ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 TABLE OF CONTENTS 1- 3 * 1- 4 *MODULE ALDISP * 1- 5 *PROGRAMMER DAVE THEURER ALIENS DISPLAY FUNCTIONS* 1- 6 *FUNCTION 1- 7 * **1-** 8 ****************************** 14 15 1- 12 ******************* 1- 13 * * 17 1- 14 *MODULE ALCOMN * 18 1- 15 *PROGRAMMER DAVE THEURER 1- 16 *FUNCTION ALIENS CONSTANTS AND VARIABLES 1- 17 * TO BE .INCLUDED IN 22 1- 18 * ALGAME, ALDISP, ALHARD 1- 19 * 24 COPYRIGHT 1980 ATARI, INC. UNAUTHORIZED REPRODUCTION, 25 1- 20 26 27 1- 21 ADAPTION, DISTRIBUTION, PERFORMANCE OR DISPLAY OF THIS 1- 22 COMPUTER PROGRAM OR THE ASSOCIATED AUDIOVISUAL WORK IS 1- 23 STRICTLY PROHIBITED. 23 4 CONSTANTS-COUNTS 2- 25 CONSTANTS-STATE CODES 34 35 4- 1 CONSTANTS-PICTURES 4- 22 BOOM HARDWARE DEFINITIONS 1 7- 1 VARIABLES-CONTROL 1 VARIABLES-WORK 8- 22 VARIABLES-PLAYERS 41 42 8- 41 VARIABLES-SWITCHES 9- 1 VARIABLES-DISPLAY 44 11- 25 VARIABLES - PLAY 46 47 12- 1 CONSTANTS-COUNTS CONSTANTS-PLAYFIELD 12- 12 49 12- 17 VARIABLES-OBJECT COUNTERS 13- 1 VARIABLES-OBJECT LOCATION + STATUS 51 13-137 VARIABLES - PAGE 1 17- 1 GLOBALS 54 55 17- 24 DISPLAY-MAINLINE 1 DISPLAY STATE EXECUTOR 20-DISPLAY-GAME PLAY MAINLINE 57 21-1 22- 1 BUFFER CONTROL 23- 1 DISPLAY-WELL 2 DISPLAY-SPOKE COLORS 24-24- 4 DISPLAY-SPOKE PULSE STATUS 25-DISPLAY-NYMPHS 27-1 DISPLAY-CURSOR 1 DISPLAY-INVADERS MAINLINE 28-DISPLAY - INVADERS PICS 29-29- 16 DISPLAY - FLIPPERS DISPLAY - TANKERS 29- 35 DISPLAY - INVADERS DRAW TRAILER 29- 46 DISPLAY-INVADERS DRAW JUMP INVADER 29- 59 29-103 TABLE-WORLD COORD OFFSETS X,Z FOR JUMPERS 31- 2 DISPLAY-INVADE FUSE PICTURE 76 DISPLAY-PULSAR PIC 32-78 33- 1 DISPLAY-CHARGES DISPLAY-EXPLOSIONS 34-

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ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 TABLE OF CONTENTS SPECIAL EXPLOSION CONTROL 36- 1 37- 1 SPECIAL EXPLOSION DATABASE 38-SPECIAL EXPLOSION FUNCTION SPECIAL EXPLOSION SUBROUTINE 39-1 40- 2 DISPLAY BIG BOOM TABLES-WELL COORDINATES WORLD 41- 2 43- 2 UTILITY - DISPLAY PIC BETWEEN PTS. 14 15 44- 1 UTILITY - DERIVE BINARY AND LINEAR SCALE FACTORS GIVEN DEPTH 45- 1 UTILITY-DRAW OBJECT BETWEEN POINTS 17 46- 1 PICTURES 18 48- 1 UTILITY PROJECT POINT ONTO SCREEN 49- 1 INITIALIZE DISPLAY 50- 1 COLORS 22 23 51- 1 INITIALIZE-GRID LINES 52- 1 INITIALIZE WELL 24 25 26 27 53- 2 UTILITY-BUILD WELL DISPLAY BUFFER UTILITY-BUILD WELL PIAC 53- 25 DISPLAY-WELL RIM 53- 46 53- 97 UTILITY-CONNECT CURRENT PT. WITH NEXT POINT 30 53-128 DISPLAY-DRAW 2 SPOKES CHECK FOR EYE PAST OBJECT ON WELL 54- 2 55- 1 UTILITY-PROJECT OUTLINE 34 35 56- 1 UTILITY-DRAW WELL SHAPE 57- 1 DISPLAY STAR FIELD 37 57- 18 DISPLAY-PLANES OF STARS 58- 2 DISPLAY - ENEMY LINES 58-102 DISPLAY - ENEMY LINES INITIAL FIXED VG CODES UTILITY - QUICK BLANK VECTOR FROM SX, SZ 41 58-139 42 58-163 DISPLAY - ENEMY LINES TIP STUFF 58-234 DISPLAY UTILITY - FAST CONNECT 44 UTILITY - VG ABS POS 45 59- 1 46 47 49 51 57

66 67

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1 ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 1 .TITLE ALDISP - ALIENS DISPLAY FUNCTIONS 2 •SBTTL ********************** 3 .SBTTL * ALDISP .SBTTL *MODULE 5 .SBTTL *PROGRAMMER DAVE THEURER .SBTTL *FUNCTION ALIENS DISPLAY FUNCTIONS* .SBTTL * 8 •SBTTL ******************** 9 21 22 23 25 24 25 26 27 32 33 34 35 36 37 42 43 45 44 45 46 47 56 57 58 59

Υ _							1412
	1 ALDISP - 2 GLOBALS	ALIEN	S DISP	LAY FUNCT	TIO ATARI MACE	C65 VM03.09 00 00 02 PAGE 17	HE:
	3					3 4	
	4 1					•SBTTL GLOBALS	
	5 2					;ENTRY POINTS	
	6 3					•GLOBL VGADD, VGJSRL, VGVCTR, GETDSP, LDRDSP, VGCNTR, SWAPVG, VGDOT •GLOBL VGADD2, VGHEXZ, DISPLA, VGHALT, INIDSP, JSRDOT, VGADD3, JSRDT1	ļ
	8 5					•GLOBL DPRSTA, D2GAME	
	9 6					•GLOBL INFO, RQRDSP, DSPHOL	
	7					•GLOBL VGRTSL, DGOVER, DPLPLA, PICLO, PICHI	
	8					-GLOBL INITEM, VGYABS, VGYAB1, INICOL	
	13 10					;TABLES •GLOBL INVERSE, INVEXP, DO7MSK, BOXPRO, LOGPRO, PTTANP, PTTANF, PTSPLF 17	ļ
	14 11					•GLOBL VGBRIT, VGLIST, VGSIZE, XCOMP, D70MSK, SCALE, DSPSYS	
	15 12					-GLOBL VGSCA1, VGVTR1, VGVTR2, VGSCAL, VGSTAT, VGSTA1	
	16					•GLOBL PTSTR1, PTEXP1, PTCURS, PTSP11, PTTANK, PTESHO, PTSPLA, PTSPAR	
	17 14 15					•GLOBL BCINFO, BCCURS, BCSHOT, BCINVA, BCEXPL, BCNYMP, BCINFO, BCENEL •GLOBL BUFBSL, BUFBSH, BUFASL, BUFASH, JMPMAL, JMPMAH, BCWELL, BUFSWL, BUFSWH 22 23 24	
	19 16					•GLOBL JMPALO, JMPAHI, JMPBLO, JMPBHI, BCSTAR, BFASTA, BFBSTA, PTFUSE, PTFUSX 25	
	20 17					•GLOBL PPSPXI, CPSPXI, FPSPXI, KILLER	
	18					-GLOBL QCHKS6, QCHKS7, QCHKS8, SCAL1, SCAL3, JMPMH2, JMPMH4, JMPMA2, JMPMA4	
	19		0000		0.470	•GLOBL BFAST1, BFBST1	
	23 20 21		00C0 0008		RATS MZCOLO	OCO 8 ; NEW COLOR STAT BIT MASK	
	25 22		0000		MZBRIT		
	26 23					$\begin{vmatrix} 34\\35 \end{vmatrix}$	
	27 24					•SBTTL DISPLAY-MAINLINE	
	28 25 29 26				;FUNCTIO	ION USING THE DATABASE SET UP BY THE GAME PORTION OF THE PROGRAM,	
	29 26 27				FUNCTIO	BUILD, IN THE AVAILABLE BUFFER, THE VECTOR GENERATOR DISPLAY LIST	
	28				•	41	
	32 29				; INPUT	DATABASE 42 43	
	33 30 34 31		0000		SPACG 0	44 • CHARRET CAME CORE	
	34 35 32		0000		SPACE U	SUPPRESS SPACE GAME CODE •NLIST CND 45 46 47	
	33		0000			•CSECT	
	34	0000			DISPLAY	Y 49	
	35	0000	20	100D		JSR INIMAT ;SET UP MATH BOX	
	36 40 37	0003	AD CD	2000 0000G		LDA VECRAM 52 CMP JMPMA4	
	11 38	0009	DO	00		IFEQ ;TRYING TO HALT	
	12 39	000B	AD	0133		LDA SPARE3 YES.	
_	40	000E	DO	00		JSR INIMAT LDA VECRAM CMP JMPMA4 IFEQ LDA SPARE3 IFEQ THALT YET RTS ENDIF ;SET UP MATH BOX 50 51 52 53 54 55 56 57 66 60	
	41 42	0010 000F	60 01			RTS ;NO. GO AWAY ENDIF	
	42 46 43	000A	06				
	44	0011	A5	01		LDA QDSTATE	
	45	0013	C9	00		ENDIF LDA QDSTATE CMP I, CDPLAY IFNE ; ANYTHING BUT PLAY STATE LDA I, BCINFO ; YES. DEFAULT TO INFO BUFFER JSR SBCLOG 61 62 63 64 65 66 67 68	
_	46 47	0015 0017	F0 A9	00e 00		IFNE ;ANYTHING BUT PLAY STATE LDA I,BCINFO ;YES. DEFAULT TO INFO BUFFER 65 66 67	
	50 47 51 48	0017	20	0108		LDA I,BCINFO ;YES. DEFAULT TO INFO BUFFER JSR SBCLOG	
	52 49	001C	20	017C		JSR BIGTEX	
	53 50	001F	80	00		IFCC ;SET UP LARGE BUFFER	
	54 51	0021	20	0057		BUFFER AVAILABLE FILL IT 72	
_	55 52 53	0021 0024	20	0057	ZATVG2	JSR DSTATE ; EXECUTE DISPLAY STATE 73	
	57 54	0024	AD	016E	241402	LDA SECUVY	
	58 55	0027	FO	00		THE GATARI ON SCREEN	1
	56	0029	AO	27		LDY I,27 ;YES. VERIFY	
	57	002B	A9	0E		LDA I, OE	

	- ALIENS -MAINLIN		LAY FUNC	:T10	ATARI MAC65 V	M03.09 00 00	02 PAGE 17+	
58 59	002D	38			SEC BEG			
60	002E	F1	B 6			NY, SECUVE		
61	0030	88			DEY	•		
62	0031	10	FB		MIE			
63 64	0033 0034	A8 F0	00		TAY IFN			
65	0036	49	E5			I,0E5		
66	0035	02			END	IF		
67 68	0038 003A	F0 49	00 29		IFN	E 1,029		
69	0039	02	29		END			
70	003C	8D	0455		STA	QT3		
71	0028	16			END			
72 73	0020 003F	1E A9	00G		END I DA	I,BCINFO		
74	0041	20	0148		JSR	SBCSWI		
75	0044	AD	0000G		LDA	JMPMA2		
76 77	0047 004A	8D AD	2000 0000G			VECRAM JMPMH2		
7 8	004D	8D	2001			VECRAM+1		
79	0050	88	50	00	ELS			
80	0016 0053	3C 4C	00 7 A		IMD	DENORM	;PLAY STATE	
81	0052	03	001A		END		FLAT STATE	
82	0056	60			RTS			

7	-					
	1 ALDISP - ALIE		UNCTIO ATARI MAC6	55 VM03.09 00 00 02 PAGE	20	12THE
	1 5 2 0057		DSTATE	.SBTTL DISPLAY STATE EXE	CUTOR 5	
	6 3 0057 7 4 0059	BD 0063	3	LDX QDSTATE LDA X,DROUTAD+1		
	8 5 005C 9 6 005D			PHA LDA X, DROUTAD	10 11 12	2
	10 7 0060 11 8 0061	60	NOOPR	PHA RTS	13 14 15	1 5
	12 9 0062 13 10 0062	0079	DROUTAD		GAME PLAY - TOP OF WELL, DOWN THE TUBE	7
		FFFFG 0703			SYSTEM CONFIGURATION GAME PLAY - BOOM	
	16 13 0068 17 14 006A	FFFFG FFFFG		.WORD RQRDSP-1	DATA ENTRY - HI SCORE INITIALS DATA ENTRY - RANKING INFO ONLY - HI SCORE TABLE GAME OVER PLAYER X PLAY PLAYER X PRESS START LOGO BOX LOGO 2 GAME MINIMUM 33 34 36 36 37 38 38 38	2 3
	19 16 006 E	FFFFG		-WORD DGOVER-1	GAME OVER PLAYER X	5
	21 18 0072	FFFFG FFFFG			PLAY PLAYER X PRESS START	3
	23 20 0076	FFFFG FFFFG		.WORD LOGPRO-1	;LOGO BOX ;LOGO)
	24 21 0078 25 22 007A 26	FFFFG	DROUTEN	-WORD D2GAME-1	\$2 GAME MINIMUM 33	2 3 4
	27				35 36 37	3 7
	29 30				38 39 40	3 0
	31 32 33				41 42 43 44	2 3 4
	34 35				45 46 47	3 7
	36 37 38				48 49 50	0
	39 40				51 52 53	3
	41 42				54 55 	5 0
	43 44 45				48 48 48 50 51 51 52 53 54 55 56 56 57 58 58 66 66 66 67 77 71 72 74 75	3 9
	46 47 48				61 62 63	2 3
	48 49 50				64 65 66 66	5 6
	51				67 68 69	3
	52 53 54				70 71 	1 2
	55 56				73 74 75	3 1 5
	57				76 77	j 1

1 2	ALDISP - DISPLAY-				CTIO ATARI MACE	5 VM03.09	00 00 02 PAGE 21	2
3 4	1					.SBTTL DIS	PLAY-GAME PLAY MAINLINE	, 1 5
5	2 3	00 7 A			DENORM		DISPLAY CURSOR	Ź
7	4	007A	A9	00G	DENORM	LDA I, BCCUF		3
8	5	007C	20			JSR SBCLOG		0
9	6	007F	20			JSR DSPCUR		2
10	7	0082	A9	00G		LDA I, BCCUF	S 11	3
11	8	0084	20	0148		JSR SBCSWI	10 10 1 4V CH400 CC	5
12 13		0087	A9	00G		LDA I, BCSHO	DISPLAY CHARGES	6
14		0089	20	0108		JSR SBCLOG		8
15		008C	20	05A5		JSR DSPCHG	13 20	.0
16		008F	Α9	00G		LDA I, BCSHO	22	1
17		0091	20	0148		JSR SBCSWI	23	.3
18 19		0094	Α9	00G		LDA I, BCIN	;DISPLAY INVADERS	4
20		0094	20	0108		JSR SBCLOG	21	6
21	18	0099	20	03F7		JSR DSPINV		7
		009C	A9	00G		LDA I, BCIN	2!	9
22 23 24 25 26 27	20	009E	20	0148		JSR SBCSWI	33	1
24	21	0011		000		LDA T DCENT	;DISPLAY EXPLOSIONS	2
25	22 23	00A1 00A3	A9 20	00G 0108		LDA I, BCEXF JSR SBCLOG	L 3. 34	4
27	24	00A6	20	05E4		JSR DSPEXP	33	5
		00A9	A9	00G		LDA I, BCEXE	L 3	7
28 29 30	26	OOAB	20	0148		JSR SBCSWI	38 38	8
							;DISPLAY NYMPHS	0
31		00AE 00B0	A9	006		LDA I, BCNYN JSR SBCLOG	Φ 4.	2
32 33	29 30	00B0	20 20	0108 02E2		JSR DSPNYM	4.	3
34		0086	A9	00G		LDA I, BCNY	S ;DISPLAY CHARGES T ;DISPLAY INVADERS A ;DISPLAY EXPLOSIONS L ;DISPLAY NYMPHS P ;DISPLAY INFORMATION SCORES, MSGS, ETC.	5
35	32	0088	20	0148		JSR SBCSWI	44 4	6
36	33	***						8
37	٠, ١	00BB 00BD	A9	006		LDA I, BCINE		9
38	35 36	0000	20 20	0108 0000G		JSR SBCLOG JSR INFO	5	1
40	37	00C3		00000	ZATVG1	33.1 2,41 3	5.	3
41		00C3	A5	05		LDA QSTATUS	5- 5-	4
42		00C5	30	00		IFPL	; ATTRACT 5	6
43	40	00C7 00C9	A9	F2		LDA I, OF2 CLC	; YES. ATARI BETTER BE ON SCREEN	8
44	. —	00C9	18 A0	27		LDY 1,39.	55	9
46	43		***	Spany 2		BEGIN		1
47	44	OOCC	71	B 6		ADC NY, SECU	VG	2
48		OOCE	88			DEY	6-	4
49		00CF	10	FB		MIEND	66 66	5
50 51		00D1 00C6	8D 0D	0118		STA QT6 ENDIF	SAVE RESSLT SHOULD BE 0	7
52	49	00D4	A9	00G		LDA I, BCINE		9
53		00D6	20	0148		JSR SBCSWI	70	0
54							DISPLAY WELL	2
55		00D9	20	0181		JSR DSPWEL	DISPLAY WELL	3
56 57		OODC OODE	A9 20	00G 0108		LDA I, BCENE JSR SBCLOG	L ;DISPLAY ENEMY LINES	5
58		00E1	20	140C		JSR DSPENL		7
59		00E4	A9	00G		LDA I, BCENE		50 51 52 53 54 55 65 78 59 60 12 33 45 66 78 90 72 73 74 75 76 77 89 90
60	57	00E6	20	0148		JSR SBCSWI	86	0

ISP - ALIENS DISPLAY FUNCTIO	ATARI MAC65 VM03.09 00 00 02	2 PAGE 21+	
LAT-GAME PLAT MAINLINE			
58 00E9 A9 00G	LDA I,BCSTAR	;DISPLAY STAR FIELD	
59 00EB 20 0108	JSR SBCLOG		
60 00EE 20 1397	JSR DSTARF		
61 00F1 A9 00G 62 00F3 20 0148	LDA I,BCSTAR JSR SBCSWI		
63 00F6 A9 00	LDA I,0		
64 00F8 8D 0114	STA ROTDIS		
65	• · · · · · · · · · · · · · · · · · · ·	•	
66 00FB AD 0000G	LDA JMPMAL	SET MASTER POINTER TO JSRL	
67 00FE 8D 2000	STA VECRAM	;LIST FOR SUBLISTS CREATED ABOVE	
68 0101 AD 0000G	LDA JMPMAH	•	
69 0104 8D 2001 70	STA VECRAM+1	•	
71 0107 60	RTS	;	
020, 00	N+0		

IDICD	AL TENC	DICD	I AV CHAI	CTIO	ATADT MAC	CE UMOS DO DO D	6 62 DACE 22	
UFFER C		D12b	LAY FUNC		ATAKI MAC	65 VM03.09 00 0	U UZ PAGE ZZ	
•						COTT! DUCC"	CONTROL	
2					•	•SBTTL BUFFER	CUNTRUL	
3					INPUT	ACC SUB BUFFER G	ROUP INDEX CODE	
4						VGLIST 2 VGY	SET UP TO VACANT BUFFER	
5					;	ACC, X, Y DESTROY	ED	
6 7	0108 0108	AA			SBCLOG	TAX	SET UP VECTOR RAM POINTS TO	
8	0109	OA				ASL	UNUSED BUFFER	
9	010A	A8				TAY		
10	0108	BD	0415			LDA X, BUFACT		
11	010E	D0	00			IFEQ	; BUFFER A OR B ACTIVE	
12 13	0110 0113	BE B9	0000G			LDX Y, BUFBSL	; A IS CTIVE. BUILD IN B	
14	0116	88	50	00		ELSE		
	010F	09						4
15	0119	BE	0000G			LDX Y, BUFASL	;B IS ACTIVE. BUILD IN A	
16 17	011C 0118	89 06	0000G			LDA Y, BUFASH ENDIF		
18	0116 011F	86	74			STX VGLIST		
19	0121	85	75			STA VGLIST+1		
20	0123	A9	00			LDA I,0		
21	0125	85	Α9			STA VGY		
22 23	0127	60				RTS	OPPOSITE OF SBCLOG-PLACE PTR	
24							TO ACTIVE BUFFER INTO INDYLO	
25	0128	AA			SBCACT	TAX	•	
26	0129	OA				ASL		
27 28	012A 012B	A8 BD	0415			TAY LDA X, BUFACT		
29	0126 012E	DO	00			IFEQ		
30	0130	BE	0000G			LDX Y, BUFASL	; A IS ACTIVE	
31	0133	B9	0000G			LDA Y, BUFASH	·	4
32	0136	88	50	00		ELSE		
33	012F 0139	09 BE	0000G			LDX Y, BUFBSL	B IS ACTIVE	
34	013C	89	0000G			LDA Y, BUFBSH	JU 13 MOTIVE	
35	0138	06				ENDIF		
36	013F	86	3B			STX INDYLO		
37	0141	85	30			STA INDYLO+1		
38 39	0143 0145	A9 85	00 A9			LDA I,O STA VGY		
40	0147	60	** 7			RTS		
41						ACC SUBBUFFER GR		
42					OUTPUT		D OF NEWLY BUILT BUFFER	
43 44					<u> </u>		OINT TO NEW BUFFER ACTIVE	
44 45	0148	48			SBCSWI	PHA PLIPPE	D INDICATING MEN DOFFER ACTIVE	
46	0149	20	0000G			JSR VGRTSL	; INSERT RTSL AT END OF BUFFER	
47	014C	68				PLA		-
48	014D	AA				TAX		
49 50	014E 014F	0 A A 8				ASL TAY		
51	0150	B9	0000G			LDA Y, BUFSWL	SET UP SWITCH LOCATION	
52	0153	85	3 B			STA INDYLO	•	
53 54	0155	B9	0000G			LDA Y, BUFSWH		
	0158	85	3C			STA INDYHI		

, _	V								7	1412
1	ALDISP BUFFER	- ALIENS	DISP	LAY FUN	CTIO	ATARI MAC	65 VM03.09 00 00 02	PAGE 22+	1 2	H
3	DOI 1 E.N	COMTROL							3 4	
4		015D	49	01			EOR I,01		5	
5 6		015F 0162	9D D0	0415 00			STA X, BUFACT IFEQ	WHICH IS THE NEW BUFFER TO DISLAY	7 8	
7		0164	B9	0000G			LDA Y, JMPALO	BUFFER A	9	
8	60	0167	BE	0000G			LDX Y, JMPAHI		10	
9		0164	B8 09	50	00		ELSE		12	
10		0163 016D	B9	0000G			LDA Y, JMPBLO	\$BUFFER B	14	
12		0170	BE	0000G			LDX Y, JMPBHI		15 16	
13		016C	06				ENDIF		17	
14		0173 0175	A0 91	00 3B			LDY I,0 STA NY, INDYLO	;UPDATE SWITCH TO PT TO ;NEW BUFFER	19	
16		0177	8A	36			TXA	FREW DOFFER	20 21	
17	68	0178	C8				INY		22	
18		0179	91	38			STA NY, INDYLO		24	
19		017B	60				RTS	•	26	
21		017C				BIGTEX		ASSIGN LARGE BUFFER FOR TEXT	27 28	
22	73	017C	AD	0000G			LDA JMPMA2	•	29	
23		01 7 F 0182	CD FO	2000 00			CMP VECRAM IFNE	• DEEN HEDE DECODE	31	
25		0184	8D	2000			STA VECRAM	;BEEN HERE BEFORE ;NO. SET UP MASTER POINTER FOR TEXT ONLY.	-32 33	
26		0187	38				SEC		34	
27		0188	60				RTS	; EXIT	36	
28	79 80	0183 0189	05 AD	0415			ENDIF LDA BUFACT	;YES. INSERT JMP TO AREA WITH MORE ROOM.	38	
30		018C	DO	00			IFEQ	*163* INSERT OMF TO AREA WITH MORE ROOM*	39 40	
31	82	018E	A2	02			LDX 1,02	;BIG AREA 1 1ST HALF OF VECRAM	12 13 14 15 16 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 7 38 39 40 41 42 43 44 45 64 47	
32		0190	88	50	00		ELSE		42	
33 34		018D 0193	05 A2	08			LDX I,08	BIG AREA 2 2ND HALF OF VECRAM	44 45	
35	85	0192	02	0.0			ENDIF	FOID AND E ZHO HAZI OF FEDNAM	46	
36		0195	BD	0000G			LDA X, JMPALO		48	
37		0198	A0 8C	00			LDY I,0 STY SECUVY		49 50	
38		019A 019D	91	016E 74			STA NY, VGLIST		51 52	
40	90	019F	C8				INY		53	
41		01A0	BD	0000G			LDA X, JMPAHI	; INSERT JMPL TO AREA WITH MORE ROOM	55	
42		01A3 01A5	91 BD	74 0000G			STA NY, VGLIST LDA X, BUFASL	POINT VGLIST AT NEW AREA	56 57	
43		01A8	85	74			STA VGLIST	FIGER FOLISI HI HER HICH	49 50 511 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 77	
45	95	Olaa	BD	0000G			LDA X, BUFASH		60	
46	96	01AD	85	75			STA VGLIST+1		61 62	
) 47 48	97 98	01AF 01B0	18 6 0				CLC RTS		63	
49		0100					7,13		65	
50									66 67	
51									68	
52									70	
51 52 53 54 55 56									71 72	
55									73 74	
56 57									75	
									77	1
58 59									78 79	
60									80	

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 23 DISPLAY-WELL .SBTTL DISPLAY-WELL ì 2 0003 CSUSTA 3 **CSUINT** 0001 1 3 DSPWEL 4 0181 0114 5 0181 AD LDA ROTDIS 0184 FO 00 IFNE :REBUILD WELL 6 LDA I, BCWELL 7 0186 A9 00G 14 15 JSR SBCLOG 0188 20 0108 9 0188 20 1157 JSR BLDWEL ;YES LDA I, BCWELL 10 018E A9 00G 18 19 20 0100 20 0148 JSR SBCSWI 11 ENDIF 12 0185 OD 20 21 22 23 24 25 26 27 01C3 00G LDA I, BCWELL ;SET UP PTR TO ACTIVE WELL BUFFER 13 A9 14 0105 20 0128 JSR SBCACT 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59

