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1 .TITLE ALWELG-ALIENS WELL GAME MAINLINE
2 .SBTTL *****
3 .SBTTL *
4 .SBTTL *PROGRAMMER DFT
5 .SBTTL *MODULE ALWELG
6 .SBTTL *FUNCTION PERFORMS ALIENS WELL GAME FUNCTION
7 .SBTTL *
8 .SBTTL *****
9 .INCLUDE ALCOMN
10 .PAGE
11 .GLOBL INEWAV, INEWLI, MOVCUR, INIDSP, NEWAV2, UPSCOR, GETCUR, INIRAO
12 .GLOBL SWAPEN, PLAY
13 .GLOBL SLAUNC, EXSNON, ESLSON, SBOING, PRSTAR, SOUTS3, PRBOOM, INBOOM
14 .GLOBL INIRAT, PRORAT, LEVEL, CCEXPL, CIEXPL, CPEXPL, IPEXPL
15 .GLOBL SELICO, PLDROP, BONSCO, SOUTS2, SOUTS3, INICOL, S3SWAR
16 .GLOBL PPSPXI, CPSPXI, FPSPXI, PULSTR, D70MSK, PULSTO
17 .GLOBL QCHKS2, QCHKS3, QCHKS4, QCHKS5
18 .ASECT
19 . 9000
20 .BYTE 02,0BB,5A,30 MORSE CODE ATARI
21 .BYTE 50,0EE,3D,0A8
22 CHKSM2 .BYTE QCHKS2
23 .SBTTL INITIALIZE - MAINLINE
24 INEWAV NEW WAVE
25 JSR CONTOUR
26 JSR INIENE INITIALIZE NYMPHS, ENEMY LINES
27 JSR INIOBJ INITIALIZE OBJECTS
28 JSR INISUZ NEW SUPERZAPPER
29 LDA I,0FA
30 STA EYH
31 LDA I,0 CURSOR STARTS AT TOP, NOT DESCENDING
32 STA CURMOD
33 STA EYL
34 LDA I,CDPLAY
35 STA QDSTATE
36 RTS
37 INEWLI NEW LIFE
38 JSR INICUR INITIALIZE CURSOR
39 JSR CONTOUR SET SKILL LEVEL ACC TO WAVE
40 INIOBJ JSR INICHA DEACTIVATE CHARGES
41 JSR INIINV DEACTIVATE INVADERS
42 JSR ININYM INITIALIZE NYMPHS
43 JSR INIEXP DEACTIVATE EXPLOSIONS
44 JSR CLRPTOT CLEAR POT
45 JSR INIDSP INITIALIZE DISPLAY
46 LDA I,-1
47 STA BOFLASH BONUS FLASHER CLEARED
48 STA PULSON
49 LDA I,0 CLEAR ENEMY SPIKE COUNTER
50 STA ELICNT
51 RTS
52 .PAGE
53 .SBTTL INITIALIZE-NEW WAVE PART 2
54
55 NEWAV2
56 LDA I,ILINLIY
57 STA CURSY
58 LDA I,0
59 STA TEMPO
60
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```
1 STA TEMP2
2 LDA ZADEST
3 STA TEMP1
4 IFMI
5 DEC TEMP2
6 ENDIF
7 LDX I,1
8 BEGIN CALCULATE Z INCREMENT
9 LDA TEMP1
10 ASL
11 ROR TEMP1
12 ROR TEMPO
13 DEX
14 MIEND
15 LDA TEMPO UPDATE Z CENTER
16 CLC
17 ADC ZADEST+1
18 STA ZADEST+1
19 LDA TEMP1
20 ADC ZADJL
21 STA ZADJL
22 LDA TEMP2
23 ADC ZADJL+1
24 STA ZADJL+1
25 LDA EYL MOVE EYE CLOSER TO WELL
26 CLC
27 ADC I,18
28 STA EYL
29 LDA EYH
30 ADC I,0
31 STA EYH
32 CMP I,0FC
33 IFCS
34 LDA I,1 TURN OFF STAR FIELD
35 STA PLAGRO
36 ENDIF
37 LDA EYL CALCULATE EYE-DESTINATION DELTA
38 SEC
39 SBC EYLDES
40 LDA EYH
41 IFNE
42 SBC I,0FF
43 ENDIF
44 IFEQ PAST DESTINATION
45 LDA EYLDES YES STOP AT DEST
46 STA EYL
47 LDA I,0FF
48 STA EYH
49 LDA I,CPLAY GO PLAY GAME
50 BIT QSTATUS
51 IFPL ATTRACT
52 LDA I,CENDGA YES. END IT
53 ENDIF
54 STA QSTATE
55 LDX PLAYUP
56 LDA I,0
57 STA X,BONUS CLEAR BONUS
58 ENDIF
59 LDA I,0FF REQUEST WELL PIC UPDATE
60 STA ROTDIS
```

1	JMP MOVCUR	UPDATE CURSOR POSITION	1
2	.PAGE		2
3	.SBTTL INITIALIZE-PREPARE FOR SKILL LEVEL REQUEST STATE		3
4	INIRAO		4
5	LDA HIWAVE	YES. SET START LEVEL ODD HIGHEST LEVEL	5
6		ACC HIGHEST LEVEL -1 COMPLETED IN LAST GAME	6
7	LDX I,LEVELE-LEVEL		7
8	BEGIN	LOOP FROM HIGHEST CHOICE TO LOWEST	8
9	DEX		9
10	CMP X,LEVEL		10
11	CSEND	EXIT WHEN WAVE IN TABLE HIGHEST LEVEL LAST GAME	11
12	LDY I,4		12
13	LDA OPTIN3		13
14	AND I,4		14
15	IFNE	MAX MIN TIED TO HI SCORE OPTION	15
16	LDA HSCORH+21.	YES. GET MSB OF HIGH SCORE	16
17	CMP I,30		17
18	IFCS	300000	18
19	INY	YES.	19
20	ENDIF		20
21	CMP I,50		21
22	IFCS	500000	22
23	INY	YES.	23
24	ENDIF		24
25	CMP I,70		25
26	IFCS	700000	26
27	INY	YES.	27
28	ENDIF		28
29	ENDIF		29
30	LDA OPTIN1		30
31	AND I,43		31
32	CMP I,40		32
33	IFEQ	SALES MODE	33
34	LDY I,18	YES. ANYTHING GOES	34
35	ENDIF		35
36	STY TEMPO	NEW MAX MIN	36
37	CPX TEMPO		37
38	IFCC	PLAYER HI LEVEL MAX MIN	38
39	LDX TEMPO	YES. USE MAX MIN FOR RIGHT LIMIT	39
40	ENDIF		40
41	STX HIRATE	MAX INDEX INTO LEVEL TABLE	41
42	LDA QSTATUS		42
43	IFMI	ATTRACT	43
44	LDA I,0	NO	44
45	STA HIWAVE		45
46	ENDIF		46
47	INIRAT		47
48	LDX NEWPLA		48
49	STX PLAYUP	YES	49
50	IFNE	SPECIAL CASE FOR 2ND PLAYER	50
51	JSR SWAPEN	SWAP 1ST PLAYER S ENEMIES OUT	51
52	ENDIF		52
53	LDA I,4	SET UP DEFAULT LEVELS LEFT RIGHT SIDES	53
54	STA RITSID		54
55	LDA I,OFF	STOP RUMBLE	55
56	STA EYH		56
57	LDA I,0	INITIALIZE CURSOR	57
58	STA CURSL1		58
59	STA CURSPO		59
60	STA LEFSID		60

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1 STA TIMHIS NO ATTRACT DELAY
2 LDX QSTATUS
3 IFMI ATTRACT
4 LDA I,SECOND NO
5 STA TIMHIS
6 LDA I,OFF
7 STA WELTYP PREVENT WRAP
8 LDA I,CREQRAT GO TO REQUEST
9 STA QSTATE RATE STATE
10 LDA I,CDREQRA
11 STA QDSTATE REQUEST RATE DISPLAY STATE
12 LDA I,0
13 STA CURWAV TO GET 1ST COLORS
14 JSR INICOL
15 LDA I,10 START TIMER
16 ENDIF
17 STA QTMPAUS
18 JSR CLRPT CLEAR POT
19 FALL INTO PRORAT STATE
20 .SBTTL INITIALIZE-SET SKILL LEVEL
21
22 PRORAT UPDATE TIMER
23 DEC TIMHIS
24 IFMI ANOTHER SECOND DONE
25 SED YES
26 LDA QTMPAUS DECREMENT # SECONDS
27 SEC
28 SBC I,1
29 STA QTMPAUS
30 CLD
31 IFMI SECONDS LEFT AT 0
32 LDA I,MFIRE YES. AUTO CHOOSE
33 STA SWFINA
34 ENDIF
35 CMP I,3
36 IFEQ
37 JSR S3SWAR 3 SECONDS WARNING
38 ENDIF
39 LDA I,SECOND RESTART FRACTIONAL SECONDS TIMER
40 STA TIMHIS
41 ENDIF
42 JSR GETCUR UPDATE CURSOR POSITION
43 LDA I,MSUZA MFIRE
44 LDY QTMPAUS
45 CPY I,8
46 IFCC
47 LDA I,MSUZA MFIRE MSTRT1 MSTRT2
48 ENDIF
49 AND SWFINA
50 IFNE PLAYER SELECTING THIS LEVEL
51 LDA I,0
52 STA SWFINA
53 LDA CURSL1 YES. USE LEVEL FOR THIS PLAYER
54 TAY
55 LDX PLAYUP
56 STA X,BONUS
57 LDA Y,LEVEL
58 BIT QSTATUS
59 IFPL ATTRACT
60 LDY I,1
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```
1  STY LIVES1
2  LDA RANDOM          YES. CHOOSE FROM 1ST 8 LEVELS
3  AND I,7
4  ENDIF
5  STA X,WAVEN1
6  STA CURWAV
7  JSR INICOL
8  JSR CONTOUR
9  JSR INIENE          INITIALIZE ENEMY
10 JSR INISUZ          NEW SUPERZAPPER
11 LDA I,CNEWLIF      GO ON TO GAME PLAY
12 STA QSTATE
13 JSR CLRPTOT        CLEAR POT
14 ENDIF
15 LDA SWFINA
16 AND I, C MFAKE MFIRES MSUZA MSTRT1 MSTRT2
17 STA SWFINA          CLEAR SWITCHES NOT PROCESSED FLAG
18 RTS
19
20 .SBTTL BONUS SCORE DETERMINATION
21 INPUT ACC BONUS LEVEL INDEX
22 OUTPUT TEMPO,1, 2 BONUS POINTS
23 ACC,X DESTROYED
24
25 BONSCO ASL
26 TAX
27 LDA I,0             LSB ALWAYS 0
28 STA TEMPO
29 LDA X,BONPTM
30 STA TEMP1
31 LDA X,BONPTH
32 STA TEMP2
33 RTS
34 BONPTM .WORD 0,60,160,320,540,740,940,1140,1340
35 .WORD 1520,1700,1880,2080,2260,2480,2660,3000,3400
36 .WORD 3820,4150,4390,4720,5310,5810
37 .WORD 6240,6560,7660,8980
38 BONPTH BONPTM+1
39 LEVEL TABLE OF LEVEL #S -1 FOR RATING DISPLAY
40 .BYTE 0,2,4,6,8,0A,0C,0E,10,13,21.,17,25.,1B,30.,32.,23,27,2B,46.,48.,51.,5
41 .BYTE 72.,80.
42 LEVELE
43 .BYTE OFF          END OF TABLE FLAG
44 .PAGE
45 .SBTTL INITIALIZE - CURSOR
46 INICUR
47 LDA I,0E          INITIALIZE CURSOR POSITION
48 STA CURSL1
49 LDA I,0F0
50 STA CURSP0
51 LDA I,0
52 STA CURMOD
53 LDA I,0F
54 STA CURSL2
55 LDA I,ILINLIY
56 STA CURSY
57 RTS
58 .SBTTL INITIALIZE - NYMPHS
59
60 INITIALIZE NYMPHS
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1 INIENE LDA NWNPMC INITIALIZE FOR NEW WAVE NYMPH COUNT + ENE
2 STA NYMCOU
3
4 LDA NWTCLI INITIALIZE ENEMY LINES HIGHT
5 .SBTTL INIT ENEMY LINES
6 ACC INITIAL HEIGHT
7
8 LDX I,NLINES-1
9 BEGIN
10 STA X,LINEY
11
12 DEX
13 MIEND
14 RTS
15
16 ININYM
17 LDA I,0
18 LDX I,NNYMPH-1
19 BEGIN
20 STA X,NYMPY
21
22 DEX
23 MIEND
24 LDX NYMCOU
25
26 DEX
27 BEGIN ON 8 Y LEVELS
28 LDA RANDOM
29
30 AND I,0F
31 STA X,NYMPL
32 TXA
33
34 ASL
35 ASL
36 ASL
37
38 ASL
39 ORA X,NYMPL
40 IFEQ
41
42 LDA I,0F
43 ENDIF
44 STA X,NYMPY
45
46 DEX
47 MIEND
48 RTS
49
50 .SBTTL INITIALIZE - INVADERS
51
52 INITIALIZE INVADERS
53
54 INIINV LDX I,NINVAD-1
55 LDA I,0
56
57 BEGIN LOOP FOR EACH INVADER
58 STA X,INVAY DEACTIVATE
59 DEX
60
61 MIEND
62 STA INMCOU
63 STA INCCOU
64
65 STA SPINCO
66 STA FLIPCO
67 STA TANKCO
68
69 STA PULSCO
70 STA FUSECO
71
72 RTS
73
74 .SBTTL INITIALIZE - CHARGES
75
76 INICHA
77 LDA I,0
78
79
80
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```
1 LDX I,NCHARG-1
2 BEGIN LOOP FOR EACH CHARGE
3 STA X,CHARY DEACTIVATE CHARGE
4 DEX
5 MIEND
6 STA CHACOU
7 STA ESHCOU
8 RTS
9 .SBTTL INITIALIZE EXPLOSIONS
10 INIEXP
11 LDX I,NEXPLO-1
12 LDA I,0
13 BEGIN
14 STA X,EXPLOY
15 DEX
16 MIEND
17 STA EXPCOU
18 RTS
19 CLEARS POTS
20
21 CLRPOP LDA I,0
22 STA TBHD
23 RTS
24 SWAPEN
25 LDX I,SAVEND-SAVEP-1
26 BEGIN LOOP FOR EACH BYTE OF PLAYER S SPECIAL PARAMETERS
27 LDA X,ACTIP SWAP ACTIVE TO SAVE AREAS
28 LDY X,SAVEP
29 STA X,SAVEP
30 TYA
31 STA X,ACTIP
32 DEX
33 MIEND
34 RTS
35 .PAGE
36 .SBTTL INITIALIZE-SET SKILL LEVEL FOR WAVE
37 CONTOUR
38
39 PARAMETER TABLES DATA STRUCTURE
40
41 BYTE 1 START WAVE
42 BYTE 2 END WAVE
43 BYTE 0 TYPE OF ENCODING
44 BYTE 3 PARAMETERS
45
46 TYPES
47 T1 2 1 BYTE IN PARAMETER FIELD GOES FOR ALL WAVES IN RANGE
48 TZ 4 1 BYTE IN PARAMETER FIELD FOR EACH WAVE IN RANGE
49 TE 0 EOT RETURN WITH 0
50 TZANDF 6 AND CURRENT WAVE WITH F, THE DO TZ
51 TA 8 AND BYTE 4 TO BYTE 3 FOR EACH LEVEL
52 TB 0A ADD BYTE 3 TO WINVIN
53 TR 0C ALTERNATE BETWEEN BYTES 3 4
54 LDA CURWAV
55 CMP I,98.
56 IFCS
57 LDA RANDO2
58 AND I,1F
59 ORA I,40
60 ENDIF
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```
1 STA TEMP2
2 INC TEMP2
3 LDX I,WTABEND-WTABLE-1
4 STX INDEX1
5 BEGIN                                LOOP FOR EACH TABLE ENTRY
6 LDX INDEX1
7 LDA X,WTABLE
8 STA INDYHI
9 LDA X,WTABLE-1
10 STA INDYLO                          SET UP POINTER TO BYTE TO BE SET UP
11 LDA X,WTABLE-2
12 STA TEMP4
13 LDA X,WTABLE-3
14 STA TEMP3                          SET UP POINTER TO ARRAY OP PARAMETERS
15 LDA I,1
16 STA INDEX2                          SET UP START RANGE COUNTER
17 LDY I,0                             SET UP TABLE POINTER
18 BEGIN                              LOOP UNTIL CURRENT WAVE IS FOUND
19 LDA NY,TEMP3
20 STA TYPCOD                          GET TYPE OF RECORD
21 BEQ TEXIT                          EXIT ON EOT TYPE CODE WITH 0
22 LDA TEMP2
23 INY
24 CMP NY,TEMP3
25 INY
26 IFCS                                IS CURRENT WAVE  START WAVE OF RANGE
27 CMP NY,TEMP3                        YES.
28 IFEQ                                END WAVE OF RANGE
29 CLC
30 ENDIF
31 IFCC
32 INY
33 JSR DOTYPE                          YES. GET PARAMETER FROM RECORD
34 JMP TEXIT                          EXIT LOOP
35 ENDIF
36 ENDIF
37 JSR DONEXT                          DO. UP POINTER TO NEXT RECORD
38 CLC
39 CSEND                              ALWAYS LOOP
40 TEXIT
41 LDY I,0                             GOT PARAMETER
42 STA NY,INDYLO                       SAVE IT
43 LDA INDEX1
44 SEC
45 SBC I,4
46 STA INDEX1                          UPDATE MASTER TABLE POINTER
47 CMP I,OFF
48 EQEND
49
50 .SBTTL  EASY - MED - HARD OPTIONS
51
52 ZEASY  1
53 ZHARD  2
54 LDA OPTIN3
55 AND I,3
56 CMP I,ZEASY
57 IFEQ                                EASY
58 DEC WCHAMX                          YES. LESS ENEMY SHOTS
59 LDA WINVIL
60 EOR I,OFF
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```
1 LSR
2 LSR
3 LSR
4 ADC WINVIL
5 STA WINVIL          DECREASE SPEEDS BY 1/8
6 LDA CURWAV
7 CMP I,17.
8 IFCC
9 DEC WTTFRA          DECREASE FLIP RATE AT TOP
10 ENDIF
11 ELSE
12 CMP I,ZHARD
13 IFEQ               HARD
14 INC WCHAMX          YES. MORE ENEMY SHOTS UP TO 4
15 LDA WCHAMX
16 CMP I,3
17 IFCS
18 LDA I,3
19 STA WCHAMX
20 ENDIF
21 LDA WINVIL          INCREASE SPEED BY 1/8
22 LSR
23 LSR
24 LSR
25 ORA I,0EO
26 ADC WINVIL
27 STA WINVIL
28 LDA NWNMYC          INCREASE ATTACK BY 1/8
29 LSR
30 LSR
31 LSR
32 ADC NWNMYC
33 STA NWNMYC
34 LDA WPULFI
35 ORA I,ZFIRYE
36 STA WPULFI          PULSARS FIRE
37 ENDIF
38 ENDIF
39 LDA WINVIL+ZABTRA   SPINNER
40 JSR TIMES8
41 STA WINVIL+ZABTRA   SPEED  FRAC
42 STY WINVIN+ZABTRA   SPEED  INT
43 STX ENSIZE+ZABTRA   COLLISION RANGE
44 LDA WCHARL
45 JSR TIMES8          ENEMY SHOT
46 STA WCHARL
47 STY WCHARIN
48 STX CHACHA          CHARGE CHARGE COLLISION RANGE
49 LDA WINVIL
50 JSR TIMES8
51 STA WINVIL
52 STA WINVIL+ZABTAN
53 STY WINVIN+ZABTAN
54 STY WINVIN
55 STX ENSIZE+ZABFLI   CHARGE INVADER COLLISION RANGE
56 STX ENSIZE+ZABTAN
57 STX ENSIZE+ZABPUL
58 LDA WINVIL
59 ASL
60 STA WFUSIL
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```
1 LDA WINVIN
2 ROL
3 STA WFUSIH FUSE INC 2X INVADER SPEED
4 LDA I, PCVELO+3 /2
5 STA ENSIZE+ZABFUS
6 LDA I,0A0
7 STA WINVIL+ZABPUL
8 LDA I,0FE
9 STA WINVIN+ZABPUL
10 LDA I,ZCARFL
11 STA WTACAR+1
12 STA WTACAR+0
13 RTS
14 INPUT ACC SPEED SIGNED
15 OUTPUT ACC LOW BYTE OF SPEED
16 Y HI BYTE OF SPEED SIGN EXT
17 X COLLISION RANGE WITH PC
18 TEMPO TRASHED
19 TIMES8
20 LDY I,OFF ALL SPEEDS ARE MINUS SO START SIGN
21 STY TEMPO EXTEND AT ALL-
22 ASL
23 ROL TEMPO
24 ASL
25 ROL TEMPO
26 ASL
27 ROL TEMPO X 8
28 LDY TEMPO
29 PHA SAVE RESULT
30 TYA COLLISION RANGE AVERAGE OF
31 EOR I,OFF ABS VAL OF SPEEDS.
32 CLC
33 ADC I,PCVELO+1+1+2
34 LSR
35 TAX
36 PLA
37 RTS
38 .PAGE
39 .SBTTL SKILL CONTOUR TABLES
40 FRAMES UNTIL INVADER CAN FIRE 28 PER SECOND
41 TCHARFR
42 .BYTE TA,1,20.,80.,-3
43 .BYTE T1,21.,64.,20.
44 .BYTE T1,65.,99.,10.
45 TCHAMX .BYTE TZ,1,9,1,1,1,2,3,2,2,3,3 ADD 1
46 .BYTE T1,10.,64.,2
47 .BYTE T1,65.,99.,3
48
49 ENEMY SHOT INCREMENT
50 TINVIN
51 .BYTE TA,1,8,-44.,-5
52 .BYTE TZ,9,16.,-81.,-84.,-84.,-84.,-88.,-92.,-96.,-96.
53 .BYTE TA,17.,25.,-81.,-3
54 .BYTE TA,26.,32.,-99.,-3
55 .BYTE TA,33.,39.,-108.,-3
56 .BYTE TA,40.,48.,-110.,-1
57 .BYTE TA,49.,64.,-120.,-1
58 .BYTE TR,65.,99.,-160.,-191.
59 TCHARIN
60 .BYTE TB,1,99.,-64.
```

