*01
B644		TIME26		
B644 B5 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	3B	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	B5 6B	STA	TEMP1
B662		TIME23	
B662	A0 07	LDY	##07
B664		TIME24	
B664	B9 96 00	LDA	JMPPTS, Y
B667	C5 9E	CMP	JMPPTS+B
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	BEG	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	BEG	TIME45
B68D		TIME25	
B68D	A4 6A	LDY	TEMP
B68F		TIME42	
B68F	88	DEY	
B690	10 D2	BPL	TIME24
B692	E6 9E	INC	JMPPTS+B
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	BEG	ROHLP1
B6A2	A9 FF	LDA	##FF
B6A4		ROHLP1	
B6A4	B5 6B	STA	TEMP1
B6A6	B5 6C	STA	TEMP2
B6A8	BD 40 0A	LDA	XPOSH, X
B6AB	B5 6A	STA	TEMP

```

B6AD AD 0A D2          LDA    RANDOM
B6B0 09 BF            ORA    ##BF
D6B2 5D D3 0A        EDR    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    XPOSH, 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    XPOSH, 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                STHPS0
                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    #HOBCCN

```

```

B709                STHPS2
B709 BC DE 09        LDY    YSIGN, X
B70C D0 09          BNE    STHPS3
B70E 38              SEC
B70F E6 6D          INC    TEMP3
B711 E5 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 STVPOS
 ; STORE VPOS, X=STAR INDEX

B71E C9 32 CMP #VDFLOW
 B720 B0 39 BCS STVPS1
 B722 B5 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 #VDBCEN

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
 B73C 70 15 BVS STVPS3
 B73E STVPS7

B73E BC AD 09 LDY XSIGN, X
 B741 D0 07 BNE STVPS6
 B743 FO 0E BEQ STVPS3 ; JUMP

B745 STVPS5
 B745 BC 0F 0A LDY ZSIGN, X
 B748 FO 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 *****

B764 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 #*OF

```

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
B7B5 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

B7DE                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 FD 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 B5 70 STA SPEED

B822 PANDS1 ; ALL DONE VELOCITY DISPLAY
 B822 A0 01 LDY #DVELQC-DISCTL-1
 B824 20 CD 88 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 88 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 88 JSR TWOCOM ; UPDATE PHI
 B83A A9 00 LDA #*00 ; DISPLAY X COORD

```

B83C A0 23          LDY      #DRHO-DISCTI      ; 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 BD 6F 09      STA      DRHO+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 BD 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 1B             CLC
B85D A5 7F          LDA      ENFLAG          ; LSRB OF ENERGY, DEC ENERGY WHEN CARRY
B85F 65 7D          ADC      SHENER          ; DRAIN FROM SHEILDS
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
                    DECREASE ENERGY
B86D A2 03          LDX      #03          ; DECREASE BIT 3 OF ENERGY
B86F                PANDS6          ; ENTRY POINT TO DECREASE ENERGY *****
B86F 24 64          BIT      ATTRACT          ; GAME OVER ?
B871 70 33          BVS      PANDS5          ; YES
                    X MUST BE DEFINED = BIT TO DECREASE 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      PAND10
B89C 20 45 B0      JSR      KEYS15
B89F A0 31          LDY      #SENOUT-SENTAB

```

```

BBA1 A2 04      LDX  ##04
BBA3 20 0A B1   JSR  CRATE
BBA6            PANDS9
BBA6            PANDS5
BBA6 60         RTS
    
```

```

BBA7            TWOCOM
                ; TWOS COMPLEMENT AND CONVERT TO B CD HELPER ROUTINE
    
```

```

                ; A=OFFSET(X,Y,Z), Y=WHERE TO STORE
BBA7 18         CLC
BBA8 6D 5C 09   ADC  DCSTOR      ; WHICH OBJ TRACKING
BBA8 AA         TAX
BBA8 A9 10      LDA  ##10        ; + SIGN
BBAE 85 6A      STA  TEMP
BBA8 BD AD 09   LDA  XSIGN, X    ; SIGN OF OBJ
BBA3 4A         LSR  A
BBA4 BD 40 0A   LDA  XPSH, X
BBA7 B0 04      BCS  TWOCM1
                ; NEGATIVE VALUE, TWOS COMPLEMENT
BBA9 49 FF      EOR  #$FF
BBA8 C6 6A      DEC  TEMP        ; - SIGN
BBA8            TWOCM1
BBA8 AA         TAX
BBA8 A5 6A      LDA  TEMP
BBA8 99 49 09   STA  DISCTL+0, Y  ; STORE SIGN
    
```

NO INFINITY FOR THETA OR PHI

```

BBA3 98         TYA
BBA4 29 10      AND  ##10        ; THETA OR PHI ?
BBA6 F0 05      BEQ  TWOCM3     ; NO
BBA8 E0 FF      CPX  #$FF       ; INFINITY ?
BBA8 D0 01      BNE  TWOCM3     ; NO
BBA8 CA         DEX             ; X=FE, NOT FF
    
```

```

BBA8            TWOCM3
                ; ENTRY POINT TO LOAD ONLY *****
    
```

```

BBA8 BD E9 0E   LDA  BCDCON, X    ; BCD CONVERT
BBA8 AA         TAX
BBA8 29 0F      AND  ##0F
BBA8 99 48 09   STA  DISCTL+2, Y  ; LOW BYTE STORED
BBA8 8A         TXA
BBA8 4A         LSR  A
BBA8 4A         LSR  A
BBA8 4A         LSR  A
BBA8 4A         LSR  A
BBA8 99 4A 09   STA  DISCTL+1, Y  ; HIGH BYTE STORED
BBA8 60         RTS
    
```