3 4 5 01C 6 01C 7 8 01C 9 01C 10 10 11 01D 12 01D 13 01D 14 15 01D 16 01D 17 01D 18 01E 20 01E 21 01E 22 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	A A2 C 9D C CA D 10 C AD D 30 T AE A BD C F0 E A0 L BD C CB B D0 A CB B BD C CB C CB C CD C CD	0F 0425 FA 0106 00 011C 02DF 00 00 0283 07 01 00 29 0283 80 00 0148 00	SBTTL DISPLAY-SE SBTTL DISPLAY-SE LDA I, 0 LDX I, NLINES-1 BEGIN STA X, SPOKST DEX MIEND LDA CURMOD IFPL LDX WINVMX BEGIN LDA X, INVAY IFNE LDY I, 0 LDA X, INVACI AND I, INVABI CMP I, ZABPUL IFEQ INY STY TEMPO LDA X, INVACI AND I, INVMOT IFEQ LDA PULSON IFPL	CURSOR AT TOP ; CURSOR AT TOP ; YES. ; LOOP FOR EACH INVADER ; ACTIVE INVADER ; YES. DEFAULT ; PULSAR ; YES. SET PULSAR BIT DO ; YES ; FLIPPING ; NO.	
6 01C 7 8 01C 9 01C 10 01D 11 01D 12 01D 13 01D 14 15 01D 16 01D 17 01D 18 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	A A2 C 9D C CA D 10 C AD D 30 T AE A BD C F0 E A0 L BD C CB B D0 A CB B BD C CB C CB C CD C CD	0F 0425 FA 0106 00 011C 02DF 00 00 0283 07 01 00 29 0283 80 00 0148 00	LDA I, 0 LDX I, NLINES-1 BEGIN STA X, SPOKST DEX MIEND LDA CURMOD IFPL LDX WINVMX BEGIN LDA X, INVAY IFNE LDY I, 0 LDA X, INVAC1 AND I, INVABI CMP I, ZABPUL IFEQ INY STY TEMPO LDA X, INVAC1 AND I, INVMOT IFEQ LDA PULSON	;LOOP FOR EACH SPOKE ;CLEAR SPOKE PULSE STATUS ;CURSOR AT TOP ;YES. ;LOOP FOR EACH INVADER ;ACTIVE INVADER ;YES. DEFAULT ;PULSAR ;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
6 01C 7 8 01C 9 01C 10 01D 11 01D 12 01D 13 01D 14 15 01D 16 01D 17 01D 18 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	A A2 C 9D C CA D 10 C AD D 30 T AE A BD C F0 E A0 L BD C CB B D0 A CB B BD C CB C CB C CD C CD	0F 0425 FA 0106 00 011C 02DF 00 00 0283 07 01 00 29 0283 80 00 0148 00	LDX I,NLINES-1 BEGIN STA X,SPOKST DEX MIEND LDA CURMOD IFPL LDX WINVMX BEGIN LDA X,INVAY IFNE LDY I,O LDA X,INVACI AND I,INVABI CMP I,ZABPUL IFEQ INY STY TEMPO LDA X,INVACI AND I,INVMOT IFEQ LDA PULSON	;CLEAR SPOKE PULSE STATUS ;CURSOR AT TOP ;YES. ;LOOP FOR EACH INVADER ;ACTIVE INVADER ;YES. DEFAULT ;PULSAR ;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
7 8 01C 9 01C 10 01D 11 01D 12 01D 13 01D 14 15 01D 16 01D 17 01D 18 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	C 9D C CA D 10 2 AD 5 30 7 AE A BD C F0 E A0 L BD 4 29 B C9 B C9 B BD C C8 B BD C8 B BD C8 B BD C8 BD BD C8 BD BD C8 BD BD C8 BD BD BD BD BD BD BD BD BD BD BD BD BD	0425 FA 0106 00 011C 02DF 00 00 0283 07 01 00 29 0283 80 00 0148 00	BEGIN STA X, SPOKST DEX MIEND LDA CURMOD IFPL LDX WINVMX BEGIN LDA X, INVAY IFNE LDY I, 0 LDA X, INVAC1 AND I, INVABI CMP I, ZABPUL IFEQ INY STY TEMPO LDA X, INVAC1 AND I, INVMOT IFEQ LDA PULSON	;CLEAR SPOKE PULSE STATUS ;CURSOR AT TOP ;YES. ;LOOP FOR EACH INVADER ;ACTIVE INVADER ;YES. DEFAULT ;PULSAR ;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
9 01C 10 01D 11 01D 12 01D 13 01D 14 15 01D 16 01D 17 01D 18 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	E CA D 10 D 20 AD 30 T AE A BD D F0 E A0 L BD A C8 B BD D C9 B BD D 29 D D0 A AD D BD D 29 D D0 A AD D BD D CD D BD D CD D BD D CD	FA 0106 00 011C 02DF 00 00 0283 07 01 00 29 0283 80 00 0148	DEX MIEND LDA CURMOD IFPL LDX WINVMX BEGIN LDA X, INVAY IFNE LDY I, 0 LDA X, INVACI AND I, INVABI CMP I, ZABPUL IFEQ INY STY TEMPO LDA X, INVACI AND I, INVMOT IFEQ LDA PULSON	CURSOR AT TOP YES. ;LOOP FOR EACH INVADER ACTIVE INVADER ;YES. DEFAULT PULSAR ;YES. SET PULSAR BIT DO ;YES FLIPPING ;NO.	
10 01D 11 01D 12 01D 13 01D 14 15 01D 16 01D 17 01D 18 01E 19 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	10 22 AD 30 7 AE A BD D F0 E A0 L BD 4 29 6 C9 B D0 A C8 B BD D 29 D D0 D 29 D D0 D BD D D0 D BD D D0 D BD D D0 D BD D D0 D BD D D0 D BD D D0 D D0	FA 0106 00 011C 02DF 00 00 0283 07 01 00 29 0283 80 00 0148	MIEND LDA CURMOD IFPL LDX WINVMX BEGIN LDA X, INVAY IFNE LDY I, 0 LDA X, INVACI AND I, INVABI CMP I, ZABPUL IFEQ INY STY TEMPO LDA X, INVACI AND I, INVMOT IFEQ LDA PULSON	;YES.;LOOP FOR EACH INVADER ;ACTIVE INVADER ;YES. DEFAULT ;PULSAR ;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
11 01D 12 01D 13 01D 14 15 01D 16 01D 17 01D 18 01E 19 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	5 30 7 AE A BD D F0 E A0 L BD 4 29 6 C9 B D0 A C8 B BD D 29 D 29 D 29 D 29 D 29 D 29 D 20 D 29 D 20 D 29 D 20 D 20 D 20 D 20 D 20 D 20 D 20 D 20	00 011C 02DF 00 00 0283 07 01 00 29 0283 80 00 0148	IFPL LDX WINVMX BEGIN LDA X, INVAY IFNE LDY I, 0 LDA X, INVAC1 AND I, INVABI CMP I, ZABPUL IFEQ INY STY TEMPO LDA X, INVAC1 AND I, INVMOT IFEQ LDA PULSON	;YES.;LOOP FOR EACH INVADER ;ACTIVE INVADER ;YES. DEFAULT ;PULSAR ;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
13 01D 14 15 01D 16 01D 17 01D 18 01E 19 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 31 01F 32 020 33 020 34 35 020	7 AE A BD C F0 E A0 L BD 4 29 B D0 A C8 B BD C 29 C D0 A AD C BD C CD	011C 02DF 00 00 0283 07 01 00 29 0283 80 00 0148	LDX WINVMX BEGIN LDA X, INVAY IFNE LDY I, 0 LDA X, INVAC1 AND I, INVABI CMP I, ZABPUL IFEQ INY STY TEMPO LDA X, INVAC1 AND I, INVMOT IFEQ LDA PULSON	;YES.;LOOP FOR EACH INVADER ;ACTIVE INVADER ;YES. DEFAULT ;PULSAR ;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
14 15 01D 16 01D 17 01D 18 01E 19 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	A BD F0 F0 A0 L BD A0 C8 B BD C0 A0	02DF 00 00 0283 07 01 00 29 0283 80 00 0148	BEGIN LDA X, INVAY IFNE LDY I, 0 LDA X, INVAC1 AND I, INVABI CMP I, ZABPUL IFEQ INY STY TEMPO LDA X, INVAC1 AND I, INVMOT IFEQ LDA PULSON	;LOOP FOR EACH INVADER ;ACTIVE INVADER ;YES. DEFAULT ;PULSAR ;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
15 01D 16 01D 17 01D 18 01E 19 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 31 01F 32 020 33 020 34 35 020	D FO A AO A CB B BD A CB B BD D 29 D 29 D AO A AD D BD D CD D CD	00 00 0283 07 01 00 29 0283 80 00 0148	IFNE LDY I,0 LDA X,INVAC1 AND I,INVABI CMP I,ZABPUL IFEQ INY STY TEMPO LDA X,INVAC1 AND I,INVMOT IFEQ LDA PULSON	;ACTIVE INVADER ;YES. DEFAULT ;PULSAR ;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
17 01D 18 01E 19 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	A0 BD C CD	00 0283 07 01 00 29 0283 80 00 0148	LDY I,0 LDA X,INVAC1 AND I,INVABI CMP I,ZABPUL IFEQ INY STY TEMPO LDA X,INVAC1 AND I,INVMOT IFEQ LDA PULSON	; YES. DEFAULT ; PULSAR ; YES. SET PULSAR BIT DO ; YES ; FLIPPING ; NO.	
18 01E 19 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	1 BD 4 29 5 C9 8 D0 4 C8 8 84 0 BD 0 29 2 D0 4 AD 7 30 9 BD C CD	0283 07 01 00 29 0283 80 00 0148	LDA X, INVACI AND I, INVABI CMP I, ZABPUL IFEQ INY STY TEMPO LDA X, INVACI AND I, INVMOT IFEQ LDA PULSON	;PULSAR ;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
19 01E 20 01E 21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	4 29 6 C9 8 D0 4 C8 8 84 0 BD 0 29 2 D0 4 AD 7 30 9 BD	07 01 00 29 0283 80 00 0148	AND I,INVABI CMP I,ZABPUL IFEQ INY STY TEMPO LDA X,INVACI AND I,INVMOT IFEQ LDA PULSON	;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
21 01E 22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	B DO CB BD C CD	00 29 0283 80 00 0148	IFEQ INY STY TEMPO LDA X,INVAC1 AND I,INVMOT IFEQ LDA PULSON	;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
22 01E 23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	A C8 B 84 D BD D 29 D 29 D AD T 30 B BD C CD	29 0283 80 00 0148	INY STY TEMPO LDA X,INVAC1 AND I,INVMOT IFEQ LDA PULSON	;YES. SET PULSAR BIT DO ;YES ;FLIPPING ;NO.	
23 01E 24 01E 25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	D BD 29 29 20 4 AD 7 30 BD C CD	0283 80 00 0148 00	LDA X,INVAC1 AND I,INVMOT IFEQ LDA PULSON	;YES ;FLIPPING ;NO.	
25 01F 26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	29 22 D0 44 AD 7 30 9 BD C CD	80 00 0148 00	AND I,INVMOT IFEQ LDA PULSON	;FLIPPING ;NO.	
26 01F 27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	2 D0 4 AD 7 30 9 BD C CD	00 0148 00	IFEQ LDA PULSON	;NO.	
27 01F 28 01F 29 01F 30 01F 31 01F 32 020 33 020 34 35 020	4 AD 7 30 9 BD C CD	00		;NO.	
29 01F 30 01F 31 01F 32 020 33 020 34 35 020	BD C CD		TEDI	*DILLCYDC UM	
30 01F 31 01F 32 020 33 020 34 35 020	C CD		LDA X, INVAY	;PULSARS ON ;YES.	
32 020 33 020 34 35 020			CMP PULPOT		
33 020 34 35 020		00	IFCC	; POTENT PULSAR	
34 35 020			INC TEMPO INC TEMPO	;YES. SET PULSE BIT D1	
	<i></i>	<u></u>	2:10 12:511 0		
			ENDIF		
36 01F 37 020			ENDIF LDA TEMPO	SET CCW LEG STATUS	
38 020			LDY X, INVAL2	The total states	
39 020			ORA Y, SPOKST		
40 020 41 01F			STA Y, SPOKST ENDIF		
42 021	э вс	0289	LDY X, INVAL1		
43 021		29	LDA TEMPO	*C"T D*C" DTT	
44 021 45 021			ORA I,80 ORA Y,SPOKST	;SET BASE BIT	
46 021	4 99		STA Y, SPOKST		
47 01E	33		ENDIF		
48 01D 49 021			ENDIF DEX		
50 021			MIEND		
51 01D	5 49		ENDIF		
52 022 53 022			LDA I,WELCOL LDY SUZTIM	;DEFAULT WELL COLO	
54 022			IFNE		

	1			17107 11107 11100 00 00 00 00		
	- ALIENS -SPOKE P		LAY FUNCTIO STATUS	ATARI MAC65 VM03.09 00 00 02	PAGE 24+	
58	022D	C9	07	CMP I,7		
59	022F	DO	00	IFEQ	*NO DI ACK	
60	0231	A9	01	LDA I,1	;NO BLACK	
61	0230	02		ENDIF		
62	0228	OA		ENDIF ENDIF		
63 64	0226 0233	0C 85	20	STA TEMPO	DEFAULT COLOR	
65	0235	A0	29 FF	LDY I,-1	; DEFAULT COLOR	
66	0237	A2	FF	LDX I,-1		
67	0239	86	2C	STX TEMP3	;DEFAULT NO BONUS FLASH	
68	023B	AD	0202	LDA CURSY	DET HOLI HO DONOS TEASH	
69	023E	FO	00	IFNE	;C;URSOR ALIVE	
70	0240	AD	0201	LDA CURSL2	y Oy OHOUH PIEZ Y G	
71	0243	30	00	IFPL		
72	0245	AE	0200	LDX CURSL1	;YES.	
73	0248	AC	0201	LDY CURSL2	•	
74	0244	06		ENDIF		
75	023F	OB		ENDIF		
76	024B	86	2A	STX TEMP1	;SAVE FLASLIGHT SPOKES	
77	024D	84	28	STY TEMP2		
78	024F	AD	0124	LDA BOFLASH		
79	0252	30	00	IFPL	;BONUS FLASH	
80	0254	29	0E	AND I, OE	;YES. SET BASE COLOR	
81	0256	4A		LSR		
82	0257	85	2C	STA TEMP3		
83	0259	CE	0124	DEC BOFLASH		
84	0253	08		ENDIF		
85	025C	A2	0F	LDX I, NLINES-1		
86				BEGIN	;LOOP FOR EACH SPOKE	
87	025E	OA OA	06	LDY I, WELCOL	;DEFAULT WELL COLOR	
88	0260	BD	0425	LDA X, SPOKST	• DUIL C.""	
89	0263	F0	00	IFNE	;PULSE	
90	0265	29	02	AND I, 2	•VEC DIB CTAC	
91	0267	F0	00	IFNE	;YES. PULSING	
92	0269	A5	03	LDA QFRAME		
93	0268	29	01	AND I,1 TAY		
94 95	026D 0268	A8 05		ENDIF		
95 96	0268 026E	88	50 00	ELSE		
70	0264	00	טט טכ	E L J E		
97	0204	E4	24	CPX TEMP1	;NO.	
98	0273	F0	00	IFNE	• · · · · · · · · · · · · · · · · · · ·	
99	0275	E4	2B	CPX TEMP2		
100	0274	02	LU	END IF		
101	0277	D0	00	IFEQ	;NO. CURSOR FLASHLIGHT	
102	0279	AO	01	LDY I, CURCOL	YES. CURSOR COLOR	
103	027B	88	50 00	ELSE	, inde deligati dagan	
	0278	05		MI 🖜 🗸 MI		
104	027E	AD	0124	LDA BOFLASH	;NO.	
105	0281	30	00	IFPL	BONUS FLASH	
106	0283	8A		TXA	YES. BONUS COLOR	
107	0284	18		CLC	•	
108	0285	65	2C	ADC TEMP3	;PLUS BASE COLOR	
109	0287	29	07	AND I,7	MOD 8	
110	0289	C9	07	CMP I,7		
111	0288	DO	00	IFEQ		
112	028D	A9	03	LDA I,3	;NO BLACK	

	ALDISP -				ICTIO	1	TARI MAC65 VMO3.	09 00 00 02	PAGE 24+	1
2	DISPLAY-	-SPOKE	PULSE	STATUS						2 3
3										4
4	113	028C	02				ENDIF			5
5	114	028F	A8				TAY			6 7
6	115	0290	88	50	00		ELSE			8
7		0282	10							9
8	116	0293	A4	29			LDY TEN	IPO	;NO. USE DEFALT COLOR	10
9	117	0292	02				ENDIF			12
10	118	027D	17				ENDIF			13
11		0270	24				ENDIF			14
12	120	0295	98				TYA			15
13		0296	BC	0200			LDY X,	TALOC		17
14		0299	91	38			STA NY			18
15		0298	CA				DEX			19
16	124	029C	10	CO			MIEND			
17		029E	A2	0F				ILINES-1	;YES. REDO TOP RUNGS	22
18	126	02A0	2C	0111			BIT WEI		TEST REDUCTOR NOMOS	21 22 23 24
19		02A3	10	00			IFMI	. 1 1 5		25
	128	02A5	CA	00			DEX		:PLANAR, SO 1 LESS RUNG	26
20	129	02A4	01				ENDIF		PLANAR, SU I LESS RUNG	25 26 27 28
21		UZAT	0.1				BEGIN		*1 OOD EOD EACH DUNC	
22	130	0246	40	CO					;LOOP FOR EACH RUNG	30
23	131	0246	AO	C0			LDY I,		;DEFAULT ON	31
24	132	02A8	BD	0425			LDA X,	PUK2 I	• Dill C i C	29 30 31 32 33 34 35 36
25	133	02AB	10	00			IFMI	<u>,</u>	;PULSAR	33
26	134	02AD	AO	00			LDY I,)	;YES. TURN OFF	35
27	135	02AC	02				ENDIF			
28	136	02AF	84	58			STY PZI			37 38
29	137	0281	ВС	02D1			LDY X,			39
30	138	02B4	Bi	B0			LDA NY			40
31	139	0286	29	1F			AND I,			41 42
32	140	0288	05	58			ORA PZI			43
33	141	02BA	91	В0			STA NY	RUNGVG		44
34	142	02BC	CA				DEX			45
35	143	02BD	10	E7			MIEND			40
36	144	02BF	60				RTS			48
37	145								NE OF COLOR STATS FOR EACH LINE	49
38	146	02C0	A8	9C	92	86	STALOC .BYTE	A8,9C,92,86,	7C, 70, 66, 5A, 50, 44, 3A, 2E, 24, 18, 0E, 2, 0B2	50 51 52 53 54 55 56 57 58 59
39		02C4	7C	70	66	5 A				52
40		02C8	50	44	3 A	2E				53
41		02CC	24	18	OE	02				54 ₅₅
42		02D0	B2							
43	147						;OFFSETS INTO \	VELL SUBROUTI	NE +OFE OF COLOR STATS FOR EACH TOP RUNG	57
44	148	02D1	38	37	33	2F	RUNLOC .BYTE	B, 37, 33, 2F, 2	B, 27, 23, 1F, 1B, 17, 13, 0F, 0B, 07, 03, 3F	58
45		02D5	28	27	23	1F				60
46		02D9	18	17	13	0F				
47		02DD	08	07	03	3F				62
48	149	02E1	00G				CHKSM6	.BYTE QCHKS	6	61 62 63 64 65 66
49	·									65
50										66

T 1	ALDISP -	_ ALTEN	מסות פ	I AV FIIM	CTIO ATARI MAC65 VM03.09 00 00 02 PAG	2F 25	1
2	DISPLAY-			LATION	CITO ATAKI MACOJ VMUSTUJ UU UU UZ PAG		2 3
3	1				SBTTL DISPLAY-NYMPHS		4 5
5	2		0004		IEYL 4		6
6	3	02E2			DSPNYM		8
7	4 5	02E2 02E4	A0 8 4	0C 9E	LDY I,NYMCOL STY COLOR		10
	6	02E4	A9	08	LDA I,MZCOLO		11
10	7	02E8	20	0000G	JSR VGSTAT		13
11	8	02EB	A2	66	LDX I,XADJL	ADOCTITON OF AN AT MANICH DI	14 15 16
12	10	02ED 02F0	20 A9	15AF 12	JSR VGYAB1 LDA I,18.	; POSITION BEAM AT VANISH PT.	16 17
14	11	02F2	85	56	STA PXL	;MAX # DISPLAYABLE	18 19 20
15	12	02F4	A2	3F	LDX I,NNYMPH-1		
16	13 14	02F6 02F8	8 6 A0	37 00	STX INDEX1 LDY I,0		21 22 23 24 25 26 27 28
18	15	0210	AU	00	BEGIN	:LOOP FOR EACH NYMPH	23
19	16	02FA	A6	37	LDX INDEX1	•	25
20		02FC	BD	0243	LDA X, NYMPY	ANVARIA ACTIVE	26 27
21	18	02FF 0301	DO 4C	00	IFEQ JMP NONYM	;NYMPH ACTIVE ;NO. SKIP IT	
23		0300	03	0373	ENDIF	\$ 10 0 0 KZ	30
24		0304	C9	50	CMP I,50	;YES.	29 30 31 32 33 34 35 36
25	22 23	0306 0308	90 C6	00 37	IFCS DEC INDEX1	SKIP EVERY OTHER ONE PAST THIS DEPTH	33
) 26 27		0307	02	31	ENDIF		35
28	25	030A	48		PHA		
29		030B	29	3F	AND I,3F	FAKE PROJECTION USE NYMPH DEPTH TO GET SCALES	37 38 39 40
30	27	030D 030F	91 68	74	STA NY, VGLIST PLA	;LINEAR SCALE	40
32		0310	2A		ROL		42 43 44
33		0311	2A		ROL		44
34	31 32	0312 0313	2A 29	03	ROL AND I,3		45 46 47
36	33	0315	18	03	CLC		47
37	34	0316	69	01	ADC I,1		49
38		0318	09	70	ORA I,70 INY		51
39	36	031A 031B	C8 91	74	STA NY, VGLIST	;BINARY SCALE	52
41	38	031D	C8		INY		54 55
42		031E	BD	0203	LDA X, NYMPL	GET NYMPH LINE	56
43	40 41	0321 0322	AA BD	038A	TAX LDA X,LIFSZL	; VECTOR TO NYMPH	50 51 52 53 54 55 56 57 58 59 60
45		0325	38		SEC	The term of the te	59 60
46	43	0326	E5	68	SBC ZADJL		61
47	44	0328 032A	85 91	63 74	STA SZL STA NY, VGLIST	;Z LSB	63
49	46	032C	C8	17	INY	J. LOD	65
50	47	032D	BD	037A	LDA X,LIFSZH		66
51	* ***	0330	E5	69	SBC ZADJL+1		68
52		0332 0334	85 29	64 1F	STA SZH AND I,1F		70
54	51	0336	91	74	STA NY, VGLIST	;Z MSB	61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76
55	52	0338	C8		INY		73 74
56 57	= .	0339 033C	BD 85	036A 61	LDA X,LIFSXL STA SXL		75
58	55	033E	91	74	STA NY, VGLIST	;X LSB	77
59	56	0340	C8		INY	-	77 78 79
60	57	0341	BD	035A	LDA X,LIFSXH		80

$\overline{}$									141
1	ALDISP -		DISP	LAY FUN	CTIO	ATARI MAC	65 VM03.09 00 00 0	02 PAGE 25+	27111
2	DISPLAY-	NYMPHS						3	
3	58	0344	85	62			STA SXH		· 5
5	59	0346	29	1F			AND I,1F	6	
6	60	0348	91	74			STA NY, VGLIST	;X MSB	3
7	61	034A	C8				INY	DISPLAY A DOT	1
8	62	034B	A9	00			LDA I,O	10 11 11 11 11 11 11 11 11 11 11 11 11 1)
9	63	034D	91	74			STA NY, VGLIST	;0 Z LSB	2
10	64	034F	C8				INY	13	3
11	65	0350	91	74			STA NY, VGLIST	;0 Z MSB	5
12		0352 0353	C8	74			INY STA NY, VGLIST	16 V I CD	3
13		0355	91 A9	AO			LDA I, OAO	;0 X LSB 18 19	3
15	69	0357	C8	70			INY	19	(6
16	70	0358	91	74			STA NY, VGLIST	;BRIGHTNESS, O X MSB	1
17	71	035A	C8				INY	;BRIGHTNESS, O X MSB ;DRAW VECTOR BACK TO FAKE V.P. 25 26 27 28	2
18	72	035B	A5	63			LDA SZL	;DRAW VECTOR BACK TO FAKE V.P.	4
19		035D	49	FF			EOR I, OFF	25	5
20	74	035F	18				CLC	27 27	7
21	75	0360	69	01			ADC I,1		
22		0362	91	74			STA NY, VGLIST	;Z LSB)
23 24	77	0364	C8				INY LDA SZH	31	
25	78 79	0365 0367	A5 49	64 FF			EOR I, OFF	32 33	3
26		0369	69	00			ADC I,O	34	4
27	81	036B	29	1F			AND I,1F	; Z LSB 25 30 31 32 33 34 35 36 36 36	5
28		036D	91	74			STA NY, VGLIST	;Z MSB	7
29		036F	C8				INY	; Z MSB	3
30	84	0370	A5	61			LDA SXL	40	5
31	85	0372	49	FF			EOR I, OFF	41 42 43	1
32		0374	18				CLC	$^{+2}$	3
33		0375	69	01			ADC I,1	44	4
34	88 89	0377 0379	91 C8	74			STA NY, VGLIST	;X LSB	8
35	90	037A	A5	62			LDA SXH	47	7
37	91	037C	49	FF			EOR I, OFF		9
38	92	037E	69	00			ADC I,O	50)
39	93	0380	29	1F			AND I, 1F	51 52	2
40	94	0382	91	74			STA NY, VGLIST	;X MSB	3
41	95	0384	C8				INY	54 55	5
42	96	0385	CO	FO			CPY I, OFO	56	3
43		0387	90	00			IFCS	; VGLIST LSB INDEX MAXING OUT	8
44	98	0389	88	00000			DEY	• VEC LIDDATE NOLICE	90011223333445566677
45 46	99 100	038A 038D	20 A0	0000G			JSR VGADD LDY I,0		
46	100	0388	06	UU			ENDIF	PUFFIE FOR THREY	2
48	102	038F	C6	56			DEC PXL	;EXIT EARLY IF MAX	3
49	103	0391	30	07			BMI EXCESS	; RESET LSB INDEX ; EXIT EARLY IF MAX ; LIMIT REACHED ; EXIT LOOP AFTER LAST NYMPH	5
50		0393	C6	37		NONYM	DEC INDEXI	• 66 67	3 7
51	105	0395	30	03	4C 02F		MIEND		
52		039A	98			EXCESS	TYA	68 70 71 72 3 19 19 19 19 19 19 19 19 19 19 19 19 19)
53	107	0398	FO	00			IFNE	71	1
54	108	039D	88	00000			DEY	PURDATE NOLICE	2
55	109	039E	20	0000G			JSR VGADD ENDIF	;UPDATE VGLIST	4
56 57	110 111	039C 03A1	04 A5	B 5		ZQATLI	LDA QT1	75	5
58	112	03A3	F0	00		LWHILI	IFNE LDA Q11		$\begin{bmatrix} 6 \\ 7 \end{bmatrix}$
59		03A5	A5	46			LDA WAVENI	78	8
60	114	03A7	C9	OA			CMP 1,10.	75 	9
_									

) –	DATE	17-04-198	1 18 51	05 USE	R THEURER	JOB TEMPEST	PAGE 001	
1	ALDISP	' - ALIENS	DISPLAY	FUNCTIO	ATART MAG	C65 VM03.09 00	00 02 PAGE 25+	1412THE
		Y-NYMPHS						2 3 4
4 5	115 116			00 7 A		IFCS LDA I,7A		5 6 7
6	117 118	03AD		53		STA FRTIMR ENDIF		8
8	119	03A4	OA	01		ENDIF LDA I,1		9 10 11
10	121	. 03Bl	4C 00	00G	VCDGT	JMP VGSCA1 PHA		12 13 14
12	122	0385		00	VGDOT	LDY I,0	;DRAW A DOT	15
13	124 125	03B8		74		TYA STA NY, VGLIST		18 19
15 16	126	03BB		74		STA NY, VGLIST		20 21 22
18	128 129	03BE		74		INY STA NY, VGLIST		23 24
19 20	130 131	. 03Cl	C8 68			INY PLA		25 26 27
21 22) 23	132 133	03C4	Α9	74 04		STA NY, VGLIST	;UPDATE DISPLAY POINTER	28 29 20
23 24	134 135	0307		74		CLC ADC VGLIST		31 32
25 26	136 137	03CB	90	74 00		STA VGLIST IFCS		33 34 35
27 28	138 139	03CC	02	75		INC VGLIST+1 ENDIF		36 37
28 29 30	140	03CF	60			RTS		38 39 40
31 32								12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44
33 34								44 45 46
35 36								47 48
37								49 50 51
39 40								52 53
41 42								54 55 56
43								57 58 59
45 46								52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67
) 47 48								62 63 64
49								65 66 67
51 52								68
53								69 70 71 72
55								72 73 74 75
57 58								75 76 77 1
59								78 79 80