1	TSPIIN	.BYTE TB,1,20.,0	
2		.BYTE TB,21.,32.,-48.	
3		.BYTE TB,33.,48.,-40.	
4		.BYTE TB,49.,99.,-48.	
5	WPULPOT		PULSAR POTENCY HEIGHT
6		.BYTE T1,1,32.,0A0	
7		.BYTE T1,33.,64.,0A0	
8		.BYTE T1,65.,99.,0C0	
9	WPULTIM		PULSAR TIMER INCREMENT
10		.BYTE T1,1,48.,4	
11		.BYTE T1,49.,64.,6	
12		.BYTE T1,65.,99.,8	
13	WWTAC2		
14		.BYTE T1,1,32.,ZCARFL	
15		.BYTE T1,33.,40.,ZCARFU	
16		.BYTE T1,41.,99.,ZCARPU	
17	WWTAC3		
18		.BYTE T1,1,48.,ZCARFL	
19		.BYTE T1,49.,99.,ZCARFU	
20	WSPIMI		
21		.BYTE TZ,1,4,0,0,0,1	
22		.BYTE T1,5,16.,2	
23		.BYTE T1,17.,19.,0	
24		.BYTE T1,20.,32.,1	
25		.BYTE T1,35.,39.,1	
26		.BYTE T1,44.,99.,1	
27	WSPIMX		
28		.BYTE TE	
29		.BYTE TZ,1,6,0,0,0,2,3,4	
30		.BYTE T1,7,10.,4	
31		.BYTE T1,11.,16.,3	
32		.BYTE T1,20.,25.,2	
33		.BYTE TZ,26.,32.,1,2,2,2,1,1,2	
34		.BYTE T1,35,39.,1	
35		.BYTE T1,43.,99.,1	
36		.BYTE TE	
37	WFLIMI		
38		.BYTE T1,1,4,1	
39		.BYTE T1,5,99.,0	
40		.BYTE TE	
41	WFLIMX		
42		.BYTE T1,1,4,4	
43		.BYTE T1,5,16.,5	
44		.BYTE T1,17.,19.,3	
45		.BYTE T1,20.,25.,4	
46		.BYTE T1,26.,99.,5	
47		.BYTE TE	
48	WTANMI		
49		.BYTE TZ,1,4,0,0,1,0	
50		.BYTE T1,5,16.,1	
51		.BYTE T1,17.,32.,1	
52		.BYTE T1,33.,39.,1	
53		.BYTE T1,40.,99.,1	
54		.BYTE TE	
55	WTANMX		
56		.BYTE TZ,1,5,0,0,1,0,1	
57		.BYTE T1,6,16.,2	
58		.BYTE T1,17.,26.,1	
59		.BYTE T1,27.,32.,1	
60		.BYTE T1,33.,44.,2	
		.BYTE T1,45.,99.,3	
		.BYTE TE	
	WPULMI		
		.BYTE T1,17.,32.,2	
		.BYTE T1,33.,99.,1	
		.BYTE TE	

1	WPULMX		1
2		.BYTE TZ,17.,32.,5,3,2,2,2,2,2,2,2,2,2,2,3,4,2	2
3		.BYTE T1,33.,99.,3	3
4		.BYTE TE	4
5	WFUSMI		5
6		.BYTE T1,11.,16.,1	6
7		.BYTE T1,22.,25.,1	7
8		.BYTE T1,27.,99.,1	8
9		.BYTE TE	9
10	WFUSMX		10
11		.BYTE T1,11.,16.,1	11
12		.BYTE T1,22.,25.,1	12
13		.BYTE T1,27.,32.,1	13
14		.BYTE T1,33.,39.,4	14
15		.BYTE T1,40.,99.,3	15
16		.BYTE TE	16
17	PN 40.		17
18	PC 20.		18
19	TPUCHDE		19
20		.BYTE TZ,17.,18.,PN,PC	20
21		.BYTE TR,19.,32.,PC,PN	21
22		.BYTE TA,33.,39.,20.,-1	22
23		.BYTE TR,40.,99.,20.,10.	23
24		.BYTE TE	24
25	TWFUSC		25
26		.BYTE TR,17.,32.,0,40	26
27		.BYTE TR,33.,48.,40,0C0	27
28		.BYTE T1,49.,99.,0C0	28
29		.BYTE TE	29
30	TFUFRQ		30
31		.BYTE T1,1,16.,220.	31
32		.BYTE T1,17.,39.,192.	32
33		.BYTE TA,40.,64.,192.,1	33
34		.BYTE T1,65.,99.,230.	34
35	TINVMX		35
36	TELIHI		36
37	TNYMMX		37
38		.BYTE TZANDF,1,99.,0,0,0,0E0,0D8,0D4,0D0,0C8,0C0,0B8,0B0,0A8,0A0,0A0,0A0,0A0,0A0	38
39		.BYTE TZ,1,16.,10.,12.,15.,17.,20.,22.,20.,24.,27.,29.,27.,24.,26.,28.,30.,	39
40		.BYTE TA,17.,26.,20.,1	40
41		.BYTE T1,27.,39.,27.	41
42		.BYTE TA,40.,48.,29.,1	42
43		.BYTE TA,49.,64.,31.,1	43
44		.BYTE TA,65.,80.,35.,1	44
45		.BYTE TA,81.,99.,43.,1	45
46	TWTFRA		46
47		.BYTE T1,1,20.,2	47
48		.BYTE T1,21.,32.,2	48
49		.BYTE T1,33.,99.,3	49
50	TWPULF		50
51		.BYTE T1,60.,99.,ZFIRYE	51
52		.BYTE TE	52
53	SEQUENCE	CIRCLE,SQUARE,CROSS,PEANUT,KEY,TRIANGLE,CLOVER,V,STAIRS,U,FLAT,	53
54		HEART,STAR,WAVES,TOPO,8	54
55	CAMWAV		55
56		.BYTE TZANDF,1,99.	56
57		.BYTE NOJUMP-CAM	57
58		.BYTE MOVJMP-CAM	58
59		.BYTE SPIRAL-CAM	59
60		.BYTE SPIRCH-CAM	60
61		.BYTE COWJM2-CAM	61
62		.BYTE MOVJMP-CAM	62
63		.BYTE SPIRCH-CAM	63
64		.BYTE SPIRAL-CAM	64
65		.BYTE COWJM2-CAM	65
66		.BYTE AVOIDR-CAM	66

```
1 .BYTE SPIRCH-CAM
2 .BYTE SPIRAL-CAM
3 .BYTE COWJM2-CAM
4 .BYTE NOJUMP-CAM
5 .BYTE AVOIDR-CAM
6 .BYTE SPIRCH-CAM
7 WTABLE
8 .WORD TWPULF,WPULFI
9 .WORD TWTFRA,WTFRA
10 .WORD TCHARFR,WCHARFR INVADER S FIRE TIMER FRAMES
11 .WORD TCHAMX,WCHAMX MAX # ENEMY SHOTS -1
12 .WORD WFLIMI,WFLMIN MIN # FLIPPERS
13 .WORD WFLIMX,WFLMAX MAX
14 .WORD WPULMI,WPUMIN
15 .WORD WPULMX,WPUMAX
16 .WORD WTANMI,WTAMIN
17 .WORD WTANMX,WTAMAX
18 .WORD WSPIMI,WSPMIN
19 .WORD WSPIMX,WSPMAX
20 .WORD WFUSMI,WFUMIN
21 .WORD WFUSMX,WFUMAX
22 .WORD WPULPOT,PULPOT
23 .WORD WPULTIM,PULTIM
24 .WORD WWTAC2,WTACAR+2
25 .WORD WWTAC3,WTACAR+3
26 .WORD TINVMX,WINVMX
27 .WORD TNYMMX,NWNYMC
28 .WORD TELIHI,NWTELI
29 .WORD TPUCHDE,PUCHDE PULSAR CHASE DELAY
30 .WORD CAMWAV,WFLICAM FLIPPER CAM
31 .WORD TSPIIN,WINVIL+ZABTRA
32 .WORD TCHARIN,WCHARL
33 .WORD TINVIN,WINVIL
34 .WORD TWFUSC,WFUSCH
35 .WORD TFUFRQ,WFUFRQ
36 WTABEND
37 .PAGE
38 .SBTTL PARAMETER TYPE CODE EXTRACTION VECTORS
39 INPUT Y POINTER TO 1ST PARAMETER IN RECORD
40 TYP COD RECORD TYPE
41 DOWTYPE
42 LDX TYP COD
43 LDA X,SPARAD+1
44 PHA
45 LDA X,SPARAD
46 PHA
47 RTS
48 INPUT Y PTS. TO END RANGE FIELD
49 DONEXT
50 LDX TYP COD
51 LDA X,NPARAD+1
52 PHA
53 LDA X,NPARAD
54 PHA
55 RTS
56 SPARAD .WORD 0 EOT
57 .WORD SAMALL-1 ONE BYTE FOR ALL
58 .WORD ITMIZE-1 ITEMIZED BYTE/LEVEL
59 .WORD DOTZAN-1
60 .WORD DOTA-1
```


1		.WORD DOTB-1	1
2		.WORD DOTR-1	2
3	NPARAD	.WORD 0	3
4		.WORD ONEBYT-1	4
5		.WORD NITMIZ-1	5
6		.WORD NITMIZ-1	6
7		.WORD TWOBYT-1	7
8		.WORD ONEBYT-1	8
9		.WORD TWOBYT-1	9
10	DOTZAN	LDA TEMP2	10
11		SEC	11
12		SBC I,1	12
13		AND I,0F	13
14		CLC	14
15		ADC I,1	15
16		BPL ITMIZ2	16
17	ITMIZE	LDA TEMP2	17
18	ITMIZ2	STY TEMPO	18
19		DEY	19
20		DEY	20
21		SEC	21
22		SBC NY,TEMP3	22
23		CLC	23
24		ADC TEMPO	24
25		TAY	25
26	SAMALL		26
27		LDA NY,TEMP3	27
28		RTS	28
29	TWOBYT	INY	29
30	ONEBYT	INY	30
31		INY	31
32		RTS	32
33	NITMIZ	LDA NY,TEMP3	33
34		DEY	34
35		SEC	35
36		SBC NY,TEMP3	36
37		STA TEMPO	37
38		TYA	38
39		SEC	39
40		ADC TEMPO	40
41		TAY	41
42		INY	42
43		INY	43
44		RTS	44
45			45
46			46
47			47
48	DOTB	LDA NY,TEMP3	48
49		CLC	49
50		ADC WINVIL	50
51		RTS	51
52			52
53	DOTA		53
54		JSR RANGER	54
55		TAX	55
56		LDA NY,TEMP3	56
57		INY	57
58		CPX I,0	58
59		IFNE	59
60		BEGIN	60