Address	Label	Byte	Description
B8DF	CLINDX		TABLES;
B8DF 00 01 02		BYTE	; COLOR INDEX TABLE USED IN OBJCOL SUBROUTINE
B8E2 03 07			0, 1, 2, 3, 7
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
B8EB 7E 76 F7			
B8EB DF DF FF			
B8EE FF F7 76			
B8F1 7E 7E 3C			
B8F4 18			
B8F5	PHGRF1		
B8F5 10 38 7C		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, \$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	
B9A3 3C 18			
B9A5	HWARTG		
B9A5 28 28 28	. BYTE	\$28, \$28, \$28, \$28, \$EE, 0, 0, \$EE, \$28, \$28, \$28, \$28	
B9AB 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, \$8D, \$FF, \$FF, \$8D, \$81, \$81, \$81, \$81
B9B5 81 8D FF			
B9B8 FF 8D 81			
B9BB 81 81 81			
B9BE	ZYGRF1		
B9BE 82 82 8A		BYTE	\$82, \$82, \$8A, \$FE, \$FE, \$8A, \$82, \$82
B9C1 FE FE 8A			
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	\$24, \$3C, \$3C, \$24
B9D5 24			
B9D6	ZYGRF5		
B9D6 28 38 38		BYTE	\$28, \$38, \$38, \$28
B9D9 28			
B9DA	ZYGRF6		
B9DA 18 18		BYTE	\$18, \$18