_	DATE	17-04-198	1 18 5	1 05 U	SER THEURER	JOB TEMPEST		PAGE 0018	
<i></i>									1412THE
1		- ALIENS Y-CURSOR	DISPL	AY FUNCTIO	ATARI MAC	C65 VM03.09 00 0	0 02 PAGE 27		-
3	DISFLA	II-CUNSUN							3 4
4	1				Depend	.SBTTL DISPLAY	-CURSOR		5
) 5	3		Α9	01	DSPCUR	LDA I, CURCOL			6 7 8
7	4	03D2	85	9E		STA COLOR			
8	5			0202		LDA CURSY IFNE			11
10	7		F0 C9	00 F0		CMP I, ILINDDY			12 13
) 1	1 8	03DB	80	00		IFCC	;AT BOTTOM		14 15
12	9 3 10		85 85	57 2F		STA PYL STA TEMPY	;NO. DEPTH		16 17
14	11	. 03E1	AD	0201		LDA CURSL2			18
15			C9 F0	81 00		CMP I,81 IFNE	*DON T DICH AV DI ACTED CHROOD		20
10				0200		LDY CURSL1	;DON T DISPLAY BLASTED CURSOR ;CURSOR S WELL LINE #S		22
18	15	03EB	A5	51		LDA CURSPO	GET CURSOR POSITION BETWEEN LINES		24
19			4A 29	07		LSR AND I,07			9 10 11 12 13 14 15 16 16 17 18
2	18	03F0	18			CLC			27 28
22 24	19		69	01 0854		ADC I, CNCURS JSR ONELIN	;ADD IN BASE PIC # ;DRAW LINE		30
24	20 4 21		20 0€	OBEA		ENDIF	,DRAW LINE		31 32
2	22	03DC	19			ENDIF			33
20			1D 60			ENDIF RTS			35
		, 03,0							37
29 29 30	9								38 39
3.									40
32	2								42 43
33	1								44 45
3	5								46
36									48
33									50
39	9								49 50 51 52 53 54 55 56 57 58 59 60 60 61 62 63 64 65 66 67
40) 								54
42	2								56
43	3								57 58
4:	5								59 60
46	6								61 62
48	() 3								63
49	9								65
) 50 51									67
52									68 69
53									70 71
54 54									69 70 71 72 73 74 75 76
) 56									74 75
5	7								76 77 1
59	9								78
60									80

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 28 DISPLAY-INVADERS MAINLINE .SBTTL DISPLAY-INVADERS MAINLINE 1 03F7 DSPINV 2 03F7 AD 0106 LDA CURMOD 3 03FA 30 00 IFPL **:CURSOR AT TOP** 4 5 03FC A2 06 LDX I, NINVAD-1 :YES 03FE 86 37 STX INDEX1 6 ;LOOP FOR EACH INVADER 7 BEGIN 14 15 0400 37 LDX INDEX1 8 A6 9 0402 BD 02DF LDA X, INVAY :ACTIVE 10 0405 FO 00 IFNE 18 0407 57 STA PYL ;YES 11 85 0283 12 0409 BD LDA X, INVACI 21 22 23 040C 13 29 18 AND I, INVSEQ GET ANIMATION SEQUENCE 14 040E 44 LSR 040F 15 44 LSR 24 25 26 27 0410 16 44 LSR 17 0411 55 STA OBJIND 85 18 0413 BD 0283 LDA X, INVACI 0416 29 07 AND I, INVABI 19 OA 23 20 0418 ASL JSR INVPIC 21 0419 20 0421 **:DRAW INVADER PIC** 32 33 34 35 22 0406 15 ENDIF 23 041C **C6** 37 DEC INDEX1 041E MIEND 24 10 EO 25 03FB 24 ENDIF 26 0420 60 RTS 42 43 44 45 49

1 2	ALDISP -				CTIO	Α	TARI MAC	65 VM03.09 00 00 02 PAGE	29
3	1	2 7 7 7 7 7 8 6.m	,,,,,	2 7 4 6.00					
5	2							.SBTTL DISPLAY - INVADE	ERS PICS
7	4	0421	A8	04.20			INVPIC	TAY	; INDIRECT JSR TO PIC DRAW ROUTINE
9	5 6	0422 0425	89 48	042C				LDA Y, INVPIT+1 PHA	
10 11	7 8	0426 0429	89 48	042B				LDA Y, INVPIT	
12	9	042A 042B	60 0434				INVPIT	RTS •WORD FLIPIC-1	;FLIPPER
14	11	042D	0564				11446.11	.WORD PULPIC-1	;PULSAR
15 16	12 13	042F 0431	0458 046B					•WORD TANPIC-1 •WORD TRAPIC-1	;TANKER ;TRALER
17 18	14 15	0433 0435	04E4				INVPIE	.WORD FUSPIC-1	;FUSE
19	16							.SBTTL DISPLAY - FLIPPE	ERS
20 21	17 18	0435					FLIPIC		;FLIPPER PIC
22 23	19 20	0435 0437	A9 85	03 9E				LDA I,FLICOL STA COLOR	
24	21 22	0439 043C	8D 30	0283				LDA X, INVAC1 IFPL	:FLIPPING
26	23	043E	ВС	0289				LDY X, INVAL1	;LINE #
27 28	24 25	0441	A6 BD	55 0455				LDX OBJIND LDA X,FLITAB	
29 30	26 27	0446 0449	20 88	OBEA 50	00			JSR ONELIN ELSE	;NO. ON LINES
31 32	28	043D 044C	0E 20	047E				JSR IJMPDS	;YES. SET UP SPECIAL COORDS
33	29	044F	AO	00				LDY I, CINVA1 JSR ONELN2	
35	30 31	0451 044B	20 08	0C15				ENDIF	;FLIPPING PIC
36 37	32 33	0454	60					RTS	; ANIMATION SEQUENCE
38 39	34 35	0455	00	00	00	00	FLITAB	.BYTE CINVAL, CINVAL, CINV .SBTTL DISPLAY - TANKER	
40 41	36 37	0459					TANPIC		· •
42	38	0459	BD	028A			TANTIC	LDA X, INVAC2	
43 44	39 40	045C 045E	29 A8	03				AND I, INVCAR TAY	; INDEX FOR TYPE CARRIED
45 46	41 42	045F 0462	B9 BC	0468 0289				LDA Y, TANTAB LDY X, INVAL1	
47 48	43 44	0465	4C	0847				JMP SCAPIC	;DRAW TANKER PIC ;ANIMATION SEQUENCE
	45	0468	00G	00G	00G	00G	TANTAB	BYTE PTTANK, PTTANK, PTT	ANP, PTTANF
49 50 51	46 47							.SBTTL DISPLAY - INVADE	CKS DKAW IKAILEK
52 53 54	48 49	046C 046C	ВС	0289			TRAPIC	LDY X, INVAL1	
54 55	50 51	046F 0471	A5 29	03 03				LDA QFRAME AND I,3	CHOOSE BETWEEN 4 PICS
55 56	52	0473	OA	0,5				ASL	
57 58 59	53 54	0474	18 69	00G				ADC I,PTSPI1	
59 60	55 56	0477	40	0847				JMP SCAPIC	;DRAW TRALER PIC

1	ALDISP -	ALIEN	S DISP	LAY FUN	CTIO	ATARI MAC	65 VM03.09 00 00 02 PA	GE 29+	1
2	DISPLAY	- INVA	DERS I	DRAW TR	AILER				2
3									4
4	57	047A	00G			TRATAB	.BYTE PTSPI1, PTSPI1+2		5
5	58	047C	04G	06G			.BYTE PTSPI1+4,PTSPI1+		7
6	59						.SBTTL DISPLAY-INVADE	RS DRAW JUMP INVADER	8
7	60	047E				IJMPDS			9
8	61	047E	A5	57			LDA PYL	; SAME Y FOR BOTH PTS.	10 11 12
9		0480	85	2F			STA TEMPY		12
10	63	0482		0289			LDY X, INVALI	AV 110 7 COD D10" 1"O	13
) 11	64	0485	B9				LDA Y, LINEX	;X AND Z FOR BASE LEG	15
12 13	65	0488	85	56			STA PXL		16
	67	048A 048D	89 85	03DE 58			LDA Y, LINEZ STA PZL		18
15		048F	BD				LDA X, INVAL2		19
16	69	0492	29	0200 0F			AND I, OF		20
17		0494	A8	٠,			TAY		22
18		0495	A5	56			LDA PXL	CALCULATE COORD OF JUMPING ENDPT	23
19		0497	49	80			EOR 1,80		25
		0499	18				CLC		26
20 22 22	74	049A	79	04D5			ADC Y, JUMPX		28
22	75	049D	50	00			IFVS	;OVERFLOW	29
23	76	049F	10	00			IFMI	;YES	30
24	77	04A1	A9	7F			LDA I,7F	;MIN	32
25	78	04A3	88	50	00		ELSE		33
23 24 25 26 27		0440	05						35
		0446	A9	80			LDA I,80	;MAX	36
28		04A5	02				ENDIF		38
29	81	049E	09	00			ENDIF		39
30		04A8 04AA	49 85	80 2E			EOR I,80 STA TEMPX		13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
_		04AA	85 A5	2⊑ 58			LDA PZL		42
32		04AE	49	80			EOR 1,80		43
3/	86	0480	18	00			CLC		44 45
3!	87	0481	79	04D1			ADC Y, JUMPZ		46
36	88	0484	50	00			IFVS	;OVERFLOW	47
37		0486	10	00			IFMI	;YES.	
38		0488	A9	7F			LDA I,7F		50
39		04BA	88	50	00		ELSE		52
40		04B7	05						53
4		04BD	A9	80			LDA I,80	;MAX	55
42		04BC	02				ENDIF		56
43		0485	09				ENDIF		49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 80
944		04BF	49	80			EOR I,80		59
45		04C1	85	30			STA TEMPZ		60
46		04C3	AC	0112			LDY WELLID	et Talman Coat m	62
47		0406	B9	0B26			LDA Y, WELLIS	;LINEAR SCALE	63
48		04C9 04CB	85 89	59 0836			STA LINSCA LDA Y, WELBIN	BINARY SCALE	64
50		04CE	85	5A			STA BINSCA	;SET UP DOWN SCALE APPROX 1/8	66
5		04D0	60	<i>J</i> 'A			RTS	\$3E1 OF DOMM SOMEE MITHON ING	67
52		0 100						ORD OFFSETS X,Z FOR JUMPERS	69
53			002C			DG000 2		manaman manan wanning and transport of the state of the s	70
54			0028			DG225 2			72
55			001F			DG450 11			73
56			0010			DG675 1			74 75
57			0000			DG900 0			76
58		04D1	00			JUMPZ	BYTE DG900		77
59		04D2	10				BYTE DG675		79
60	111	04D3	1F				BYTE DG450		80

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 29+ TABLE-WORLD COORD OFFSETS X,Z FOR JUMPERS 04D4 .BYTE DG225 112 28 04D5 20 JUMPX .BYTE DG000 113 114 04D6 28 .BYTE DG225 04D7 1F .BYTE DG450 115 116 04D8 10 .BYTE DG675 117 04D9 00 .BYTE DG900 118 04DA FO .BYTE-DG675 14 15 119 04DB El .BYTE-DG450 120 04DC D8 .BYTE-DG225 16 17 121 04DD **D4** .BYTE-DG000 18 19 20 04DE D8 .BYTE-DG225 122 04DF 123 El .BYTE-DG450 20 21 22 23 24 25 26 27 04E0 124 FO .BYTE-DG675 04E1 00 .BYTE DG900 125 126 04E2 10 .BYTE DG675 127 04E3 16 .BYTE DG450 128 04E4 28 .BYTE DG225 28 29 30 31 32 33 34 35 36 37 38 39 40 23 41 42 43 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 71 72 73 74 75 76 77 78 79

1 2					.SBTTL DISPLAY-I	NVADE FUSE PICTURE	
3							
4	04E5	BD	02DF	FUSPIC	LDA X, INVAY		
5	04E8	85	57		STA PYL		
- 6	04EA	BC	02B9 03CE		LDY X, INVAL1 LDA Y, LINEX		
7 8	04ED 04F0	89 85	56		STA PXL		
9	04F2	B9	03DE		LDA Y, LINEZ		
10	04F5	85	58		STA PZL		
11	04F7	BD	02CC		LDA X, INVAL2		
12	04FA	10	00	MIO	IFMI	RUNGING	
13	04FC	98			TYA	;YES.	
14 15	04FD 04FE	18 69	01		CLC ADC I,1		
16	0500	29	OF		AND I, OF		
17	0502	A8	•,		TAY		
18	0503	B 9	03CE		LDA Y, LINEX		
19	0506	38	_		SEC		
20	0507	E5	56		SBC PXL		
21	0509	20	0544		JSR DELTA8 CLC		
22 23	050C 050D	18 65	56		ADC PXL		
24	050F	85	56		STA PXL		
25	0511	B9	03DE		LDA Y, LINEZ		
26	0514	38			SEC		
27	0515	E5	58		SBC PZL		
28	0517	20	0544		JSR DELTA8		
29	051A	18	E0		CLC		
30 31	051B 051D	65 85	58 58		ADC PZL STA PZL		
32	04FB	23	J (3		ENDIF		
33	051F	20	OEE2		JSR WORSCR		
34	0522	A2	61		LDX I,SXL		
35	0524	20	15AF		JSR VGYABI	DRAW BLANK VECTOR TO FUSE	
36	0527	A9	00		LDA I,O		
37 38	0529 052B	85 20	A9 0888		STA VGY JSR CASCAL	SET PERSPECTIVE SCALE	
39	052E	20 84	A9		STY VGY	9 SET FERSFECTIVE SCALE	
40	0530	A5	03		LDA QFRAME		
41	0532	29	03		AND I,3		
42	0534	OA			ASL		
43	0535	18			CLC		
44	0536	69	00G		ADC I, PTFUSE		
45 46	0538 0539	A8 BE	0000G		TAY LDX Y, PICHI		
47	053C	89	0000G		LDA Y, PICLO		
48	053F	A4	A9		LDY VGY		
49	0541	4C	0000G		JMP VGADD3	; ADD PIC TO DISPLAY LIST	
50						; INPUT ACC DELTA BETWEEN LINES	
51						; X INVADER INDEX	
52 53	05//			DELTA8		; Y LINE INDEX OF CCW PT	
53 54	0544			DELIAS		;OUTPUT X,Y PRESERVED : ACC OFFSET FROM BASE FOR MIDPT	
55	0544	85	29		STA TEMPO	, ACC OFF THOSE PART FIRST	
56	0546	BD	02CC		LDA X, INVAL2		
57	0549	29	07		AND I,7		

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 31+ DISPLAY-INVADE FUSE PICTURE 0548 20 STA TEMP3 58 85 054D **2B** STX TEMP2 59 86 054F A2 02 LDX I,2 60 LDA I,0 A9 61 0551 00 62 BEGIN 0553 20 LSR TEMP3 63 46 64 0555 90 00 **IFCS** 14 15 65 0557 18 CLC 0558 65 29 ADC TEMPO 66 67 0556 03 ENDIF 18 19 20 055A OA ASL 68 PHP 69 055B 08 20 21 22 23 24 25 26 27 055C ROR 70 6A 71 055D 28 PLP ROR 72 055E 6A 73 055F DEX CA 74 0560 10 Fl MIEND LDX TEMP2 75 0562 A6 **2**B 28 29 30 31 32 33 34 35 36 37 38 39 40 76 0564 60 RTS 23 41 42 43 45 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 71 72 73 74 75 76 77 78 79

1	ALDISP .	- ALIENS	DISP	LAY FUN	ICTIO	A	TARI MAC	65 VM03.09 00 00	02 PAGE	32	1
2	DISPLAY.	-PULSAR	PIC								2 3
3											4
4	1							.SBTTL DISPLAY-	-PULSAR F	PIC	5
5	2										6 7
6	3	0565					PULPIC				8
7	4	0565	A9	04				LDA I, TURQOI		;PULSE OFF	9
8	5	0567	AC					LDY PULSON			10 11 12
9	6	056A	30	00				IFPL			12
10	7	056C	A9	00				LDA I, WHITE		;PULSE ON	13 14 15 16
11	8	056B	02	e in				ENDIF		ADUL 640, 601.00	15
12	9	056E	85	9E				STA COLOR		; PULSAR COLOR	16
13	10	0570	AD	0148				LDA PULSON		;CALCULATE PIC #	18
14	11 12	0573 0574	18 69	40				CLC ADC I,64.			19
15 16	13	0576	4A	40				LSR			20
17	14	0577	4A					LSR			22
18	15	0578	4A					LSR			23
19	16	0579	4A					LSR			24
20	17	057A	C9	05				CMP I,5			26
21	18	057C	90	00				IFCS			27
	19	057E	A9	00				LDA I,O			29
22	20	057D	02					ENDIF			30
24	21	0580	A8					TAY			32
25	22	0581	B 9	059F				LDA Y, PULTAB			17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
26	23	0584	85	29				STA TEMPO			34
27	24	0586	BD	0283				LDA X, INVACI			36
28	25	0589	30	00				IFPL		FLIPPING	37
29	26	058B	BC					LDY X, INVALI		;NO. ON LINES	39
30	27	058E	A5	29				LDA TEMPO		;GET PIC #	40
31	28	0590	20	OBEA				JSR ONELIN		;DRAW PIC	41 42
32	29	0593	88	50	00			ELSE			43
33	30	058A	0B	0/75				ICD TIMBDC		• MEC CET HD CDECTAL COODDC	44
34 35	30 31	0596 0599	20 A4	047E 29				JSR IJMPDS LDY TEMPO		;YES. SET UP SPECIAL COORDS	45
36	32	059B	20					JSR ONELN2		;FLIPPING PIC	47
37	33	0595	08	UCIS				ENDIF			
38	34	059E	60					RTS			50
39	35	059F	OD	oc	08	OA	PULTAB		ILST - CPUI	S2, CPULS3, CPULS4, CPULS4	51
40		05A3	09	09							49 50 51 52 53 54 55 56 57 58
41											54
42											55
43											57
44											58

. 417	2102	44 T 2 31 C	0100	I AV CIIN	CT10 47401	HICLE WHO AG AG AG AG AG	NACE 22	
		- ALIENS -CHARGES		LAY FUN	CIIU AIAKI	MAC65 VM03.09 00 00 02 F	'AGE 33	
2 121.	OF LAT	-CHANGES	1					3
4	1					.SBTTL DISPLAY-CHARG	\$F \$	5
5	2	05A5			DSPC			6
6	3	05A5	A2	08		LDX I, NCHARG-1		7 8
7	4	05A7	86	37		STX INDEX1		9
8	5					BEGIN	;LOOP FOR EACH CHARGE	10
9	6	05A9	A6	37		LDX INDEX1		10 11 12
10	7	05AB	BD	02D3		LDA X, CHARY		13
11	8	05AE	FO	00		IFNE	; ACTIVE	15
12	9	0580	85	57		STA PYL	;YES. BOTH YS ARE SAME	16
13	10	05B2	85	2F		STA TEMPY		17
14	11	0584	EO	80		CPX I, NPCHAR		19
15	12	0586 0589	BC BO	02AD 00		LDY X, CHARL1 IFCC		20
16 17	13 14	05BB	A9	00G		LDA I, PTCURS	PLAYER SHOT	22
18	15	05BD	88	50	00	ELSE	FLATER SHOT	23
19	1,7	05BA	05			to to to		25
20	16	05C0	A5	03		LDA QFRAME	; ENEMY SHOT	26
21	17	05C2	OA			ASL		27
	18	05C3	29	06		AND I,6		29
22 23 24	19	05C5	18			CLC		30
24	20	05C6	69	00G		ADC I,PTESHO		32
25	21	05BF	08			ENDIF		33
26	22	05C8	20	0847		JSR SCAPIC		34
27	23	05AF	18			ENDIF		36
28 29 30	24	05CB	60	37		DEC INDEX1		37
29	25	05CD	10	DA		MIEND	ADLENTY	39,
	26	05CF	AO	04		LDY I,ZYELLO	;PLENTY	40
31 32	2 7 28	05D1 05D4	AD C9	0135 06		LDA CHACOU CMP I,NPCHARG-2		13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
33	29	05D4 05D6	90	00		IFCS		43
	30	05D8	AO	0B		LDY I,ZBLUE	;LOW	44
34 35	31	05DA	C9	08		CMP I, NPCHARG	;	46
36	32	05DC	90	00		IFCS		47 48
37	33	05DE	AO	OC		LDY I, ZRED	;OUT	49
38	34	05DD	02			ENDIF		50
39	35	05D7	08			ENDIF		51
40	36	05E0	8C	0808		STY COLPOR+PSHCTR	SET UP COLOR FOR CENTER OF PLAYER SOT	53
41	37	05E3	60			RTS		54
42								50 51 52 53 54 55 56 57 58
43								57 58
44								59

, 											1412
1	ALDISP .		S DISPLAY FU IONS	JNCTIO AT	TARI MAC65	VM03.09 00	00 02 P	PAGE 34		1 2	HE.
3	DIGI LAT									3 4	
4	1				•	SBTTL DISPLA	Y-EXPLO	SIONS		5	
5 6		05E4			DSPEXP					7 8	
7	4	05E4	A0 00		L	DY I, EXPCOL				9	
8		05E6	84 9E			TY COLOR	,			10 11	
10		05E8 05EA	A2 07 86 37			DX I,NEXPLO-1 TX INDEX1	<u> </u>			12	
11		4 7 tm 4	30 31			EGIN		\$LOOP FOR EACH BANG	•	14	
12		05EC	A6 37			DX INDEX1				16	
13		05EE 05F1	BD 030A F0 00			DA X, EXPLOY FNE		;ACTIVE BANG		17	
15		05F3	85 57			TA PYL		YES SAVE DEPTH		19	
16	13	05F5	BD 02FA		L	DA X, EXPLOL		SET UP GRID LINES		21	
17		05F8	85 29			TA TEMPO		•CALC DICTURE TO U	ICE	23	
18 19		05FA 05FD	BC 0302 C0 01			DY X, EXPLOT PY I, 1		;CALC. PICTURE TO U	192	24 25	
20	17	05FF	DO 00		I	FEQ		;CHARGE-PLAYER		12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 46 47	
21		0601	20 0635			SR CHPLKI		;YES.		28	
22	19	0604 0600	88 50 06	00	£	LSE		;NO		30	
24	20	0607	BD 0312		L	DA X, EXPLOS				31	
25	21	060A	4 A		L	SR				33	
26		060B	29 FE			ND I,OFE				35	
27 28		060D 060F	90 00			PY I,2 FCS				36 37	
29	25	0611	A9 00			DA I,O		; NO SEQUENCE TYPE		38	
30		0610	02			NDIF				40	
31		0613 0614	18 79 062F			LC DC Y,TEXTYP				41 42	
33		0617	A4 29			DY TEMPO				43	
34	30	0619	20 0847		J	SR SCAPIC		;DO EXPLOSION PICTU	JRE	45	
35		0606 05F2	15 29			NDIF NDIF					
36		0610	C6 37			EC INDEX1				48 49	
38	34	061E	10 CC		М	IEND				50 51	
39		0620	AD 0720		ZQPOKS	LDA Q1	[4	*DOVEW DOECH T CTOD		52	
40		0623 0625	F0 00 A5 9F			FNE Da curwav		; POKEY DOESN T STOP	•	54	
42	38	0627	C9 OD		C	MP I,13.				55 56	
43	39	0629	90 00		I	FCS		AUT. 1 700 05 07 17		57 58	
44		062B 062A	8D 01FF 03			TA 1FF NDIF		;KILL TOP OF STACK		59	
46	42	0624	09			NDIF				61	
47	43	062E	60		R	TS				62 63	
48 49		062F	000		TEXTYP	BVTE DTEVDS	;STAR	T CODE FOR EACH BANG T		64	
49 50		062F 0630	00G			BYTE PTEXP1 BYTE 0	:CHAR	CHARGE CHARGE, CHA	ANGE INVADER	66	
51	47	0631	04G		•	BYTE PTFUSX+4	+	;BUSE EXPL 1		67 68	
		0632	02G			BYTE PTFUSX+2		FUSE EXPL 2		69 70	
52 53 54 55 56	49 50	0633 0634	00G 00G			BYTE PTFUSX+0 BYTE PTSPAR)	;FUSE EXPLOSIN 3 :INVADER -	PLAYER COLLISION	49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 71 72 73 74 75 75	
55		0054			•	w : 1 to 1 1 4 1 111		**************************************	- Entrain Odelioadii	73	
56										74 75	
57 58										76 77	1
58 59										78	
60										79 80	

DISP - ALIENS ECIAL EXPLOSI			ATARI MAC65 VM03	•09 00 00 02	PAGE 36	
1			CRTTI	SDECTAL EXD	LOSION CONTROL	
2			•30111	SFECIAL EXP	EUSTON CONTROL	
3 0635		20	CHPLKI	una		
4 0635 5 0637	A4 B9 0	29 435	LDY TE	MPU LINEXM	SET UP MID PT	
6 063A	85	56	STA PX	L	y 0 1 3125 / 1	
7 063C		445	LDA Y,			
8 063F 9 0641	85 20 0	58 EE2	STA PZ JSR WO		POSITION BEAM FOR EXPLOSION	
10 0644		61	LDX I,		grostitum bank ton an edston	
11 0646	20 1		JSR VG	YAB1		
12 0649 13 064C	AE 0	13C	LDX SP DEC SP			
14 064F	DO	00	IFEQ .	, , <u>,</u> , ,	;UPDATE FRAME TIMER. DONE	
15 0651	E8	* 25	INX	W T N D	;YES. NEXT PICTURE	
16 0652 17 0655		13B 674	STX SP LDA X,			
18 0658	8D 0	13C	STA SP			
19 0650	0.4	407	ENDIF	TCDCOD		
20 065B 21 065E	BC 0 30	68 7 00	LDY X, IFPL	TSPCOD	SPECIAL ROUTINE THIS FRAME	
22 0660	20 0	698	JSR SP	ECIAL	;YES. DO IT	
23 065F	03		ENDIF			
24 0663 25 0666	AD 0	13B	LDA SP ASL	XIND		
26 0667	18		ČĽĊ			
27 0668	69	00G		PTSPLA	GET OFFSET INTO TABLE	
28 066A 29 066B	A8 BE 0	0006	TAY LDX Y,	DICHI		
30 066E	B9 0		LDA Y,			
31 0671	4C 0	000G	JMP VG	ADD2	;MOVE JSRL TO PICTURE TO DISPLAY LIST	