ITEMIZED BYTE FOR EACH WAVE

SAME BYTE FOR EACH WAVE IN RANGE


```
1 CLC
2 ADC NY,TEMP3
3 DEX
4 EQEND
5 ENDIF
6 RTS
7 RANGER LDA TEMP2          CALCULATE # OF LEVELS BETWEEN
8 STY TEMP0          START AND END INCLUSIVE ACC .
9 DEY          PRESERVE Y
```

```
10 DEY
11 SEC
12 SBC NY,TEMP3
13 INY
14 INY
15 RTS
```

```
16
17 DOTR          ALTERNATE BETWEEN 2 VALUES
```

```
18 JSR RANGER
19 AND I,1
20 IFNE
21 INY
```

```
22 ENDIF
23 LDA NY,TEMP3
24 RTS
```

```
25 .PAGE
26 .SBTTL PLAY - MAINLINE TOP OF WELL
```

```
27 PLAY
```

```
28 JSR MOVCUR          MOVE CURSOR AROUND
29 JSR FIREPC          FIRE PLAYER CHARGE
30 JSR PROSUZ          PROCESS SUPER ZAP
31 JSR MOVNYM          MOVE NYMPHS
32 JSR MOVINV          MOVE INVADERS
33 JSR MOVCHA          MOVE CHARGES
34 JSR FIREIC          FIRE INVADER CHARGE
35 JSR COLLIS          COLLISION DETECT
36 JSR PROEXP          EXPLOSIONS
37 JMP ANALYZ          ANALYZE PLAYER STATUS
```

```
38 .PAGE
39 .SBTTL PLAY - MAINLINE DROP MODE
```

```
40
41          PLAYER IS SHOOTING THRU TUBE TO GET TO NEXT
```

```
42
43 PLDROP
```

```
44 LDA ELICNT          CLEAR WARNING REQUEST
45 AND I,7F
```

```
46 STA ELICNT
47 JSR MOVCUR          MOVE CURSOR AROUND
48 JSR MOVCLUD          MOVE CURSOR DOWN
```

```
49 JSR PROEXP          EXPLOSIONS
50 JSR FIREPC          FIRE PLAYER CHARGES
51 JSR MOVCHA          MOVE CHARGES
```

```
52 LDA CURSL2
53 IFMI          CURSOR DEAD
54 JSR ANALYZ          YES. ANALYZE CURSOR STATUS
```

```
55 ENDIF
56 RTS
```

```
57 .PAGE
58 .SBTTL PLAY - MOVE CURSOR PRELIMINARY CHECK
```

```
59 MOVCUR
```

```
60 LDA CURSL2
```

```
1 IFMI -- CURSOR DEAD
2 RTS YES. DON T MOVE IT
3 ENDIF
4 .SBTTL PLAY - MOVE CURSOR MAINLINE
5 LDX I,0
6 LDA QSTATUS
7 IFPL ATTRACT
8 JSR AUTOCU YES, AUTO MOVEMENT
9 ELSE
10 LDA TBHD NO. MANUAL
11 IFMI MAXIMIZE KNOB READING
12 CMP I,-1F
13 IFCC
14 LDA I,-1F
15 ENDIF
16 ELSE
17 CMP I,1F
18 IFCS
19 LDA I,1F
20 ENDIF
21 ENDIF
22 STX TBHD
23 ENDIF
24 STA TEMP2
25 EOR I,0FF INVERT READING
26 SEC
27 ADC CURSP0 UPDATE CURSOR MASTER POSITION
28 STA TEMP3 NEW CURSP0
29 LDX WELTYP
30 IFNE PLANAR SURFACE
31 CMP I,0F0 YES.
32 IFCS SPLIT CURSOR WRAP
33 LDA I,0EF YES. MOVE AWAY FROM EDGE
34 STA TEMP3
35 ENDIF
36 EOR TEMP2
37 IFMI
38 LDA TEMP3
39 EOR CURSP0
40 IFMI WRAPPED AROUND
41 LDA CURSP0 YES.
42 IFPL OLD POSITION LOW OR HI
43 LDA I,00 LOW END
44 ELSE
45 LDA I,0EF HIGH END
46 ENDIF
47 STA TEMP3 NEW CURSP0
48 ENDIF
49 ENDIF
50 LDA TEMP3 NEW CURSP0
51 LSR
52 LSR
53 LSR
54 STA TEMP1 NEW CURSL1
55 CLC
56 ADC I,1 CCW ADJACENT LINE # FOR CURSOR IS 1 AWAY
```

```
1 AND I,OF
2 STA TEMP2 NEW CURSL2
3 LDA TEMP1
4 CMP CURSL1
5 IFNE NEW POSITION
6 JSR SBOING YES. MAKE SOUND
7 ENDIF
8 LDA TEMP1 UPDATE CURSOR POSITION
9 STA CURSL1
10 LDA TEMP2
11 STA CURSL2
12 LDA TEMP3
13 STA CURSP0
14 RTS
15 .SBTTL PLAY-AUTO MOVE OF CURSOR
16 AUTOCU LDA I,-1
17 STA TEMPO
18 STA TEMP1
19 LDX WINVMX
20 BEGIN LOOP FOR ALL INVADERS
21 LDA X,INVAY
22 IFNE ALIVE
23 CMP TEMPO YES.
24 IFCC HIGHEST
25 STA TEMPO YES.
26 STX TEMP1
27 ENDIF
28 ENDIF
29 DEX
30 MIEND
31 LDX TEMP1
32 IFPL
33 LDA X,INVAL1
34 LDY CURSL1
35 JSR POLDEL HOW FAR BEST DIRECTION
36 TAY
37 IFNE ALREADY THERE
38 IFPL YES. WHICH WAY
39 LDA I,-9
40 ELSE
41 LDA I,9
42 ENDIF
43 ENDIF
44 ENDIF
45 RTS
46
47 .SBTTL PLAY-MOVE CURSOR DOWN
48 MOVCUD LDA CURSL2
49 IFMI
50 RTS
51 ENDIF
52 LDA CURMOD
53 IFPL CURSOR DROPPING
54 RTS NO
55 ENDIF
56 YES.
57 LDA CURSY
58 CMP I,ILINLI
59 IFEQ STILL AT TOP
60 JSR SOUTS2 YES. START RUMBLE
```

```
1  ENDIF
2  LDA CURSYL          UPDATE CURSOR DEPTH
3  CLC
4
5  ADC CURSVL
6  STA CURSYL
7  LDA CURSY
8
9  ADC CURSVH
10 STA CURSY
11 IFCC
12
13 CMP I,ILINDDY
14 ENDIF
15 IFCS          IS CURSOR PAST BOTTOM
16
17 LDA I,CENDWA      YES. INITIALIZE SPACE MODE
18 STA QSTATE
19 JSR SOUTS3        START SPACE SOUND
20
21 LDA I,OFF
22 STA CURSY
23 ENDIF
24
25 LDA CURSY
26 CMP I,50
27 IFCS
28
29 LDA PLAGRO
30 IFEQ
31 JSR INSTAR
32
33 ENDIF
34 ENDIF
35 LDA EYLL          UPDATE EYE POSITION
36 CLC
37 ADC CURSVL
38 STA EYLL
39
40 LDA EYL
41 ADC CURSVH
42 IFCS
43
44 INC EYH
45 ENDIF
46 CMP EYL
47
48 IFNE          EYE POSITION CHANGE
49 INC ROTDIS      YES. REQUEST NEW WELL DISPLAY
50 ENDIF
51
52 STA EYL
53
54          CONSTANT ACCELERATION FOR VELOCITY
55 LDA CURWAV      WAVE ACCELERATION +
56 ASL
57 ASL
58 CMP I,30
59 IFCS          MAX OUT
60 LDA I,30
61 ENDIF
62
63 CLC
64 ADC I,20        BASE ACCELERATION
65 CLC
66
67 ADC CURSVL
68 STA CURSVL
69 LDA CURSVH
70
71 ADC I,0
72 STA CURSVH
73
74          CHECK FOR COLLISION WITH ENEMY LINES
75
76 LDA CURSY
```

```
1  CMP I,ILINDDY
2  IFCC
3  LDX I,NLINES-1          CURSOR STILL ON LINES
4  BEGIN                  LOOP FOR EACH LINE
5  LDA X,LINEY
6  IFNE                  ACTIVE LINE
7  CPX CURSL1            YES.
8  IFEQ                  SAME LINE AS CURSOR
9  CMP CURSY            YES.
10 IFCC                  CURSOR AT ENEMY LINE POSITION
11 JSR PULSTO            TURN OFF THRUST SOUND
12 JSR INPPSQ            YES. START BANG. KILL CURSOR
13 LDA I,0              TURN OFF STARFIELD, EXIT LOOP
14 STA PLAGRO
15 JSR INICHA            CLEAR OUT ALL CHARGES
16 ENDIF
17 ENDIF
18 ENDIF
19 DEX
20 MIEND
21 ENDIF
22 RTS
23 .PAGE
24 .SBTTL PLAY - MOVE NYMPHS
25 MOVNYM
26 LDY I,0
27 STY NEOFLI            CLEAR NEW OFF LIMITS FLAGS
28 LDA INMCOU
29 CLC
30 ADC INCCOU
31 CMP WINVMX
32 IFCS                  INVADER SLOTS BOOKED ALREADY
33 IFNE
34 LDY I,-1              YES.
35 ENDIF
36 ENDIF
37 LDA SUZTIM            AVOID KAMIKAZE
38 IFNE
39 LDY I,-1
40 ENDIF
41 STY TEMPY            ALLOW/DISALLOW UP NYMPH MOVEMENT
42 LDX I,NNYMPH-1
43 BEGIN                  LOOP FOR EACH NYMPH
44 LDA X,NYMPY
45 IFNE                  ACTIVE
46 BIT TEMPY            YES.
47 IFPL                  UP MOVEMENT OK
48 SEC                  YES.
49 SBC I,1
50 STA X,NYMPY
51 IFEQ                  UPDATE NYMPH POSITION. CONVERT
52 JSR CONYMP            YES. MAKE IT AN INVADER
53 ELSE
54 CMP I,3F              NO.
55 IFEQ                  JUST ENTERING ALONE ZONE
56 LDY X,NYMPY
57 LDA NEOFLI
58 ORA NEOFLI
59 AND Y,D7OMSK
60 IFNE                  ALREADY OCCUPIED
```

```
1 INC X,NYMPY YES. BACK OFF
2 ENDIF
3 ENDIF
4 ENDIF
5 ENDIF
6 LDA X,NYMPY
7 CMP I,40
8 IFCS DON T ROTATE PAST A CERTAIN PT.
9 LDA QFRAME OK TO ROTATE
10 AND I,1
11 IFEQ TIME TO ROTATE
12 LDA X,NYMPL YES. ROTATE NYMPH
13 CLC
14 ADC I,1
15 AND I,0F
16 STA X,NYMPL
17 ENDIF
18 ELSE
19 CMP I,20 NO ROTATE.
20 IFCS IN ALONE ZONE
21 LDY X,NYMPL YES.
22 LDA Y,D70MSK MARK LINE OFF LIMITS
23 ORA NEOFLI
24 STA NEOFLI
25 ENDIF
26 ENDIF
27 ENDIF
28 DEX
29 MIEND
30 LDA NEOFLI
31 STA OLOFLI NEW TO OLD OFF LIMITS
32 RTS
33
34 .SBTTL PLAY - CONVERT NYMPH TO INVADER
35
36 CONYMP
37 LDA I,ILINDDY START AT BOTTOM
38 STA TEMPO
39 LDA X,NYMPL START LINE
40 STA TEMP1
41 STX SAVEX
42 JSR NYMCHA NYMPH CHARACTERISTICS
43 LDX SAVEX
44 LDA TEMPO
45 IFNE
46 JSR ACTINV ACTIVATE AN INVADER
47 IFNE SLOT FOUND
48 DEC NYMCOU YES. DECREMENT NYMPH COUNT
49 LDA I,0
50 STA X,NYMPY DEACTIVATE INVADER
51 RTS
52 ENDIF
53 ENDIF
54 LDA I,0FF NO. STOP UP MOVEMENT FLAG
55 STA TEMPY
56 INC X,NYMPY MOVE NYMPH BACK TO OLD POSITION
57 RTS
58 .PAGE
59 .SBTTL PLAY - ACTIVATE INVADER
60 INPUT TEMPO Y POSITION AT WHICH TO START INVADER
```