B9DC		ZYGRF7		
B9DC	10 10		BYTE	\$10, \$10
B9DE		GBASER		
B9DE	E0 FB FB		BYTE	\$E0, \$FB, \$FB, \$FE, \$57, \$FE, \$FB, \$FB, \$C0
B9E1	FE 57 FE			
B9E4	FB FB 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 B0 B0			
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		ROGRF	
BA12	18 3C 7E	BYTE	\$18, \$3C, \$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 3B 2B		. BYTE \$10, \$3B, \$2B
BA37		KLGRF6	
BA37	1B 3C 7E		. BYTE \$1B, \$3C, \$7E, \$FF, \$1B, \$1B, \$FF, \$7E, \$3C, \$1B
BA3A	FF 1B 1B		
BA3D	FF 7E 3C		
BA40	1B		
BA41		KLGRF1	
BA41	10 3B 7C		. BYTE \$10, \$3B, \$7C, \$FE, \$3B, \$3B, \$FE, \$7C, \$3B, \$10
BA44	FE 3B 3B		
BA47	FE 7C 3B		
BA4A	10		
BA4B		KLGRF2	
BA4B	1B 3C 7E		. BYTE \$1B, \$3C, \$7E, \$1B, \$7E, \$3C, \$1B
BA4E	1B 7E 3C		
BA51	1B		
BA52		KLGRF3	
BA52	10 3B 7C		. BYTE \$10, \$3B, \$7C, \$10, \$7C, \$3B, \$10
BA55	10 7C 3B		
BA5B	10		
BA59		KLGRF4	
BA59	1B 3C 1B		. BYTE \$1B, \$3C, \$1B, \$3C, \$1B
BA5C	3C 1B		
BA5E		KLGRF5	
BA5E	10 3B 3B		. BYTE \$10, \$3B, \$3B, \$10
BA61	10		

```

BA62          LISTAB          ; DISPLAY LIST TABLE LDISP
SHIP ALIVE
BA62 8D 00 46      .BYTE  $8D, 0, $46
BA65 49 09          .WORD  DISCTL
BA67 20 05 00      .BYTE  $20, 5, 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 FB A0          .WORD  SESCOAN
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
BAB0 0D 0D 0D      .BYTE  $0D, $0D, $0D, $0D, $0D
BAB3 0D 0D
BAB5          LISTB6          ; MESSAGE ON
BAB5 30 46          .BYTE  $30, $46
BAB7 1F 0D          .WORD  MESSAGE
BAB9 4D          .BYTE  $4D
BABA AB 12          .WORD  MEMMAP+680
    
```

```

BABC          DISDIS          ; FOR KEYSRV , DISPLAY LIST POINTERS
BABC 1B 13 0B      .BYTE  LISTB5-LISTAB, LISTB4-LISTAB, LISTB3-LISTAB, LISTB2-LISTAB
BABF 0B
    
```

```

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
BAAB 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, \$DB, \$DD, \$DB, \$F3, \$F5, \$F0
 BAC1 DA DB DD
 BAC4 DB F3 F5
 BAC7 F0
 BAC8 F8 FF C0 . BYTE \$F8, \$FF, \$C0, \$FD, \$ED, \$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 80 CB		
BAEF 00 D8 DF	. BYTE	208, 216, 223, 232, 241, 250
BAF2 EB 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, \$34, \$32, 15
 BB28 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 FE . BYTE \$FE ; ALL DONE

BB3A YINIT ; HLINES
 BB3A 04 04 03 . BYTE 4, 4, 3, 2
 BB3D 02
 BB3E ZINIT ; HLINES
 BB3E 02 03 04 . BYTE 2, 3, 4, 4
 BB41 04

Address	Label	Description	Value
BB42	STINIT	STATUS INIT TABLE (LDTABS)	
BB42 12 0B 00	. BYTE		1B, 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 B9			
BB52 0A 16 0B	. BYTE		10, \$16, 11, 0
BB55 00			
BB56 0A	. BYTE		10
BB57 14 0B 0F	. BYTE		\$14, \$0B, \$0F, 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, \$E1, \$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			

Code	Function	Type	Parameters	Description
BBAA	SENTAB			; TABLE OF SENTENCES
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	
BBDA	SENWHT			; WHAT?
BBDA 48		. BYTE	\$48	
BBBB	SENHYP			; HYPERWARP ENGAGED
BBBB 09 4A		. BYTE	9, \$4A	
BBBD	SENSUR			; STARBASE SURROUNDED
BBBD 08 CD		. BYTE	11, \$CD	
BBBF	SENDES			; STARBASE DESTROYED
BBBF 08 CC		. BYTE	11, \$CC	
BBC1	SENHWA			; HYPERWARP ABORTE
BBC1 09 4E		. BYTE	9, \$4E	
BBC3	SENHWC			; HYPERWARP COMPLETE
BBC3 09 4F		. BYTE	9, \$4F	
BBC5	SENHSP			; HYPERSPACE
BBC5 D0		. BYTE	\$D0	
BBC6	SENORB			; ORBIT ESTABLISED
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	
BBDO				
BBDO 98 8C 9D				
BBD3				
BBD3 1E 9F FD				
BBD6				
BBD6 25 FC 78				
BBD9	SENATA			; TITLE
BBD9 9B 60		. BYTE	\$9B, \$60	

BBDB		SENOUT		; OUT OF ENERGY
BBDB	BB 97 98	. BYTE		\$BB, \$97, \$98, 26, \$BE, 28, \$94, 36, \$9F, \$FD, 37, \$FC, \$A7, \$68
BBDE	1A BE 1C			
BBE1	94 24 9F			
BBE4	FD 25 FC			
BBE7	A7 68			
BBE9		SENWIN		; YOU WIN
BBE9	BB 97 98	. BYTE		\$BB, \$97, \$98, 26, \$BF, 36, \$9F, \$FD, 37, \$FC, \$66
BDEC	1A BF 24			
BBEF	9F FD 25			
BBF2	FC 66			
BBF4		SENNOV		; NOVICE MISSION
BBF4	2C 5A	. BYTE		44, \$5A
BBF6		SENPII		; 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
BDFC	SENDMC		; DAMAGE CONTROL
BBFC 88 34 76		. BYTE	\$88, 52, \$76
BBFF	SENPDM		; PHOTONS DAMAGED
BBFF 37 B5 78		. BYTE	55, \$B5, \$78
BC02	SENPSD		; PHOTONS DESTROYED
BC02 37 BC 78		. BYTE	55, \$8C, \$78
BC05	SENEDE		; ENGINES DAMAGED
BC05 23 B5 78		. BYTE	35, \$B5, \$78
BC08	SENEDE		; ENGINES DESTROYED
BC08 23 BC 78		. BYTE	35, \$8C, \$78
BC0B	SENSDM		; SHIELDS DAMAGED
BC0B 04 B5 78		. BYTE	4, \$B5, \$78
BC0E	SENSDS		; SHIELDS DESTROYED
BC0E 04 BC 78		. BYTE	4, \$8C, \$78
BC11	SENCDM		; COMPUTER DAMAGED
BC11 06 B5 78		. BYTE	6, \$B5, \$78
BC14	SENCDS		; COMPUER DESTROYED
BC14 06 BC 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	SENMDM		; 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 BE 24			
BC26 9F FD 25			
BC29 FC 66			

BC2B	WORD TAB	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 48		
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, "OMplete"
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		
BCE 45 52		
BCD0 D3 54 41	. BYTE	\$D3, "TANDBY"
BCD3 4E 44 42		
BCD6 59		
BCD7 D3 54 41	. BYTE	\$D3, "TAR FLEET TO"
BCDA 52 20 44		
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 30 55 4E		
BCF8 49 54 53		
BCFB CD 49 53	BYTE	\$CD, "MISSION"
BCFE 53 49 4F		
BD01 4E		
BD02 A0 20 20	BYTE	\$A0, " STAR RAIDERS"
BD05 20 53 54		
BD08 41 52 20		
BD0B 52 41 49		
BD0E 44 45 52		
BD11 53		
BD12 DA 45 52	BYTE	\$DA, "ERQ"
BD15 4F		
BD18 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 4B 55		
BD29 4D 4F 55		
BD2C 53		
BD2D D2 41 4E	BYTE	\$D2, "ANK IS:"
BD30 4B 20 49		
BD33 53 3A		
BD35 C3 4F 50	BYTE	\$C3, "OPYRIGHT ATARI 1979"
BD38 59 52 49		
BD3B 47 4B 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 20 52 41		
BD55 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 49 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
 BD6F 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
 BDAB C7 41 52 . BYTE \$C7, "ARBAGE SCOW CAPTAIN"
 BDAB 42 41 47
 BDAE 45 20 53
 BDB1 43 4F 57
 BDB4 20 43 41
 BDB7 50 54 41
 BDBA 49 4E
 BDBC D2 4F 4F . BYTE \$D2, "OOKIE"
 BDBF 4B 49 45
 BDC2 CE 4F 56 . BYTE \$CE, "QVICE"
 BDC5 49 43 45
 BDCB 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 4B 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
 BE1F 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 TOGGLE OFF MESSAGE
 BE26 0E 09 04 . BYTE SENCTF-SENTAB, SENSOFF-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	AB		
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
BE7E	C1		

BE7F	NBYTAB		NUMBER OF BYTES TO STORE (OBJCCL)
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 0B 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 0B 05	. BYTE	9, 8, 5, 2, 0, 0, 0, 0
BEA2	02 00 00		
BEA5	00 00		
BEA7	0F 0D 0A	. BYTE	15, 13, 10, 8, 4, 3, 1, 1
BEAA	0B 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	0B 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 LOCALI, 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 2B
 BEE6 32 2B 5A
 BEE9

RANKTB ; RANK 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
 BEFB B3

BEF9 B3 B9 B9 . BYTE \$B3, \$B9, \$B9

```

;
BEFC          ; DMA ASCII CLASS VS RATING LO NIBBLE
BEFC 95 95 95      CLASTB      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
BFOA 91 91      BYTE  $91, $91