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 37 SPECIAL EXPLOSION DATABASE *SBTTL SPECIAL EXPLOSION DATABASE 2 3 *# OF FRAME/PICTURE 4 5 TSPTIM .BYTE 2 **:SPLAT6:CHARGE PLAYER EXPLOSION START** 0674 02 6 ;SLAT5 7 0675 02 .BYTE 2 0676 02 .BYTE 2 :SPLAT4 8 9 0677 02 .BYTE 2 ;SPLAT3 10 0678 02 .BYTE 2 :SPLAT2 11 0679 04 .BYTE 4 :SPLATI 12 067A 03 :SPLAT3 .BYTE 3 13 067B 02 .BYTE 2 :SPLAT5 14 067C PPSTART .BYTE 1 ;SPLAT6;CHARGE PLAYER EXPLOSION FINISH;START PULSAR PLAYER BA 22 0 01 15 067D 20 .BYTE 20 **FPSTART** FUSE PLAYER PICS 16 067E 03 .BYTE 3 26 27 067F 17 03 .BYTE 3 18 0680 03 .BYTE 3 0681 03 .BYTE 3 19 23 20 0682 03 .BYTE 3 03 .BYTE 3 21 0683 22 03 .BYTE 3 0684 34 35 23 0685 :SHRAP 26 0685 24 37 25 **SPECIAL SUBROUTINE FOR PICTURE** 26 TSPCOD 27 0687 00 .BYTE 0 SPLAT6-ALTER COLORS .BYTE 2 **:**SLAT5-ROTATE SPLAT COLORS 41 28 0688 02 42 29 0689 02 .BYTE 2 30 068A 02 .BYTE 2 3 44 31 0688 2 02 .BYTE 2 32 068C 02 .BYTE 2 1 3 33 068D 02 .BYTE 2 49 34 068E 02 .BYTE 2 35 068F 04 .BYTE 4 GET SET FOR SHRAPNEL 0690 SHRAP CHANGE SCALE VARIABLE 36 06 .BYTE 6 37 0691 FF .BYTE -1 :FUSE PLAYER - JUST PICS 38 0692 FF .BYTE -1 0693 FF 39 .BYTE -1 40 0694 FF .BYTE -1 41 0695 FF .BYTE -1 0696 FF .BYTE -1 42 FF .BYTE -1 43 0697 FFFF **CPSPXI** 44 -1 45 **PPSPXI** PPSTART-TSPTIM-1 0007 46 0009 **FPSPXI** FPSTART-TSPTIM-1

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 38 2 SPECIAL EXPLOSION FUNCTION .SBTTL SPECIAL EXPLOSION FUNCTION 2 ; INPUT Y INDEX INTO SUBROUTINE ADDRESS TABLE 3 5 0698 SPECIAL 0698 06A2 LDA Y, XSUBR+1 6 **B9** 7 069B 48 PHA 069C **B9** 06A1 LDA Y, XSUBR 9 069F 48 PHA 10 06A0 60 RTS 11 **XSUBR** 12 06A1 06A8 .WORD ALTCOL-1 ; ALTER REGULAR COLORS 21 22 23 13 06A3 06BE .WORD ROTCOL-1 ROTATE EXPLOSIN COLORS 14 06A5 06D1 .WORD SETSHR-1 GET SET FOR SHRAPNEL 15 06A7 06DF .WORD SHRSCA-1 *CHANGE SCALE VARIABLE 24 25 26 27 32 33 34 35 42 43 44 45 48 49

<i></i>										
1	ALDISP	- ALIENS	DISP	LAY FUN	CTIO ATARI MAC	55 VM	3.09 00 00	D2 PAGE	39	1
2	SPECIAL	EXPLOS!	ION SU	BROUTIN	-					3
3	•							454.56.75		4
4	1					·SBT	IL SPECIAL E	XPLUSIU	ON SUBROUTINE	6
) 5	3								ALTER COLOR	7
7	4								• ALTEN COLON	9
8	5	06A9			ALTCOL					10
9	6	0649	A9	OC		LDA :	I, ZRED		SET UP SLAT COLORS	11
10	7	06AB	8D	080B			COLPOR+PDIRED			13
11	8	06AE	85	24			COLRAM+PDIRED			14
12		0680	A9	04			I,ZYELLOW			16
13	10	06B2 06B5	8D 85	080A 23			COLPOR+PDIYEL COLRAM+PDIYEL			17
15	12	06B7	A9	00			I, ZWHITE			19
16		0689	85	22			COLRAM+PDIWHI			21
17	14	06BB	8D	0809		STA	COLPOR+PDIWHI			22
18		06BE	60			RTS				24
19										25 26
) 20									ROTATE COLORS FOR PLAYER EXPLOSION	27
21		06BF	Α4	22	ROTCOL	IDV (COLRAM+PDIWHI			28 29
23		06C1	A2	02	NO.00E	LDX				30
24						BEGI				31
25	22	06C3	85	22			(,COLRAM+PDIW	ΗI		33
26		06C5	48			PHA				34
27	· · · ·	0606	94	22			(,COLRAM+PDIW	4 I		36
28		06C8 06C9	98 9D	0809		TYA	(,COLPOR+PDIW	u T		38
30		0600	68	0007		PLA	K COLFORTEDIM	11		39
31		06CD	A8			TAY				41
32	29	06CE	CA			DEX				42 43
33		06CF	10	F2		MIEN)		ı	44
34		06D1	60		C*** T C : 10	RTS	•	~ ~ ~ ~ ~ ~	T COD CHOADNET	10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 44 45 46 47 48
35	32	06D2 06D2	20	OFEO	SETSHR	100	INICOL ;'		FOR SHRAPNEL RESTORE COLORS	47
37		06D2	A9	7F		LDA :			•	+ 1
38		06D7	8D	0139			SPLINE		TATELLA MARCHA MARCHAN MARCHAN CONTROL OF THE CONTR	50
39		06DA	A9	04		LDA :				51
40		06DC	8D	013A			SPBINA			53 54
41		06DF	60		C110 CC 1	RTS	<u>.</u>	C11 & 310 ***	CHOADMEL COALE WARTARIE	55
42		06E0 06E0	AD	0139	SHRSCA	IDA (SPLINE ;	CHANGE	SHRAPNEL SCALE VARIABLE	56 57
44		06E3	8D	0000G			SCALE		;LINEAR SCALE	58
45		06E6	AD	013A			SPBINA			59 60
46	43	06E9	09	70		ORA	1,70		;SCALE OPCODE	61
47		06EB	8D	0000G			SCAL1		;BINARY SCALE	62 63
48		06EE	A9	CO			1,000		RTSL	49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 77
49		06F0 06F3	8D AD	0000G 0139			SCAL3 SPLINE		;UPDATE SCALE BIGGER	66
) 50 51		06F6	38	0134		SEC	OL TIME		OFDATE SCALE DIGGEN	67
52		06F7	E9	20		SBC	1,20			69
53		06F9	10	00		IFMI	- · · ·		;LINEAR OVERLFLOW	70 71
54	51	06FB	29	7F		AND			YES.	72
55		06FD	CE	013A			SPBINA		;UPDATE BINARY	73 74
) 56		06FA	05	0120		ENDI				75
57 58		0700 0703	8D 60	0139		RTS	SPLINE			76 77
50	رو	0103	35			1113				78

			-	LAY FUNC BROUTINE		65 VI	103.09 00	00 02 PAG	E 40	
3 4	1									
5	2 3 0	704			DSBOOM	•SB	ITL DISPLA	Y BIG BOO	M	
7		704	Α9	00	DODUM	LAH	KILLER+1			
8	0	705	0001G							
9		706	A2	00		LXL	KILLER			
10		707 708	0000G 20	0000G		158	VGJSRL		*KILL BEAM KILLER	
12		70B	A9	00			I,0		CLEAR CURRENT SCREEN POSITION	
13		70D	85	6A		STA	CURNTX		•	
14		70F	85	6B 6C			CURNTX+1 CURNTY			
		711 713	85 85	6D			CURNTY+1			
		715	8D	0202			CURSY			
		718	85	68			ZADJL			
		71A 71C	85 A9	69 E0			ZADJL+1 I,0E0			
		71E	85	5F		STA				
22	17 0	720	Α9	FF		LDA	I,OFF			
		722	85	58		STA	EYH	160 1017	CHE	
		724 727	20 85	0781 77		STA	SVGLIST+1	JSR WHI	инв	
		729	86	76			SVGLIST			
27	22						;SET U	P SUBROUT	INE PC	
		72B	A2	0F			I, NPARTI-1			
	24 0° 25	72D	86	37		BEG	INDEX1		;LOOP FOR EACH PARTICLE	
		72F	A6	37			INDEX1		TOO LACTIANTICE	
32	27 0	731	BD	0283			X, PARTIY			
		734	F0 85	00 57		IFN	PYL		;ACTIVE PARTICLE	
		736 738	BD	0263			X, PARTIX			
36	31 0	73B	85	56		STA	PXL			
		73D		02A3			X, PARTIZ			
38		740 742	85 20	58 0EE2			PZL WORSCR		;PROJECT PT.	
		745	A9	00			I,0		y nove or inte	
41	36 0	747	85	73		STA	VGBRIT			
		749	20	078E			SWAPVG		SWAP POINTERS TO VG MAINLINE SUBROUTINE	
		74C 74F	20 A9	1204 A0			CONNEC I,OAO		;DRAW VECTOR IN SUBROUTINE	
		751	20	0384		JSR	VGDOT		;DRAW DOT IN SUBROUTINE	
16	41 0	754	20	078E		JSR	SWAPVG		SWAP MAINLINE TO VG PTRS.	
		757 750	A2	61 1580			I,SXL			
		759 75C	20 20	15BC 079F			VGYABS CALMAG		CALCULATE MAGNIF FACTOR	
		75F	20	0000G		JSR	VGSCAL		;Y LINEAR; ACC BINARY; PLACE INTO MAINLINE	
		762	A5	37		LDA	INDEXI			
		764 766	29 C9	07 07			1,7			
		168	D0	00		IFE(I,7			
55	50 0	76A	A9	00		LDA	1,0			
		769	02			END				
		76C 76D	A8 84	9E		YAT	COLOR			
		76F	84 A9	9E 08			I,MZCOLO			
60		771	20	0000G			VGSTAT		;PLACE INTO MAINLINE	

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 40+ DISPLAY BIG BOOM 0774 00 LDA I, MZBRIT 56 A9 0000G 57 0776 20 JSR VGSTA1 SET INTENSITY 0779 0781 JSR WHICHB 58 20 59 077C 20 0000G JSR VGJSRL *PLACE JSRL TO SUBROUTINE INTO MAINLINE 60 0735 49 ENDIF 077F DEC INDEX1 61 **C6** 37 0781 10 AC MIEND 62 14 15 0783 078E JSR SWAPVG SUBROUTINE PTRS. 63 20 SWAP MAINLINE 0786 A9 01 ;AT END OF SUBROUTINE 64 LDA I,1 65 0788 20 0000G JSR VGSCA1 RESTORE SCALE 18 19 JSR VGRTSL 66 078B 20 0000G :RTS SWAPVG 74 LDX VGLIST **SWAP MAINLINE SUBROUTINE PTRS.** 67 078E A6 68 0790 A4 75 LDY VGLIST+1 22 23 0792 69 A5 76 LDA SVGLIST 70 0794 85 74 STA VGLIST 25 26 27 71 0796 86 76 STX SVGLIST 0798 77 72 A5 LDA SVGLIST+1 73 079A 85 75 STA VGLIST+1 74 079C 84 77 STY SVGLIST+1 23 75 079E 60 RTS 76 77 079F CALMAG 34 35 079F 78 LDA PYL A5 57 79 07A1 44 LSR 37 80 07A2 44 LSR 07A3 44 81 LSR 07A4 44 LSR 82 07A5 41 83 AO 00 LDY I,0 42 43 84 BEGIN 85 07A7 C8 INY 44 07A8 LSR 86 4A FC 07A9 EQEND 87 DO CLC **07AB** 88 18 49 ADC I,2 89 07AC 69 02 90 07AE AO 00 LDY I,0 0780 RTS 91 60 WHICHB 92 0781 0415G 93 0781 AD LDA BUFACT+BCINFO 0784 00 IFNE 94 FO **57** 95 0786 AD 0000G LDA BFAST1 0789 AE 0000G LDX BFASTA 96 07BC 50 ELSE 97 88 00 0785 09 078F 0000G LDA BFBST1 98 AD 99 07C2 AE 0000G LDX BFBSTA 100 07BE 06 ENDIF RTS 101 07C5 60

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1	ALDISP	- ALIEN	S DISP	LAY FUN	CTIO	Δ	TARI MAC	55 VM03.09 00 00 02 PAGE 41	1
2	DISPLAY	BIG BO	OM						3
3 4	1								4 5
5	2							.SBTTL TABLES-WELL COORDINATES WORLD	6
6	3		00F0				DGO	70+80	8
7	4		00E7 00CF				DG225 DG450	67+80 4F+80	9
	6		OOCA				DG450 DG675	2A+80	11
10	7		0080				DG900	0+80	13
11	8	0706	FO	E 7	CF	AA	NEWLIX	.BYTE DG0,DG225,DG450,DG675,DG900 ;CIRCLE	14
12 13	9	07CA 07CB	80 56	31	19	10		.BYTE -DG675,-DG450,-DG225,-DG0	16 17
14	10	07CF	19	31	56	10		.BYTE -DG225,-DG450,-DG675	18
15	11	07D2	80	AA	CF			.BYTE DG900, DG675, DG450	20
16	12	0 7 D5	E7				LCIRCL	•BYTE DG225	21
) 17 18	13 14		00F0 00B8				DIO DI1	0F0 0B8	22 23 24
19	15		0080				DI2	80	25
20	16		0048				DI3	4 8	25 26 27 28
21	17	0707	0010	E 0	E 0	8.0	DI4	10	28
22	18 19	07D6 07DA	F0 80	F0 48	F0 10	88 10		BYTE DIO, DIO, DIO, DII ; SQUARE BYTE DI2, DI3, DI4, DI4	29 30
22 23 24	20	07DE	10	10	10	48		.BYTE DI4, DI4, DI3	31 32
25 26	21	07E2	80	88	FO			.BYTE DI2,DI1,DI0	33
) 26 27	22 23	0 7 E5	F0 00F0				LDIAMO CRO	•BYTE DIO 70+80	33 34 35 36
	24		00F0				CR1	70+80	37
28 29 30	25		0088				CR2	38+80	38 39
	26		0088				CR3	38+80 0+80	40
31 32	27 28	07E6	0080 F0	FO	88	88	CR4	BYTE CRO, CRI, CR2, CR3, CR4 ; CROSS	42
33		07EA	80						43 44
34	29	07EB	48	48	10	10		BYTE -CR3,-CR2,-CR1,-CR0	45 46 47
35	30 31	07EF 07F2	10 80	48 88	48 88			.BYTE -CR1,-CR2,-CR3 .BYTE CR4,CR3,CR2	47
37	32	07F5	FO				LCROSS	.BYTE CR1	49
38	33		OOEC				PXO	6C+80	50
39 40	34 35		00D5 00B1				PX1 PX2	55+80 31+80	_52 53
41	36		0090				PX3	10+80	53 54 55 56
42	37		0094				PZO	14+80	_56
43	38		0080				PZ1	30+80	57 58
44 45	39 40		00B8 00A7				PZ2 PZ3	38+80 27+80	59
46	41	07F6	EC	D5	B1	90		.BYTE PXO, PX1, PX2, PX3 ; PEANUT	61
47	42	07FA	70	4F	28	14		BYTE -PX3,-PX2,-PX1,-PX0	62 63 64
48 49	43 44	07FE 0802	14 90	28 B1	4F D5	70		BYTE -PX0,-PX1,-PX2,-PX3 BYTE PX3,PX2,PX1	64
50	45	0805	EC	0.1	2,7		LPEANU	BYTE PXO	65 66 67 68
51	46	0806	FO	CO	AO	94		.BYTE 0F0,0C0,0A0,94,6C,60,40,10 ;4 KEY	68
52 53	47	080A 080E	6C	60	40	10		BALE 10 VO 40 4C OV OVO DED	69 70
54	41	080E 0812	10 94	40 A0	60 C0	6C F0		.BYTE 10,40,60,6C,94,0A0,0C0,0F0	71
55	48	0816	D9	C2	AC	97		.BYTE 0D9,0C2,0AC,97,80,69,52,3C,27,10 ;TRIANGLE	73 74
56		081A	80	69	52	3C			75
57 58	49	081E 0820	27 35	10 5A	80	A6		.BYTE 35,5A,80,0A6,0CA,0F0	76 77
59	,,,	0824	CA	FO		***			78 70
60	50	0826	EA	EO	9C	80		.BYTE 0EA,0E0,9C,80,64,20,16,50 ;CLOVER	80

	ALIENS				-	ATARI MAC6	VM03.09 00 00 02 PAGE 41+	
ABLES-W	IELL COO	IRDINAT	ES WOR	LD				
	082A	64	20	16	50			4
51	082E	16	20	64	80		BYTE 16,20,64,80,9C,0E0,0EA,0B0	6
	0832	9C	EO	EA	80			
52	0836	10	16	20	3A		BYTE 10,1E,2C,3A,48,56,64,70 ;V	,
	083A	48	56	64	70			1
53	083E	90	9E	AC	BA		BYTE 90,9E,0AC,0BA,0C8,0D6,0E4,0F0	1
	0842	C8	D6	E4	FO			1
54	0846	10	16	2D	3C		BYTE 10,1E,2D,3C,4B,5A,69,78,87 ;PLANE	1
	084A	4B	5 A	69	78			1
cc	084E	87		D.4	Ca		DATE OF VETE OBS OCCUPANT OCC	1
55	084F 0853	96 D2	A5 El	84 F0	C3		BYTE 96,0A5,0B4,0C3,0D2,0E1,0F0	1
56	0856	10	10	10	10		BYTE 10,10,10,10,16,29,46,69,97 ;U	2
70	085A	16	29	46	69		10112 10110110110110129140109191	2
	085E	97	- /	,0	3,			2
57	085F	BA	D7	EA	FO		BYTE 0BA, 0D7, 0EA, 0F0, 0F0, 0F0	2 2 2 2 2 2 2 2 2 2 2 2
	0863	FO	FO	FO	_			2
58	0866	10	24	30	36		BYTE 10,24,30,36,3E,49,5A,75 ;JAGGED	
	086A	3E	49	5 A	75		·	
59	086E	94	A4	AC	BA		BYTE 94,0A4,0AC,0BA,0DA,0E2,0EA,0F0	[3]
	0872	DA	E2	EA	FO			3
60							• · · · · · · · · · · · · · · · · · · ·	3
61	0876	80	70	48	20		BYTE 80,70,48,20 ;LYING 8	
62	087A	10	20	48	70		BYTE 10, 20, 48, 70	
63	087E	80	90	B8	EO		BYTE 80,90,088,0E0	
64	0882	FO	EO	88	90		BYTE 0F0,0E0,0B8,90	
65 66	0886	DA	A4	87	80		BYTE ODA, 0A4, 87, 80, 79, 5C, 26, 10 ; HEART	4
00	088A	79	5C	26	10		DITE UDAŞUATŞBIŞBUŞIYŞDCŞZOŞIU ŞILEANI	4
67	088E	10	20	48	80		BYTE 10,20,48,80,088,0E0,0F0,0F0	[2]
•	0892	88	EO	FO	FO			4
68	0896	10	10	30	30		BYTE 10,10,30,30,50,50,70,70 ;STAIRCASE	4
	089A	50	50	70	70			2
69	089E	90	90	80	В0		BYTE 90,90,080,080,0D0,0D0,0F0,0F0	4
	08A2	DO	DO	FO	FO			E E
70	0846	80	80	50	47		BYTE 0B0,80,50,47,18,30,18,47 ;STAR X	
	OBAA	18	30	18	47			
71	08AE	50	80	B0	B9		BYTE 50,80,080,089,0E8,0D4,0E8,0B9	
~ ~	0882	E8	D4	E8	B9		DWTE 10 15 21 20 20 55 47 72 AUGUE V	
72	0886	10	1E	21	28 73		BYTE 10,1E,21,28,3C,55,66,73 ;WAVE X	
73	08BA 08BE	3C 8D	55 9A	66 AB	73 C4		BYTE 8D, 9A, 0AB, 0C4, 0D8, 0DF, 0E2, 0F0	Į.
13	08C2	D8	DF	E2	F0		DITE OU! THE UND! UND! UND! UND! UND!	
74	0866	80	AA	CF	E7	NEWLIZ	BYTE DG900, DG675, DG450, DG225, DG0 ; CIRCLE	6
17	08CA	F0	MM	C1	Em ¶	MELL	OTTE DOVOURDOTSTDOTSOTDOESTDOO CINCLE	(
75	08CB	E7	CF	AA	80		BYTE DG225, DG450, DG675, DG900	(6
76	08CF	56	31	19	10		BYTE -DG675,-DG450,-DG225,-DG0	6
77	08D3	19	31	56			BYTE -DG225, -DG450, -DG675	
7 8								6
79	08D6	80	88	FO	FO		BYTE DI2,DI1,DI0,DI0	7
80	08DA	FO	FO	FO	88		BYTE DIO, DIO, DIO, DI1	-
81	08DE	80	48	10	10		BYTE DI2,DI3,DI4,DI4	
82	08E2	10	10	10	48		BYTE D14, D14, D13	-
83	08E6	80	88	88	FO		BYTE CR4, CR3, CR2, CR1, CR0 ; CROSS	7
84	08EA	F0		0.0	.ee.		DMT# CD1 (CD2 (CD2 (CD4	7 -
	08EB	FO	88	88	80		BYTE CR1, CR2, CR3, CR4	<u>'</u>

) - ,								
1	AIDTSP -	- ALTEN	SDISPL	AY FIIN	CTIO	Δ1	TARI MAC65 VM03.09 00 00 02 PAGE 41+	1
1 ALDISP - ALIENS DISPLAY FUNCTIO 2 TABLES-WELL COORDINATES WORLD							14N2 114005 \$1105\$07 00 00 02 1 40t 42.	2
3	***************************************		J. 1. 2 . 1. 1. 1	7 11011				3 4
4	86	08F3	10	48	48		.BYTE -CR1,-CR2,-CR3	5
) 5	87							6
6	88	08F6	94	80	88	A7	.BYTE PZO,PZ1,PZ2,PZ3 ;PEANUT	8
7	89	08FA	A7	88	80	94	BYTE PZ3,PZ2,PZ1,PZ0	9
8	90	08FE	60	50	48	59	•BYTE -PZ0,-PZ1,-PZ2,-PZ3	10
9	91	0902	59	48	50	6C	.BYTE -PZ3,-PZ2,-PZ1,-PZ0	12
10	92						;	13
11	93	0906	96	A3	C5	F0	.BYTE 96,0A3,0C5,0F0,0C5,0A3,96 ;4 KEY	15
12		090A	FO	C5	A3	96		16
13	94	090E	6A	5D	3B	10	.BYTE 6A,5D,3B,10,10,3B,5D,6A	17
) 14	25	0912	10	3B	5D	6A	DMTE 3D (A DT 00) 050 000 07 (A 3D	19
15	95	0916	3D FO	6A C4	97 97	C4 6A	.BYTE 3D,6A,97,0C4,0F0,0C4,97,6A,3D ;TRIANGLE	20
16		091A 091E	3D	U4	91	OA		22
17	96	091E	10	10	10	10	.BYTE 10,10,10,10,10,10	23
19	70	0923	10	10	10	7.0	+Ditc Initainitainita	25
20	97	0926	AO	E0	EA	В0	.BYTE 0A0,0E0,0EA,0B0,0EA,0E0,0A0,80 ;CLOVER	26
21	,	092A	EA	EO	AO	80	The state of the s	21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
22	98	092E	60	20	16	50	.BYTE 60,20,16,50,16,20,60,80	29
23		0932	16	20	60	80		30
24	99	0936	FO	DO	В0	90	.BYTE 0F0,0D0,0B0,90 ;V	31
25	100	093A	70	50	30	10	.BYTE 70,50,30,10	33
26	101	093E	10	30	50	70	.BYTE 10,30,50,70	34
27	102	0942	90	В0	DO	F0	.BYTE 90,080,0D0,0F0	36
28	103		0010				•REPT 10 ;PLANE LOW	37 38 39 40
29	104						BYTE 40	38
30	105	0946	40	40	40	40	• ENDR	40
31		094A	40	40	40	40		41
32		094E	40	40	40	40		43
33	* * *	0952	40	40	40	40		44
34	106	0956	F0	CB	A6	80	.BYTE 0F0,0CB,0A6,80,5C,39,20,12 ;U	46
35	107	095A	5C	39	20 39	12 5C	PATE 12:20 20 EC :00:044 0CD:0E0	46 47
36	107	095E 0962	12 80	20 A6	CB	F0	.BYTE 12,20,39,5C,80,0A6,0CB,0F0	48
37	108	0902	ου	AO	CD	FU	•	50
30	109	0966	CO	A6	84	6A	.BYTE 0C0,0A6,8A,6A,4A,2F,14,24 ;JAGGED	51
40	703	096A	4A	2F	14	24	to its ood ond to the total training and the second	53
41	110	096E	20	39	59	75	.BYTE 20,39,59,75,72,90,080,0D0	54
42		0972	72	90	80	DO		55
43	111							57
44	112	0976	80	57	48	57	.BYTE 80,57,48,57 ;BIG 8	58
45	113	097A	80	A9	BA	Α9	.BYTE 80,0A9,0BA,0A9 ;	60
46	114	097E	80	57	48	57	.BYTE 80,57,48,57	61
) 47	115	0982	80	A9	BA	Α9	.BYTE 80,0A9,0BA,0A9	62 63
48	116						;	61 62 63 64 65 66 67 68
49	117	0986	E4	E8	B7	80	.BYTE 0E4,0E8,0B7,80,0B7,0E8,0E4,0B2 ;HEART	65
50		098A	B7	E8	E4	B2		67
51	118	098E	7A	47	20	10	BYTE 7A, 47, 20, 10, 20, 47, 7A, 0B2	68
52	* * ~	0992	20	47	7A	B2	DATE ON TO TO SO	69 70
53	119	0996	90	70	70	50	BYTE 90,70,70,50,50,30,10 ;STAIRCASE	71
54	1 20	099A	50	30	30	10	PVTE 10 20 20 E0 E0 70 70 00	72
55	120	099E	10	30	30	50 90	.BYTE 10,30,30,50,50,70,70,90	74
56	1 21	09A2 09A6	50 E6	70 D0	70 E6	90 B9	.BYTE 0E6,0D0,0E6,0B9,0AE,80,52,47 ;STAR Z	75
57	121	0944	AE	80	52	47	.BYTE 0E6,0D0,0E6,0B9,0AE,80,52,47 ;STAR Z	76 77
50	122	09AE	14	30	14	47	.BYTE 14,30,14,47,52,80,0AE,0B9	78
29	166	09AE 09B2	52	80	AE	89	+UIIE IT\$JU\$IT\$T\$\$JZ\$QU\$UAE\$UD7	79
OU		U7UZ	26	Oυ	P4 1	UF		[80]