TEMP2,3 CHARACTERISTICS OF NEW INVADER
TEMP1 CW LINE #
TEMP4 CAM VALUE

OUTPUT IF A SLOT IS FOUND INMCOU INCREMENTED
INVAC1,2 N UPDATED WITH CHARACTERISTICS

INVAL1 CW LINE #
INVAL2 CCW LINE #
INVAY Y POSITION
INVCAM CAM PC
INVACT 0
STATUS FLAGS 0

IF NO SLOT IS FOUND STATUS FLAGS 0
X,Y PRESERVED
SAVEY DESTROYED

ACTINV

STY SAVEY
LDY WINVMX

BEGIN LOOP THRU INVADERS UNTIL SLOT IS FOUND

LDA Y, INVAY
IFEQ

SLOT

LDA TEMPO
STA Y, INVAY
LDA TEMP1

YES.
Y

CMP I, 0F

IFEQ

POTENTIAL PLANAR SPLIT

BIT WELTYP

YES

IFMI

PLANAR

LDA RANDOM
AND I, 0E

YES. NO SPLITS

ENDIF

ENDIF

STA Y, INVAL1

CW LINE

CLC

ADC I, 1

AND I, 0F

STA Y, INVAL2

CCW LINE

LDA I, 0

STA Y, INVACT

TIMER

LDA TEMP3

STA Y, INVAC2

LDA TEMP4

STA Y, INVCAM

INC INMCOU

INVADER COUNT

LDA TEMP2

STA Y, INVAC1

CHARACTERISTICS

LDY SAVEY

AND I, INVABI

STX SAVEY

TAX

INC X, FLIPCO

UPDATE INVADER TYPE COUNTER

LDX SAVEY

RESTORE X

LDA I, 10

SOT FOUND FLAG

RTS

ENDIF

DEY

MIEND

LDY SAVEY

LDA I, 0

SLOT NOT FOUND FLAG

RTS

1	.PAGE		1
2	.SBTTL	PLAY - DETERMINE NYMPH TYPE	2
3	NYMCHA		3
4	LDA I,0		4
5	LDX I,4		5
6	BEGIN		6
7	STA X,OPFLIP	0 ALL OPENING COUNTERS	7
8	DEX		8
9	MIEND		9
10	LDX I,4		10
11	BEGIN	LOOP FOR EACH TYPE-CHECK MAX	11
12	LDA X,WFLMAX		12
13	SEC		13
14	SBC X,FLIPCO		14
15	IFCS	MAX OF TYPE ALREADY	15
16	STA X,OPFLIP	NO SAVE # OPENINGS	16
17	ENDIF		17
18	DEX		18
19	MIEND		19
20			20
21		TAKE AWAY Z OPENINGS OF TYPE FOR EACH TANKER	21
22			22
23	LDY WINVMX		23
24	BEGIN	LOOP FOR EACH INVADER	24
25	LDA Y,INVAY		25
26	IFNE	ALIVE	26
27	LDA Y,INVAC2	YES.	27
28	AND I,INVCAR	CARRIER	28
29	IFNE		29
30	TAX	YES.	30
31	CPX I,ZCARFU		31
32	IFEQ		32
33	LDX I,ZABFUS+1		33
34	ENDIF		34
35	DEC X,OPFLIP-1	2 LESS OPENINGS OF THAT TYPE	35
36	DEC X,OPFLIP-1		36
37	ENDIF		37
38	ENDIF		38
39	DEY		39
40	MIEND		40
41	LDX I,4		41
42	LDA WINVMX		42
43	CLC		43
44	ADC I,1		44
45	BEGIN	LOOP FOR EACH TYPE-CALC TOTAL # OPENINGS	45
46	SEC		46
47	SBC X,FLIPCO		47
48	DEX		48
49	MIEND		49
50	LDX I,4		50
51	BEGIN	LOOP FOR EACH TYPE	51
52	CMP X,OPFLIP		52
53	IFCC	IF TOTAL # OPENINGS TYPE OPENINGS	53
54	STA X,OPFLIP	THEN DECREASE TYPE OPENINGS	54
55	ENDIF		55
56	DEX		56
57	MIEND		57
58	LDX I,4		58
59	LDY I,0		59
60	BEGIN	LOOP FOR EACH TYPE	60

```
1 LDA X,OPFLIP
2 IFNE
3 INY COUNT # TYPES WITH OPENINGS
4 ENDIF
5 DEX
6 MIEND
7 TYA
8 IFNE OPENING
9 DEY YES.
10 IFEQ ONLY 1 TYPE
11 LDX I,4 YES.
12 BEGIN LOOP UNTIL THAT ONE IS FOUND
13 LDA X,OPFLIP
14 IFNE
15 LDA X,WFLMIN YES
16 IFNE LAUNCH OK
17 JSR NEWTYP NO. TRY FOR TYPE
18 IFNE GOT IT
19 RTS YES. EXIT
20 ENDIF NO. KEEP TRYING
21 ENDIF
22 ENDIF
23 DEX
24 MIEND
25 ELSE
26 STY SXL NO.
27 LDX I,4
28 BEGIN LOOP FOR EACH TYPE-CHECK MINS
29 LDA X,OPFLIP
30 IFNE TYPE OPENINGS
31 LDA X,FLIPCO YES.
32 CMP X,WFLMIN
33 IFCC TYPE MIN SATISFIED
34 JSR NEWTYP NO. TRY FOR TYPE
35 IFNE GOT IT
36 RTS YES. EXIT
37 ENDIF NO. KEEP TRYING
38 ENDIF
39 ENDIF
40 DEX
41 MIEND
42 MINS ARE OK.
43 LDA OPSPIN TRY FOR SMART LAUNCH
44 IFNE
45 LDA OPTANK
46 IFNE SLOTS FOR TANKERS SPINNER OPEN
47 LDY TEMP1 YES.
48 LDA Y,LINEY
49 IFEQ LINE DEAD
50 LDA I,OFF YES. REAL SHORT THEN
51 ENDIF
52 LDX I,OPSPIN-OPFLIP SHORT LINE LAUNCH SPINNER
53 CMP I,0CC
54 IFCC LONG ENEMY LINE
55 LDX I,OPTANK-OPFLIP YES LAUNCH TANKER
56 ENDIF
57 JSR NEWTYP NO. TRY FOR TYPE
58 IFNE GOT IT
59 RTS YES. EXIT
60 ENDIF NO. KEEP TRYING
```

```
1  ENDIF
2  ENDIF
3  LDA RANDO2          RANDOM TYPE  ELIM TYPE 0 THO
4
5  AND I,3
6  TAX
7  INX
8
9  LDY I,4             START AT RANDOM SPOT AND
10 BEGIN              LOOP UNTIL NEEDY TYPE FOUND
11 LDA X,WFLMIN
12
13 IFNE                OK FROM BOTTOM  NOT 0
14 LDA X,OPFLIP        NO.
15 IFNE                NEEDY TYPE
16 JSR NEWTYP           YES. TRY LAUNCH
17 IFNE                GOT IT
18 RTS                 YES. EXIT
19
20 ENDIF
21 ENDIF
22 ENDIF
23
24 DEX
25 IFMI
26 LDX I,4             WRAP
27
28 ENDIF
29 DEY
30 MIEND
31
32 ENDIF
33 ENDIF
34 LDA I,0             SIGNAL FAILURE
35 STA TEMPO
36 RTS
37
38 NEWTYP
39
40 TXA
41 NEWTY2 ASL
42 TAY
43
44 LDA Y,NYMTAD+1
45 PHA
46 LDA Y,NYMTAD
47 PHA
48 RTS
49
50 NYMTAD .WORD NEWFLI-1
51 .WORD NEWPUL-1
52 .WORD NEWTAN-1
53
54 .WORD NEWSPI-1
55 .WORD NEWFUS-1
56
57 NEWFLI
58 LDA TNEWI2+ZABFLI
59 STA TEMP3           INVAC2
60 LDA WFLICAM
61
62 LDY I,ZABFLI         FLIPPER  INVAC1
63 BEQ NEWGN3           ALWAYS
64
65 NEWPUL                PULSAR
66 LDA TNEWI2+ZABPUL
67 ORA WPULFI           PULSAR FIRE
68 LDY I,ZABPUL         PULSAR  INVAC1
69 BNE NEWGN2           ALWAYS
70
71 NEWFUS                FUSE
72 LDY I,ZABFUS
73 BNE NEWGEN
74
75 NEWSPI                SPINNER
76 LDY I,ZABTRA
```

```
1  BNE NEWGEN
2  NEWTAN                                TANKER
3  LDA RANDOM
4  AND I,3
5  TAY
6  LDA I,4
7  STA TEMP2
8  STX INDEX3                          SAVE X
9  BEGIN                               LOOP 4 TIMES  FAIL  OR UNTIL OPENING
10
11  DEC TEMP2
12  IFMI                               FAILURE FOR ALL
13  LDX INDEX3                         YES. RESTORE X
14  LDA I,0                           SIGNAL FAILURE
15  RTS
16  ENDIF
17  DEY
18  IFMI                               CYCLE BETWEEN 0+3
19  LDY I,3
20  ENDIF
21  LDX Y,WTACAR                       GET TYPE OF TANKER
22  CPX I,ZCARFU
23  IFEQ
24  LDX I,ZABFUS+1
25  ENDIF
26  LDA X,OPFLIP-1
27  NEEND                              EXIT IF OPENINGS FOR TYPE
28  LDX INDEX3                         RESTORE X
29  LDA Y,WTACAR                       GET TANKER CONTENTS
30  ORA I,ZFIRYE
31  LDY I,ZABTAN
32  BNE NEWGN2
33  NEWGEN
34  LDA Y,TNEWI2
35  NEWGN2 STA TEMP3
36  LDA Y,TNEWCAM
37  NEWGN3 STY TEMP2                    GENERAL
38  STA TEMP4
39  LDA TEMP0                          SUCCESS SIGNAL
40  RTS
41  TNEWCAM .BYTE NOJUMP-CAM,PULSCH-CAM,NOJUMP-CAM
42  TNEWI2 .BYTE TRALUP-CAM,FUSEUP-CAM
43  .BYTE ZCARNO ZFIRYE ZDIRUP
44  .BYTE ZCARNO ZFIRNO ZDIRUP
45  .BYTE ZCARFL ZFIRYE ZDIRUP
46  .BYTE ZCARNO ZFIRYE ZDIRUP
47  .BYTE ZCARNO ZFIRNO ZDIRUP
48  .SBTTL PLAY - DETERMINE SPLIT INVADER CHARACTERISTICS
49  INPUT Y INVADER INDEX
50  TEMP2 INVABI TYPE CODE              TEMPO SPLIT DEPTH
51  SPLCHA STY SAVEY
52  LDA TEMP0
53  CMP I,20
54  LDA TEMP2
55  IFCC                               SPLITTING TOO CLOSE TO PLAYER
56  TAY                               YES. NO FLIPPING
57  JSR NEWGEN
58  ELSE
59  JSR NEWTY2                         NO. ASSIGN NORMAL PARAMETERS
60  ENDIF
```

```
1 LDY SAVEY
2 RTS
3 .PAGE
4 .SBTTL PLAY - MOVE INVADERS MAINLINE
5 MOVINV LDA CURSL2
6 IFPL PLAYER DEAD OR DROPPING
7 YES. EXIT
8
9 LDX WINVMX
10 STX INDEX1
11 BEGIN LOOP FOR EACH INVADER
12 LDX INDEX1
13 LDA X,INVAY
14 IFNE ACTIVE
15 LDA I,1 SET NO EXIT FLAG
16 STA EXICAM
17 LDA X,INVCAM SET UP INVADER S CAM PC
18 STA CAMPC
19 BEGIN LOOP UNTIL EXIT REQUESTED
20 LDA CAMPC
21 TAY GET INTO INTO CAM TABLE
22 LDA Y,CAM GET CAM CODE
23 JSR JSRCAM EXECUTE CAM REQUESTED
24 INC CAMPC AUTO INCREMENT CAM PC
25 LDA EXICAM EXIT REQUESTED
26 EQEND
27 LDA CAMPC UPDATE INVADER S CAM PC
28 STA X,INVCAM
29 ENDIF
30 DEC INDEX1
31 MIEND
32 ENDIF
33 UPDATE PULSE STATUS
34 LDA PULSON
35 CLC
36 ADC PULTIM
37 TAY
38 EOR PULSON
39 STY PULSON
40 IFMI PULSAR STATUS CHANGE
41 TYA YES.
42 IFMI GO OFF
43 JSR PULSTO YES. TURN OFF
44 ELSE
45 LDA FLIPCO+ZABPUL NO. TURN ON IF ACTIVE PULSARS
46 IFNE
47 LDA CURSL2
48 IFPL
49 JSR PULSTR ACTIVE SO TURN ON
50 ENDIF
51 ENDIF
52 ENDIF
53 ENDIF
54 LDA PULSON
55 IFPL BONUCE BETWEEN-27. AND +15.
56 CMP I,15.
57 BCS NEGPUL
58 ELSE
59 CMP I,-63.
60 IFCC
```



```
1 NEGPUL LDA PULTIM          NEGATE INCREMENT
2 EOR I,OFF
3 CLC
4 ADC I,1
5 STA PULTIM
6 ENDIF
7 ENDIF
8 RTS
9
10
11 .SBTTL  PLAY - INVADERS - CAM DISPATCHER
12
13 JSRCAM TAY          JSR INDIRECT TO CAM ROUTINE
14 LDA Y,TABJSR+1
15 PHA
16 LDA Y,TABJSR
17 PHA
18 RTS
19
20 .SBTTL  CAM TABLE MACROS
21 .MACRO CAMAC ...X,...Y,...W
22 .WORD ...X-1
23 .MACRO ...Y
24 .BYTE ...W
25 .ENDM
26
27 .MACRO CAMA2I ...X,...Y,...W
28 .WORD ...X-1
29 .MACRO ...Y,...Z
30 .BYTE ...W
31 .BYTE ...Z
32 .ENDM
33 .ENDM
34
35 .MACRO CAMA2F ...X,...Y,...W
36 .WORD ...X-1
37 .MACRO ...Y,...Z
38 .BYTE ...W
39 .BYTE ...Z-CAM-1
40 .ENDM
41 .ENDM
42 .MACRO TEST1 X
43 .BYTE X
44 .ENDM
45 .SBTTL  CAM TABLE SUBROUTINE POINTERS
46
47 TABJSR
48 CAMAC JEXIT,VEXIT,0
49 CAMA2I JSLOOP,VSLOOP,2
50 CAMAC JSKIP0,VSKIP0,4
51 CAMA2F JSETPC,VSETPC,6
52 CAMA2F JELOOP,VELOOP,8
53 CAMAC JNOOP,VNOOP,0A
54 CAMAC JSMOVE,VSMOVE,0C
55 CAMAC JSTRAI,VSTRAI,0E
56 CAMA2I JSLOPB,VSLOPB,10
57 CAMAC JJUMPS,VJUMPS,12
58 CAMAC JJUMPM,VJUMPM,14
59 CAMAC JCHROT,VCHROT,16
60 CAMAC JKITST,VKITST,18
```

```
1  CAMA2F JBR0PC,VBR0PC,1A
2  CAMAC JELTST,VELTST,1C
3  CAMAC JFUSEUP,VSFUSE,1E
4  CAMAC JFUSKI,VFUSKI,20
5  CAMAC JPULMO,VSPUMO,22
6  CAMAC JCHPLA,VCHPLA,24
7  CAMAC JCHKPU,VCHKPU,26
8  TABJSE
9      .PAGE
10     .SBTTL  PLAY - INVADERS - CAM SUBROUTINES
11
12         EXIT CAM
13
14  JEXIT
15      LDA I,0                EXIT CAM FLAG
16      STA EXICAM
17  JNOOP  RTS
18
19         SET CAM LOOP COUNTER
20
21  JSLOOP  INC CAMPC
22          LDY CAMPC
23          LDA Y,CAM
24          STA X,INVLOO      NEW LOOP VALUE
25          RTS
26  JSLOPB  SAME AS JSLOOP EXCEPT OPERAND BP ADDRESS OF PARAMETER
27          INC CAMPC
28          LDY CAMPC
29          LDA Y,CAM
30          TAY                BP LOC OF VALUE
31          LDA Y,0            NEW LOOP VALUE
32          STA X,INVLOO
33          RTS
34
35         SKIP NEXT CAM LINE IF CAMSTA 0
36         DOUBLE BYTE
37  JSKIP0  LDA CAMSTA
38          IFEQ
39          INC CAMPC
40          INC CAMPC
41          ENDIF
42          RTS
43
44         BRANCH IF CAMSTA 0
45
46  JBR0PC  INC CAMPC
47          LDA CAMSTA
48          IFEQ                BRANCH
49          LDY CAMPC          YES. SET NEW PC
50          LDA Y,CAM
51          STA CAMPC
52          ENDIF
53          RTS
54
55         DEC LOOP VALUE
56         IF 0 THEN EXIT
57         ELSE RELOOP
58  JELOOP
59      DEC X,INVLOO
60      IFEQ
```

```
1  INC CAMPC                EXIT LOOP
2  ELSE
3  JSETPC  LDY CAMPC        NEW CAM PC
4          LDA Y,CAM+1      RELOOP
5          STA CAMPC
6          ENDIF
7          RTS
8  JELTST
9          LDY X,INVAL1
10         LDA Y,LINEY
11         IFEQ
12         LDA I,OFF        WORST CASE LINE  DEAD
13         ENDIF
14         CMP X,INVAY
15         IFCC              ENEMY ON AN ENEMY LINE
16         LDA I,0          YES.
17         ELSE
18         LDA I,1          NO.
19         ENDIF
20         STA CAMSTA
21         RTS
22
23         .SBTTL  PLAY - INVADERS - CAM ROUTINES
24 JCHKPU          CHECK FOR PULSING NOW OR IN NEXT 4 FRAMES
25         LDA PULTIM
26         ASL
27         ASL
28         CLC
29         ADC PULSON
30         AND PULSON
31         AND I,80
32         EOR I,80
33         STA CAMSTA      EXIT  0 NO PULSE  80 PULSE
34         RTS
35
36         CHANGE DIRECTION OF JUMP
37 JCHROT
38         LDA X,INVAC1
39         EOR I,INVROT
40         STA X,INVAC1
41         RTS
42
43         .SBTTL  PLAY - MOVE INVADERS  MOVE 1 UP
44 INPUT          X INVADER INDEX
45
46 JSMOVE
47         LDA X,INVAC1
48         AND I,INVABI
49         TAY              INVADER TYPE
50         LDA X,INVAC2
51         IFPL              GOING UP
52 JSMOVU  LDA X,INVAYL      YES.
53         CLC
54         ADC Y,WINVIL
55         STA X,INVAYL      MOVE UP
56         LDA X,INVAY
57         ADC Y,WINVIN
58         STA X,INVAY
59         CMP CURSY
60         BEQ ATOP
```