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```

;
BFOC          ; MISSION TYPE TABLE
BFOC 4A 4C 4E      MSENTB      BYTE  SENNOV-SENTAB, SENPIL-SENTAB, SENWAR-SENTAB, SENCOM-SENTAB
BFOF 50

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;
BF10          ; DAMAGE PROB BASED ON MISDIF
BF10 00 50 B4      DPRBTB      BYTE  0, 80, 180, $FE
BF13 FE
BF14          ; SENTENCES FO DAMAGE (DAMCTL)
BF14 55 5B 61      DAMGTB      BYTE  SENPDM-SENTAB, SENEDM-SENTAB, SENSDM-SENTAB, SENCMD-SENTAB
BF17 67
BF18 6D 71      BYTE  SENTDM-BENTAB, SENMDM-BENTAB
BF1A          ; SENTENCES FO DESTROY (DAMCTL)
BF1A 58 5E 64      DESTTB      BYTE  SENPDS-SENTAB, SENEDS-SENTAB, SENSDS-SENTAB, SENCDS-SENTAB
BF1D 6A
BF1E 6F 73      BYTE  SENTDS-SENTAB, SENMDS-SENTAB

```

```

;
BF20          ; NOISE ROUTINE, INIT AUDTIM, AUDADD, AFREQ2, AFREQ1, ATYPE3
; ATYPE2, AUDEXP, PHOREP, AUDCTL, AUDF3
; FOR PHOTONS
BF20 18 FF 02      NOISTB      BYTE  $18, $FF, 2, 0, $8A, $A0, 0, 8, $50, $00

```

```

BF23 00 8A A0
BF26 00 08 50
BF29 00

```

```

;
BF2A          ; FOR SHIELD EXPLOSION
BF2A 40 40 01      NOITB1      BYTE  $40, $40, 1, 3, $88, $AF, 8, 0, $50, 4
BF2D 03 8B AF

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```

BF30 08 00 50
BF33 04
BF34          ; FOR ZYLON EXPLOS
BF34 30 40 01      NOITB2      BYTE  $30, $40, 1, 3, $84, $AB, 4, 0, $50, 4

```

```

BF37 03 84 AB
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 08 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 0 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 ZYLDN TARGET	
BF6E B4 B4 FC	. BYTE	\$B4, \$B4, \$FC, \$B4, \$B4	
BF71 B4 B4			

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 INTSEG ; 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, B, 4, 2, 1, 0, 0, \$81, \$82, \$84, \$88, \$70, \$7E, \$BE
 BF9C 08 04 02
 BF9F 01 00 00
 BFA2 81 82 84
 BFA5 88 90 9E
 BFAB BE

BFAB
 BFA9 A6 AA AF ; CLITAB ; LDTABS
 BFAC 00 00 BB . BYTE \$A6, \$AA, \$AF, 0, 0, \$BB, \$5A, \$FC, \$5E, \$90
 BFAF 5A FC 5E
 BFB2 90

BFB3
 BFB3 FF FF 3F ; JMASK ; HWARP SUB, USED FOR INITING TARG POSITIONS
 BFB6 0F 3F 7F . BYTE \$FF, \$FF, \$3F, \$0F, \$3F, \$7F, \$FF, \$FF
 BFB9 FF FF

BFB8
 BFB8 00 FF FF ; JMPWHN ; TIMERS, WHEN EACH ZYLON TYPE SHOULD JUMP
 BFBE C0 20 . BYTE 0, \$FF, \$FF, \$C0, \$20

BFC0
 BFC0 F0 EF FF ; JMPTAB ; TIMERS, JUMP VECTORS FOR ZYLONS
 BFC3 0F 10 11 . BYTE \$F0, \$EF, \$FF, 15, 16, 17, 1, \$F1, 0
 BFC6 01 F1 00

BFC9
 BFC9 00 08 10 ; PHVECT ; POHELP
 BFCC 18 28 30 . BYTE 0, 8, \$10, \$18, \$28, \$30, \$38, \$40
 BFCF 38 40

BFD1
 BFD1 50 00 20 ; COLTAB ; OBJCOL, CHROMA FOR EACH TYPE GRAPHIC
 BFD4 20 20 00 . BYTE \$50, 0, \$20, \$20, \$20, 0, \$A0, 0, 0, \$9F
 BFD7 A0 00 00
 BFDA 9F

BFDB
 BFDB 0E 0E 0E ; COLINT ; OBJCOL, INTENSITY PER XPOSH
 BFDE 0C 0C 0C . BYTE \$E, \$E, \$E, \$C, \$C, \$C, \$A, \$A, \$A, 8, 8, 8, 6, 6, 4, 4
 BFE1 0A 0A 0A
 BFE4 08 08 08
 BFE7 06 06 04
 BFEA 04

BFE8		PHOTB2		; AUDIO, ATYPE3
BFE8 8A 8F 8D			. BYTE	*8A, *8F, *8D, *8B, *89, *87, *85, *83
BFE8 88 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		

↑
07
Blank

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, HOW MANY ZYLONS IN EACH QUAD
		**+128	
0949	DISCTL		; DISPLAY OF CONTRAL STATUS PANNEL
		**+2	
0948	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	

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      *==+5
      NEXT LINE
098D      DTARG      ; DISP OF TARGETS IN QUAD
      *==+8
      *==+1
      *==+4
0992      DAMAGE      ; DAMAGE CONTROL RAM, +0=PHOTONS,+1=ENGINES
      *==+6      ; +2=SHIELDS,+3=COMPUTER,+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 MAY BYTES TO STORE          OBJECT
0CEE      STRBYT      ; THE BYTE TO STORE          STARS
      *==+RAMNUM
0D1F      MESSAGE      ; DISPLAY OF MESSAGE RAM
      *==+20
      *==+2      ; BUFFER ZONE
0D35      CHTDIS      ; CHAR GRAPHICS PNTR FO CALCHT