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		- ALIENS				· · ·	ATARI MAC65 VM03.09 00 00 02 PAGE 41+	
2	TABLES-	WELL COO	ORDINAT	ES WOR	LD			
3	* 22	0007			- +	2 4	DUTE TE VALET OA OO OO OO VE ANAVE T	7
4	123	0986 098A	7E	6A	51 20	3 A 4 E	.BYTE 7E,6A,51,3A,2C,2C,38,4E ;WAVE 7	<u>Z</u>
5	124	09BE	2C 4E	2C 38	38 2C	4E 2C	.BYTE 4E,38,2C,2C,3A,51,6A,7E	
7	147	09C2	3A	51	6A	7E	*UITE TE; JO; ZC; ZC; JA; JI; OA; TE	
8	125	0906	05	06	07	08	ILINANG .BYTE 5,6,7,8,9,10.,11.,12.,13.,14.,15.,0,1,2,3	3,4 ;CIRCLE
9		09CA	09	OA	08	OC		401 1102111
10		09CE	OD	0E	0F	00		
11		09D2	01	02	03	04		
12	126	09D6	04	04	08	08	.BYTE 4,4,8,8,8,8,0C,0C,0C,0C,0,0,0,0,4,4	; SQUARE
13		09DA	08	08	OC	OC		
14		09DE	00	00	00	00		
15	1 27	09E2	00	00	04	04 08		•0000
17	127	09E6 09EA	04 08	08 0C	04 08	08 0C	.BYTE 4,8,4,8,8,0C,8,0C,0C,0,0C,0,4,0,4	;CROSS
18		09EE	0C	00	0C	00		
19		09F2	00	04	00	04		
20	128	09F6	06	07	09	08	.BYTE 6,7,09,8,7,9,0A,0C,0E,0F,1,0,0F,01,02,4	; PEANUT
21		09FA	07	09	OA	OC		
22		09FE	0E	0F	01	00		
23		0402	OF	01	02	04		
24	129	0A06	07	06	05	08	.BYTE 7,6,5,8,0B,0A,9,0C,0F,0E,0D,0,3,2,1,4	;4 KEY
25		OAOA	08	OA	09	00		
26		OAOE	0F	0E	OD.	00		
27	130	0A12 0A16	03 05	02 05	01 05	04 05	.BYTE 5,5,5,5,0B,0B,0B,0B,0B,0,0,0,0,0,5	;TRIANGLE
28 29	130	0A1A	08	0B	0B	0B	•0116 31313131001001001001010101010101010101	, INTANGLE
30		OALE	08	00	00	00		
31		0A22	00	00	00	05		
32	131	0A26	04	08	08	05	.BYTE 4,8,08,5,8,0C,0E,9,0C,0,3,0D,0,4,7,2	;CLOVER
33		OAZA	08	OC	ΟE	09		
34		OAZE	OC	00	03	OD		
35		0A32	00	04	07	02		
36	132	0A36	OD	OD	OD	OD	.BYTE OD,OD,OD,OD,OD,OD,O,3,3,3,3,3,3,3,0	;V
37		0A3A	OD	OD	OD	00		
38		0A3E 0A42	03 03	03 03	03 03	03 00		
40	133	0A42 0A46	00	00	00	00	.BYTE 0,0,0,0,0,0,0,0,0,0,0,0,0,0	;FLAT
41	133	0444	00	00	00	00		4, E01
42		0A4E	00	00	00	00		
43		0A52	00	00	00	00		
44	134	0A56	OC	OC	OC	OD	.BYTE OC, OC, OC, OD, OE, OF, OF, O, 1, 1, 2, 3, 4, 4, 4, 0	; U
45		0A5A	0E	0F	0F	00		
46		0A5E	01	01	02	03		
47	*	0A62	04	04	04	00	DUTE AE AB	10000
48	135	0466	0E	OD OD	0C	OD OF	.BYTE 0E,0D,0C,0D,0D,1,0F,2,3,3,0,3,3,3,0;J	AGGED
49		0A6A 0A6E	0D 02	0D 03	01 03	00		
51		0A6E 0A72	03	03	03	00		
52	136	0A76	0B	09	07	05	.BYTE 0B,9,7,5,3,1,0F,0D,0D,0F,1,3,5,7,9,0B	;LYING 8
53	200	0A7A	03	01	0F	OD		y = 1 = 11 = 1
54		OA7E	OD	OF	01	03		
55		0482	05	07	09	08		
56	137	0A86	08	08	OC	04	.BYTE 8,0B,0C,4,5,8,0B,0C,0D,0E,0F,1,2,3,4,5;H	EART
57		OABA	05	08	08	OC.		
58		OASE	OD	0E	0F	01		
59	* 2 ^	0492	02	03	04	05	DUTE ACA ACA ACA ACA ACA AAAAAAAAAA	*CTAIDCACE
30	138	0A96	00	00	OC	00	BYTE OC,0,0C,0,0C,0,0C,0,4,0,4,0,4,0,4,0	; STAIRCASE

	- ALIENS				1	TARI MAC65 VM03.09 00 00 02 PAGE 41+	
	0404	0.0	00	0.0	0.0		
	0A9A 0A9E	0C 04	00 00	0C 04	00 00		
	OAA2	04	00	04	00		
139	OAA6	OA	06	OC	08	BYTE 0A,6,0C,8,0E,0A,0,0C ;STAR ANGLES	
* 4 5	OAAA	0E	OA	00	0C		
140	OAAE OAB2	02 06	0E 02	04 08	00	.BYTE 2,0E,4,0,6,2,8,4	
141	0AB2	06 0E	0C	OD	0E	.BYTE 0E, 0C, 0D, 0E, 0, 2, 2, 0 ; WAVE ANGLES	
	OABA	00	02	02	00		
142	OABE	0 E	0 E	00	02	.BYTE 0E,0E,0,2,3,4,2,0	
143	OAC2	03	04	02	00	ullet	
144						OTHER WELL PARAMETERS	
145						# SET TO THE SET OF TH	
146	OAC6	00	01	02	03	WELSEQ .BYTE 0,1,2,3,4,5,6,7,0D,9,8,0C,0E,0F,0A,0B ;WELL ID SEQUENCE WAVE	
	OACA	04	05	06	07		
	OACE OAD2	OD OE	09 0F	08 0A	0C 0B		
147	OAD2	U £	- 01	UA	- 00	WELSEN :	
148	OAD6	18	10	18	0F	HOLEYL .BYTE 18,1C,18,0F,18,18,18,18,0A,18,10,0F,18,0C,14,0A ;EYE POSITION Y	
	OADA	18	18	18	18		
	OADE OAE2	0A 18	18 0C	10 14	OF OA		
149	OAE2	18 50	50	50	68	HOLEZL .BYTE 50,50,50,68,50,50,68,080,0A0,50,90,80,20,080,60,0A0 ;EYE POSITION Z	
	OAEA	50	50	68	80	The service of the se	
	OAEE	AO	50	90	80		
150	OAF2	20	B0	60	A0	HOLTAR - RVTE AG 26 AG GG AG AG 70 AG G 20 AG G GAG AG AG GG CENTED ARTHET	
150	OAFA	40 40	20 40	40 70	80 6 0	HOLZAD .BYTE 40,20,40,80,40,40,70,60,0,20,40,0,0A0,40,40,0;CENTER ADJUST	
	OAFE	00	20	40	00		
	0802	AO	40	40	00		
151	0B06	FF	FF FF	FF FF	FF	HOLZDH .BYTE OFF,OFF,OFF,OFF,OFF,OFF,O,1,OFF,O,0,OFE,1,OFF,1	
	OBOA OBOE	FF 01	FF		00		
	0B12	FE	01	00 FF	01		
152	0816	00	00	00	00	HOLRAP .BYTE 0,0,0,0,0,0,0,-1,-1,-1,-1,0,0,-1,0,-1 ;PLANAR -1 /CLOSED 0 FLAG	
	OB1A	00	00 FF	00 FF	FF		
	0B1E 0B22	FF 00	FF FF	66 00	00 FF		
153	0B26	00	00	60	40	WELLIS .BYTE 0,0,60,40,0,0,48,40,50,28,50,0,0,50,0,40 ;LINEAR SCALE FOR JUMPER	
	OB2A	00	00	60 48 50	40		
	0B2E	50	28	50	00		
154	0B32 0B36	00 04	50 04	00 03	40 04	WELBIN .BYTE 4,4,3,4,4,4,4,5,4,4,4,4,4,5 ;BINARY SCALE FOR JUMPER	
エンサ	0B3A	04	04	03	04	RELUIN OUTE TITIOITITICITITITITITITITITI OUTHANT SCHEE FUN JUMEN	
	0B3E	05	04	04	04		
	0842	04	04	04	05	CHILCHAR DATE OCHILCA	
155	0846	00G				CHKSM7 •BYTE QCHKS7	

	ALDISP - Tables-v					VM03.09	9 00 00 02 PA	GE 43	1 2
3	IADELST	WELL COL	JUDINA	ILS NUN	.u				3 4
4	1					CDTT: 11T	TILITY DICOL	AY PIC BETWEEN PTS.	5 6
6	3							ENTERED BETWEEN 2 POINTS AND SCALED	7 8
7	4						ORDING TO ITS		9
8	5				;				10
10	7				; INPUT	(INDEX	X INTO LINEX, 2	OF 1ST PT S X Z WC WORDS	12
11	8				,			OF 2ND PT S X Z WC WORDS	13 14 15 16
12 13	10				V		LOR OF OBJECT WC COORD FOR E	NTH PTS.	16 17
14	11				• • • • • • • • • • • • • • • • • • •			TO DISPLAY INDEX INTO PICLO	18
15	12	0847			SCAPIC	~			20
16 17	13 14	0847 0849	85 89	55 0435		STA OBJIN .DA Y,LIN		;CALCULATE X COORD. OF MIDWAY PT.	22
18	15	0B4C	85	56		TA PXL	A Lin 145	TOUR OF THE PART O	23 24
19	16	084E	B9			DA Y, LIN	NEZM	CALCULATE Z COORD OF MIDWAYPT.	18 19 20 21 22 23 24 25 26 27 28 29 30 31 31 32 33 34 35 36 37 38 39 40
20 21	17 18	0851	85	58	•	STA PZL			27
22	19				▼		OC OF OBJECT		29
23 24	20				▼		NDEX INTO PTR.	TABLE	31
25	21 22	0853			SCAPI2	JULUK CUL	LOR OF OBJECT		32
26	23	0853	20	0EE2		ISR WORSO	CR	;PROJECT MIDWAY PT. ONTO SCREEN.	34
27	24	0057	4.2			DV I CVI	•		36
28 29	25 26	0856 0858	A2 20	61 15AF		.DX I,SXL ISR VGYAB		DRAW BLANK VECTOR TO MIDWAY PT.	37
30	27	0858	A9	00		DA I,O		AT VGLIST	39 40
31	28	085D	85	A9		TA VGY	A 1	•CALCIN ATE CCALE FOR DT	41 42 43 44
32	29 30	085F 0862	20 A5	0888 7 8		ISR CASCA .Da bfact		;CALCULATE SCALE FOR PT.	43
34	31	0864	49	07		OR I,7	,,,		45 46 47
35 36	32	0866	O A	0.4		SL TOA			46 47
36	33 34	0867 0869	C9 B0	0A 00		MP I,OA			48
38	35	08 6 B	A9	OA		DA I,OA			50 51
39	36	086A	02			NDIF			52
40	37 38	086D 086E	0 A 0 A			\SL \SL			54
42	39	086F	OA			SL			55 56
43	40 43	0870 0871	0 A	7/.		SL	CLIST	;BRIGHTNESS	57 58
44 45	41 42	0871	91 C8	74		STA NY,VG ENY	JLI31	PORTORINESS	59
46	43	0874	A9	60		DA 1,60			61
47 48	44 45	08 76 08 7 8	91 C8	74		STA NY,VG ENY	GLIST		63
49	46	0879	84	A9		STY VGY			64 65
50	47	0B 7 B	A4	55		DY OBJIN			66 67
51	48 49	087D 0880	BE B9	0000G		DX Y,PIC DA Y,PIC			68
52 53	50	0883	A4	A9		DY VGY	ULU		70
54	51	0885	4C	0000G		IMP VGADD	03	;DRAW PIC AT PT.	49 50 51 52 53 54 55 56 57 58 59 60 61 61 62 63 64 65 66 67 70 71 72 73 74 75
55 56	52					RTS			73 74
57									75 76

LITY	- DERIV	E BIN	ARY AND L	INEAR SCALE FACTOR	S GIVEN DEPTH		
1 2				; INPUT	PYL OBJECT DEPTH	BINARY AND LINEAR SCALE FACTORS GIVEN DEPTH ;EYL,H EYEPOSITION	
3				• 01170117	VGY OFFSET INTO VGLIST	SCALE FACTORS READY FOR VGSCAL	
5				;001701	ACC BEACTR	;Y LFACTR	
6	0888			ČASCAL			
7							
9	0888	A5	57		LDA PYL	;CALCULATE YDELTAS	
10	0B8A	C9	10		CMP 1,10	***	
11	088C	90	00		IFCS		
12	088E 088F	38 E5	5F		SEC SBC EYL		
14	0891	8D	6095		STA MXPL		
15	0894	A9	00		LDA I,0		
16 17	0896 0898	E5 8D	58 6096		SBC EYH STA MXPH	Y DELTA FOR PT TO DISPLAY	
18	0898	80 A9	18		LDA I,18	SET UP MATH BOX TO GIVE FRACTIONAL PORTION	
19	OB9D	8D	608C		STA MNL	OF QUOTIENT IN MYHIGH AND MYLOW	
20	00 10		* ^		IDA VOCINI	ملت بلت بلت	
21	OBAO OBA2	A5 8D	A0 608E		STA MZLH	**** Y DELTA FOR SCALE 1	
23	OBA5				STA MSZXD	START DIVIDE Z/X	
24					D		
25 26	OBAS	20	6040		BEGIN BIT MSTAT		
2 0 27	OBAB	30	FB		PLEND	; EXIT LOOP WHEN DIVIDE IS DONE	
28							
29	OBAD		6060		LDA MYLOW	; RESULT IS SCALE FACTOR	
30 31	0880 0882	85 AD	79 6070		STA SCFL LDA MYHIGH		
32	0885	85	7 A		STA SCFL+1		
33	0887	A2	0F		LDX I, OF	; RESTORE MATH BOX QUOTIENT SIZE	
34 35	0BB9 0BBC	8E 38	608C		STX MNL SEC		
36	OBBD	50 E9	01		SBC I,1		
37	OBBF	DO	00		IFEQ		
38	OBC1	A9	01		LDA I,01		
39 40	0BC0 0BC3	02 A2	00		ENDIF LDX I,0		
41	0.00				BEGIN		
42	0BC5	E8			INX		
43 44	0BC6 0BC8	06 2A	79		ASL SCFL ROL		
44 45	0BC9	90	FA		CSEND		
46							
47	OBCB	4A	3 C		LSR		
48 49	OBCE OBCE	49 18	7 F		EOR I,7F		
50	OBCF	69	01		ADC I,1		
51	OBD1	A8			TAY		
52 53	0BD2 0BD3	8 A B 8	50	00	TXA ELSE		
93	088D	48	90		ln L J ln		
54	OBD6	A9	01		LDA I,1	;SET MAX SCALE FACTOR 1	
55	OBD8	AO	00		LDY I,0 ENDIF		

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 44+ UTILITY - DERIVE BINARY AND LINEAR SCALE FACTORS GIVEN DEPTH STA BFACTR OBDA 78 57 85 58 OBDC PHA 48 59 OBDD 98 TYA 60 OBDE A4 A9 LDY VGY 61 OBEO 91 74 STA NY, VGLIST ;LINEAR FACTOR OBE2 C8 INY 62 63 **0BE3** 68 PLA 14 15 **0BE4** 09 70 ORA 1,70 ;SCALE OPCODE 64 OBE6 91 74 STA NY, VGLIST ;BINARY FACTOR 65 66 08E8 C8 INY ; RETURN WITH Y PT TO NEXT VG SLOT 18 0BE9 60 RTS 67 20 21 22 23 24 25 26 27 32 33 34 35 36 37 41 42 43 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 71 72 73 74 75 76 77 78 79

DISP - ALI ILIT y- Draw				65 VM03.09 00 00 02 PAGE	45	
		The same of the sa				
1				.SBTTL UTILITY-DRAW OBJ	ECT BETWEEN POINTS	
2			; INPUT			
3			<u> </u>	Y INDEX INTO LEXEX, LINE	C OF 2ND POINT S X Z WC COORDS	
4			•			
5			; ACC		IDEX, USED TO SET UP INDEX1 AND SUBCOU	
7				INDEX1 OFFSET INTO SUBVE	CTOR PARAMETERE OF OBJECT	
g g			*	SUBCOU # OF VECTORS TO		
9			•	PYL, 1ST POINT WC	2 Lm - 24 € 1 € 7 ₹ ₹ 2 3	
10 OBE	ΞA		ONELIN	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
11 OBE		36		STA SAVEY		
12 OBE				LDA Y, LINEX		
13 OBE				STA PXL		
14 OBF				LDA Y, LINEZ		
15 OBF				STA PZL		
16 0BF				LDA PYL		
17 OBF 18 OBF				STA TEMPY TYA		
19 OBF				CLC	;CALCULATE ADJACENT CW LINE #	
20 OBF				ADC I,1	COLCOLATE ADDACEME OF LIME #	
21 OBF				AND I, OF		
22 OC0				TAX		
23 OC0				LDA X, LINEX		
24 OC0		25		STA TEMPX		
25 OC0)6 BD	03DE		LDA X, LINEZ		
26 OCO				STA TEMPZ		
27 OCO				LDA I.O	;SET UP FOR 1,16. SCALE	
28 OC0				STA LINSCA		
29 000				LDA I,4		
30 OC1				LDY SAVEY		
32	.5 44	30	• TNDIIT	Y PIC ID		
33			* 2.44, O.4	TEMPX, TEMPY, TEMPZ RIGHT	PT.WC	
34				PXL, PYL, PZL LEFT PT.WC	, , , , , , , , , , , , , , , , , , , ,	
35 OC1	.5		ONELN2		;INPUT Y PIC #	
36 OC1		58		LDA EYH		
37 OC1	7 30			IFPL	; IF LINE WOULD BE BEHIND EYE	
38 OC1				LDA PYL		
39 OC1				CMP EYL		
40 OC1				IFCC	ATHEN ADODT LINE	
41 OC1				RTS	;THEN ABORT LINE	
42 OC1				ENDIF		
43 OC1				ENDIF LDA Y, PCOUNT		
45 OC2				STA SUBCOU		
46 OC2				LDA Y, PINDEX		
47 OC 2				STA INDEX2		
48 OC2				LDY COLOR		
49 OC2				LDA I, MZCOLO		
50 OC2				JSR VGSTAT	;SET BEAM COLOR	
51				;JSR SETINT	;SET INTENSITY AS FUNC OF PYL	
52 OC3				JSR WORSCR	;PROJECT 1ST POINT ONTO SCREEN	
53 0C3				LDX I,SXL	ADDOLTTON DE 19 17 107 DOLLT	
54 0C3	36 20	15AF		JSR VGYAB1	POSITION BEAM AT 1ST POINT	
55 56 0C3)	3 #=		LDA TEMPX	; SAVE SCREEN COORDS OF 1ST POINT	- I
56 OC3	39 A5 38 85			STA PXL		7

	ALDISP -					ATARI MAC65 VM03.09 0	0 00 02 PAGE 45+
2	UTILITY-	-DRAW O	BJECT	BETWEEN	POINTS		$\begin{vmatrix} 2 \\ 3 \end{vmatrix}$
3	F 0	0000		25		1 7 4 7 11 12 13 14	4
4	58 59	0C3D 0C3F	A5	2F		LDA TEMPY STA PYL	
	60	0C41	85 A5	57 30		LDA TEMPZ	7
7	61	0C41	85	58		STA PZL	9
8	62	0C45	20	OEE2		JSR WORSCR	:PROJECT 2ND POINT ONTO SCREEN
9	63					33.1 .13.133.1	CALCULATE + AND - UNIT AND PERPENDICULAR
10	64						UNIT VECTORS FOR THESE 2 POINTS
11	65	0C48	A4	59		LDY LINSCA	14 15
12	66	OC4A	A5	5 A		LDA BINSCA	15
13	67	OC4C	20	0000G		JSR VGSCAL	; REDUCE SCALE BY APPROX. 1/16.
14	68	OC4F	A5	61		LDA SXL	CALCULATE VECTOR FROM ONE ENDPT TO OTHER
15	69	0C51	38			SEC SUBNEY	; IN SCREEN UNITS UNIT VECTOR
16	70	0C52 0C54	E5	6A		SBC CURNTX STA X1L	21 22 23 24
) 17	71 72	0C54	85 A5	79 62		LDA SXH	23
10	73	0C58	E5	6B		SBC CURNTX+1	
20	74	0C5A	85	9B		STA UNITXH	25 26 27 28 28
21	75	0C5C	30	00		IFPL	; MAXIMIZE AT 1 BYTE
22	76	OC5E	FO	00		IFNE	
23	77	0060	A9	FF		LDA I, OFF	YES MAX OUT
24	78	0C62	85	79		STA X1L	; PLUS. 1 BYTE ; YES MAX OUT 29 30 31 32 33 34 35 36
25	79	0C5F	04			ENDIF	33
26	80	0C64	88	50	00	ELSE	34 35
27		0C5D	09			CUD T	
28	81	0067	C9	FF		CMP I,-1	; MINUS. ; 1 BYTE ; YES. MAX OUT
29	82 83	0C69 0C6B	F0 A9	00 FF		IFNE LDA I,OFF	; 1 BYTE ; YES. MAX OUT
31	84	0C6D	B8	50	00	ELSE	40 41
32	٠,	0C6A	05	70	•••	km 📞 🗸 km	42
33	85	0070	A5	79		LDA X1L	;NO. NEGATE FOR ABS VALUE
34	86	0C72	49	FF		EOR I, OFF	
35	87	0C74	18			CLC	45 46 47
36	88	0C75	69	01		ADC I,1	48
37	89	0C77	90	00		IFCS	49
38	90	0079	A9	FF		LDA I,OFF	51
39	91	0078	02			ENDIF	52
40	92 93	0C6F 0C7B	0B 85	79		ENDIF STA X1L	53
42	94	0076	16	17		ENDIF	55
43	95	0C7D	A5	63		LDA SZL	49 50 51 52 53 54 55 56 57 58 59 60
44	96	0C7F	38			SEC	58
45	97	0080	E5	6C		SBC CURNTY	59 60
46	98	0C82	85	89		STA ZIL	61
47	99	0C84	A5	64		LDA SZH	61 62 63 64 65 66 66 67 68
48	100	0086	E5	6D		SBC CURNTY+1	64
49	101	0C88	85	9D		STA UNITZH	65 66
50	102	OC O A	20	0.0		TEDI	•MAVIMI7E AT 1 DVIE
51	103 104	0C8A 0C8C	30 F0	00		IFPL IFNE	; MAXIMIZE AT 1 BYTE ; PLUS. 1 BYTE
52	104	OC8E	A9	FF		LDA I,OFF	YES. MAX OUT
54	106	0C90	85	89		STA ZIL	PLUS. 1 BYTE YES. MAX OUT 70 71 72 73 74 75 76
55	107	0C8D	04			ENDIF	73
56	108	0C92	88	50	00	ELSE	74
57		0C8B	09				75
58	109	0C95	C9	FF		CMP I,-1	;MINUS. BYTE
59	110	0C97	FO	00		IFNE	; MINUS. BYTE 77 78 79
60	111	0C99	A9	FF		LDA I, OFF	;YES. MAX OUT

$\mathbf{\gamma}$								141
1	ALDISP -	ALIENS	DISPL	AY FUN	CTIO	ATARI MAC65 VM03.09	00 00 02 PAGE 45+	2TH
2	UTILITY-							
3								l
4	112	0C9B	88	50	00	ELSE	5 6	
5		0C98	05				7	
6	113	OC9E	A5	89		LDA Z1L	; NO. NEGATE FOR ABS. VALUE	l
7	114	OCAO	49	FF		EOR I, OFF	9 10	
8	115	OCA2	18			CLC	10 11	
9	116	OCA3	69	01		ADC I,1	12	l
10		0C9D	07	^^		ENDIF	13 14	
11	118	OCA5	85	89		STA ZIL	14 15	
12	119	0094	12	00		ENDIF		l
13	120 121	OCA7 OCA9	A9	00		LDA I,O STA X2H	17 18 19	
14	122	OCAB	85 85	82 92		STA Z2H	19	
15		DCAD	رن	74		;90 CYCLES FOR X	CALCULATE UNITXL X 0 THRU 7	l
16	124	OCAD	A5	79		LDA XIL	22	
18	125	OCAF	OA	* 7		ASL	23	
19		OCBO	26	82		ROL X2H	;X2	ı
20	127	OCB2	85	7A		STA X2L	26	
		OCB4	OA	• • • •		ASL	27 ₁ 28	
21 22 23 24 25 26 27 28 29 30	129	OCB5	85	7C		STA X4L	;X2	l
23	130	OCB7	A5	82		LDA X2H	30	
24	131	OCB9	2A			ROL	31 ₃₂ 32	
25	132	OCBA	85	84		STA X4H	33	ı
26	133	OCBC	A5	7C		LDA X4L	34	
27	134					;CLC	33	
28	135	OCBE	65	79		ADC X1L	37	l
29	136	occo	85	7 D		STA X5L	\$X5	
30	137	OCC2	A5	84		LDA X4H	40	ı
31	138	OCC4	69	00		ADC I,0	41	l
32	139	0006	85	85		STA X5H	$\begin{vmatrix} 42 \\ 43 \end{vmatrix}$	
32	140	0008	A5	7 A		LDA X2L	44	l
34	141					;CLC	45 46 47	
35	142	OCCA	65	79		ADC XIL	47	
36	143	OCCC	85	7 B		STA X3L	*X3	
37	144	OCCE	A5	82		LDA X2H	49 50	
38	145	OCDO	69	00		ADC I,0	51	
39		OCD2	85	83		STA X3H	52	ı
40	147	OCD4	85 45	86 79		STA X6H	49 50 51 52 \$X6 53 54 55 56 57 58 59 60	
41	148	OCD6	A5	7 B		LDA X3L	55	
42		0CD8 0CD9	0A 85	7 E		ASL STA X6L	56	I
43	150 151	OCDB	85 26	86		ROL X6H	57	
45	152	0000	20	90		CLC	59	
45	153	OCDD	65	79		ADC X1L	60	I
47	154	OCDF	85	7F		STA X7L	61 62 63 64	
48	155	OCE1	A5	86		LDA X6H		
49	156	OCE3	69	00		ADC I,0	65	I
50	157	OCE5	85	87		STA X7H	65 66 67	
51	158					2	;90 CYCLES FOR Z	
51 52 53 54 55 56	159						• CALCIII ATE IINITAL Y O THRU 7	I
53	160	OCE7	A5	89		LDA Z1L	70 71	
54	161	OCE9	OA	•		ASL	72	
55	162	OCEA	26	92		ROL Z2H	73	I
56	163	OCEC	85	8 A		STA Z2L	73 74 75	
57	164	OCEE	OA			ASL	75	্র র
58		OCEF	85	8C		STA Z4L	77	<u> </u>
59	166	OCF1	A5	92		LDA Z2H	$\begin{vmatrix} 78 \\ 70 \end{vmatrix}$	
60	167	OCF3	2A			ROL		
	· Are							_