1		IFCC	AT TOP	1
2	ATOP	JSR CHASER	YES. CONVERT TO CHASER	2
3		ELSE		3
4		CMP I,20	NO	4
5		IFCC	TOO CLOSE TO TOP FOR CARRIER	5
6		LDA X,INVAC2	YES.	6
7		AND I,INVCAR	CARRIER	7
8		IFNE		8
9		TXA	YES.	9
10		PHA	SAVE X	10
11		TAY		11
12		JSR KILINV	SPLIT CARRIER	12
13		PLA		13
14		TAX	RESTORE X	14
15		ENDIF		15
16		ENDIF		16
17		ENDIF		17
18		ELSE		18
19	JSMOVD	LDA X,INVAYL	DOWN	19
20		SEC		20
21		SBC Y,WINVIL		21
22		STA X,INVAYL		22
23		LDA X,INVAY		23
24		SBC Y,WINVIN		24
25		STA X,INVAY		25
26		CMP I,ILINDDY		26
27		IFCS	AT BOTTOM	27
28		LDA I,OF2		28
29		STA X,INVAY	YES.	29
30		ENDIF		30
31		ENDIF		31
32		RTS		32
33		.PAGE		33
34		.SBTTL PLAY - INVADERS	PULSE MOVE	34
35	JPULMO	LDY I,ZABPUL		35
36		LDA X,INVAC2		36
37		IFPL	GOING UP	37
38		LDA X,INVAY	YES.	38
39		CMP PULPOT		39
40		IFCS	IN POWER ZONE	40
41		LDY I,ZABFLI	NO. GO FASTER	41
42		ENDIF		42
43		JSR JSMOVU	MOVE UP	43
44		ELSE		44
45		JSR JSMOVD	MOVE DOWN RETURN WITH ACC Y POS	45
46		LDY NYMCOU		46
47		IFEQ	NYMPHS GONE	47
48		LDA I,OFF	SEND PULSAR UP	48
49		ENDIF		49
50		CMP PULPOT		50
51		IFCS	TIME TO REVERSE	51
52		LDA X,INVAC2	YES	52
53		EOR I,INVDIR		53
54		STA X,INVAC2		54
55		ENDIF		55
56		ENDIF		56
57		LDA PULSON	YES. SEE IF CURSOR GOT ZAPPED	57
58		IFPL	PULSAR ON	58
59		LDA X,INVAY	YES.	59
60		CMP PULPOT		60

```
1 IFCC PULSAR IN RANGE
2 LDA CURSL1 YES
3 CMP X,INVAL1
4 IFEQ
5 LDA CURSL2
6 CMP X,INVAL2
7 IFEQ ON CURSOR LINES
8 JSR INPPSQ YES. KILL CURSOR
9 ENDIF
10 ENDIF
11 ENDIF
12 ENDIF
13 RTS
14 CHKSM3 .BYTE QCHKS3
15 .PAGE
16 .SBTTL PLAY - INVADERS CONVERT TO CHASER
17 INPUT X INVADER INDEX
18
19 CHASER
20 LDA CURSY PLACE EXACTLY AT TOP
21 STA X,INVAY
22 LDA X,INVAC1
23 AND I,INVABI
24 CMP I,ZABPUL
25 IFEQ PULSAR
26 LDA NYMCOU YES.
27 IFNE ANY MORE NYMPHS
28 LDA X,INVAC2 YES. SEND IT DOWN
29 EOR I,INVDIR
30 STA X,INVAC2
31 RTS EXIT
32 ENDIF
33 ENDIF
34 LDA X,INVAC1
35 IFMI STILL FLIPPING 2
36 INC X,INVAY YES. FINISH FLIP
37 RTS BEFORE AT TOP STATUS
38 ENDIF
39 DEC INMCOU -1 TO # WALL INVADERS
40 LDA INCCOU
41 CMP I,1
42 IFNE OTHER THAN 1 CHASER
43 JSR JCHPLA YES. SEND CHASER SHORTEST WAY
44 ELSE
45 NO. 1 OTHER CHASER, SO SEND
46 LDY I,NINVAD-1 THIS GUY IN OPPOSITE DIRECTION
47 BEGIN LOOP UNTIL OTHER CHASER IS FOUND
48 LDA Y,INVAY
49 IFNE
50 STY INDEX2
51 CPX INDEX2
52 IFNE MAKE SURE IT S NOT NEW CHASER
53 LDA Y,INVAY
54 CMP CURSY
55 BEQ GOTCHA EXIT LOOP IF FOUND
56 ENDIF
57 ENDIF
58 DEY
59 MIEND
60 GOTCHA LDA Y,INVAC1
```

1	AND I, INVROT	GET OTHER CHASER S DIRECTION	1
2	EOR I, INVROT	USE ITS OPPOSITS	2
3		SET CHASE DIRECTION	3
4	STA X, INVAC1		4
5	ENDIF		5
6	LDA I, TOPPER-CAM-1		6
7	STA CAMPC	SET CHASER CAM	7
8	INC INCCOU	+1 TO CHASER COUNT	8
9	RTS		9
10	.SBTTL		10
11	JCHPLA		11
12	LDA X, INVAL1	SEND CHASER SHORTEST WAY	12
13	TAY		13
14	LDA CURSL1		14
15	JSR POLDEL	DETERMINE POLAR DELTA TO CURSOR	15
16	ASL		16
17	LDA X, INVAC1		17
18	IFCC	SET CHASE DIRECTION SHORTEST WAY	18
19	ORA I, INVROT	CCW	19
20	ELSE		20
21	AND I, CINVROT	CW	21
22	ENDIF		22
23	STA X, INVAC1		23
24	RTS		24
25	.PAGE		25
26	.SBTTL PLAY - MOVE INVADERS PROCESS JUMP		26
27	JJUMPM		27
28			28
29		UPDATE JUMP ANGLE	29
30			30
31	LDY X, INVAL2		31
32	LDA X, INVAC1		32
33	AND I, INVROT		33
34	IFEQ	MOVING	34
35	INY	CW JUMP ROTATION CCW	35
36	ELSE		36
37	DEY	CCW JUMP ROTATION CW	37
38	ENDIF		38
39	TYA	NEW JUMP ANGLE	39
40	AND I, 0F	MOD 16	40
41	ORA I, 80	JUMP CODE	41
42	STA X, INVAL2	UPDATED JUMP ANGLE	42
43	LDA X, INVAC1		43
44	AND I, INVABI		44
45	CMP I, ZABFUS	FUSE AT A JUNCTION IFEQ	45
46	IFEQ		46
47	LDA X, INVAL2	MAYBE.	47
48	AND I, 7		48
49	IFEQ	AT A JUNCTION	49
50	LDA X, INVAL2	YES	50
51	AND I, 8		51
52	IFNE	MOVING CCW	52
53	LDA X, INVAL1	YES. ADJUST BASE	53
54	CLC		54
55	ADC I, 1		55
56	AND I, 0F		56
57	STA X, INVAL1		57
58	ENDIF		58
59	LDA X, INVAC1	YES	59
60	AND I, CINVMOT		60


```
1 STA X,INVAC1          SET STATUS BACK TO LINE
2 LDA I,020
3 STA X,INVAL2          MAKE IT INVINCIBLE
4 LDA X,INVAC2
5 EOR I,INVDIR
6 STA X,INVAC2          REVERSE UP DOWN DIRECTION
7 LDA NYMCOU
8 IFEQ                  NYMPHS GONE
9 LDA X,INVAY           YES
10 CMP CURSY
11 IFEQ                  AT TOP
12 JSR FUCHPL           YES. STAY THERE   CHASE PLAYER
13 ELSE
14 LDA X,INVAC2          NO. SEND UP.
15 AND I,INVDIR
16 STA X,INVAC2
17 ENDIF
18 ENDIF
19 ENDIF
20 ELSE
21                      CALCULATE FINAL JUMP ANGLE
22 LDY X,INVAL1
23 LDA X,INVAC1
24 EOR I,INVROT          BACKWARDS
25 JSR CALSAN
26 CMP X,INVAL2
27 IFEQ                  FINAL JUMP ANGLE UPDATED ANGLE
28 LDA X,INVAC1          YES
29 AND I,C INVMOT
30 STA X,INVAC1          SET STATUS BACK TO MOVER
31 AND I,INVROT
32 IFEQ                  NEW LINE IN WHICH DIRECTION
33 LDA X,INVAL1          CW
34 STA X,INVAL2
35 SEC
36 SBC I,1
37 AND I,0F
38 STA X,INVAL1
39 ELSE
40 LDA X,INVAL1          CCW
41 CLC
42 ADC I,1
43 AND I,0F
44 STA X,INVAL2
45 ENDIF
46 ENDIF
47 ENDIF
48 LDA X,INVAC1
49 AND I,INVMOT          RETURN WITH STATUS 0 JUMP DONE
50 STA CAMSTA           SET CAM STATUS
51 RTS
52 .PAGE
53 .SBTTL PLAY - MOVE INVADERS   CHASE PLAYER
54
55 JKITST
56 LDA X,INVAC1
57 IFPL                  MOVING NOT JUMPING
58 LDA X,INVAL1          YES
59 CMP CURSL1
60 IFEQ                  IS ANY INVADER LEG ON SAME LINE
```

```
1 LDA X,INVAL2 AS ANY CURSOR LEG
2 CMP CURSL2
3 IFEQ
4 JSR INIPSQ YES. DESTROY CURSOR
5 ENDIF
6 ENDIF
7 ENDIF
8 RTS
9 JFUSKI LDA X,INVAY CHECK FOR FUSE KILL CURSOR
10 CMP CURSY
11 IFEQ SAME HEIGHT
12 LDA X,INVAL1 YES.
13 CMP CURSL1
14 IFEQ SAME LINE
15 JSR INFPSQ YES. DEAD CURSOR NOW
16 ENDIF
17 ENDIF
18 RTS
19
20 .SBTTL PLAY - MOVE INVADERS START A JUMP
21 INPUT INVACO X BIT IJDIRE
22 ACC BIT IJDIRE JUMP DIRECTION JUMPSD ENTRY ONLY
23 OUTPUT INVACO X BIT IMOVER
24 INVAL1 X SET TO BASE LEG
25 INVAL2 X SET TO JUMP SEQ START
26
27 JJUMPS
28 JSR OKTOJM VERIFY JUMP DIRECTION
29 JUMPSD
30 LDA X,INVAC1
31 ORA I,ZMOTJM
32 STA X,INVAC1 SET JUMPS STATUS
33 AND I,INVABI
34 CMP I,ZABFUS
35 IFEQ FUSE
36 LDA X,INVAC1 YES.
37 AND I,INVROT
38 IFEQ WHICH WAY
39 LDA I,81 CCW
40 ELSE
41 LDA X,INVAL1 CW
42 SEC
43 SBC I,1
44 AND I,0F
45 STA X,INVAL1
46 LDA I,87
47 ENDIF
48 STA X,INVAL2
49 ELSE
50 LDA X,INVAC1 NO
51 AND I,INVROT
52 IFNE MOVING CCW
53 LDA X,INVAL1 YES. ADJUST BASE LEG
54 CLC
55 ADC I,1
56 AND I,0F
57 STA X,INVAL1
58 ENDIF
59 LDA X,INVAC1 NO.
60 LDY X,INVAL1
```

1	JSR CALSAN	CALC. STARTING ANGLE	1
2	STA X,INVAL2		2
3	ENDIF		3
4	RTS		4
5	OKTOJM LDA WELTYP		5
6	IFNE	PLANAR SURFACE	6
7	LDA X,INVAC1	YES	7
8	AND I,INVROT		8
9	IFNE	MOVING CCW	9
10	LDA X,INVAL1	CCW	10
11	CMP I,0E		11
12	IFCS	AT RIGHT EDGE	12
13	LDA X,INVAC1	YES CHANGE TO CW JUMP	13
14	AND I, CINVROT		14
15	STA X,INVAC1		15
16	ENDIF		16
17	ELSE		17
18	LDA X,INVAL1	CW	18
19	IFEQ	AT LEFT EDGE	19
20	LDA X,INVAC1	YES CHANGE TO CCW JUMPS	20
21	ORA I,INVROT		21
22	STA X,INVAC1		22
23	ENDIF		23
24	ENDIF		24
25	ENDIF		25
26	RTS		26
27			27
28	CALSAN	CALCULATE STARTING JUMP ANGLE	28
29			29
30		BASE LEG IN Y	30
31	AND I,INVROT		31
32	IFNE	MOVING CCW	32
33	DEY	YES.	33
34	TYA		34
35	AND I,0F		35
36	TAY		36
37	LDA Y,LINANG		37
38	CLC	YES. ADJUST ANGLE FOR BASE LEG ON	38
39	ADC I,8	RIGHT SIDE	39
40	AND I,0F	MOD 16	40
41	ELSE		41
42	LDA Y,LINANG	CW	42
43	ENDIF		43
44	ORA I,80	JUMP CODE	44
45	RTS		45
46	.PAGE		46
47	.SBTTL PLAY-INVADER FUSE UP/DOWN MOTION		47
48			48
49	JFUSEUP LDY I,ZABFUS		49
50	LDA X,INVAC2		50
51	IFPL	UP OR DOWN	51
52	LDA X,INVAYL	UP.	52
53	CLC		53
54	ADC WFUSIL		54
55	STA X,INVAYL		55
56	LDA X,INVAY		56
57	ADC WFUSIH		57
58	STA X,INVAY		58
59	CMP CURSY		59
60	IFCC	AT TOP	60

```
1 LDA CURSY YES
2 STA X,INVAY
3 ELSE
4 LDY NYMCOU NO
5 IFNE NYMPHS LEFT
6 LDY CURWAV YES.
7 CPY I,17.
8 IFCC EARLY WAVE
9 CMP I,20 YES. TURN BACK BEFORE TOP
10 ENDIF
11 ELSE
12 RTS NONE LEFT. HEAD FOR TOP
13 ENDIF
14 ENDIF
15 IFCC TOO HIGH
16 LDA WFUSCH YES.
17 IFMI CHASE PLAYER AT TOP
18 JSR FUCHPL YES. CHASE
19 ELSE
20 JSR LEFRIT NO. RANDOM
21 ENDIF
22 ELSE
23 JSR MAYBLR NO. MAYBE GO LEFT OR RIGHT ANYWAY
24 ENDIF
25 ELSE
26 JSR JSMOVD MOVE DOWN
27 CMP I,080
28 IFCS AT BOTTOM OF RANGE
29 BIT WFUSCH YES.
30 IFVS CHASE PLAYER ON TUBE
31 JSR FUCHPL YES. CHASE
32 ELSE
33 JSR LEFRIT NO. RANDOM
34 ENDIF
35 ELSE
36 JSR MAYBLR NO. MAYBE GO LEFT OR RIGHT
37 ENDIF
38 ENDIF
39 RTS
40 .SBTTL INVADER FUSE JUMP DECISION
41
42 MAYBLR
43 LDA X,INVAY
44 AND I,20
45 IFNE
46 LDA RANDO2
47 CMP WFUFRQ
48 IFCS
49 BIT WFUSCH
50 IFVS CHASE PLAYERS ON TUBE
51 TXA YES. ONLY IF INDEX IS EVEN
52 LSR
53 BCC LEFRIT
54 JSR FUCHPL YES. CHASE
55 ELSE
56 JSR LEFRIT NO. RANDOM
57 ENDIF
58 ENDIF
59 ENDIF
60 RTS
```

```
1 .SBTTL INVADER FUSE LEFT/RIGHT VECTOR
2 FUCHPL JSR JCHPLA CHASE PLAYER
3 JSR JCHROT REVERSE DIRECTION FUSE IS BACKWARDS
4 JMP GOTJUM
```

```
5 LEFRIT
6 LDA X,INVAC1 RANDOMLY CHOOSE LEFT OR RIGHT
7 AND I,CINVROT
8 BIT RANDOM
9 IFVS
```

```
10 ORA I,INVROT
11 ENDIF
12 STA X,INVAC1
```

```
13 GOTJUM LDA WELTYP
14 IFNE PLANAR SURFACE
15 LDA X,INVAC1 YES.
```

```
16 AND I,INVROT
17 IFEQ GOING CCW
18 LDA X,INVAL1 YES.
```

```
19 CMP I,OF
20 BCS REVFLP AT RIGHT EDGE
21 ELSE NO.
```

```
22 LDA X,INVAL1 NO. GOING CW
23 IFEQ AT LEFT EDGE
24 REVFLP LDA X,INVAC1 YES. GO BACK
```

```
25 EOR I,INVROT
26 STA X,INVAC1
27 ENDIF
```

```
28 ENDIF
29 ENDIF
```

```
30 LDA I,FUSELR-CAM
31 STA CAMPC PT TO LEFT RIGHT FUSE CAM
32 JMP JUMPSD GO START JUMP
```

```
33 .PAGE
```

```
34 .SBTTL PLAY - INVADERS -TRAILER
```

```
37 SPECIAL TRAILER PROCESSING
```

```
39 JSTRAI
```

```
40 LDA I,1
41 STA CAMSTA
42 LDY X,INVAL1
43 LDA Y,LINEY
44 IFEQ LINE VACANT
45 LDA I,ILINDDY+1 YES. START LOW. 2
```

```
46 STA Y,LINEY
47 ENDIF
```

```
48 LDA X,INVAY
49 CMP Y,LINEY
50 IFCC NEW ENEMY LINE
51 STA Y,LINEY YES.
```

```
52 LDA I,80
53 STA Y,LINSTA REQUEST RECALC.
54 NO DESTRUCTION PICS
```

```
55 ENDIF
```

```
56 LDA X,INVAY
57 CMP I,20
```

```
58 IFCC MAX HEIGHT
59 LDA X,INVAC2 YES.
60 ORA I,ZDIRDO SEND IT DOWN
```

```
1 STA X,INVAC2
2 LDA I,20 MAX HEIGHT
3 STA X,INVAY
4 ELSE
5 CMP I,0F2 NO.
6 IFCS MIN HEIGHT
7 JSR ASTRAL YES. REASSIGN, REVERSE
8 LDA I,0F0 DON T LET IT GET TO LOW
9 STA X,INVAY
10 LDA NYMCOU ANY NYMPHS, OR NON SPIKER TYPE CLIMBERS
11 IFEQ
12 LDA X,INVAC2
13 AND I, C INVCAR CONVERT IT TO TANKER
14 ORA I,ZCARFL CARRYING FLIPPERS
15 STA X,INVAC2
16 LDA X,INVAC1 LOOKS LIKE TANKER TOO
17 AND I, C INVABI
18 ORA I,ZABTAN
19 STA X,INVAC1
20 LDA I,0 SET ZERO STATUS CONVERTED TOO CARRIER
21 STA CAMSTA
22 ENDIF
23 ENDIF
24 ENDIF
25 RTS
26 ASTRAL
27 LDA I,0
28 STA TEMP4
29 LDA I,NLINES-1 LOOP LINE COUNTER
30 STA OPSPIN
31
32 LDA RANDO2 START AT A RANDOM LINE
33 AND I,0F
34 TAY
35 BEGIN LOOP FOR EACH LINE
36 CPY I,0F
37 IFEQ
38 LDA WELTYP
39 BNE SKIPIT SKIP LINE IF PLANAR FAR RIGHT EDGE
40 ENDIF
41 LDA Y,LINEY
42 IFEQ DEAD LINE
43 LDA I,0FF YES. WORST CASE
44 ENDIF
45 CMP TEMP4
46 IFCS NEEDIEST LINE SO FAR
47 STA TEMP4 YES. CONDITION
48 STY TEMPO LINE #
49 ENDIF
50 SKIPIT DEY
51 IFMI
52 LDY I,NLINES-1
53 ENDIF
54 DEC OPSPIN
55 MIEND
56 LDA TEMPO REASSIGN TO NEW LINE
57 STA X,INVAL1
58 CLC
59 ADC I,1
60 AND I,0F
```



```
1 STA X,INVAL2
2 LDA X,INVAC2          SEND BACK UP
3 AND I, C INVDIR
4 STA X,INVAC2
5 RTS
6
7 .SBTTL PLAY - KILL INVADER
8 INPUT Y INVADER TO BE SPLIT
9 OUTPUT ORIGINAL KILLED OFF
10 UP TO 2 NEW ONES CREATED
11 X IS PRESERVED
12
13 KILINV
14 LDA Y,INVAY          SAVE Y
15 STA TEMPO
16 CMP CURSY
17 IFEQ                DECREMENT COUNTER
18 LDA Y,INVAC1
19 AND I,INVABI
20 CMP I,ZABFUS
21 BEQ MOVER           FUSE BRANCH IF FUSE OR CHASE
22 DEC INCCOU          CHASER
23 ELSE
24 MOVER DEC INMCOU     MOVER
25 ENDIF
26 LDA I,0             DEACTIVATE ENEMY
27 STA Y,INVAY
28 LDA Y,INVAC1
29 AND I,INVABI
30 STX SAVEX
31 TAX
32 DEC X,FLIPCO         UPDATE TYPE COUNTER
33 LDX SAVEX
34 LDA Y,INVAC2
35 AND I,INVCAR
36 IFNE                SPLIT TYPE INVADER
37 SEC                 YES
38 SBC I,1
39 CMP I,ZABTAN
40 IFEQ                TANKER
41 LDA I,ZABFUS        YES. REALLY FUSE
42 ENDIF
43 STA TEMP2           RESULTANT MUTATION
44 LDA Y,INVAL1        YES.
45 SEC
46 SBC I,1
47 AND I,0F
48 CMP I,0F            DON T ALLOW WRAPAROUND ON PLANE
49 IFCS
50 BIT WELTYP
51 IFMI
52 LDA I,0
53 ENDIF
54 ENDIF
55 STA TEMP1           LINE # CW
56 Y
57 JSR SPLCHA          CHARACTERISTICS
58 LDA TEMP4           JUST IN CASE THE DEAD
59 STA CAMPC           SLOT GETS USED
60 DEC CAMPC
```