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*==+180

0DE9 PTAB ; X80 SCALER TABLE

*==+256

0FE7 BCDCON ; BINARY TO BCD TABLE

*==+256

0FE9 PHASE7

*=\$1000

1000 MEMMAP ; SCREEN MAP RAM

*==+4096

2000 MEMEND

2000 PHASE3

END PROGRAM

END

SYMBOL TABLE							
AFREQ1	00DE	AFREG2	00DF	ALLPOT	D20B	ALPHA	E000
ANTIC	B400	ASERV1	A600	ASERV2	A635	ASERV3	A61B
ASERV4	A50C	ATENER	007E	ATTRACT	0064	ATTARG	00BF
ATYPE2	00DC	ATYPE3	00DD	AUD10	B32B	AUD11	B2F3
AUD12	B349	AUDADD	00E0	AUDC1	D201	AUDC2	D203
AUDC3	D205	AUDC4	D207	AUDCTL	D20B	AUDEXP	00DB
AUDF1	D200	AUDF2	D202	AUDF3	D204	AUDF4	D206
AUDIO	B2AB	AUDIO1	B2E6	AUDIO2	B2C1	AUDIO3	B2E1
AUDIO4	B337	AUDIO5	B357	AUDIO6	B369	AUDIO7	B39F
AUDIO8	B397	AUDTIM	00E1	BACKUP	A109	BASFLG	007B
BCDCON	0EE9	BHORTB	BEDB	BIGEXP	00E3	BINNMI	0077
BINTIM	0076	BOUND1	A422	BOUND3	A42B	BOUND4	A43F
BOUND5	A43C	BRT	00FF	BRTABL	BA90	BRTBLU	00AF
BRTRED	004F	BSEGTM	0075	BSER11	AD70	BSER12	ADCA
BSER13	AD12	BSER14	AD35	BSER15	AD6C	BSER20	ADD7
BSERV1	AD26	BSERV3	AD71	BSERV4	AD82	BSERV5	ADB9
BSERV7	ADBB	BSERV8	AD61	BSERV9	ACF3	BSERVE	ACE6
BSTRAF	008B	C0	A000	C1	A00B	C2	A010
C3	A01B	C4	A020	C5	A02B	C6	A030
C7	A03B	C8	A040	C9	A04B	CALC14	A4AD
CALCV1	A453	CALCV3	A49A	CALCV4	A4A4	CALCV5	A4A7
CALCV8	A473	CALCV9	A47D	CBLK	A050	CC	A0BB
CDOT	A0D0	CE	A06B	CEG	A05B	CGCBLK	A060
CGRAPH	A000	CH4TAB	BF3E	CH4TB1	BF3E	CH4TB2	BF44
CH4TB3	BF4A	CH4TB4	BF50	CH4TB5	BF56	CHACTL	D401
CHBASE	D409	CHLINE	A0C0	CHRTAB	BBA6	CHTABL	BED1
CHTDIS	0D35	CHTRAM	08C9	CINF	A070	CK	A0AB
CLASTB	BEFC	CLINDX	B8DF	CLITAB	BFA9	CLRMAB	AE0D
CLRMP1	AE0F	CLRMP2	AE1A	CLROB1	A26A	CLROB2	A277
CLROB3	A2B4	CLROB4	A291	CLROB5	A29E	CLRSR1	A201
CLRSR2	A21F	CMINUS	A07B	CNSTAR	007A	CODCON	BABE
COLBK	D01A	COLINT	BFDB	COLPFO	D016	COLPF1	D017
COLPF2	D01B	COLPF3	D019	COLPM0	D012	COLPM1	D013
COLPM2	D014	COLPM3	D015	COLRAM	00EE	COLTAB	BFD1
CONSOL	D01F	CONSR2	A6C2	CONSR3	A6B7	CPHI	A08B
CPLUS	A0B0	CRATE	B10A	CRATE1	B121	CRATE2	B14A
CRATE3	B161	CRATE4	B15D	CRATE5	B15A	CRHO	A09B
CSBASE	A0DB	CSER10	B173	CSER11	B10B	CSERV1	B16B
CSERV2	B18E	CSERV3	B1D3	CSERV4	B1E0	CSERV5	B200
CSERV6	B1FE	CSERV7	B212	CSERV8	B1A7	CSERV9	B16A
CSERVE	B162	CT	A0B0	CTHETA	A0A0	CTIA	D000
CV	A090	CVLINE	A0CB	CZY1	A0E8	CZY2	A0E0
CZY3	A0F0	DAMAGE	0992	DAMCT1	AF3C	DAMCT2	AEE7
DAMCT3	AF1E	DAMCT4	AF32	DAMCT5	AF10	DAMCT6	AF19
DAMCTL	AEE1	DAMGTB	BF14	DBLUE	00A0	DCSTOR	095C
DENERG	0955	DESTTB	BF1A	DGALAC	0971	DIFTAB	BEDD
DIM	0055	DIMBLU	0090	DIMRED	0042	DISCTL	0949
DISDIS	BABC	DISFLG	00D0	DISNM1	A72B	DISNM2	A730
DISNMI	A71B	DISPL1	02B2	DISPL2	02BF	DISPL3	02DF
DISPLY	02B0	DISTOP	007C	DISTYP	BE22	DIVID1	AA40
DIVID2	AA52	DIVID3	AA66	DIVID4	AA6F	DIVID5	AA7B
DIVIDE	AA21	DKGRAF	B927	DKGRF1	B937	DKGRF2	B945
DKGRF3	B950	DKGRF4	B959	DKGRF5	B95E	DKILL	0950
DLISTH	D403	DLISTL	D402	DMACTL	D400	DPHI	0966
DPRBTB	BF10	DRAWER	A7B2	DRAWR1	A7BE	DRAWR2	A7BE
DRAWR3	A7B4	DRAWR4	A7BB	DRAWR5	A7BA	DRHO	096C
DRKRED	0060	DSDATE	09A3	DTARG	09BD	DTHETA	0960
DVELOC	094B	DWENER	097D	ENDCLS	00CE	ENDRAT	00CD
ENFLAG	007F	ENGTAB	BADD	ETIMER	0073	EXHELP	ACAF