2 UTILI 3 4 16 5 16 6 17 7 17 8 17 9 17 10 17 11 17 12 17 13 17 14 17 15 17 16 18 17 18 18 19 18	TY-DRAW C 8	85 A5 65 85 A5 69 85 A5 69 85 A5	94 8C 89 8D 94 00 95 8A 89 8B 92	STA Z4H LDA Z4L CLC ADC Z1L STA Z5L LDA Z4H ADC I,0 STA Z5H LDA Z2L CLC ADC Z1L STA Z3L	3X4 \$X5	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
3 4 16 5 16 6 17 7 17 8 17 9 17 10 17 11 17 12 17 13 17 14 17 15 17 18 18 18 19 18	08 OCF4 09 OCF6 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	85 A5 65 85 A5 69 85 A5 69 85	94 8C 89 8D 94 00 95 8A 89 8B	STA Z4H LDA Z4L CLC ADC Z1L STA Z5L LDA Z4H ADC I,0 STA Z5H LDA Z2L CLC ADC Z1L STA Z3L	; X5	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
5 16 6 17 7 17 8 17 9 17 10 17 11 17 12 17 13 17 14 17 15 17 16 18 17 18 18 18 19 18	9 OCF6 1 OCF8 2 OCFA 3 OCFC 4 OCFE 5 OD00 6 OD02 7 8 OD04 9 OD06 1 OD08 1 OD0A 2 OD0C 3 OD0E 4 OD10	A5 65 85 A5 69 85 A5 65 85 A5	8C 89 8D 94 00 95 8A 89 8B	CLC ADC Z1L STA Z5L LDA Z4H ADC I,0 STA Z5H LDA Z2L CCC ADC Z1L STA Z3L	; X5	4 5 6 7 8 9 10 11 11 12 13 14 15 16
5 16 6 17 7 17 8 17 9 17 10 17 11 17 12 17 13 17 14 17 15 17 16 18 17 18 18 18	9 OCF6 1 OCF8 2 OCFA 3 OCFC 4 OCFE 5 OD00 6 OD02 7 8 OD04 9 OD06 1 OD08 1 OD0A 2 OD0C 3 OD0E 4 OD10	A5 65 85 A5 69 85 A5 65 85 A5	8C 89 8D 94 00 95 8A 89 8B	CLC ADC Z1L STA Z5L LDA Z4H ADC I,0 STA Z5H LDA Z2L CCC ADC Z1L STA Z3L	; X5	6 7 8 9 10 11 12 13 14 15 16
6 17 7 17 8 17 8 17 9 17 10 17 11 17 12 17 13 17 14 17 15 17 16 18 17 18 18 19 18	71 OCF8 72 OCFA 73 OCFC 74 OCFE 75 ODOO 76 ODO2 77 78 ODO4 79 ODO6 80 ODO8 81 ODOA 82 ODOC 83 ODOE 84 OD10	65 85 A5 69 85 A5 65 85 A5 69	89 8D 94 00 95 8A 89 8B	CLC ADC Z1L STA Z5L LDA Z4H ADC I,0 STA Z5H LDA Z2L CC ADC Z1L STA Z3L		10 11 11 12 13 14 15 16
8 17 9 17 10 17 11 17 12 17 13 17 14 17 15 17 16 18 17 18 18 18	22 OCFA 23 OCFC 24 OCFE 25 OD00 26 OD02 27 28 OD04 29 OD06 30 OD08 31 OD0A 32 OD0C 33 OD0E 34 OD10	85 A5 69 85 A5 65 85 A5 69 85	8D 94 00 95 8A 89 8B 92	STA Z5L LDA Z4H ADC I,0 STA Z5H LDA Z2L CCC ADC Z1L STA Z3L		9 10 11 12 13 14 15 16 17 18
9 17 10 17 11 17 12 17 13 17 14 17 15 17 16 18 17 18 18 18 19 18	3 OCFC 24 OCFE 25 OD00 26 OD02 27 28 OD04 29 OD06 30 OD08 31 OD0A 32 OD0C 33 OD0E 34 OD10	A5 69 85 A5 65 85 A5 69 85	94 00 95 8A 89 8B 92	LDA Z4H ADC I,0 STA Z5H LDA Z2L CCC ADC Z1L STA Z3L		11 12 13 14 15 16
10 17 11 17 12 17 13 17 14 17 15 17 16 18 17 18 18 18 19 18	0 OCFE 0 DD00 0 DD02 0 DD04 0 DD06 0 DD08 0 DD08 0 DD0A 0 DD0C 0 DD0C	69 85 A5 65 85 A5 69 85	00 95 8A 89 8B 92	ADC I,0 STA Z5H LDA Z2L ;CLC ADC Z1L STA Z3L	• • • •	12 13 14 15 16 17 18
11 17 12 17 13 17 14 17 15 17 16 18 17 18 18 19 18	7 0D00 7 0D02 7 0D04 7 0D06 8 0D04 9 0D06 1 0D0A 1 0D0A 2 0D0C 3 0D0E 14 0D10	85 A5 65 85 A5 69 85	95 8A 89 8B 92	STA Z5H LDA Z2L ;CLC ADC Z1L STA Z3L	• • • •	14 15 16 17 18
13 17 14 17 15 17 16 18 17 18 18 18 19 18	7	65 85 A5 69 85	89 8B 92	CLC ADC Z1L STA Z3L	•٧2	16 16 17 18
14 17 18 18 18 19 18	8 0D04 9 0D06 0 0D08 1 0D0A 2 0D0C 3 0D0E 4 0D10	85 A5 69 85	8B 92	ADC Z1L STA Z3L	•va	17 18
15 17 16 18 17 18 18 18 19 18	9 0D06 0 0D08 1 0D0A 2 0D0C 3 0D0E 4 0D10	85 A5 69 85	8B 92	STA Z3L	*V3	1.5
16 18 17 18 18 18 19 18	0 0D08 1 0D0A 2 0D0C 3 0D0E 4 0D10	A5 69 85	92		T # 4	18 19 20
17 18 18 18 19 18	1 0D0A 2 0D0C 3 0D0E 4 0D10	69 85		LDA Z2H	9 NJ	
19 18	3 ODOE 4 OD10			ADC I,O		22
	4 OD10		93	STA Z3H		24
		85	96	STA Z6H	;X6	25 26
20 18 21 18	The Cast 1 1 1	A5 0 A	88	LDA Z3L ASL		27
22 18		85	8 E	STA Z6L		29
23 18		26	96	ROL Z6H		30
24 18				;CLC		21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
25 18 26 19		65 85	8 9	ADC Z1L STA Z7L	;X7	33
26 19 27 19		65 A5	8F 96	LDA Z6H	• • • • • • • • • • • • • • • • • • •	35
28 19		69	00	ADC I, O		
29 19	3 OD1F	85	97	STA Z7H		37 38 39 40
30 19		AO	00	LDY I,0		40
31 19 32 19		84	Α9	STY VGY BEGIN	*LOOP FOR EACH VECTOR TO BE DRAWN	42
33 19		A4	38	LDY INDEX2	ground and radion to be blinks	42 43 44
34 19	8 0D27	B 9	0E1D	LDA Y, VBASE+1		45 46 47
35 19		C9	01	CMP I,1	ALICE DEDTH TAITEACTTY	47
36 20 37 20		D0 A9	00 C0	IFEQ LDA I,RATS	;USE DEPTH INTENSITY ;YES.	48
38 20		02	00	ENDIF	9160	50
39 20	3 0D30	85	73	STA VGBRIT		52
40 20		89	OEIC	LDA Y, VBASE	GET MULTIPLIER S	53 54
41 20 42 20		85 C8	2D	STA TEMP4 Iny	SIGN FOR PERP. UNIT VECTOR MULT.	55
42 20 43 20		C8		INY		56 57
44 20		84	38	STY INDEX2		49 50 51 52 53 54 55 56 57 58 58 60
45 20		AA		TAX		
46 21		29	07	AND 1,07	GET UNIT VECTOR MULTIPLIER	61 62
47 21 48 21		A8 8A		TAY TXA	; ABS. VALUE	63
49 21		0A		ASL		61 62 63 64 65 66 67 68
50 21	4 0D41	85	2 B	STA TEMP2	;SIGN FOR UNIT VEC MULT	66
51 21		44		LSR		
52 21 53 21		4A 4A		LSR LSR		69 70 71 72 73 74 75 76
53 21		4A		LSR		71
55 21	9 0D47	29	07	AND 1,07	GET PERP UNIT VECTOR MULTIPLIER	73
56 22		AA	20	TAX	; ABSOLUTE VALUE	74 75
57 22 58 22		A5 45	2B 9B	LDA TEMP2 EOR UNITXH		76 77
59 22	/ [11].61	30	00	IFPL	; ACC TO SIGNS, UPDATE VECTOR ACCUMULATOR	77 78 79 80
60 22			0078	LDA Y, XOL	POSITIVE RESULTS	[/9]

								<u>4</u>
1		- ALIENS				ATARI MAC65 VM03.09	00 00 02 PAGE 45+	1412THE
2	UTILITY	-DRAW O	BJECT	BETWEE	N POINTS		$\begin{vmatrix} 2 \\ 3 \end{vmatrix}$	"
3	2.25	0000	سو پس	, 4		671 641	4	
4	225 226	0D53 0D55	85 89	61 0080		STA SXL LDA Y,XOH		
5	226	0D58	88	50	00	ELSE	7	
7	to to 1	0D4F	0B			Kin 🖦 🛂 kin		
8	228	0D5B	89	0078		LDA Y, XOL	; NEGATIVE RESULTS	
9	229	OD5E	49	FF		EOR I, OFF	12	
10	230	0D60	18			CLC	13 14	
) 1	231 2 232	0D61	69	01 61		ADC I,1 STA SXL	15	
12		0D63 0D65	85 89	0080		LDA Y, XOH		
14		0D68	49	FF		EOR I, OFF	18	
15		OD6A	69	00		ADC I,0	$\frac{19}{20}$	
16		OD5A	11			ENDIF	21	
17	237	0D6C	85	62		STA SXH	$\begin{vmatrix} 22\\23 \end{vmatrix}$	
18		0D6E	A5 45	2D 9D		LDA TEMP4 EOR UNITZH	24	
19	T	0D70 0D72	10	9D		IFMI	;ACC. TO SIGNS UPDATE VECTOR ACCUMULATOR	
2		0D74	B5	88		LDA X, ZOL	POSITIVE RESULTS	
22		0D76	18			CLC	; ACC. TO SIGNS UPDATE VECTOR ACCUMULATOR ; POSITIVE RESULTS ; NEGATIVE RESULTS	
23	243	0D77	65	61		ADC SXL	$\begin{vmatrix} 30 \\ 31 \end{vmatrix}$	
24		0D79	85	61		STA SXL	32	
25	1	0D78	85	90		LDA X,ZOH	33 34	
26		0D 7 D 0D 7 F	65 88	62 50	00	ADC SXH ELSE	35	
28		0D73	0E	<i>J</i> U	- 55	ξο L. J ξο	36 37	
29		0D82	A5	61		LDA SXL	; NEGATIVE RESULTS	
30		0D84	38			SEC	40	
3		0D85	F5	88		SBC X, ZOL	41	
32		0D87	85 ^5	61		STA SXL LDA SXH	43	
33	252 4 253	0D89 0D8B	A5 F5	62 90		SBC X, ZOH	44	
35		0D81	08	70		END IF	45 46 47	
36	255	0D8D	85	62		STA SXH	47 48	
37							49	
38							NOW CALCULATE Z VECTOR	
39		ADAE	λE	20		IDA TENDO	52	
40		0D8F 0D91	A5 45	2B 9D		LDA TEMP2 EOR UNITZH	53 54	
42		0D91	30	00		IFPL	55	
43	262	0D95	B9	0088		LDA Y, ZOL	57	
44	263	0D98	85	63		STA SZL	58 59	
45		OD9A	B9	0090	p. p.	LDA Y, ZOH	NOW CALCULATE Z VECTOR 50 51 52 53 54 55 56 60 61 62 63 64 65 66 67	
46	265	0D9D 0D94	88 08	50	00	ELSE	61 62	
47		0D94 0DA0	89	0088		LDA Y, ZOL	63	
49	A	ODA3	49	FF		EOR I, OFF	64 65	
50	268	ODA5	18			CLC	66	
51	100	ODA6	69	01		ADC I,1	68	-
52		ODA8	85	63		STA SZL	69 70	
) 53 54	1	OD AA OD AD	89 49	0090 FF		LDA Y,ZOH EOR I,OFF	71	
54		ODAF	69	00		ADC I,0	69 70 71 72 73 74 75 76	
56		OD9F	11			ENDIF	74	
57	275	ODB1	85	64		STA SZH		<u>-</u>
58		ODB3	A5	2D		LDA TEMP4	77 78	1
59		0DB5	45	9B		EOR UNITXH	78 79	
60	278	0DB7	10	00		IFMI	80	

7						<u>▼</u>	1
ALDISP - ALIE UTILITY-DRAW (ATARI MAC	C65 VM03.09 00 00 0	02 PAGE 45+	1 2 3
			, 01,,,,				3 4
279 ODB9 280 ODBB		63			LDA SZL SEC		5 6
280 ODBB 281 ODBC		7 8			SBC X, XOL		6 7
282 ODBE		63			STA SZL		9
283 ODC0	A5	64			LDA SZH		9 10 11
284 ODC2		80	* *		SBC X, XOH		12
285 ODC4 ODB8		50	00		ELSE		13
286 ODC7		63			LDA SZL		13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 44 44 44 44 44 44 44 44 44 44 44 44
287 ODC9	18				CLC		17
288 ODCA		78			ADC X,XOL		19
289 ODCC 290 ODCE		63 64			STA SZL LDA SZH		20
291 ODDO		80			ADC X,XOH		22
292 ODC6					ENDIF		24
293 ODD2		64			STA SZH	AND VECTOR TO RECREASE LECT	25 26
294 ODD4 295 ODD6		A9 63			LDY VGY LDA SZL	; ADD VECTOR TO DISPLAY LIST	27
296 ODD8		74			STA NY, VGLIST	;Z LSB	29
297 ODDA					INY		30
298 ODDB 299 ODDD		64			LDA SZH		32
299 ODDD 300 ODDF		1F 74			AND I,1F STA NY,VGLIST	;Z MSB	34
301 ODE1		• •			INY	y managed and the second and the sec	35 36
302 ODE2		61			LDA SXL		37
303 ODE4 304 ODE6		74			STA NY, VGLIST	;X LSB	39
304 ODE6 305 ODE7		62			LDA SXH		40
306 ODE9		1F			AND I, IF		42
307 ODEB		73			ORA VGBRIT	AN SIGN AND THE WOLLD'S	44
308 ODED 309 ODEF		74			STA NY, VGLIST	;X MSB AND INTENSITY	45 46 47
310 ODF0		Α9			STY VGY		47 48
311 ODF2	C6	99			DEC SUBCOU		49
312 ODF4 313 ODF9		03 A9	4C 0D2	5	EQEND LDY VGY		51
314 ODFB		AJ			DEY		53
315 ODFC	4C	0000G			JMP VGADD	;UPDATE VGLIST PC	49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 70 71 72 73 74 75 77 78
316 ODFF	08			C8	.BYTE 8		56
							58
							59 60
							61
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		ALIENS	DISPLAY FUNCTIO	ATARI MAC6	5 VM03.09 00 00 02 PAGE 46	1412THE
	PICTURES					3
	4 1				•SBTTL PICTURES	5
	5 2		0000	CINVAL	0	6 7
	6 3		0001	CNCURS	CINVAl+1	8
	7 4 8 5		0009 000A	CPULS4 CPULS3	CNCURS+8 CPULS4+1	9 10 11
	9 6		000B	CPULS2	CPULS3+1	11 12
	0 7	C	000C	CPULS1		13
	8		000D	CPULSO	CPULS1+1	15
		0E00	08	PCOUNT	.BYTE INVALE-INVALS /2 ;INVADER 1	16
		0E01	08		.BYTE NCRSIE-NCRSIS /2	18
		0E02	08		BYTE NCRS2E-NCRS2S /2	19 2 0
	6 13	0E03	08		•BYTE NCRS3E-NCRS3S /2	21
		0E04	08		BYTE NCRS4E-NCRS4S /2	23
		0E05 0E06	08 08		BYTE NCRS5E-NCRS5S /2 BYTE NCRS6E-NCRS6S /2	24 25
		0E07	08		•BYTE NCRS7E-NCRS7S /2	26
	1 8	0E08	09		BYTE NCRS8E-NCRS8S /2	28
2	19	0E09	06		•BYTE PULS4E-PULS4S /2	29
	20	0EOA	07		BYTE PULS3E-PULS3S /2	31
		0E0B 0E0C	07 04		.BYTE PULS2E-PULS2S /2 .BYTE PULS1E-PULS1S /2	32
	26 23	OEOD	02		•BYTE PULSOE-PULSOS /2	34
	27 24				•MACRO MINDX ARG	36
2	25				-BYTE ARG-VBASE	37
	29 26	acac		D T XIO !!! >	• ENDM	39
		0E0E	00	PINDEX	MINDX INVAIS ;INVADER 1	13
_		OEOF	10		MINDX NCRSIS	42
	30	0E10	20		MINDX NCRS2S	44
_		OE11	30		MINDX NCRS3S	45 46 47
	35 32 36 33	0E12 0E13	40 50		MINDX NCRS4S MINDX NCRS5S	47
3	36 33 34	0E14	60		MINDX NCRS6S	48 49
		0E15	70		MINDX NCRS7S	50
3	36	0E16	80		MINDX NCRS8S	52
4	37	0517	0.2		MINDY DILICAC	53 54 55 56 57 58 59 60
		0E17 0E18	92 9E		MINDX PULS4S MINDX PULS3S	55
		0E19	AC		MINDX PULS2S	57
	41	OEIA	ВА		MINDX PULSIS	58 59
		0E18	C2			60
	43 44			BYTE 0	D7 SIGN FOR PERP. UNIT VECTOR MULTIPLIER D6 SIGN FOR UNIT VECTOR MULTIPLIER	62
	17 44 18 45			† *	D5-D3 PERP UNIT VECTOR MULTIPLIER ABS. VALUE	63
4	19 46			7 • •	D2-D0 UNIT VECTOR MULTIPLIER ABS. VALUE	65
	47			• • • • • • • • • • • • • • • • • • •	1 USE DEPTH CUE INTENSITY	66 67
5	48				O BEAM OFF	68
	52 49 53 50			i	10 DRAW A DOT 10 USE VALUE FOR INTENSITY	70
	53 50 54 51			•	.MACRO VEC UX,UZ,UI	71
	52				NARG NUM	73
	53				•••ONF 0	74 75
5	54				IIF EQ, NUM-3, ONF UI	76 77 1
	58 55				.IIF EQ,NUM-2,ONF 1PUV UZ	78
	50 57				••••UV UX	79 80

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1	ALDISP - PICTURES		DISPL	AY FUNC	CTIO ATARI MAC	55 VM03.09 00 00 02 PAGE 46+	1412THE
$\frac{1}{3}$	PICTURES						
4	58					•••SPU 0	
5	59 60					•••SUV 0 •IF LT,•••PUV	
7	61					••••PUV - •••PUV	
8	62					•••SPU 80	
9	63 64					• ENDC	
11	65					•IF LT, •••UV ••••UV ••••UV	
12	66					•••SUV 40	
13						BYTESPUSUVPUV*8UV ,ONF	
) 14 15	68 69					.BYTESPUSUVPUV*8UVONF .ENDM	
16	70					•MACRO DOT, •••DX, •••DY	
17	71					VECDX,DY,10	
18	72 73	OEIC			VBASE	• ENDM 24 25	
20	74	OE1C			CURS4E	$\frac{26}{27}$	
21		OFIC	0.0	0.3	INVALS	28	
22		OEIC OEIE	0C 8C	01 01		VEC 4,1,1 VEC 4,-1,1	
24	7 8	0E20	4A	01		VEC -2,1	
25	79	0E22	09	01		VEC 1,1	
) 26 27		0E24 0E26	CB 4B	01 01		VEC -3,-1 VEC -3,1	\bigcirc
28		0E28	89	01		VEC 1,-1	
29		0E2A	CA	01	* * * * * * * * * * * * * * * * * * *	VEC -2,-1	
30		0E2C 0E2C			INVA1E NCRS1S	40	
32		OE2C	90	01	*10H323	VEC 0,-2 VEC 2,-1	
33		0E2E	8A	01		VEC 2,-1	
34		0E30 0E32	23 DB	01 01		VEC 3,4 VEC -3,-3	
36	90	0E34	41	01		VEC -1,0	
37		0E36	10	01		VEC 0,2	
38	II	0E38 0E3A	OA CB	01 01		VEC 2,1 VEC -3,-1	
40	94	0E3C			NCRSIE	53	
41		0E3C	0.3	0.3	NCRS2S	VEC 3 2	
42		0E3C 0E3E	91 17	01 01		VEC 0, 2 VEC 2, 1 VEC -3, -1 VEC 1, -2 VEC 7, 2 VEC -3, 1 VEC 2, -1 VEC 0, 1 VEC 0, 1	
44	98	0E40	48	01		VEC -3,1	
45 46	* * * *	0E42 0E44	8A CE	01		VEC 2,-1 VEC -6,-1	
47	* * *	0E46	08	01		VEC 0,1	
48	102	0E48	OA	01		VEC 2,1	
49	103 104	OE4A OE4C	CB	01	NCRS2E	VEC -3,-1	
) 50 51	* * *	0E4C			NCRS3S	VEC -3,-1 65 66 67 68	
52	106	0E4C	92	01		VEC 2,-2	
53 54		0E4E 0E50	16 48	01 01		VEC 6,2 VEC -3,1	
55		0E52	8A	01		VEC 2,-1 VEC 2,-1 VEC -5,-1	
56	110	0E54	CD	01		75	
57 58	111	0E56 0E58	49 0A	01 01		VEC -1,1 VEC 2,1	1
59	113	0E5A	CB	01		VEC -3,-1	
60	114	0E5C			NCRS3E	80	

PICTURES	ALIENS	DISPL	AY FUNCTIO	ATARI MAC	5 VM03.09 00 00 02 PAGE 46+	
115	0E5C			NCRS4S		
116	0E5C	93	01		/EC 3,-2	
117	0E5E	15	01		/EC 5,2	
118	0E60	4B	01		/EC -3,1	
119	0E62	8 A	01		/EC 2,-1	
120	0E64	CC	01		/EC -4,-1	
121	0E66	44	01		/EC -2,1	
122 123	0E68	OA	01		/EC 2,1	
123	0E6A	СВ	01	MCOC/***	/EC -3,-1	
124	0E6C			NCRS4E		
125 126	0E6C	0.E	0.3	NCRS5S	/EC 5,-2	
127	0E6E	95 13	01 01		/EC 3,2	
128	0E70	4B	01		/EC -3,1	
129	0E72	8A	01		/EC 2,-1	
130	0E74	CA	01		/EC -2,-1	
131	0E76	4C	01		/EC -4,1	
132	0E78	OA	01		/EC 2,1	
133	OE7A	СВ	01		/EC -3,-1	
134	OE7C			NCRS5E		
135	OE7C			NCRS6S		
136	OE7C	96	01		/EC 6,-2	
137	0E7E	12	01		/EC 2,2	
138	0E80	4B	01		/EC -3,1	
139	0E82	8 A	01		/EC 2,-1	
140	0E84	C9	01		/EC -1,-1	
141	0E86	4D	01		/EC -5,1	
142	0E88 0E8A	OA CB	01		/EC 2,1	
143 144	OE8C	Co	01	NCRS6E	/EC -3,-1	
145	0E8C			NCRS7S		
146	0E8C	97	01	**************************************	/EC 7,-2	
147	0E8E	11	01		/EC 1,2	
148	0E90	4B	01		/EC -3,1	
149	0E92	8A	01		/EC 2,-1	
150	0E94	88	01		/EC 0,-1	
151	0E96	4 E	01		/EC -6,1	
152	0E98	OA	01		/EC 2,1	
153	OE9A	СВ	01		/EC -3,-1	
154	0E9C			NCRS7E		
155	0E9C			NCRS8S		
156	0E9C	<u>0B</u>	00		/EC 3,1,0	
157	0E9E	A3	01		/EC 3,-4	
158	OEAO	AO	01		/EC 2,1	
159	OEA2	10	01		/EC 0,2	
160	OEA4 OEA6	4B 8A	01		/EC -3,1 /EC 2,-1	
161 162	OEA8	90	01 01		/EC 0,-2	
163	OEAA	41	01		/EC -1,0	
164	OEAC	5B	01		/EC -3,3	
165	OEAE	20	~.	NCRS8E		
166	mar son 4 % Son			2 * 2 * 1 * 2 * 2 * 6 m	MACRO BVEC UUX, UUY	
167					VEC UUX, UUY, 0E0	
168					ENDM	
169	OEAE			PULS4S		
170	OEAE	9A	01		/EC 2,-3	
171	0EB0	31	01		/EC 1,6	

) -							
		ALIENS	DISPL	AY FUNCTION	D ATARI MAC	65 VM03.09	00 00 02 PAGE 46+
	PICTURES						
	³ 4 172	0EB2	81	01		VEC 1,-6	
		0EB4	31	01		VEC 1,6	
	174	0EB6	Bl	01		VEC 1,-6	
		0EB8	14	01	Dill C / ****	VEC 2,3	9
		OEBA OEBA			PULS4E PULS3S		11 12
	0 178	OEBA	01	00	100000	VEC 1,0,0	12
	1 179	OEBC	91	01		VEC 1,-2	14 15
		OEBE	21	01		VEC 1,4	
_		0EC0 0EC2	A1 21	01 01		VEC 1,-4 VEC 1,4	17 18
		OEC4	Al	01		VEC 1,-4	19
	6 184	0EC6	11	01		VEC 1,2	21
		0EC8			PULS3E		22 23
	8 186	OEC8	0.1	00	PULS2S	VEC 1 0 0	24
_		OEC8 OECA	01 89	00 01		VEC 1,0,0 VEC 1,-1	25 26
		OECC	11	01		VEC 1,2	27 28
_		OECE	91	01		VEC 1,-2	29
		0ED0	11	01		VEC 1,2	30 31
		0ED2 0ED4	91 09	01		VEC 1,-2 VEC 1,1	32 33
_		OED6	0,	01	PULS2E	* t V	34
	195	0ED6			PULSIS		35
_		0ED6	01	00		VEC 1,0,0	37 38
	197 198	OED8 OEDA	8A 12	01 01		VEC 2,-1 VEC 2,2	39
		OEDC	8A	01		VEC 2,-1	40 41
	200	OEDE			PULS1E		42 43
		OEDE	01	00	PULSOS	VEC 1,0,0	44
_	202 203	OEEO OEE2	06	01	PULSOE	VEC 6,0	133 14 15 16 16 17 18 19 20 21 21 22 23 24 25 26 27 28 29 30 30 31 32 29 30 30 31 32 40 41 41 42 43 44 44 44 44 45 46 47 47
	s6	W Lin Lin Kay			, OL 30 t		47 48
_	37						49 50
	88						50 51
	.0						52 53
	1						51 52 53 54 55 56 56 57 58 59 60
4	2						55
4	3						57 58
	5						59 60
4	6						
	7						62 63
4	8						64
	50						66
,	51						67 68
	52						61 62 63 64 65 66 67 68 69 70
	3						71
	55						72 73
	66						74 75
	57						76
	59						77 78

USER THEURER JOB TEMPEST PAGE 0052 DATE 17-04-1981 18 51 05 ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 47 2 PICTURES 1