1	LDA I,0	SET EXIT FLAG	1
2	STA EXICAM		2
3	JSR ACTINV	ACTIVATE AN INVADER	3
4	IFNE	ANY SLOTS	4
5	LDA TEMP1	YES	5
6	CLC		6
7	ADC I,2		7
8	AND I,0F		8
9	CMP I,0F		9
10	IFEQ	DON T ALLOW WRAP AROUND ON PLANE	10
11	BIT WELTYP		11
12	IFMI		12
13	LDA I,0E		13
14	ENDIF		14
15	ENDIF		15
16	STA TEMP1	LINE #CCW	16
17	LDA TEMP2		17
18	ORA I,ZROCCW		18
19	STA TEMP2		19
20	JSR ACTINV	ACTIVATE ANOTHER INVADER	20
21	ENDIF		21
22	ENDIF		22
23	RTS		23
24	.PAGE		24
25	.SBTTL PLAY - INVADER CAM TABLES		25
26			26
27	CAM		27
28			28
29		TRAILER MOVING UP	29
30			30
31	TRALUP		31
32	VSMOVE	MOVE UP	32
33	VSTRAI	PROCESS TRALER	33
34	VBROPC NOJUMP	CONVERT TO CARRIER	34
35	VEXIT	EXIT	35
36	VSETPC TRALUP	RELOOP	36
37			37
38		MOVING UP NO JUMPS	38
39			39
40	NOJUMP		40
41	VSMOVE	MOVE UP	41
42	VEXIT		42
43	VSETPC NOJUMP	RELOOP	43
44			44
45		MOVE 3 TIMES, THEN JUMP	45
46	MOVJMP		46
47	VSLOOP 8		47
48	MJLOP1 VSMOVE	MOVE UP N FRAMES	48
49	VEXIT		49
50	VELOOP MJLOP1		50
51	VJUMPS	START JUMP	51
52	MJLOP5 VEXIT		52
53	VJUMPM	PROCESS JUMP	53
54	VSKIP0	SKIP IF JUMP IS DONE	54
55	VSETPC MJLOP5		55
56	VSETPC MOVJMP	JUMP IS DONE. RESTART SEQUENCE	56
57			57
58		SMOOTH UPWARD SPIRAL	58
59			59
60	SPIRAL		60

1		VSMOVE			1
2		VEXIT			2
3		VJUMPS	START JUMP		3
4	SPILOP	VEXIT			4
5		VJUMPM	PROCESS JUMP		5
6		VSMOVE	MOVE UP		6
7		VSKIP0			7
8		VSETPC SPILOP			8
9		VSETPC SPIRAL	RESTART JUMP WHEN FINISHED		9
10					10
11			CHANGE JUMP DIRECTION EVERY N JUMPS		11
12					12
13	SPIRCH				13
14		VSMOVE			14
15		VEXIT			15
16		VSLOOP 2	LOOP FOR N JUMPS		16
17	SPRLP1	VJUMPS	START JUMP		17
18	SPRLP2	VEXIT			18
19		VJUMPM	CONTINUE JUMP		19
20		VSMOVE	MOVE UP		20
21		VSKIP0	JUMP DONE		21
22		VSETPC SPRLP2	NO. CONTINUE JUMP		22
23		VEXIT			23
24		VELOOP SPRLP1	YES. NEW JUMP OR EXIT		24
25		VCHROT	CHANGE JUMP DIRECTION		25
26		VSLOOP 3	LOOP FOR N JUMPS		26
27	SPRLP3	VJUMPS	START JUMP		27
28	SPRLP4	VEXIT			28
29		VJUMPM	CONTINUE JUMP		29
30		VSMOVE	MOVE UP		30
31		VSKIP0	JUMP DONE		31
32		VSETPC SPRLP4	NO. CONT JUMP		32
33		VEXIT			33
34		VELOOP SPRLP3	YES. NEW JUMP OR EXIT		34
35		VCHROT			35
36		VSETPC SPIRCH	START OVER		36
37					37
38			CHASE PLAYER AROUND TOP		38
39					39
40	TOPPER				40
41		VSLOOP 4	WAIT IN CROUCH FOR N FRAMES		41
42					42
43	KICHEK	VKITST	TEST FOR CURSOR KILL		43
44		VEXIT			44
45		VELOOP KICHEK			45
46		VJUMPS	START A JUMP		46
47					47
48	KJULP1	VEXIT			48
49		VSLOPB WTTFRA			49
50	KJULP2	VJUMPM	DOUBLE SPEED JUMP		50
51		VBROPC TOPPER	SKIP IF JUMP IS DONE		51
52		VELOOP KJULP2			52
53		VSETPC KJULP1			53
54			ENEMY FLIPS MOVES ON OPEN LINES, MOVES ON ENEMY		54
55	COWJM2	VEXIT			55
56	COWJMP	VSMOVE	MOVE ENEMY		56
57		VELTST	ON AN ENEMY LINE		57
58		VBROPC COWJM2	YES. CONTINUE UP ON LINE		58
59		VJUMPS	NO. START A JUMP		59
60		VEXIT			60

1		VSMOVE	MOVE UP	1
2	COWJM3	VJUMPM	PROCESS JUMP	2
3		VBROPC COWJM2	JUMP DONE	3
4		VEXIT		4
5		VSETPC COWJM3	CONTINUE JUMP	5
6				6
7			PULSAR	7
8				8
9				9
10			FUSE UP/DOWN	10
11	FUSEUP			11
12		VSFUSE	PROCESS FUSE	12
13		VFUSKI	FUSE KILL CURSOR	13
14		VEXIT	EXIT	14
15		VSETPC FUSEUP	RELOOP	15
16				16
17	FUSELR	VEXIT	FUSE LEFT/RIGHT	17
18		VSLOOP 3	SLOWL	18
19	FUSLOP	VFUSKI	CURSOR KILLED	19
20		VEXIT		20
21		VELOOP FUSLOP		21
22		VJUMPM	LEFT/RIGHT	22
23		VBROPC FUSEUP	JUMP DONE	23
24		VSETPC FUSELR	NO. CONTINUE JUMP	24
25				25
26	PULSCH			26
27	PULSCP		PULSAR CHASER PLAYER	27
28		VSLOPB PUCHDE		28
29	PULSC1	VSPUMO	MOVE 1/8 OF TUBE BEFORE NEXT FLIP	29
30		VEXIT		30
31		VELOOP PULSC1		31
32	PULSC2	VCHKPU	PULSING	32
33		VBROPC PULSC3	BRANCH IF NOT	33
34		VSPUMO	PULSING, SO KEEP MOVING	34
35		VEXIT		35
36		VSETPC PULSC2	RECHECK FOR PULSE	36
37	PULSC3	VCHPLA	SET FLIP DIRECTION TOWARD PLAYER	37
38		VJUMPS	START FLIP	38
39	PULSCJ	VEXIT		39
40		VJUMPM	CONTINUE FLIP	40
41		VBROPC PULSCP	DONE	41
42		VSETPC PULSCJ	NO	42
43				43
44			AVOIDANCE FLIPPER	44
45				45
46	AVOIDR			46
47		VCHPLA	SET DIRECTION TOWARD PLAYER	47
48		VCHROT	REVERSE IT	48
49		VJUMPS		49
50	AVOID1	VEXIT	FLIP PROCESSING LOOP	50
51		VSMOVE		51
52		VJUMPM		52
53		VSKIP0		53
54		VSETPC AVOID1		54
55		VSLOOP 4.		55
56	AVOID2	VEXIT	FLIP DONE. MOVE UP LOOP	56
57		VSMOVE		57
58		VELOOP AVOID2		58
59		VSETPC AVOIDR		59
60				60

```
1 .SBTTL PLAY - MOVE CHARGES
2 MOVCHA
3     LDX I,NPCHAR+NICHAR-1
4     STX INDEX1
5     BEGIN                                LOOP FOR EACH CHARGE
6     LDX INDEX1
7     LDA X,CHARY
8     IFNE                                CHARGE ACTIVE
9     CPX I,NPCHAR
10    IFCC                                DETERMINE DIRECTION
11                                         TOWARD INVADER
12    ADC I,PCVELO
13    LDY X,CHARCO
14    IFNE                                CHARGE IN COLLISION W. LINE
15    SEC                                YES. SLOW IT DOWN
16    SBC I,4
17    ENDIF
18    STA X,CHARY
19    JSR LIFECT
20    LDA X,CHARY
21    CMP I,ILINDDY
22    IFCS                                AT END
23    DEC CHACOU
24    LDA I,0                                YES, DEACTIVATE
25    STA X,CHARY
26    ENDIF
27    ELSE
28    LDA X,CHARYL
29    CLC                                TOWARD PLAYER
30    ADC WCHARL
31    STA X,CHARYL
32    LDA X,CHARY
33    ADC WCHARIN
34    CMP CURSY
35    IFCC                                AT TOP
36    DEC ESHCOU
37    JSR CHATOP                                YES. CHECK FOR COLLISION WITH CURSOR
38    LDA I,0                                DEACTIVATE
39    ENDIF
40    STA X,CHARY
41    ENDIF
42    ENDIF
43    DEC INDEX1
44    MIEND
45    RTS
46 CHATOP                                CHECK FOR CURSOR CHARGE COLLISION
47    LDA CURSL1
48    CMP X,CHARL1
49    IFEQ
50    LDA CURSL2                                SAME LINE AS CURSOR.
51    IFPL                                CURSOR ALREADY DEAD
52    JSR INCPSQ                                NO. KILL CURSOR
53    LDA I,81                                SPECIAL BLASTED CODE
54    STA CURSL2
55    ENDIF
56    ENDIF
57    RTS
58 .SBTTL PLAY - CHARGE LINE COLLISION
```