EXHLP1	ACC1	EXHLP2	ACE5	EXPDEL	00E2	EXPLOS	AC6B
EXPL51	AC73	EXPNUM	0020	GALCHT	A11A	GBASEL	B9FB
GBASEM	B962	GBASER	B9DE	GBASL1	BA03	GBASL2	BA0C
GBASL3	BA01	GBASH1	B972	GBASM2	B981	GBASM3	B98E
GBASM4	B998	GBASM5	B9A0	GBASM6	B95F	GBASR1	B9E9
GBASR2	B9F2	GBASR3	B9E7	GHPOS	00BD	GINDEX	0C8C
GLDISP	A12E	GPOINT	BE2F	GRACTL	D01D	GRAFM	D011
GRAFP0	D00D	GRAFP1	D00E	GRAFP2	D00E	GRAFP3	D010
GRAFH	00E4	GVPOS	008C	HABOR1	A98D	HABOR2	A987
HABOR3	A9A6	HABORT	A980	HDRAW	00A6	HFLAG	00C0
HISPED	00C1	HITCLR	D01E	HITME	008A	HITSH1	A69B
HITSH2	A687	HITZ10	AFE7	HITZ11	AF94	HITZY1	AF43
HITZY2	AF3F	HITZY3	AF6F	HITZY4	AFC6	HITZY5	AFEC
HITZY6	AFF3	HITZY7	AFFD	HITZY8	AF64	HITZY9	AF58
HITZYL	AF3D	HLINE1	AA20	HLINE2	A9C6	HLINE3	AA1A
HLINE4	A9E5	HLINES	A9B4	HMAX	00A0	HOBCEM	007D
HGFLOW	0050	HORCHT	003D	HORJQY	00CB	HPNTR	00C3
HPOS	0C2A	HPOSMO	D004	HPOSM1	D005	HPOSM2	D006
HPOSM3	D007	HPOSP0	D000	HPOSP1	D001	HPOSP2	D002
HPOSP3	D003	HSCRVL	D404	HSER10	A91E	HSERV1	A97F
HSERV2	A96F	HSERV3	A947	HSERV4	A900	HSERV5	A901
HSERV6	A8AC	HSERV7	ABEC	HSERV8	A915	HSERV9	ABE8
HSERVE	A89B	HSTCEN	0050	HSTEER	00C4	HTARGET	00A0
HTIMER	00C2	HWART0	B9A5	HYHPOS	008F	HYPENG	0091
HYPQAD	0092	HYVPOS	008E	ICON1	1D40	ICON2	1BFE
INCKL1	AFD5	INCKL2	AFE7	INIT	A14A	INIT1	A15E
INIT2	A165	INIT3	A15A	INIT4	A15C	INIT5	A172
INSET	1B36	INSTAB	BAF9	INSTB1	BB23	INSTB2	BB2A
INTSEQ	BF91	IRGEN	D20E	IRGMSK	0040	IRGST	D20E
IRQVEC	A751	JMASK	BFB3	JMPMSK	00C7	JMPQUT	009F
JMPPTS	0096	JMPTAB	BFC0	JMPTIM	007B	JMPWHN	BFBB
JQYTAB	BAF5	KBCODE	D209	KEYS10	B096	KEYS13	BOED
KEYS14	B0FB	KEYS15	B045	KEYS18	B082	KEYS20	B02B
KEYS23	B036	KEYS24	B0E6	KEYS27	B0FC	KEYS28	B106
KEYSR1	B011	KEYSR2	B020	KEYSR3	B040	KEYSR4	B041
KEYSR5	B060	KEYSR6	B056	KEYSR7	B07B	KEYSR8	B099
KEYSR9	B073	KEYSRV	AFFE	KILBAS	0093	KILOCH	0094
KILOCV	0095	KLGRAF	BA37	KLGRF1	BA41	KLGRF2	BA4B
KLGRF3	BA52	KLGRF4	BA59	KLGRF5	BA5E	LDGAL1	B4BD
LDGAL2	B4C6	LDGALT	B4B9	LDINS1	A77B	LDINS2	A7B1
LDINS4	A77A	LDINS6	A765	LDINST	A76F	LDISP	ADF1
LDISP1	AE03	LDISP2	ADFB	LDISP3	ADF4	LDMES1	B22E
LDMES2	B21E	LDMES3	B234	LDMES4	B23A	LDMES5	B249
LDMES6	B25F	LDMES7	B276	LDMES8	B27C	LDMES9	B286
LDMES5	B223	LDMS10	B2A8	LDMS11	B2A2	LDMS12	B268
LDMS14	B21F	LDTAB1	B3EE	LDTAB2	B41B	LDTAB3	B441
LDTAB4	B44C	LDTAB5	B488	LDTAB6	B492	LDTAB7	B47C
LDTAB8	B3CA	LDTAB9	B3BA	LDTB10	B3BC	LISTAB	BA62
LISTB2	BA6A	LISTB3	BA6D	LISTB4	BA75	LISTB5	BA7D
LISTB6	BA85	LOKFLG	00A3	LOKLDC	0086	LOKTAR	0089
LOKWAT	0088	LTBLUE	0092	MOPF	D000	MOPL	D008
M1PF	D001	M1PL	D009	M2PF	D002	M2PL	D00A
M3PF	D003	M3PL	D00B	MAIN	A1F3	MAIN1	A3BB
MAIN3	A69B	MAIN4	A5D0	MASK	BAB0	MED	00AA
MEMEND	2000	MEMMAP	1000	MESAGE	0D1F	MESTIM	00CF
MGRAPH	0300	MISDIF	0062	MOTIN1	A3E4	MOTIN2	A3EB
MOTIN3	A3FE	MOTIN9	A3EA	MSENTB	BFOC	MSERVE	B216
NBYTAB	BE7F	NDURAT	00D4	NDURTM	00DB	NEWST1	B7D7
NEWST2	B7BE	NEWST3	B7B5	NEWST4	B7BE	NEWST5	B7A9
NEWST6	B7F0	NEWSTR	B764	NMIEN	D40E	NMIRE5	D40F