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_ [NCTIO	ATARI MAC65 VM03.09 00 00 02 PAGE 48	1 2 2 THE
	UTILITY	PROJEC	T POI	NT ONT	O SCREEN		3
	4					SBTTL UTILITY PROJECT POINT ONTO SCREEN	5
	5 2						6 7
	ŝ 3					; INPUT	8
	7 4					; PXL,PYL,PZL WORLD COORDINATES OF POINT TO PROJECT	9
71	3 6					; EXL, EYL WORLD COORDINATES OF EYE EYL HAS AN ; IMPLIED NEGATIVE SIGN	11
1	o 7					THE LIED MECHANIZE STON	13
) 1	1 8					;OUTPUT SXH, SZH SCREEN COORDINATES OF PROJECTED POINT	14 15
1	2 9					; MTEMPS DESTROYED	16 17
1	3 10 4 11					FORMULAE SCREEN X FACTOR/ PY-EY * PX-EX +SXCENT	18 19
) 1	5 12					e	19
1	6 13					SCREEN Z FACTOR/ PY-EY * PZ-EZ +SZCENT	21
1	7 14					•	22 23
1	8 15 9 16					CALCULATE COMMON FACTOR FACTOR/ PY-EY	21 22 23 24 25 26 27
2	0 17					• • • • • • • • • • • • • • • • • • •	26
2	18						28
2	2 180	OEE2				WORSCR	29 30 31 32 33 34 35 36
2	181 4 182	0EE2 0EE4	A5 38	57		LDA PYL SEC	31
2	5 183	OEE5	E5	5F		SBC EYL	33
2	184	0EE7	8D	6095		STA MXPL	34 35
2		OEEA	A9	00		LDA I, 0	36
2	8 186 9 187	OEEC OEEE	E5 8D	5B 6096		SBC EYH STA MXPH	38
3	188	OEF1	10	00		IFMI ; IS POINT BEHIND EYE	39
3	189	0EF3	A9	00		LDA I,0 ;YES. PUT IT AT EYE	41
3	190	0EF5	8D			STA MXPH	42 43
3	3 191 4 192	OEF8 OEFA	8D	01 6095		LDA I,1 STA MXPL	44
3	5 193	OEF2	OA	0077		ENDIF	46
3	194	OEFD	A5	58		LDA PZL	47
3		OEFF	C5	60		CMP EZL	49
3	8 196 9 197	0F01 0F03	90 E5	00 60		IFCS SBC EZL	49 50 51 52
	0 198	0F05	A2	00		LDX I,0	53
4		0F07	88	50	00	ELSE	54
	2	0F02	07	9 5		1.D.A. #71	53 54 55 56 57 58 59 60
4	3 200 4 201	OFOA OFOC	A5 38	60		LDA EZL SEC	58
	5 202	OFOD	50 E5	58		SBC PZL	59
4	6 203	OFOF	A2	FF		LDX I,-1	61
	7 204	0F09	07	2 Pr 19 400		ENDIF	61 62 63 64
	8 205 9 206	0F11 0F14	8D 8D	608E 6094		STA MZLH STA MSZXD	64
_	0 207	0F17	86	33		STX MTEMP+2	65 66 67
5	208	0F19	A5	56		LDA PXL	68
_	2 209	0F1B	C5	5E		CMP EXL	69
) 5 5	3 210 211	OF1D OF1F	90 E5	00 5E		IFCS SBC EXL	70 71 72 73 74 75 76
	5 212	0F21	A2	00		LDX I,0	72
5	213	0F23	88	50	00	ELSE	74 75
5		OF1E	07	gen yan		LDA EVI	
5 5		0F26 0F28	A5 38	5 E		LDA EXL Sec	78
6	0 216	0F29	50 E5	56		SBC PXL	79 80
		_					17.7

ALDISP -					<u> </u>
UTILITY	PRUJECT	PUI	NI UNIU S	.Ketn	
217	0F2B	A2	FF	LDX I,-1	
218	0F25	07		ENDIF	
219	OF 2D	85	32	STA MTEMP+1	
220	0F2F	86	34	STX MTEMP+3	
221				BEGIN	
222	0F31	20	6040	BIT MSTAT	
223 224	0F34 0F36	30 AD	FB 6060	PLEND LDA MYLOW	
225	0F39	85	63	STA SZL	
226	0F3B	AD	6070	LDA MYHIGH	
227	OF3E	85	64	STA SZH	
228					
229	0F40	A5	32	LDA MTEMP+1	
230	0F42	8D	608E	STA MZLH	
231	0F45	8D	6094	STA MSZXD	
232 233	0F48 0F4A	A5 30	33 00	LDA MTEMP+2 IFPL	
234	OF4C	A5	63	LDA SZL	
235	0F4E	18	- 65	CLC	
236	OF4F	65	68	ADC ZADJL	
237	0F51	85	63	STA SZL	
238	0F53	A5	64	LDA SZL+1	
239	0F55	65	69	ADC_ZADJL+1	
240	0F57	50	00	IFVS	
241	0F59	A9	FF (2	LDA I, OFF	
242 243	0F5B 0F5D	85 A9	63 7F	STA SZL LDA I,7F	
244	0F58	06	<i>*</i>	ENDIF	
245	0F5F	85	64	STA SZL+1	
246	0F61	88	50	DO ELSE	
	0F4B	18			
247	0F64	A5	68	LDA ZADJL	
248	0F66	38		SEC	
249	0F67 0F69	E5 85	63 63	SBC SZL STA SZL	
250 251	0F6B	65 A5	69	LDA ZADJL+1	
252	0F6D	E5	64	SBC SZL+1	
253	0F6F	50	00	IFVS	
254	0F71	A9	00	LDA I,O	
255	0F73	85	63	STA SZL	
256	0F75	A9	80	LDA I,80	
257	0F70	06		END IF	
258	0F77	85	64	STA SZL+1	
259 260	0F63	15		ENDIF BEGIN	
261	0F79	20	6040	BIT MSTAT	
262	0F7C	30	FB	PLEND	
263	OF7E	AD	6060	LDA MYLOW	
264	0F81	85	61	STA SXL	
265	0F83	AD	6070	LDA MYHIGH	
266	0F86	85	62	STA SXH	
267	0F88	A6	34	LDX MTEMP+3	
268	OF8A	30	00	IFPL	
269 270	OF8C OF8E	A5 18	61	LDA SXL CLC	
271	OF8F	65	66	ADC XADJL	
272	0F91	85	61	STA SXL	

ALDESP - ALTENS DISPLAY FUNCTIO) -							
274 0F95 65 67 ADC XADJL+1 275 0F97 50 00 IFVS 7 276 0F99 A9 FF LDA I,0FF 277 0F98 B5 61 STA SXL 278 0F90 A9 7F LDA I,7F 280 0F9F 85 62 STA SXL+1 281 0FA1 60 RTS 282 0F8B 16 ENDIF 283 0FA2 A5 66 LDA XADJL 284 0FA4 38 SFC 286 0FA7 85 61 SFC SXL 287 0FA9 A5 67 LDA XADJL+1 289 0FAB F5 62 SSC SXL+1 290 0FAF A9 00 IDA I,0 291 0FB1 85 61 STA SXL 292 0FBB 85 62 SSC SXL+1 293 0FAB F5 62 SSC SXL+1 294 0FAB A9 NO IDA I,0 295 0FAB F5 62 SSC SXL+1 296 0FAB F5 62 SSC SXL+1 297 0FAB A9 NO IDA I,0 298 0FAB F5 62 SSC SXL+1 299 0FAB A9 NO IDA I,0 299						ATARI MAC65 VM03.09 00 00 02 PAGE 48+	1 2 3	
275 0F97 50 00 IFVS 276 0F99 49 FF LDA I,0FF 277 0F98 95 61 STA SXL 279 0F98 95 62 FNDIF 280 0F9F 85 62 STA SXL+1 281 0FA1 60 FNDIF 283 0FA2 A5 66 LDA XADJL 284 0FA4 38 SEC SXL 286 0FA7 85 61 STA SXL 286 0FA7 85 61 STA SXL 289 0FA8 55 62 SEC SXL+1 290 0FAF A9 00 LDA I,0 297 0FA8 A9 80 LDA I,0 297 0FA8 A9 80 LDA I,0 298 0FA8 55 62 STA SXL 299 0FA8 65 62 STA SXL 299 0FA8 65 62 SEC SXL+1 290 0FAF A9 00 LDA I,0 291 0FB1 85 61 STA SXL 292 0FB3 A9 80 LDA I,8 293 0FA8 65 62 STA SXL 294 0FB5 85 62 STA SXL 295 0FB7 60 RTS					62		4 5	
276							6 7	
277 0F9B 85 61 STA SXL 278 0F9B 0A9 7F LDA 1,7F 10 279 0F9B 06 ENDIF 11 280 0F9F 85 62 STA SXL+1 12 281 0FA1 60 RTS 12 282 0F8B 16 ENDIF 13 282 0F8B 16 ENDIF 14 283 0FA2 A5 66 LDA XADJL 15 284 0FA4 38 SEC 16 286 0FA7 85 61 STA SXL 17 286 0FA7 85 61 STA SXL 18 287 0FA9 A5 67 LDA XADJL 18 288 0FAB E5 62 SRC SXL+1 19 289 0FAB E5 62 SRC SXL+1 299 0FAB A9 00 LDA 1,0 299 0FAF A9 00 LDA 1,0 299 0FAF A9 00 ENDIF 299 0FAF A9 00 RAS ANDIS AN					FF		8 9	
278 0F90 A9 7F LDA 1,7F 280 0F9F 85 62 STA SXL+1 280 0F9F 85 62 STA SXL+1 281 0FA1 60 RTS 282 0F8B 16 ENDIF 283 0FA2 A5 66 LDA XADJL 284 0FA4 38 SEC 285 0FA5 E5 61 SSC SXL 286 0FA7 85 61 STA SXL 287 0FA9 A5 67 LDA XADJL+1 289 0FAD 50 00 FFVS 289 0FAD 50 00 FFVS 289 0FAD 50 00 FFVS 299 0FAF A9 00 LDA 1,0 299 0FAB A9 80 ENDIF 390 2FF A9 00 ENDIF		8 277	0F9B	85	61	STA SXL	10	
280					7F		12	
281				85	62		14	
10		12 281	OFAL	60		RTS	16	
10				16	44		17 18	
285	1				88		19 20	
34 35 46 47				E5	61		21	
34 35 46 47				85 45	61 67		23	
34 35 46 47		19 288	OFAB	E5	62	SBC SXL+1	25	
34 35 46 47							26 27	
34 35 46 47	1					STA SXL		
34 35 46 47		23 292	OFB3	A9		LDA I,80	30 31	
34 35 46 47	1				6.2		32	
34 35 46 47)	295			02		34 35	
34 35 46 47	1	28					36	
34 35 46 47) :	29					38 39	
34 35 46 47	1	30					40	
34 35 46 47) :	32					42	
	;	33					44	
) :	35					46	
77		36						
50		37					49 50	
40		39					51 52	
141	, ,	10					53 54	
3	1	+1 42					55	
44	4	13					57	
50)	14					59	
47	,	16					60	
48)	L 7					62 63	
50	4	49 49					64 65	
51)	50					66	
52 53 54 55 56 57 57 58		51					68	-
54)	53					70	
55 56 57 58 58		54					71 72	
57 57 58 59		i5					73 74	
58 77 78		57					75 76	니
	!	58					77 78 /	

	1 ALDISP -			LAY FUNC	TIO ATARI MAC	65 VM03.09 00 00 0	02 PAGE 49	1 2	
7	3	Lington 1213	~ 1			•SBTTL INITIALIZE	DISPLAY	3 4 5	
	5 2							6	
	6 3	OFB8	20	0000G	INIDSP	JSR INITEM	COPY SCORE TEMPLATE TO VECTOR RAM	8	
	7 4	OFBB	A9	80		LDA I.80	; EYE CENTERED X WISE	9	
)	8 5 9 6	OFBD OFBF	85 A9	5E FF		STA EXL LDA I,OFF	REG-WELL UPDATE FROM MAINLINE	10	
	9 8 7	OFC1	8D	0114		STA ROTDIS	, REG-WELL OPDATE FROM MAINLINE	12	j
	11 8	OFC4	20	107F		JSR INIWLS	; INIT. WELL	14	
	12 9	OFC7	AD	0133		LDA SPARE3		16	
. 1	10	OFCA	DO	00		IFEQ	; VG HALT AS REQUESTED	17 18	
) [14 11 12	OFCC OFCB	8D 03	5800		STA VGSTOP ENDIF	;NO. STOP IT	19	
	16 13	OFCF	A9	00		LDA I,O		20	
)	17 14	OFD1	8D	0133		STA SPARE3		22	
1	15	OFD4	AD	0000G		LDA JMPMA4	;REQUEST HALT	24	
1	16	OFD7	8D	2000		STA VECRAM		22 23 24 25 26 27 28	
	20 17 21 18	OFDA OFDD	AD 8D	0000G 2001		LDA JMPMH4 STA VECRAM+1		27	
	21 18 22 19	OFEO	A5	9F	INICOL	LDA CURWAV			
- 1		OFE2	29	70	2742006	AND 1,70		29 30 31 32 33 34 35 36	
2	24 21	OFE4	C9	5F		CMP I,5F		32	
2	25 22	OFE6	90	00		IFCS		33	
	26 23 24	OFE8 OFE7	A9 02	5F		LDA I,5F ENDIF		35	
2	27 24 25	OFEA	4A			LSR		37	,
2	29 26	OFEB	09	07		ORA 1,07	COLOR TABLE INDEX	38 39 40	
- 1	30 27	OFED	AA			TAX		40	
	2 8	OFEE	AO	07		LDY I,07	ACET UD COLOR 049	41	
	29 33 30	0FF0	BD	1047		BEGIN LDA X, COLTAB	;SET UP COLOR RAM	42	
3	31 31	0FF3	29	0F		AND I, OF		44 45	i
) 3	32	OFF5	99	0019		STA Y, COLRAM		46 47	
3	33	0FF8	99	0800		STA Y, COLPORT		48	
	34	OFFB		1047		LDA X, COLTAB		49 50	
	35 36	OFFE OFFF	4A 4A			LSR LSR		51	
2	10 37	1000	4A			LSR		53	;
) 2	11 38	1001	44			LSR		54	
	12 39	1002	99	0021		STA Y, COLRAM+8		50 51 52 53 54 55 56 57 58 59	
	40	1005	99	0808		STA Y, COLPORT+8		57 58	
	41 42	1008 1009	CA 88			DEX DEY		59	
2	46 43	1004	10	E4		MIEND			
) 4	44	100C	60	•••••		RTS		62	
	48 45	100D			INIMAT			61 62 63 64 65 66 67 68	
	46	100D	A9	00		LDA I,O	; INITIALIZE FOR ONELIN	65 66	
	47 48	100F 1011	85 85	81 91		STA X1H STA Z1H		67	
	52 49	1013	85	80		STA XOH		69)
	53 50	1015	85	78		STA XOL		70	
	54 51	1017	85	90		STA ZOH		72	
	55 52	1019	85	88		STA ZOL	• TEDO HAHCED MATH DOV DECICTEDS	73 74	
	56 53 54	1018 101D	A9 8D	00 6080		LDA I,O STA MAL	; ZERO UNUSED MATH BOX REGISTERS	75	
	58 55	1020	8D	6081		STA MAH		77	1 71
	59 56	1023	8D	6084		STA MEL		78 79	
6	57	1026	8D	6085		STA MEH		80	

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 49+ INITIALIZE DISPLAY 1029 STA MFL 58 6086 102C 6087 STA MFH 59 8D 60 102F 8D 6089 STA MXH STA MBH 61 1032 8D 6083 62 1035 8D 608D STA MZLL 1038 8D 608E STA MZLH 63 12 13 14 15 STA MZHL 64 103B 8D 608F 65 103E 8D 6090 STA MZHH 1041 A9 OF LDA I, OF 66 67 1043 8D 608C STA MNL 17 18 19 20 21 22 23 24 25 26 27 28 1046 60 RTS 68 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 50 COLORS .SBTTL COLORS COLTAB 2 1047 1047 3 00 .BYTE ZWHITE ;1 EXPLOSIONS O ;PLAYER SHOT CENTER 8 1048 04 .BYTE ZYELLO CURSOR, FLASHLIGHT 1 :SPLAT A 5 1049 08 .BYTE ZPURPL ;TANKERS 2 ;SPLAT B 104A .BYTE ZRED :FLIPPERS 3 :SPLAT C OC 6 104B **C3** .BYTE ZTURQOI ZRED*10 ;PULSARS 4 ;NYMPHS OD 104C .BYTE ZGREEN 07 :LETTERS S 104D .BYTE ZBLUE :WELL 6 08 10 104E 08 .BYTE ZBLUE ;LETTERS 7 ;FLASH 104F 11 00 .BYTE ZWHITE ;2 1050 .BYTE ZGREEN 12 07 13 1051 08 .BYTE ZBLUE 1052 .BYTE ZPURPL 14 08 15 1053 44 .BYTE ZYELLOW ZYELLOW*10 16 1054 03 .BYTE ZTURQOI 26 27 1055 .BYTE ZRED 17 OC 18 1056 OC .BYTE ZRED 1057 00 19 .BYTE ZWHITE ;3 23 20 1058 OB .BYTE ZBLUE 1059 .BYTE ZTURQOI 21 03 22 105A 07 .BYTE ZGREEN 34 35 .BYTE ZPURPL ZRED*10 105B 23 C8 24 105C OC .BYTE ZRED 25 105D 04 .BYTE ZYELLO 26 105E 04 .BYTE ZYELLOW 27 105F 00 .BYTE ZWHITE ;4 1060 .BYTE ZBLUE 28 08 42 29 1061 08 .BYTE ZPURPL 30 1062 07 .BYTE ZGREEN 1063 ZRED*10 31 **C4** .BYTE ZYELLO 1064 OC 32 .BYTE ZRED 33 1065 03 .BYTE ZTURQOI 49 34 1066 03 .BYTE ZTURQOI 35 36 37 38 1067 00 .BYTE ZWHITE ;5 1068 39 04 .BYTE ZYELLO 40 1069 08 .BYTE ZPURPL 41 106A OC .BYTE ZRED 106B .BYTE ZTURQOI ZRED*10 42 **C3** 106C .BYTE ZGREEN 07 43 106D OF 44 .BYTE ZBLACK 106E 08 .BYTE ZBLUE 45 46 106F 00 .BYTE ZWHITE ;6 1070 OC 47 .BYTE ZRED 1071 48 08 .BYTE ZPURPL 49 1072 04 .BYTE ZYELLOW 1073 **C3** .BYTE ZTURQOI ZRED*10 50 51 1074 08 .BYTE ZBLUE 52 1075 07 .BYTE ZGREEN 1076 53 07 .BYTE ZGREEN 1077 54 06 01 04 .BYTE BLUE, RED, YELLOW, TURQOI, WHITE, GREEN, GREEN, GREEN :SPECIAL WELL COLOR 107B 00 05 05 05

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 51 INITIALIZE-GRID LINES .SBTTL INITIALIZE-GRID LINES 2 ; INPUT Y INDEX INTO NEW LIX, Z OF LAST GRID LINE S COORDINATES 12 13 14 15 18 19 20 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 67 68 69 70 71 72 73 74 75 76 77 77 78

r □	ALDISP -	- ALTENS	nisp	I AV FIIN	ICTIO ATARI MAC	65 V	M03.09 00 00 02 P	AGE 52	1
2	INITIALI			LAI , O	aranz mad	U	105407 00 00 02 1		2 3
3	1					•SB	TTL INITIALIZE WE	LL	4 5
5	2	1070			TAITIU C				$\begin{bmatrix} 6 \\ 7 \end{bmatrix}$
7	3	107F	A6	3 D	INIWLS	LDX	PLAYUP		8 9
8	5	1081	85	46		LDA	X, WAVENI		10
9	6	1083	20 48	1132		JSR PHA	LVLWEL	CONVERT CODE TO INDEX	12
11	8	1087	AC	0112			WELLID	CONTENT CODE TO INDEX	14
12	9	108A	B9	OAD6			Y, HOLEYL	; EYE POSITION Y	16
13	10 11	108D 108F	49 18	FF		CLC	I,OFF	;CONVERT+TABLE VALUE TO NEG.	18
15	12	1090	69	01		ADC	1,1		19
16	13 14	1092 1094	8 5 8 5	5F 5D			EYL EYLDES		21
18	15	1094	A9	10			I,10		22 23 24
19	16	1098	38			SEC			25
20	17 18	1099 1098	E5 85	5F A0			EYL YDEUNI	;DELTA FOR UNIT SCALE	25 26 27 28
22	19	109D	Α9	FF		LDA	I,-1		
23		109F	85 89	5B			EYH	• EVE DOCTTION 7	29 30 31 32
25	21 22	10A1 10A4	85	0AE6 60			Y, HOLEZL EZL	; EYE POSITION Z	32
26	23	1046	89	0816		LDA	Y, HOLRAP	;WELL TYPE OPEN I CLOSED	34 35 36
27	24 25	10A9 10AC	8D A5	0111			WELTYP QNXTST		36 37
29	26	10AE	C9	1E			I, CNWLF2		38 39 40
30	27	1080	DO	00		IFE		• • • • • • • • • • • • • • • • • • •	40
31	28 29	10B2 10B5	89 85	0AF6 68			Y, HOLZAD ZADJL	; AT CENTER IMMEDIATELY NEW LIFE	41
33	30	1087	89	0806		LDA	Y, HOLZDH		43
34	31 32	10BA 10BC	8 5 88	69 50	00	STA	ZADJL+1		45 46
36	5 32	1081	OD	70	00	Ł. LJ	Lim		47 48
37				OAF6			Y, HOLZAD	;MOVE UP SLOWLY NEW WAVE	49
38		10C2 10C3	38 E5	68		SEC SBC	ZADJL		51
40	36	10C5	8D	0121		STA	ZADEST		53
41	T :	10C8 10CB	B9 ED	0806 0069			Y,HOLZDH A,ZADJL+1		55
43		10CE	A2	03			I,3		56
44	40		, ,			BEG	IN		58 59
45	41 42	10D0 10D1	4A 6E	0121		LSR ROR	ZADEST		50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
47	43	1004	CA			DEX			62 63
48	44	10D5 10BE	10 18	F9		MIE			64
50		10D7	A9	00			1,0	;X SCREEN CENTER	66
51		10D9	85	66			XADJL		68
52		10DB 10DD	8 5 A 9	67 00			XADJL+1 I,0	;SAY TOP BOTTOM ON SCREEN	70
54	50	10DF	8D	010F		STA	LEVELY	• • • • • • • • • • • • • • • • • • • •	71
55 56		10E2 10E5	8D A9	0110 2C			LEVELY+1	00 ;SET UP SUBR BUFR PC	73 74
57		10E7	8D	0113			ROTFLG	DO POET OF SUDN BUIN FO	75 76
58	54	10EA	68			PLA			77
59	55 56	10EB 10EC	A8 A2	0F		TAY	I, NLINES-1		79
		- V V	e v Sinn	~ '		/	— g - r = = - r + ton 54 - de		IOU

1	ALDISP .	- ALIENS	DISP	LAY FU	NCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 52+	1
2	INITIAL					2
3						4
4	57				BEGIN ;LOOP FOR EACH GRID LINES	5
5	58	10EE	B9	0706	LDA Y, NEWLIX	6
6	59	10F1	9D	03CE	STA X,LINEX ;SET UP X AND Z INTEGER PORTIONS	8
7	60	10F4	B 9	08C6	LDA Y, NEWLIZ	9
8	61	10F7	9D	03DE	STA X,LINEZ	10
9		10FA	A9	00	LDA I,O ;ZERO FRACTIONAL PORTION	12
10		10FC	9D	031A	STA X, LINSXH	13 14 15 16 17
11		10FF	9D	033A	STA X, LINSZH	15
12		1102	9D	039A	STA X,LINSTA	16
13		1105	B9	0906	LDA Y, ILINANG ; LINE ANGLE	17
) 14		1108	9D	03EE	STA X, LINANG	18 19 20
15		1108	88		DEY	20
16		110C 110D	CA 10	DF	DEX MIEND	22
17		1100	10	Ur	MIENU *	23
18						24
19		110F	AO	00	LDY I,0 CALCULATE MIDPTS	26
21		1111	A2	0F	LDX I, OF	27
22		TILL	HL	Ui	BEGIN ;LOOP FOR EACH LINE	21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
23		1113	B9	03CE	LDA Y, LINEX	30
24		1116	38	0301	SEC	31
25		1117	7 D	03CE	ADC X,LINEX	33
26		IIIA	6A	U J U	ROR	34
27	_	1118	9D	0435	STA X,LINEXM	35
28		1116	B9	03DE	LDA Y, LINEZ	37
29		1121	38		SEC	37 38 39 40
30		1122	7 D	03DE	ADC X,LINEZ	40
31		1125	6A		ROR	41
32		1126	9D	0445	STA X,LINEZM	42
33		1129	88		DEY	42 43 44
34	87	112A	10	00	IFMI	45
35	88	112C	AO	OF	LDY I, OF	45 46 47
36	89	112B	02		ENDIF	48
37		112E	CA		DEX	49
38		112F	10	E2	MIEND	50
39		1131	60		RTS	51 52
40	93					53 54 55 56 57 58 59 60
41					DETERMINE WELL SEQUENCE INDES	55
42	- m-				; INPUT ACC LEVEL #-1	56
43					OUTPUT ACC INDEX INTO WELL SEQUENCE TABLES	57 58
) 44		1122	4.2	0.0	; WELLID WELL ID	59
45	98 99	1132 1134	A2 C9	00 62	LVLWEL LDX I,0 CMP I,98.	60
46		1134	90	00	IFCS	61 62 63 64
48		1136	AD	60CA	LDA RANDOM	63
48		1138	29	5F	AND I,5F	64
50		1137	05	٦,	ENDIF	65 66 67
51		113D	C9	10	CMP I, WELSEN-WELSEQ	67 68
52		** 70	.	10	BEGIN :WAVE # MOD # OF WELLS	
53		113F	90	00	IFCS	69 70
54		1141	E8		INX	71 ₇₂
55		1142	38		SEC	73
56		1143	E9	10	SBC I, WELSEN-WELSEQ	74
57		1140	04		ENDIF	72 73 74 75 76
58		1145	C9	10	CMP I, WELSEN-WELSEQ	
59		1147	80	F6	CCEND	77 78 79
60	113	1149	A8		TAY	80

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 52+ INITIALIZE WELL 114 114A OAC6 LDA Y, WELSEQ GET WELL CODE FOR THIS WAVE **B9** 115 114D 0112 STA WELLID 8D 116 1150 OA ASL 117 1151 OA ASL 118 1152 OA ASL 119 1153 OA ASL 12 13 14 15 ORA I, OF OF 120 1154 09 121 1156 60 RTS 18 19 20 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 41 42 43 45 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

T								
1	ALDISP -	- ALIENS	DISP	LAY FUN	ICTIO ATARI MAC	65 VM03.09 00 00 02	PAGE 53	1
	INITIAL							2
	3							3
	1							5
	2					COTTI IITTI TTVQIII	ILD WELL DISPLAY BUFFER	6
	2	1157			D1 D1/21	• SBITE OTTETT - BUT	ILD WELL DISPLAT DOFFER	7
16	3	1157	1.0	A * * A	BLDWEL			8
_ 7	4	1157	AD			LDA LEVELY+1		10
) 8	5	115A	DO	00		IFEQ	;BOTTOM OF WELL ON SCREEN LAST TIME	11
9	6	115C	A9	FO		LDA I, ILINDDY	; YES	12
1	7	115E	85	57		STA PYL	;BOTTOM OF WELL Y	13 14 15 16
1	1 8	1160	A2	4F		LDX I,4F	INDEX FOR SCREEN COORDS	14
1	2 9	1162	20	12BD		JSR CALOUT	CALCULATE SCREEN COORDS FOR BOTTOM OF WELL	15
1	3 10	1165	8D	0110		STA LEVELY+1	OFF SCREEN FLAG	17
	4 11	1168	FO	00		IFNE	BOTTOM OFF SCREEN	18
	12	1164	8D	010F		STA LEVELY	;YES. THEN SO IS TOP	19
				0106			, TES. THEN SU IS TUP	20
	6 13	1169	03	0105		ENDIF		22
$\bigcup 1$	7 14	116D	AD	010F		LDA LEVELY		23
1	15	1170	DO	00		IFEQ	;TOP OF WELL ON SCREEN LAST TIME	24
_ 1		1172	A9	10		LDA I, ILINLIY	;YES.	25
2		1174	85	57		STA PYL	;TOP OF WELL Y	20
2	1 18	1176	20	129D		JSR CHKDEP		17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
2		1179	A5	57		LDA PYL		29
		117B	A2	0F		LDX I,OF	; INDEX FOR SCREEN COORDS	30
2 2	4 21	117D		12BD		JSR CALOUT	CALCULATE SCREEN COORDS FOR TOP OF WELL	31
2	5 22	1180	8D	010F		STA LEVELY	OFF SCREEN FLAG	33
		1171	11	010,		ENDIF	July Johnson Lao	34
2 2	7 24	1158	27			ENDIF		35
	24	1130	<u> </u>				TID NELL DIAC	36
2		* * ^ ^				.SBTTL UTILITY-BU	ILD WELL PIAC	38
2 3	9 26	1183			WELPIC		į	39
		1183	A9	01		LDA I,1		40
3		1185	20	0000G		JSR VGSCA1	;NORMAL SCAL	41 42 43 44
3	2 29	1188	AO	06		LDY I, WELCOL		42
3	3 0	118A	84	9E		STY COLOR		44
3	4 31	118C	AE	0110		LDX LEVELY+1		45
3	32	118F	FO	00		IFNE	;OFF SCREEN	46
3	6 33	1191	60			RTS	YES. ABORT	45 46 47 48
3	•	1190	01			ENDIF		
3		1192	AE	0113		LDX ROTFLG	;WELL ON	50
		1195	DO	00		IFEQ	• null on	51
3				00			•NO NO CDONEC	52
4		1197	60			RTS	;NO. NO SPOKES	54
) 4		1196	01			ENDIF		55
4							; ABORT IF ANY OF FAR PTS ARE OFF SCREEN LDX I, NL S-	≛ 56
4		1198	A2	OF		LDX I, NLINES-1		57
4						BEGIN	;LOOP FOR ACH SPOKE	58
4	5 42	119A	A9	CO		LDA I, RATS	SPOKE INTENSITY	60
4		119C	20	1238		JSR SPOKE	DRAW SPOKE	61
4		119F	CA			DEX		62
4		11A0	10	F8		MIEND		64
4						.SBTTL DISPLAY-WEL	1 RTM	65
5		1142	AO	06		LDY I, WELCOL		66
5		1144	84	9E		STY COLOR		67
								68
5		1146	A9	80		LDA I,MZCOLO		70
5		1148	20	0000e		JSR VGSTAT		71
5		11AB	AO	4F		LDY I,4F		72
5		11AD	AD	0110		LDA LEVELY+1		73
5		1180	20	1188		JSR OUTLIN		74 75
5		1183	AO	OF		LDY I, OF		49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78
5	55	1185	AD	010F		LDA LEVELY		77
5		1188			OUTLIN		DRAW TOP Y O OR BOTTOM Y 40 OF WELL	78
6		1188	DO	00		IFEQ	ON SCREEN	80