1	LIFECT	PROCESS PLAYER CHARGE S EFFECT	1
2		ON ENEMY LINES	2
3			3
4	LDY X,CHARL1	DO CHARGE LINE 1 FIRST	4
5	LDA Y,LINEY		5
6	IFNE	LINE DEAD	6
7	LDA X,CHARY	NO.	7
8	CMP Y,LINEY		8
9	IFCS	CHARGE ON ENEMY LINES	9
10	CMP I,ILINDDY	YES	10
11	IFCS	LINE DEAD	11
12	LDA I,0	YES	12
13	ENDIF		13
14	STA Y,LINEY	YES. UPDATE LINE ENEMY TO	14
15	INC X,CHARCO	UPDATE CHARGE - ENEMY LINE COLLISION COUNTER	15
16	LDA I,OCO		16
17	STA Y,LINSTA	SET RECALC FLAG	17
18		REQUEST LINE DESTRUCTION PIC.	18
19	JSR SELICO	MAKE SOUND	19
20		GIVE PTS	20
21	LDX I,-1	SIGNAL SCORE ROUTINE TO USE TEMPS	21
22	LDA I,0	ADD 1 TO SCORE FOR EACH HIT	22
23	STA TEMP1		23
24	STA TEMP2		24
25	LDA I,1		25
26	STA TEMPO		26
27	JSR UPSCORE		27
28	LDX INDEX1	RESTORE CHARGE INDEX	28
29	ENDIF		29
30	LDA X,CHARCO		30
31	CMP I,2		31
32	IFCS	CHARGE EXHAUSTED	32
33	LDA I,0	YES. DEACTIVATE IT	33
34	STA X,CHARY		34
35	DEC CHACOU		35
36	ENDIF		36
37	ENDIF		37
38	RTS		38
39	.PAGE		39
40	.SBTTL PLAY - FIRE PLAYER CHARGE		40
41	FIREPC		41
42	LDA CURSL2		42
43	IFPL	PLAYER ALIVE	43
44	LDA QSTATUS		44
45	IFPL	ATTRACT	45
46	LDA CURMOD	YES. AUTO FIRE	46
47	STA TEMPO		47
48	LDX I,NICHARG+NINVAD-1		48
49	BEGIN	LOOP FOR EACH INVADER SHOT UNTIL EXHAUSTED OR CL	49
50	LDA X,CHARY+NPCHAR		50
51	IFNE	ACTIVE	51
52	LDA X,CHARL1+NPCHAR	YES CALUCULATE ABSOLUTE VALUE OF LINE DELTA	52
53	SEC		53
54	SBC CURSL1		54
55	IFMI		55
56	EOR I,OFF		56
57	CLC		57
58	ADC I,1		58
59	ENDIF		59
60	CMP I,2		60


```
1 IFCC TOO CLOSE
2 INC TEMPO YES. FIRE
3 ENDIF
4 ENDIF
5 DEX
6 MIEND
7 LDA TEMPO
8 ELSE
9 LDA SWSTAT
10 AND I,MFIRE
11 ENDIF
12 IFNE FIRE CHARGE
13 LDX I,NPCHARG-1 YES
14 BEGIN LOOP UNTIL VACANCY IS FOUND
15 LDA X,CHARY
16 IFEQ VACANCY
17 YES FIRE CHARGE
18 INC CHACOU
19 LDA CURSY START AT CURSOR
20 STA X,CHARY
21 LDA CURSL1
22 STA X,CHARL1 STARTS AT SAME LINE AS CURSOR
23 LDA CURSL2
24 STA X,CHARL2
25 LDA I,0 0 COLLISION COUNTER
26 STA X,CHARCO
27 JSR SLAUNC LAUNCH SOUND
28 LDA CURSY
29 JSR COLCHK CHECK FOR COLLISION
30 LDX I,0 EXIT LOOP
31 ENDIF
32 DEX
33 MIEND
34 ENDIF
35 ENDIF
36 RTS
37 .PAGE
38 .SBTTL PLAY - FIRE INVADER CHARGE
39 FIREIC
40 LDA CURSL2
41 IFPL PLAYER ALIVE
42 LDX I,NINVAD-1 YES.
43 BEGIN LOOP FOR EACH INVADER
44 LDA X,INVAY
45 IFNE ACTIVE
46 CMP I,ILINLIY+20 YES
47 IFCS INVADER LOW ENOUGH
48 LDA X,INVAC2 YES
49 AND I,INVFIR
50 IFNE INVADER MOVING BOTH LEGS ON LINES
51 DEC X,INVACT YES. UPDATE INVADER S FIRE TIMR
52 IFMI
53 INC X,INVACT
54 LDA X,INVAC1
55 AND I,INVMOT
56 IFEQ
57 LDA RANDOM
58 LDY ESHCOU
59 CMP Y,CHANCE
60 IFCS TIMER IN FIRE WINDOW
```

```
1 LDY WCHAMX
2 BEGIN LOOP THRU EACH INVADER CHARGE
3 LDA Y,CHARY+NPCHARG UNTIL VACANCY
4 IFEQ VACANCY
5 LDA X,INVAY YES
6 STA Y,CHARY+NPCHARG START AT INVADER LOC
7 LDA X,INVAL1
8 STA Y,CHARL1+NPCHARG SAME LINE AS INVADER
9 LDA X,INVAL2
10 STA Y,CHARL2+NPCHARG
11 LDA WCHARFR
12 STA X,INVACT RESTART TIMER
13 JSR ESLSON
14 INC ESHCOU
15 LDY I,0 EXIT LOOP
16 ENDIF
17 DEY
18 MIEND
19 ENDIF
20 ENDIF
21 ENDIF
22 ENDIF
23 ENDIF
24 ENDIF
25 DEX
26 MIEND
27 ENDIF
28 RTS
29 CHANCE .BYTE 0,0E0,0F0,0FA,0FF HIGHER CHANCE FOR ENEMY SHOT IF LESS ON SCREEN
30 .PAGE
31 .SBTTL PLAY-START EXPLOSION
32 OUTPUT X AND Y PRESERVED
33 SAVEX,SAVEY,TEMPO,1,2,3,4 ARE GARBAGE
34
35 .SBTTL PLAY-EXPLOSION OF FUSE INIT
36
37 INCFS2 STX INDEX1
38 LDA I,0FF MARK SHOT USED
39 STA X,CHARCO
40 TYA CONVERT SHOT INDEX TO INVADER INDEX
41 SEC
42 SBC I,NICHAR
43 TAY
44 LDA Y,INVAL1
45 STA TEMP4
46 LDA RANDO2
47 AND I,7
48 CMP I,3
49 IFCS RANDOMLY CHOOSE 0 250 ,1 500 , OR 2 750
50 LDA I,0
51 ENDIF
52 PHA
53 CLC
54 ADC I,CFTYPE
55 JSR GEXIFU INITIALIZE EXPLOSION
56 JSR KILINV KILL FUSE
57 PLA
58 CLC
59 ADC I,5
60 TAX
```

```
1 JSR UPSCOR UPDATE SCORE
2 LDX INDEX1
3 RTS
4 INIPSQ LDA I,IPTYPE
5 JSR DEADCU KILL CURSOR
6 DEC CURSL2 DISPLAY CURSOR
7 RTS
8 INFPSQ LDA I,FPSPXI SPECIAL BANG PIC CODE
9 BNE INCP2
10 INPPSQ LDA I,PPSPXI SPECIAL EXPLOSION PIC CODE
11 BNE INCP2
12 INCPSQ LDA I,CPSPXI SPECIAL EXPLOSION PIC CODE
13 INCP2 STA SPXIND
14
15 LDA I,CPTYPE
16 DEADCU KILL CURSOR
17 STA TEMP3 EXPOLSION CODE
18 LDA CURSY POSITION
19 STA TEMPO
20 LDA CURSL1
21 STA TEMP4
22 JSR CPEXPL START NOISE
23 JSR GENEX2 INIT EXPLOSION
24 LDA I,81 KILL CURSOR/NO DISP
25 STA CURSL2
26 LDA I,1 INIT TIMER FOR EXP.
27 STA SPFTIM
28 RTS
29 INCCSQ JSR CCEXPL CHARGE-CHARGE
30 LDA Y,CHARY+NPCHAR
31 STA TEMPO
32 LDA Y,CHARL1+NPCHAR
33 STA TEMP4
34 LDA I,CCTYPE
35 JSR GENEXP
36 LDA I,0 DEACTIVATE SHOT
37 STA Y,CHARY+NPCHAR
38 DEC ESHCOU ONE LESS SHOT
39 LDA I,OFF SHOT USED FLAG
40 STA X,CHARCO
41 RTS
42 INCIS2
43 LDA I,OFF SHOT USED MARKER
44 STA X,CHARCO
45 TYA CONVERT SHOT INDEX TO INVADER INDEX
46 SEC
47 SBC I,NICHAR
48 TAY
49 INCISQ LDA Y,INVAC1
50 AND I,ZROCCW ZMOTJM
51 CMP I,ZROCCW ZMOTJM
52 IFNE FLIPPING CCW
53 LDA Y,INVAL1 NO. USE BASE LEG
54 ELSE
55 LDA Y,INVAL1 YES. ADJUST BASE LIVE
56 SEC
57 SBC I,1
58 AND I,OF
59 ENDIF
60 STA TEMP4
```

1	LDA I,CITYPE		1
2	JSR GEXIFU	INITIALIZE BANG PIC	2
3	JSR KILINV	KILL INVADER	3
4	LDA Y,INVAC1		4
5	AND I,INVABI		5
6	TAY		6
7	LDX Y,INVPIN	INDEX FOR PTS TO ADD	7
8	JMP UPSCOR	UPDATE SCORE	8
9	INVPIN .BYTE 1,2,3,4,1		9
10	GEXIFU PHA		10
11	JSR CIEXPL	BANG SOUND	11
12	LDA Y,INVAY		12
13	STA TEMPO		13
14	PLA		14
15			15
16		GENERAL EXPLOSION STARTER	16
17		INPUT ACC EXPLOSION TYPE	17
18	GENEXP	TEMPO EXPLOSION Y TEMP4 EXPLOSION LINE	18
19	STA TEMP3	SAVE TYPE DEPTH	19
20	GENEX2 STX SAVEX		20
21	STY SAVEY		21
22	LDA I,0		22
23	STA TEMP1		23
24	STA TEMP2		24
25	LDX I,NEXPLO-1		25
26	BEGIN	LOOP UNTIL VACANCY IS FOUND	26
27	LDA X,EXPLOY		27
28	BEQ GOTEXP	EXIT IF VACANCY	28
29	LDA X,EXPLOS		29
30	CMP TEMP1		30
31	IFCS	FURTHEST ALONG SO FAR	31
32	STA TEMP1	YES. SAVE IT	32
33	STX TEMP2		33
34	ENDIF		34
35	DEX		35
36	MIEND		36
37	DEC EXPCOU	WILL BE INCD LATER	37
38	LDX TEMP2	NO VACANCIES. USE FURTHEST AONG	38
39	GOTEXP LDA I,0		39
40	STA X,EXPLOS	START SEQUENCES	40
41	LDA TEMP3		41
42	STA X,EXPLOT	EXPLOSION TYPE	42
43	LDA TEMPO		43
44	STA X,EXPLOY	EXPLOSION DEPTH	44
45	LDA TEMP4		45
46	STA X,EXPLOL	EXPLOSION LINE	46
47	INC EXPCOU	INC COUNTER	47
48	LDX SAVEX		48
49	LDY SAVEY		49
50	RTS		50
51	IPTYPE 5	EXPLOSION TYPE CODES	51
52	CPTYPE 1		52
53	CCTYPE 0		53
54	CITYPE 0		54
55	CFTYPE 2		55
56	.PAGE		56
57	.SBTTL PLAY-PROCESS EXPLOSIONS		57
58	PROEXP		58
59	LDA EXPCOU		59
60	IFNE	ANY BANGS	60

```
1 LDA I,0 YES CLEAR COUNT
2 STA EXPCOU
3 LDX I,NEXPLO-1
4 BEGIN LOOP FOR ACH EXPLOSION
5 LDA X,EXPLOY
6 IFNE ACTIVE BANG
7 LDA X,EXPLOS YES. UPDATE SEQUENCES
8 LDY X,EXPLOT
9 CLC
10 ADC Y,TEXINC
11 STA X,EXPLOS
12 CMP Y,TEXPDN
13 IFCS EXPLOSION DONE
14 LDA I,0 YES. DEACTIVATE IT
15 STA X,EXPLOY
16 ELSE
17 INC EXPCOU NO. INC COUNTER
18 ENDIF
19 ENDIF
20 DEX
21 MIEND
22 ENDIF
23 RTS
24 TEXPDN .BYTE 10,15,20,20,20,10 LAST SEQUENCE # TABLE #4
25 TEXINC .BYTE 3,1,3,3,3,3
26 .PAGE
27 .SBTTL PLAY - COLLISION MAINLINE
28 COLLIS
29 LDX I,NPCHAR-1
30 BEGIN LOOP FOR EACH PLAYER CHARGE
31 LDA X,CHARY
32 IFNE PLAYER CHARGE ACTIVE
33 JSR COLCHK
34 ENDIF
35 DEX
36 MIEND ENDOLOOP FOR PLAYER CHARGES
37 RTS
38 CHKSM4 .BYTE QCHKS4
39 .PAGE
40 .SBTTL PLAY - COLLISION - SINGLE CHECK
41
42 INPUT ACC PLAYER CHARGE Y
43
44 COLCHK
45 STA TEMPX
46 LDY I,NICHAR-1+NINVAD YES.
47 BEGIN LOOP FOR EACH INVADER CHARGE INVADER
48 LDA Y,CHARY+NPCHAR
49 IFNE I C OR INVADER ACTIVE
50 CMP TEMPX YES. DETERMINE OBSOLUTE DELTA
51 IFCS
52 SBC TEMPX
53 ELSE
54 LDA TEMPX
55 SEC
56 SBC Y,CHARY+NPCHAR
57 ENDIF
58 CPY I,NICHAR
59 IFCC ENEMY SHOT OR INVADER
60 CMP CHACHA SHOT
```



```
1 IFCC IN RANGE
2 LDA Y,CHARL1+NPCHAR YES.
3 EOR X,CHARL1
4 IFEQ ON SAME LINE
5 JSR INCCSQ YES. INITIALIZE EXPLOSION
6 ENDIF
7 ENDIF
8 ELSE
9 PHA INVADER. SAVE DELTA
10 STY INDEX2
11 LDA Y,INVAC1-NICHAR
12 AND I,INVABI
13 TAY
14 PLA
15 CMP Y,ENSIZE
16 IFCC IN RANGE BY TYPE
17 CPY I,ZABFUS YES.
18 IFEQ FUSE
19 LDY INDEX2 YES.
20 LDA Y,INVAY-NICHAR
21 CMP CURSY
22 IFNE FUSE AT TOP
23 LDA X,CHARL1 NO.
24 CMP Y,INVAL1-NICHAR
25 IFEQ SAME BASE LINE
26 LDA Y,INVAL2-NICHAR YES.
27 IFMI VULNERABLE FUSE
28 JSR INCFS2 YES. START BANG, KILL FUSE, GIVE PTS.
29 ENDIF
30 ENDIF
31 ENDIF
32 ELSE
33 LDY INDEX2 NO. FLIPPER,TANKER,SPINNER,PULSAR
34 LDA Y,INVAL2-NICHAR
35 IFMI FLIPPER
36 LDA Y,INVAL1-NICHAR YES.
37 CMP X,CHARL2 BASE SECONDARY MATCH
38 BEQ YESCOL
39 BNE OKATOP NO. CHECK FOR BASE MATCH
40 ENDIF
41 LDA Y,INVAY-NICHAR
42 CMP CURSY
43 IFNE AT TOP
44 OKATOP LDA Y,INVAL1-NICHAR NO.
45 CMP X,CHARL1
46 IFEQ BASE LEG MATCH
47 YESCOL STX INDEX1 YES.
48 JSR INCIS2 START BANG
49 LDX INDEX1
50 ENDIF
51 ENDIF
52 ENDIF
53 NOCOL
54 ENDIF
55 LDY INDEX2
56 ENDIF
57 ENDIF
58 DEY
59 MIEND ENDLOOP FOR ICS
60 LDA X,CHARCO
```



```
1  CMP I,OFF
2  IFEQ                                PLAYER CHARGE SPENT
3  LDA I,0                            YES. DEACTIVATE IT
4  STA X,CHARY
5  DEC CHACOU
6  STA X,CHARCO
7  ENDIF
8  RTS
9
10 .PAGE
11 .SBTTL PLAY - ANALYZE GAME
12 ANALYZ
13 LDA CURSL2
14 IFMI                                CURSOR DEAD
15 LDA CHACOU                          YES
16 ORA ESHCOU
17 ORA EXPCOU
18 IFEQ                                ANY ACTIVE CHARGES OR BANGS
19 LDX WINVMX                          NO. DROP EVERYBODY INTO WELL
20 BEGIN                              LOOP FOR EACH INVADER
21 LDA X,INVAY
22 IFNE                                ACTIVE INVADER
23 CLC                                YES MOVE IT DOWN
24 ADC I,15.
25 IFCC
26 CMP I,ILINDDY
27 ENDIF
28 IFCS                                INVADER AT BOTTOM
29 LDA I,0                            YES. DEACTIVATE IT
30 ENDIF
31 STA X,INVAY
32 ENDIF
33 DEX
34 MIEND
35 LDX PLAYUP
36 LDA X,LIVES1
37 CMP I,1
38 IFEQ                                GAME OVER
39 LDA I,0                            YES. REQUEST RECALC OF WELL TOP
40 STA LEVELY
41 LDA I,1                            REQUEST REDISPLAY OF WELL
42 STA ROTDIS
43 LDA EYL
44 SEC
45 SBC I,20
46 STA EYL                            SHRINK HOLE
47 LDA EYH
48 SBC I,0
49 STA EYH
50 CMP I,0FA
51 CLC
52 IFEQ                                FAR ENOUGH
53 SEC                                YES. END GAME
54 ENDIF
55 ELSE
56 LDA CURSY                          MOVE CURSOR DOWN
57 CLC
58 ADC I,15.
59 STA CURSY
60 IFCC
```