NHIST	D40F	NOISE	AEAB	NOISE1	AEB1	NOISE2	AEC9
NOISE3	AEB3	NOISTB	BF20	NOITB1	BF2A	NOITB2	BF34
NOSTAR	17E3	NOTIN1	BCAF	NOTIN2	B3B9	NOTINT	B3A6
NOTSEQ	00D2	NOTTAB	BF5C	NOTVOL	00D9	NPRIOR	00D6
NSTARS	0079	NIEMP	006F	NUMBYT	OCEE	NUMPTS	00A4
OBJCOMP	0003	OBJC11	A569	OBJC12	A579	OBJCL1	A4ED
OBJCL2	A4E7	OBJCL3	A503	OBJCL4	A4FC	OBJCL5	A548
OBJCL6	A52E	OBJCL7	A53E	OBJCL8	A52A	OBJNUM	0005
OBLAST	0004	OBPHOT	0002	OLDBYT	OCBD	OLDHOR	OC8C
OLDNUM	OCBD	OLDVER	OC5B	POPF	D004	POPL	D00C
P1PF	D005	P1PL	D00D	P2PF	D006	P2PL	D00E
P3PF	D007	P3PL	D00F	PACTL	D302	PAGE0	0067
PAND10	B896	PANDIS	B804	PANDS1	BB22	PANDS2	B812
PANDS3	B810	PANDS4	B85C	PANDS5	B8A6	PANDS6	B86F
PANDS7	B88E	PANDS8	B88C	PANDS9	B8A6	PBCTL	D303
PENH	D40C	PENV	D40D	PGRAP0	0400	PGRAP1	0500
PGRAP2	0600	PGRAP3	0700	PGRAPH	0300	PHASE2	0300
PHASE3	2000	PHASE4	00FC	PHASE5	BFFB	PHASE7	0FE9
PHASE8	A14A	PHASE9	C000	PHEXWT	00BE	PHGRAF	B8E4
PHGRF1	B8F5	PHGRF2	B903	PHGRF3	B90F	PHGRF4	B919
PHGRF5	B921	PHITS	0082	PHODIF	BF85	PHOFLG	0084
PHOREP	00DA	PHOTB2	BFE8	PHOTB4	BFF3	PHOTIM	0085
PHOTN2	AE40	PHOTN3	AE56	PHOTN4	AE58	PHOTN7	AE66
PHOTN8	AE41	PHOTG0	0087	PHOTON	AE29	PHOYPS	BF73
PHPOSB	BF7D	PHPOST	BF75	PHVECT	BFC9	PIA	D300
PMBASE	D407	PNTR	0068	POHELP	AECA	POHLP1	AED2
POHLP2	AEDA	POKEY	D200	POPALL	A74B	PORTA	D300
PORTB	D301	POTO	D200	POT1	D201	POT2	D202
POT3	D203	POT4	D204	POT5	D205	POT6	D206
POT7	D207	POTG0	D208	PRIOR	D018	PROGST	0067
PTAB	0DE9	QUADRT	0090	RAMMAP	0280	RAMNUM	0031
RANDOM	D20A	RANKTB	BEE9	RATING	00CB	RED	0044
REDFLG	008B	REPMSG	0065	REPTR	00D7	REPSEQ	00D3
RESET	0063	RMLAST	0030	ROGRAF	BA12	ROGRF1	BA1B
ROGRF2	BA23	ROGRF3	BA2A	ROGRF4	BA30	ROGRF5	BA34
ROHELP	B69B	ROHLP1	B6A4	ROHLP2	B6E1	ROTTIM	00BA
SCBCD	0064	SCPTAB	0051	SCVCON	0028	SDURAT	00D5
SECOND	0074	SENABR	BC20	SENACF	BBAE	SENACN	BBAB
SENATA	BBD9	SENCDM	BC11	SENCDS	BC14	SENCOM	BBFA
SENCTF	BBB8	SENCTN	BBB5	SENDES	BBBF	SENDKA	BB9C
SENDMC	BBFC	SENDS	BBCD	SENEDE	BC05	SENEDE	BC08
SENTEC	BBBC	SENHSP	BBC5	SENHWA	BBC1	SENHWC	BB83
SENHYP	BBBB	SENMDM	BC18	SENMDS	BC1D	SENNOV	BBF4
SENDOR	BBC6	SENOUT	BBDB	SENPD	BBFF	SENPD5	BC02
SENPL	BBF6	SENPTR	00D1	SENRED	BC1F	SENSDM	BC0B
SENSDS	BC0E	SENSOF	BBB3	SENSON	BBB1	SENSUR	BBBD
SENTAB	BBAA	SENTDM	BC17	SENTDS	BC19	SENWAR	BBF8
SENWHT	BBBA	SENWIN	BBE9	SEGEN	00A8	SEGTIM	00AA
SERIN	D20D	SEROUT	D20D	SESCAN	A0F8	SHENER	007D
SIZEM	D00C	SIZEPO	D008	SIZEP1	D009	SIZEP2	D00A
SIZEP3	D00B	SKCTL	D20F	SKRES	D20A	SKSTAT	D20F
SPABAK	0081	SPEED	0070	SSERV1	A4E5	SSERV2	A4C0
SSERV3	A4CA	SSERV4	A4DB	STERMK	00C6	STERTB	BED7
STFLAG	00E9	STHPS0	B6FB	STHPS2	B709	STHPS3	B717
STIMER	D209	STINIT	BB42	STLAST	0010	STO0B1	A2BA
STO0B2	A2E0	STO0B3	A306	STO0B5	A327	STO0B6	A343
STO0B7	A30E	STO0B8	A2C2	STO0B9	A2E8	STOSR1	A250
STOSR2	A227	STOSR3	A262	STRBR1	A593	STRBR2	A58D
STRBR4	A5AB	STRBR5	A5A5	STRBR6	A5A3	STRBYT	OCEE
STRNUM	000C	STRRAM	09AD	STVPS0	B71E	STVPS1	B75A

STVPS2	B72E	STVPS3	B753	STVPS4	B764	STVPS5	B745
STVPS6	B74A	STVPS7	B73E	STVPS8	B763	TARPTR	00A2
TEMP	006A	TEMP1	006B	TEMP2	006C	TEMP3	006D
TEMP4	006E	THEKEY	00CA	THIN10	AC0A	THIN11	ABCA
THIN12	ABE1	THIN13	AC31	THIN14	AB36	THIN15	AC4F
THIN16	AC32	THIN20	AB11	THIN22	ABE9	THIN23	ABEB
THIN24	ABFA	THIN26	AB98	THIN27	AB9C	THIN28	ABB3
THIN30	ABC4	THIN31	ABBA	THIN33	ABE5	THIN35	ABAE
THIN36	ABDD	THIN37	AA90	THIN38	AAB3	THIN39	AAB5
THIN40	AACB	THIN41	AACF	THIN42	AAD5	THIN43	AADD
THIN44	AAE0	THIN45	AB66	THINK	AA79	THINK1	AB09
THINK2	AB03	THINK3	AAF4	THINK4	AB00	THINK5	AB37
THINK6	ABB4	THINK8	ABFC	THINK9	AC0B	TIME10	B544
TIME11	B59A	TIME12	B57C	TIME13	B5B0	TIME14	B5DA
TIME15	B5C1	TIME16	B5D1	TIME18	B5EA	TIME19	B619
TIME20	B5EF	TIME21	B601	TIME22	B655	TIME23	B662
TIME24	B564	TIME25	B68D	TIME26	B644	TIME27	B632
TIME28	B5BB	TIME30	B53E	TIME31	B516	TIME32	B50F
TIME33	B51A	TIME40	B61D	TIME42	B68F	TIME44	B61C
TIME45	B698	TIME46	B4F5	TIME47	B511	TIME61	B574
TIMER1	B569	TIMER2	B54E	TIMER3	B565	TIMER4	B562
TIMER5	B56A	TIMER6	B51C	TIMER7	B527	TIMER9	B536
TIMER8	B4E4	TIMERX	0072	TIMHLP	B7F1	TIMHP1	B803
TIMOUT	0066	TOFFMG	BE26	TOGTAB	BE29	TONMS0	BE2C
TRIGO	D010	TRIG1	D011	TRIG2	D012	TRIG3	D013
TRKFLG	007C	TRKTAB	BECF	TWOCM1	B88D	TWOCM3	B8CD
TWOCM	B8A7	UPIN10	A7E9	UPIN11	A85F	UPIN12	AB3A
UPIN13	AB3C	UPIN14	AB50	UPINS1	AB98	UPINS2	A7EC
UPINS3	AB30	UPINS4	AB04	UPINS5	AB0A	UPINS6	AB21
UPINS7	AB27	UPINS8	A7CF	UPINS9	A7E1	UPINST	A7BF
VBLNK1	A6E9	VBLNK2	A6F2	VBLNK3	A6F6	VBLNK4	A6EA
VBLNK5	A715	VBNMI	A6D1	VCONH	0B64	VCONL	0B00
VCOUNT	D40B	VDELAY	D01C	VDRAW	00A5	VDSLST	0200
VERCHT	003F	VERJDY	00C9	VIMIRG	0216	VMAX	0064
VBCEN	007A	VOFLOW	0032	VPDS	0BF9	VSCROL	D405
VSTCEN	0032	VSTEER	00C5	VTAROT	00A1	VVBLKI	0222
WARP	0071	WARPTB	BAB4	WENTAB	BAD3	WPENER	0080
WRDTAB	BC2B	WSYNC	D40A	XINCRE	0B66	XINDEX	00AC
XINPRS	00B2	XMOVE1	A3BD	XMOVE2	A3C6	XMOVE3	A3DF
XPOSH	0A40	XPOSL	0AD3	XSIGN	09AD	YELLOW	0026
YINCRE	0B97	YINDEX	00AE	YINIT	BB3A	YPOSH	0A71
YPOSL	0B04	YROTA1	A39E	YROTA2	A389	YSIGN	09DE
ZINCRE	0BCB	ZINDEX	00B0	ZINIT	BB3E	ZPOSH	0AA2
ZPOSL	0B35	ZROTA1	A3BB	ZROTA2	A3A6	ZSIGN	0A0F
ZYGIND	BF89	ZYGRAF	B9B1	ZYGRF1	B9BE	ZYGRF2	B9C6
ZYGRF3	B9CC	ZYGRF4	B9D2	ZYGRF5	B9D6	ZYGRF6	B9DA
ZYGRF7	B9DC	ZYTARG	BF6E	ZYTOGG	00A7	ZYWARP	BF99