1	CMP I,ILINDDY		1
2	ENDIF		2
3	ENDIF		3
4	IFCS	CURSOR AT BOTTOM	4
5		YES. END OF LIFE PHASE.	5
6	LDA I,CENDLI	YES. GO TO END OF LIFE STATE	6
7	STA QSTATE		7
8	JSR INICHA	CLEAR CHARGES	8
9	LDA INMCOU	ADD # OF INVADERS	9
10	CLC		10
11	ADC INCCOU		11
12	CLC		12
13	ADC NYMCOU	TO # NYMPHS	13
14	CMP I,NNYMPH-1		14
15	IFCS	MAX OUT	15
16	LDA I,NNYMPH-1		16
17	ENDIF		17
18	STA NYMCOU	FOR NEXT LIFE	18
19	ENDIF		19
20	ENDIF		20
21	ELSE		21
22	ZQVAVG LDA QT3		22
23	ORA QT6		23
24	IFNE		24
25	LDA I,17		25
26	CMP LSCORH		26
27	IFCC		27
28	LDX LSCORL		28
29	INC X,0		29
30	ENDIF		30
31	ENDIF		31
32	LDA CURMOD		32
33	IFEQ	TOP MODE	33
34	LDA NYMCOU	YES CURSOR ALIVE BANGS DONE	34
35	ORA EXPCOU		35
36	IFEQ	ALL NYMPHS CONVERTED	36
37	LDY WINVMX	YES. ALL INVADERS OOF LINES	37
38	BEGIN	LOOP FOR EACH INVADER UNTIL ALL CHECKED ON LINE FO	38
39	LDA Y,INVAY		39
40	IFNE		40
41	CMP I,11		41
42	BCS LINER	EXIT IF LINER NOT AT TOP	42
43	ENDIF		43
44	DEY		44
45	MIEND	EXIT AFTER ALL CHECKED. NO LINERS	45
46	JSR INDROP	YES.	46
47	JSR INICHA	CLEAR CHARGES	47
48	ENDIF		48
49	LINER LDA SWSTRT		49
50	AND I,MSTRT2 MSTRT1		50
51	IFNE	EITHER START PRESSED	51
52	BIT QSTATUS	YES	52
53	IFMI	ATTRACT	53
54	LDA OPTIN1	NO.	54
55	AND I,43		55
56	CMP I,40		56
57	IFEQ	FREE PLAY ABORT ENABLED	57
58	JSR INDROP	YES. INITIATE DROP MODE	58
59	ENDIF		59
60	ENDIF		60

```
1  ENDIF
2  ENDIF
3  ENDIF
4  RTS
5  .PAGE
6  .SBTTL  INITIALIZE CURSOR DROP MODE
7
8  INDROP
9      LDA I,CDROP          DROP STATE NEXT
10
11     STA QSTATE
12     LDA CURMOD          SET CURSOR DROP MODE
13     ORA I,80
14     STA CURMOD
15     LDA I,0              INITIALIZE DOWNWARD ACCELERATION
16     STA CURSVL
17     STA CURSYL          ZERO FRAC. POSITION
18     STA EYLL            TO PREVENT JERKING
19     STA ELICNT
20     LDA I,2
21     STA CURSVH
22     LDX I,NLINES-1
23     BEGIN
24     LDA X,LINCY
25     IFNE
26     INC ELICNT          COUNT LIVE SPIKES
27     ENDIF
28     DEX
29     MIEND
30     LDA ELICNT
31     IFNE                ENEMY LINES
32     LDA CURWAV          YES.
33     CMP I,7
34     IFCC                WARN PLAYER
35                        YES
36     LDA I,6*QUASEC      WARNING DELAY
37     STA QTMPAUS
38     LDA I,CPAUSE        PAUSE FIRST
39     STA QSTATE
40     LDA I,CDROP          THEN DROP MODE
41     STA QNXTSTA
42     LDA I,80            SET WARNING FLAG
43     STA ELICNT
44     ENDIF
45     ENDIF
46     LDA I,-1
47     STA SUZTIM          DEACTIVATE SUPERZAPPER
48     RTS
49     .PAGE
50     .SBTTL  PLAY-PROCESS BIG BOOM
51
52  PRBOOM  LDA BOOMTI          SET BOOM OFF FLAG
53          STA BOOMFL
54          LDX I,NPARTI-1
55          STX INDEX1
56          BEGIN              LOOP FOR EACH PARTICLE
57          LDX INDEX1
58          LDA X,PARTIY
59          IFEQ              ACTIVE PARTICLE
60          LDA BOOMTI          NO.
```

```
1 IFNE BOOM TIMER EXPIRED
2 JSR TIMLAU NO. LAUNCH MORE PARTICLES OF TIME
3 ENDIF
4 ELSE
5 JSR UPARPO YES. UPDATE PARTICLE POSITION
6 JSR DECPAR DECELERATE PARTICLE
7 LDA I,-1 BOOM ACTIVE
8 STA BOOMFL
9 ENDIF
10 DEC INDEX1
11 MIEND END LOOP
12 LDA QFRAME
13 AND I,1
14 IFEQ
15 LDA BOOMTI
16 IFNE
17 DEC BOOMTI UPDATE BOOM TIMER STOP AT 0
18 ENDIF
19 ENDIF
20 LDA BOOMFL
21 IFEQ BOOM ACTIVE
22 LDA I,CGETIN NO. GET INITIALS
23 STA QSTATE
24 ENDIF
25 RTS
26 .PAGE
27 TIMLAU
28 LDA QFRAME
29 AND I,0
30 IFEQ DELAY SINCE LAST LAUNCH OK
31 YES. LAUNCH ANOTHER
32 LDA I,80 SET UP INITIAL LOCATION IN CENTER
33 STA X,PARTIX
34 STA X,PARTIY
35 STA X,PARTIZ
36 SET UP VELOCITY RANDOM WITHIN
37 LDA RANDO2 GIVE RANGE
38 STA X,PARLXV FRACTIONAL X VELOCITY
39 JSR FIXTOP
40 STA X,PARTXV INTEGER X
41 LDA RANDOM
42 STA X,PARLYV Y
43 JSR FIXTOP
44 IFPL UPDATE PARTICLE POSITION
45 EOR I,0FF
46 CLC
47 ADC I,1
48 ENDIF
49 STA X,PARTYV
50 LDA RANDOM Z
51 STA X,PARLZV
52 JSR FIXTOP
53 STA X,PARTZV
54 JSR CIEXPL MAKE NOISE
55 ENDIF
56 RTS
57 FIXTOP
58 LSR
59 LDA RANDO2
60 AND I,7
```

```
1 IFCS
2 EOR I,OFF
3 CLC
4 ADC I,1
5 ENDIF
6 RTS
7 .PAGE
8 UPARPO UPDATE PARTICLE POSITION
9 LDA X,PARLYV Y
10 CLC
11 ADC X,PARLIY
12 STA X,PARLIY FRACTIONAL
13 LDA X,PARTYV
14 IFPL
15 ADC X,PARTIY + VELOCITY
16 CMP I,0F0
17 IFCS
18 LDA I,0 OFF SCREEN
19 ENDIF
20 ELSE
21 ADC X,PARTIY - VELOCITY
22 CMP I,10
23 IFCC
24 LDA I,0 OFF SCREEN
25 ENDIF
26 ENDIF
27 TAY
28 LDA X,PARLXV X
29 CLC
30 ADC X,PARLIX
31 STA X,PARLIX FRACTIONAL
32 LDA X,PARTXV
33 IFPL
34 ADC X,PARTIX +VELOCITY
35 CMP I,0F0
36 IFCS
37 LDY I,0 OFF SCREEN
38 ENDIF
39 ELSE
40 ADC X,PARTIX -VELOCITY
41 CMP I,10
42 IFCC
43 LDY I,0 OFF SCREEN
44 ENDIF
45 ENDIF
46 STA X,PARTIX
47 LDA X,PARLZV Z
48 CLC
49 ADC X,PARLIZ
50 STA X,PARLIZ FRACTIONAL
51 LDA X,PARTZV
52 IFPL
53 ADC X,PARTIZ + VELOCITY
54 CMP I,0F0
55 IFCS
56 LDY I,0 OFF SCREEN
57 ENDIF
58 ELSE
59 ADC X,PARTIZ VELOCITY
60 CMP I,10
```

```
1 IFCC
2 LDY I,0 OFF SCREEN
3 ENDIF
4 ENDIF
5 STA X,PARTIZ
6 TYA
7 STA X,PARTIY
8 RTS
9 .PAGE
10 DECPAR
11 LDA I,-3 VELOCITY 0 COUNTER
12 STA TEMPO
13 LDA X,PARLXV
14 LDY X,PARTXV
15 JSR DECELE DECELERATE X VELO
16 STA X,PARLXV
17 TYA
18 STA X,PARTXV
19 LDA X,PARLYV
20 LDY X,PARTYV
21 JSR DECELE DECELERATE Y VELO
22 STA X,PARLYV
23 TYA
24 STA X,PARTYV
25 LDA X,PARLZV
26 LDY X,PARTZV
27 JSR DECELE DECELERATE Z VELO
28 STA X,PARLZV
29 TYA
30 STA X,PARTZV
31 LDA TEMPO
32 IFEQ ALL 3 DIRECTIONS VELOCITY 0
33 STA X,PARTIY YES. DEACTIVATE PARTICLE
34 ENDIF
35 RTS
36 DECELE
37 STY TEMP2
38 BIT TEMP2
39 IFPL VELOCITY+ OR -
40 SEC + SO ECELERATE BY SUBTRACTING
41 SBC DECELO
42 STA TEMP1
43 LDA TEMP2
44 SBC I,0
45 BCC HIT0 VELOCITY HIT 0 BR IF YES
46 ELSE
47 CLC -, SO DECELERATE BY ADDING
48 ADC DECELO
49 STA TEMP1
50 LDA TEMP2
51 ADC I,0
52 IFCS VELOCITY HIT 0
53 HIT0 INC TEMPO YES INCREMENT VELOCITY 0 COUNTER
54 LDA I,0
55 STA TEMP1
56 ENDIF
57 ENDIF
58 TAY RETURN WITH NEW VELOCITY
59 LDA TEMP1
60 RTS
```



```
1 DECELO .BYTE 20
2 .PAGE
3 .SBTTL INITIALIZE PARTICLES
4 INBOOM
5     LDX I,NPARTI-1
6     BEGIN
7     LDA I,0
8     STA X,PARTIY          DEACTIVATE PARTICLE
9     DEX
10
11    MIEND
12    LDA I,020             1/5 SECOND UNTIS
13    STA BOOMTI
14    STA BOOMFL           ACTIVATE BOOM
15    LDA I,CDBOOM         BOOM DISPLAY STATE
16    STA QDSTATE
17    LDA I,0
18    STA ZADJL
19    STA ZADJL+1
20    RTS
21    .SBTTL UTILITY - LINE LINE POLOR DELTA
22 INPUT Y,ACC LINE # FOR DETERMINATIN
23
24 OUTPUT ACC # OF LINES ACC LINE IS FROM Y LINE IN
25     SHORTEST DIRECTION -8 TO +7 -MEANS CLOCKWISE
26
27 POLDEL
28     STY TEMP1
29     SEC
30     SBC TEMP1
31     STA TEMP1
32     BIT WELTYP
33     IFPL                 PLANAR
34     AND I,0F
35     BIT A,EIGHT         NO.
36     IFNE                 TAKE SHORTEST ROUTE
37     ORA I,0F8
38     ENDIF
39     ENDIF
40     RTS
41 EIGHT .BYTE 8
42
43 .SBTTL INITIALIZE-PLANES OF STARS
44 INSTAR
45     LDX I,NPLANE-1
46     LDA I,0
47     BEGIN                DEACTIVATE ALL PLANES
48     STA X,PLANEY
49     DEX
50     MIEND
51     LDA I,0F0
52     STA PLANEY+NPLANE-1  ACTIVATE LAST PLANE FAR AWAY
53     LDA I,0FF
54     STA PLAGRO           SET STAR FIELD GROWING FLAG
55     RTS
56     .PAGE
57     .SBTTL PLAY-PROCESS PLANES OF STARS
58 INPUT IF PLAGRO IS-,THEN STAR FIELD IS STILL GROWING
59     IF PLAGRO IS 0,THEN STAR FIELD IS DEACTIVATED
60 OUTPUT IF PLAGRO IS 0,THEN STAR FIELD IS COMPLETELY DEAD
```

1	PRSTAR	LDA PLAGRO	STAR FIELD ACTIVE	1
2		IFNE		2
3		LDA I,0	YES. PROCESS PLANES	3
4		STA TEMPO	CLEAR COUNT OF ACTIVE PLANES	4
5		LDX I,NPLANE-1		5
6		STX INDEX1		6
7		BEGIN	LOOP FOR EACH PLANE	7
8		LDX INDEX1		8
9		LDA X,PLANEY		9
10		IFNE	PLANE ACTIVE	10
11		SEC	YES.	11
12		SBC I,07	UPDATE PLANE POSITION	12
13		IFCS		13
14		CMP I,10		14
15		ENDIF		15
16		IFCC	TOO CLOSE	16
17		LDY PLAGRO	YES	17
18		IFMI	STILL GROWING	18
19		LDA I,0F0	YES. START AT FARTHEST POINT	19
20		ELSE		20
21		LDA I,0	NO. DEACTIVATE	21
22		ENDIF		22
23		ENDIF		23
24		ELSE		24
25		LDY PLAGRO	NO. STILL GROWING	25
26		IFMI		26
27		TXA	YES.	27
28		CLC		28
29		ADC I,1	GET INDEX OF PREVIOUS PLANE	29
30		CMP I,NPLANE		30
31		IFCS		31
32		LDA I,0		32
33		ENDIF		33
34		TAY		34
35		LDA Y,PLANEY	PREVIOUS PLANE ACTIVE	35
36		IFNE		36
37		CMP I,0D5	YES.	37
38		IFCC	IS PREVIOUS PLANE CLOSE ENOUGH	38
39		LDA I,0F0	YES. START NEW PLANE	39
40		ELSE		40
41		LDA I,0	NO. STILL INACTIVE	41
42		ENDIF		42
43		ENDIF		43
44		ENDIF		44
45		ENDIF		45
46		STA X,PLANEY		46
47		ORA TEMPO		47
48		STA TEMPO		48
49		DEC INDEX1		49
50		MIEND		50
51		LDA TEMPO		51
52		IFEQ		52
53		STA PLAGRO		53
54		ENDIF		54
55		ENDIF		55
56		RTS		56
57		.PAGE		57

.SBTTL INITIALIZE SUPER ZAP

CSUMAX 2

```
1 CSUINT 1
2 CSUSTA 3
3 INISUZ
4 LDA I,0 SET SUPZAP USE COUNTER AND TIMER TO 0.
5 STA SUZCNT
6 STA SUZTIM
7 RTS
8 .SBTTL PROCESS SUPER ZAPPER
9 PROSUZ
10 LDA QSTATUS
11 IFMI ATTRACT
12 LDA SUZTIM NO
13 IFEQ ZAP ACTIVE
14 LDA CURSL2 NO.
15 IFPL CURSOR ALIVE
16 LDA SWFINA YES
17 AND I,MSUZA
18 IFNE ZAP PRESSED
19 LDA SUZCNT YES.
20 CMP I,CSUMAX
21 IFCC ZAPS LEFT
22 INC SUZCNT YES. UPDATE ZAP COUNTER
23 LDA I,1
24 STA SUZTIM START ZAP TIMER
25
26 ENDIF
27 LDA SWFINA
28 AND I, C MSUZA MFAKE
29 STA SWFINA
30 ENDIF
31 ENDIF
32 ELSE
33 INC SUZTIM YES. ZAP ACTIVE
34 LDX SUZCNT
35 LDA SUZTIM
36 CMP X,TIMAX
37 IFCS ZAP TIMER EXPIRED
38 LDA I,0
39 STA SUZTIM YES. DEACTIVATE ZAP
40 ENDIF
41 JSR KILENE WIPE OUT INVADERS CHARGES
42 ENDIF
43 ENDIF
44 LDA SWFINA
45 AND I, CMFAKE
46 STA SWFINA CLEAR SWITCH NOT PROCESSED FLAG
47 RTS
48
49 TIMAX .BYTE 0,CSUSTA+ 8* CSUINT+1 ,CSUSTA+ 1* CSUINT+1 ,0,0
50
51 .SBTTL SUPER ZAP-WIPE OUT ENEMY
52 KILENE LDA SUZTIM
53 CMP I,CSUSTA
54 IFCS
55 AND I,CSUINT
56 IFEQ TIME FOR ANOTHER WIPE OUT
57
58 LDY WINVMX YES.
59
60 BEGIN LOOP THRU INVADERS
```

```
1
2      LDA Y,INVAY
3      BNE EXIKIL          SPECIAL EXIT FOR 1ST LIVE ONE
4      DEY                EXIT LOOP IF ALL ARE DEACTIVE
5      MIEND
6      LDA I,0            ALL ARE DEAD. DEACTIVATE ZAP
7      STA SUZTIM
8      ENDIF
9      ENDIF
10     RTS
11
12 EXIKIL
13     LDA Y,INVAC2        MAKE SURE IT S NOT A CARRIER
14     AND I, C INVCAR
15     STA Y,INVAC2
16     JMP INCISQ          START EXPLOSION
17 CHKSM5      .BYTE QCHK5
18     HLL65
19     .END
```