) -								
_ 1	ALDISP -			LAY FU	NCTIO ATARI MAC	65 VM03.09 00	00 02 PAGE 53+	1
$\frac{1}{2}$	DISPLAY-	WELL RI	M					2 3
4	58	11BA	84	37		STY INDEX1	;YES	4 5
5	59	11BC	89			LDA Y, LINSXL		6
6	60	118F	85	61		STA SXL		8
7	61	11C1	89	031A		LDA Y, LINSXH		9
8	62	1104	85	62		STA SXH		11
10		11C6 11C9	89 85	034A 63		LDA Y, LINSZL STA SZL		12
1		11CB	89	033A		LDA Y, LINSZH		14
12		IICE	85	64		STA SZH		15 16
13		11D0	A2	61		LDX I,SXL		17
14		1102	20	15BC		JSR VGYABS	;UPDATE CURNTX,Y	18
15		11D5 11D7	A5 85	74 B0		LDA VGLIST STA RUNGVG	; SAVE FOR RUNG CHANGES	20
10		1107	65 A5	75		LDA VGLIST+1		22
18		1108	85	Bl		STA RUNGVG+1		23 24
19	73	1100	A2	0F		LDX I, NLINES-		25
20	74	11DF	AD	0111		LDA WELTYP		26 27
2	75	11E2	FO	00		IFNE	;PLANAR	28
22	76 77	11E4 11E3	CA 01			DEX ENDIF	;YES. BEAM OFF FOR 1ST LINE	30
20 22 22 23 24 24	78	11E5	A9	CO		LDA I, RATS		31
2	79	11E7	85	73		STA VGBRIT	;TURN ON BEAM	33
20	80	11E9	86	38		STX INDEX2		34 35
27	81					BEGIN	;LOOP FOR EACH LINE ON LEVEL	36
28	82	11EB	C6	37		DEC INDEX1		37
29	83	llED llEF	A5 29	37 0F		LDA INDEX1		39
3.	85	11F1	C9	0F		CMP I,OF		10 11 12 13 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 31 32 29 30 31 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 45
32	86	11F3	DO	00		IFEQ	; INDEX WRAPPING	42 43
33		11F5	A5	37		LDA INDEX1		44
34		11F7	18	10		CLC	;YES	45 46
3	89 90	11F8 11FA	69 85	10 37		ADC I,10 STA INDEX1		47
3	91	11F4	07	J ;		ENDIF		101
38		11FC	20	126D		JSR LINTOS	;MOVE LINS TO SXLSZH	49 50 51 52
39		11FF	C6	38		DEC INDEX2		52
40	94	1201	10	E8		MIEND		53 54
42		1189 1203	49 60			ENDIF RTS		55
4:		1403	00				Y-CONNECT CURRENT PT. WITH NEXT POINT	53 54 55 56 57 58 59 60
4	98							58
4	99	1204			CONNEC		;DRAW A LINE TO NEXT POINT SX	60
46		1204	A5	61		LDA SXL	; CURRENT POINT CURNTX AND	61 62
47		1206 120 7	38 E5	6A		SEC SBC CURNTX	;SET CURRENT POINT NEXT POIN	61 62 63 64
49		1209	85	6E		STA XCOMP		64
50		120B	A5	62		LDA SXH		65 66 67 68
5	105	120D	E 5	6 B		SBC CURNTX+1		
52		120F	85	6F		STA XCOMP+1	;X PORTION OF VECTOR	69
5		1211	A5	63		LDA SZL SEC		69 70 71 72 73 74 75 76
54 55		1213	38 E5	60		SBC CURNTY		
56		1216	85	70		STA YCOMP		74
5	111	1218	A5	64		LDA SZH		75
58		121A	E5	6D		SBC CURNTY+1		77 78 79 80
59		121C	8 5	71		STA YCOMP+1	; Z PORTION OF VECTOR	79
60	114	121E	A2	6E		LDX I,XCOMP		80

_	V	A							
1 2	ALDISP -				CTIO ATARI MAC WITH NEXT POINT	55 VI	M03.09 00 00 02 PA	GE 53+	1 2
3									3 4
4	115	1220	20	0000G	UPCURN		VGVCTR	DRAW VECTOR	5
5	116 117	1223 1225	A5	61 6A			SXL CURNTX	;SET CURRENT PT NEXT PT	7
7	118	1227	85 A5	62			SXH		$-\begin{vmatrix} 8\\9\end{vmatrix}$
8	119	1229	85	6B			CURNTX+1		10
9	120	122B	A5	63			SZL		11
10	121	122D	85	6C			CURNTY		13
) 11	122	122F	A5	64			SZH		14 15 16
12	123 124	1231	85	6D		SIA	CURNTY+1	;MAKE SURE BEAM IS ON	-16 17
14	125	1233	A9	CO		LDA	I, RATS	granta Jona Danii 13 Uri	18 19 20
15	126	1235	85	73		STA	VGBRIT		20
16	127	1237	60			RTS			21
17	128				• TMDUT		TTL DISPLAY-DRAW 2		23
18	129				; INPUI		INE # TO ILLUMINATE INTENSITY		- 24 25
20					OUTPUT		RESERVED		21 22 23 24 25 26 27 28
21	132	1238	86	37	SPOKE	STX	INDEX1		
22	133	123A	48			РНА			29
23		123B	A4 A9	9E 08			COLOR		29 30 31 32 33 34 35 36
24 25	135 136	123D 123F	20	0000G			I, MZCOLO VGSTAT		32
26		14.5		00000		05.1	100171	CENTER BEAM	34
27	138	1242	20	1286		JSR	LIFTOS	FAR PT SCREEN COORD	36
28	139	1245	AZ	61			I,SXL	DRAW BLANK VEC TO FAR PT.	37 38 39 40
29		1247	20	15BC			VGYABS	;CURRENT PT. FAR PT.	39
30	141	124A 124B	68 85	73		PLA	VGBRIT		$-\frac{40}{41}$
32		124D	48	• • •		PHA			42 43 44
33	144							; NEAR PT COORD	
34	145	124E	20	126D			LINTOS	DRAW FROM FAR PT TO NEAR PT.	45 46 47
) 35	146 147	1251 1253	C6 A4	37 9E			INDEX1 COLOR		47
37		1255	A9	00			I,0		- 48 49
38		1257	85	73		STA	VGBRIT		50
39		1259	A9	08			I,MZCOLO		52
40	151	125B	20	0000G			VGSTAT	ADDAU COOM NEAD DE TO ADA NEAD DE	53 54
41 42	152 153	125E 1261	20 68	126D		PLA	LINTOS	;DRAW FROM NEAR PT. TO ADJ NEAR PT.	55
43	154	1262	85	73			VGBRIT		49 50 51 52 53 54 55 56 57 58 59 60
44	155	1264	20	1286		JSR	LIFTOS		58 59
45		1267	20	1204			CONNEC	;DRAW TO FAR PT.	
46	157	126A	A6	37			INDEX1		61
47		126C 126D	60 A6	37	LINTOS	RTS	INDEX1		63
49	160	126F	BD	032A	LIMIUS		X, LINSXL		61 62 63 64 65 66 67 68
50	161	1272	85	61		STA	SXL		66 67
51		1274	BD	031A			X,LINSXH		68
52		1277 1279	8 5 BD	62 034A			SXH V 1 TNC71		69 70
53 54		1279 1270	85	63			X,LINSZL SZL		69 70 71 72 73 74 75 76
55		127E	BD	033A			X, LINSZH		73
56	167	1281	85	64		STA	SZH		74 75
57		1283	4C	1204		JMP	CONNEC	;DRAW LINE	76
58	169 170	1286 1286	A6	37	LIFTOS	INY	INDEX1		77 78 79
60	171	1288	BD	036A			X, LIFSXL		79
			*** ****				THE STATE OF PERSONS		100

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 53+ 2 DISPLAY-DRAW 2 SPOKES 172 128B STA SXL 85 61 173 128D 035A LDA X, LIFSXH BD 174 1290 85 62 STA SXH 1292 038A LDA X, LIFSZL 175 BD 176 1295 85 63 STA SZL 177 1297 BD 037A LDA X, LIFSZH 12 13 14 15 129A 178 85 64 STA SZH 129C 179 60 RTS 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

SPLAY-DRAW 2	DISPLAY FUNCTI	O ATARI MAC65 VM03.09 00 00 02 PAGE	5.4	
SFEAT-DRAW Z		U ATAKI MACOS VMUSTUS UU UU UZ PAGE	2 4	
1 2		•SBTTL CHECK FOR EYE PAS	ST OBJECT ON WELL	
3 129D		CHKDEP		
4 129D 5 129F	A5 5B D0 00	LDA EYH Ifeq	EYE +	
6 12A1	A5 57	LDA PYL	YES.	
7 12A3 8 12A4	38 E5 5F	SEC SBC EYL		
8 12A4 9 12A6	90 00	IFCS		
10 1248	C9 OC	CMP I,OC		
11 12A7 12 12AA	02 B0 00	ENDIF IFCC	EYE TO CLOSE	
13 12AC	A5 5F	LDA EYL	YES. NUDGE PT. AWAY	
14 12AE 15 12AF	18 69 OF	CLC ADC I, OF		
16 1281	BO 00	IFCC		
17 12B3	C9 F0	CMP I, OFO		
18 12B2 19 12B5	90 00	END I F IFCS	;	
20 1287	A9 F0	LDA I,OFO	BUT NOT PAST END OF WELL	
21 12B6 22 12B9	02 85 5 7	ENDIF STA PYL		
23 12AB	OF	ENDIF		
24 12A0 25 12BB	1A 60	ENDIF RTS		
26 12BC	00G	CHKSM8 .BYTE QCHKS8		

1	ALDISP -	- ALIENS	DISP	LAY FUN	ICTIO	ATARI MAC65	VM03.09 00 0	00 02 PAGE 55	1
2	UTILITY-								2
3									4
4	1							Y-PROJECT OUTLINE	5
) 5	2					•	Y COORDINATE		7
6	3							R NEAR OR FAR ARRAY	8
7	4					į	INEX,Z 10 OU	JTLINE S X AND Z COORDINATES	9
	5					* OUTDUT A		IE TO ONCODEEN	11
1/2	7					• OUTPUT AL		NE IS ONSCREEN NY PT. IS OFF SCREEN	12
1	8					3 °	NOI U IT AN	AL FIR IS OUT SCREEN	14
1:	9	12BD				CALOUT			15
13	10	12BD	85	57			TA PYL	;SAVE Y FOR OUTLINE	17
1	11	12BF	86	38		S1	IX INDEX2	SAVE INDEX OF DEST IN ARRAY	18
1	12	1201	Α9	00			0A I,0		20
_ 10	13	1203	85	59			TA LINSCA	START OFF SCREEN FLAG AT ON SCREEN	21 22 23 24
) 1	14	1205	A2	0F			X I,OF		23
18	15	1207	86	37			IX INDEX1	*LOOD EOD EACH DT ON OUTLINE	24
19	16 17	1209	A6	37			EGIN DX INDEX1	;LOOP FOR EACH PT. ON OUTLINE	25
2	-	12C9 12CB	BD	03CE			A X,LINEX		27
2	19	12CE	85	56			TA PXL		28
2:		12D0	BD	03DE			A X, LINEZ		30
2	21	12D3	85	58			TA PZL		29 30 31 32 33 34 35
2	22	1205	20	OEE2		19	SR WORSCR	;PROJECT PT.	33
20	23	12D8	A6	38			X INDEX2		34
2		12DA	A4	61			Y SXL		
2	25	12DC	A5	62			DA SXH		37
) 2	26	12DE	30	00			PL	;X OFF SCREEN	37 38 39 40
30	27	12E0 12E2	C9 90	04			MP I,4 FCS		40
3:		12E4	A0	FF			Y I,OFF		42
3	30	12E6	A9	03			A I,3		43
34	4 31	12E8	E6	59			IC LINSCA	;YES	45
3	32	12E3	06			E	NDIF		45 46 47
30	33	12EA	B8	50	00	El	-SE		48
3.		12DF	OD						49
) 3		12ED	C9	FC			1P I,-4		51
39		12EF	80	00			CC C		52
4	36 37	12F1 12F3	A0 A9	01 FC			OY I,1 DA I,-4		54
) 4° 42		12F5	E6	59			NC LINSCA	;YES. SET OFF SCREEN FLAG	55
4	39	12F0	06				ND IF	grade was with www.strace.	49 50 51 52 53 54 55 56 57 58 59 60
4	4 40	12EC	OA				NDIF		58
4	41	12F7	9D	031A		S1	TA X, LINSXH		60
4	42	12FA	98			TY	/A		
4	43	12FB	9D	032A			A X, LINSXL		61 62 63 64 65 66 67 68
4	44	12FE	A4	63			Y SZL		64
4	45	1300	A5	64			DA SZH PL	•7 DEE CODEN	65
) 5 5		1302 1304	30 C9	00 04			P 1,4	; Z OFF SCREEN	67
5		1304	90	00			CS		68
5		1308	AO	FF			Y I,OFF		70
54		130A	A9	03			DA I,3		71 72
5	51	130C	E6	59		IN	IC LINSCA	;YES.	73
50		1307	06				NDIF		74 75
5		130E	B8	50	00	E. L	-SE		69 70 71 72 73 74 75 76 77 78 79
5		1303	OD	<i></i>		^ :	in r		77 78
5	54	1311	C9	FC			P I,-4		79
6	55	1313	В0	00		1†	-CC		80

7											, 0
	1 ALDISP - /2 UTILITY-PF			UNCTIO	ATARI MAC65 V	/M03.09 00 00	02 PAGE	55+		·	1 2 3
	5 57 6 58 1	1317 1319	A9 F0 A0 01 E6 59		LD)	1,-4 (I,1 C LINSCA	ţ,	YES			4 5 6 7 8
	8 60 1	1310	06 0A 9D 033	1	END END STA						9 10 11 12
	10 62 1 11 63	L31E L31F	98 9D 034A C6 38	1	TY/ ST/	A X,LINSZL C INDEX2					13 14 15
	13 65 1	1324 1326	C6 37		DEC MIE	INDEX1					16 17 18 19
			A5 59 60)	LD/ RTS	A LINSCA					20 21 22 22
	18										23 24 25 26
	20 21 22										27 28 29
	23 24 25										30 31 32 33
	26 27										34 35 36
	28 29 30										17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44
	31 32 33										41 42 43
	34 35										44 45 46 47
	36 37 38										
	37 38 39 40 41 42 43										51 52 53 54
)	41 42 43										55 56 57
	44 45 46										58 59 60 61
	47 48										62 63 64
	49 50 51										65 66 67 68
	52										69 70 71
	45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 60										48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 70 71 72 73 74 75 76 77 78 79
	57 58 59										76 77 78
	60										79

LDISP - ALIE			ATARI MAC65 VM03.09 00 00 0	2 PAGE 56	
*			•SBTTL UTILITY-DRA	AN MELL CHADE	
1 2			:INPUT ACC LEVEL #-1	AW NELL SHAFE	
3			·		
4 132B			DSPHOL		
5 132B			JSR LVLWEL	SET UP WELL INDEX ID	
6 132E 7 1330	85 86	36 35	STA SAVEY STX SAVEX	;WELL INDEX ;CYCLE	
8 1332		00	LDA I,0	, CTOLE	
9 1334	85	73	STA VGBRIT		
10 1336	Α9	05	LDA I,5	; MAKE WELL REALLY SMALL	
11 1338	20	0000G	JSR VGSCA1		
12 133B	A5	35	LDA SAVEX	GET CYCLE TIMES THRU ALL WELLS	
13 133D	29	07	AND I,7		
14 133F 15 1340	AA BC	1077	TAX LDY X,SPWECO	GET SPECIAL WELL COLOR FOR CYCLE	
16 1343	84	9E	STY COLOR	JULY STEEL HELL COLOR FOR CTOLE	
17 1345	Ă9	08	LDA I, MZCOLO		
18 1347	20	0000G	JSR VGSTAT	;SET WELL COLOR	
19 1344	AE	0112	LDX WELLID		
20 134D	A5	36	LDA SAVEY		
21 134F 22 1352	BC D0	0B16 00	LDY X, HOLRAP IFEQ	:PLANAR	
23 1354	38	00	SEC	NO. START BEAM AT FIRST POINT	
24 1355	E9	0F	SBC I, OF	IN TABLE FOR CLOSED WELLS	
25 1353	03	<u> </u>	ENDIF		
26 1357	A8		TAY		
27 1358	B9	08C6	LDA Y, NEWLIZ		
28 135B	85	57	STA PYL	AAD WAT T CTON	
29 135D 30 135F	49 AA	80	EOR I,80 TAX	; ADJUST Z SIGN	
31 1360	B9	0706	LDA Y, NEWLIX	\$SAVE COORDS OF 1ST PT	
32 1363	85	56	STA PXL	\$5A72 000A55 01 251 7 7	
33 1365	49	80	EOR I,80	; ADJUST X SIGN	
34 1367		0000G	JSR VGVTR1	;POSITION BEAM AT 1ST PT ON WELL	
35 136A	A9	CO	LDA I,OCO	;TURN BEAM ON	
36 136C	85	73	STA VGBRIT		
37 136E 38 1370	A2 86	0F 38	LDX I,NLINES-1 STX INDEX2		
39	90	30	BEGIN	:LOOP FOR EACH PT ON EDGE	
40 1372	A4	36	LDY SAVEY	graduates is the constructed to the second state of the second se	
41 1374	B9	07C6	LDA Y, NEWLIX	• • • • • • • • • • • • • • • • • • •	
42 1377	AA		TAX		
43 1378	38	<i>= ,</i>	SEC DYL	ane. Til V	
44 1379 45 1378	E5 48	56	SBC PXL PHA	;DELTA X	
46 137C	86	56	STX PXL	CURRENT X OLD X	
47 137E	B9	08C6	LDA Y, NEWLIZ	y comment in the in	
48 1381	A8		TAY		
49 1382	38		SEC		
50 1383	E5	57	SBC PYL	;DELTA Z	
51 1385	AA	£7	TAX	• CHED WAT 7 OLD 7	
52 1386 53 1388	84 68	57	STY PYL PLA	CURRENT Z OLD Z	
54 1389	20	0000G	JSR VGVTR1	DRAW VECTOR TO NEXT PT.	
55 138C		36	DEC SAVEY	printer to the total to the	
56 138E		38	DEC INDEX2		
57 1390	10	EO	MIEND		

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 56+ 2 UTILITY-DRAW WELL SHAPE LDA I,1 1392 A9 01 ; NORMAL SIZE AGAIN 58 59 1394 4C 0000G JMP VGSCA1 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

	- ALIENS		LAY FUN	CTIO ATARI MA	C65 VM03.09 00 0	0 02 PAGE 57	
1				-SBTTI	. DISPLAY STAR FI	ELD	
2							
3	1397			DSTARF			
4	1397		0115		LDA PLAGRO		
5	139A 139C	F0	00 5F		IFNE LDA EYL	•CAVE EVE DOCITION	
7	139E	48	ファ		PHA	; SAVE EYE POSITION	
8	139F	A5	58		LDA EYH		
9	13A1	48	-		РНА		
10	13A2	A5	AO		LDA YDEUNI		
11	1344	48	3464 m		РНА		
12	1345	A9	<u>E8</u>		LDA I,OE8		
13 14	13A7 13A9	85 A9	5F FF		STA EYL LDA I,OFF		
15	13AB	85	5B		STA EYH		
16	13AD	A9	28		LDA I,28		
17	13AF	85	ÃO		STA YDEUNI		
18						-PLANES OF STARS	
19	1381	A2	07		LDX I, NPLANE-1		
20	1383	86	37		STX INDEX1	*LOOD FOR WACH DLANK OF CTARC	
21	1385	A6	37		BEGIN LDX INDEX1	;LOOP FOR EACH PLANE OF STARS	
23	1387	BD	03FE		LDA X, PLANEY		
24	13BA	FO	00		IFNE	;ACTIVE PLANE	
25	13BC	85	57		STA PYL	YES	
26	13BE	A9	80		LDA 1,80	CENTER OF WORLD	
27	13C0	85	56		STA PXL		
28	13C2	A9	80		LDA 1,80		
29	1304	85	58 os		STA PZL		
30 31	13C6 13C8	A5 C9	9F 05		LDA CURWAV CMP I,5		
32	13CA	B0	00		IFCC		
33	13CC	A9	06		LDA I, BLUE	;BLUE STARS IN WAVES 1-4	
34	13CE	88	50	00	ELSE	·	
	13CB	05					
35	1301	8A	ø. ***		TXA		
36 37	13D2 13D4	29 C9	07 07		AND I,7 CMP I,7		
37 38	13D4 13D6	D0	00		IFEQ		
39	13D8	A9	04		LDA I,4		
40	1307	02	- •		ENDIF		
41	13D0	09			ENDIF		
42	13DA	85	9E		STA COLOR		
43	13DC	A8	66		TAY		
44 45	13DD 13DF	A9 20	0000G		JSR VGSTAT		
45 46	13E2	20 A5	37		LDA INDEX1		
47	13E4	29	03		AND I,3	DETERMINE PICTURE SUBROUTINE CODE	
48	13E6	OA			ASL	•	
49	13E7	69	00G		ADC I, PTSTR1		
50	13E9	85	55		STA OBJIND		
51 52	13EB	20	0853		JSR SCAPI2	;DRAW PLANE OF STARS ACC TO SCALE	
52 53	13BB 13EE	32 C6	37		ENDIF DEC INDEX1		
54	13F0	10	C3		MIEND		
55	13F2	68			PLA		
56	13F3	85	AO		STA YDEUNI		

DATE 17-04-1981 18 51 05 USER THEURER JOB TEMPEST PAGE 0073

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 57+ DISPLAY-PLANES OF STARS 13F5 PLA ; RESTORE EYE POSITION 57 68 13F6 STA EYH 58 85 **5**B 59 13F8 68 PLA 13F9 STA EYL 60 85 5F 61 139B 5F ENDIF 13FB AD 011F **ZQPONS** LDA QT5 62 IFNE 63 13FE FO 00 1400 42 LDX LSCORH 64 A6 1402 EO 15 CPX 1,15 65 00 66 1404 90 IFCS 1406 40 LDX LSCORL 67 A6 FE 0200 1408 INC X, 200 68 20 21 22 23 24 25 26 27 1405 ENDIF 69 05 **13FF** OB ENDIF 70 71 140B 60 RTS 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59

		- ALIENS			ICTIO ATARI MA	C65 VM03.09 00 00 0	2 PAGE 58	
3	DISPLAT	-PLANES	UF 51	AKS				
4 5 6	1 2 3					.SBTTL DISPLAY -	ENEMY LINES	
7	4	140C			DSPENL			
8	5	140C	AD	0110		LDA LEVELY+1	;BOTTOM OF WELL	
0	7	140F 1411	F0 60	00		RTS	;WELL ON ;NO. NO ENEMY LINES THEN	
1	8	1410	01			ENDIF	grade rad mranera Links arena	
2	9	1412	A5	5 B		LDA EYH		
3	10	1414	DO	00		IFEQ	; EYE ON WELL	
1	11 12	1416 1418	A5 C9	5F F0		LDA EYL CMP I,OFO	;YES.	
3	13	141A	90	00		IFCS	;PAST END	
7	14	141C	60			RTS	YES. ABORT	
3	15	1418	01			ENDIF		
9	16 17	1415 141D	07 A9	01		ENDIF LDA I,1		
1	18	1410 141F	20	0000G		JSR VGSCA1		
2	19	1422	A5	74		LDA VGLIST	SAVE FOR NEXT TIME	
3	20	1424	48			РНА		
4	21	1425	A5	75		LDA VGLIST+1		
6	22 23	1427 1428	48 A9	00		PHA LDA I,0	;LINE LOOP INDEX	
	24	142A	85	38		STA INDEX2	, EIME COOL IMPEX	
3	25	142C	85	Α9		STA VGY		
	26	142E	A2	0F		LDX I, NLINES-1		
	27	1430	AD	0111		LDA WELTYP IFNE	•DI AMAD	
	28 29	1433 1435	FO CA	00		DEX	;PLANAR ;YES. 1 LESS LINE	
3	30	1434	01			ENDIF		
1	31	1436	86	37		STX INDEX1		
5	32	1/20	* 2	0.3		BEGIN	;LOOP FOR EACH LINE FROM O TO TOP	
ة 7	33 34	1438 143A	A2 A4	03 A9		LDX I,3		
3	35	1434	77	~ 7		BEGIN	SET FIXED CODES	
9	36	143C	BD	1483		LDA X, ENLFIX	; CSTATGREEN, CNTR	
	37	143F	91	74		STA NY, VGLIST		
	38 39	1441 1442	C8 CA			INY DEX		
2	40	1443	10	F7		MIEND		
ŀ	41	1445	84	A9		STY VGY		
5	42	1447	AD	0114		LDA ROTDIS		
3	43	144A	DO	00		IFEQ	;REDO WELL	
	44 45	144C 144E	A6 BD	38 039A		LDX INDEX2 LDA X,LINSTA	;NO	
	46	1451	30	00		IFPL	; ACTION AT NEAR PT	
	47	1453	A2	08		LDX I,0B		
1	48	1455	Δ4	Α9		LDY VGY	AND CORY WARTING CTUES	
2	49 50	1457	81	AA		BEGIN LDA NY,OLDLLO	;NO. COPY VARIABLE STUFF ;COPY VECTOR TO FAR POINT AND	
4	51	1457	91	74		STA NY, VGLIST	; VECTOR TO NEAR POINT	
5	52	145B	C8			INY	•	
6	53	145C	CA			DEX		
7	54 55	145D 145F	10	F8 A9		MIEND STY VGY		
9	55 56	145F 1461	8 4 88	А 9 50	00	ELSE		
ار	70	1452	11	70		Notes that the state of the sta		

1	ALDISP -	ALTENS	DISPI	AY FUNC	CTIO	ΔΤ	ARI MACA	65 VM03.09 00 00 02 PAG	SF 58+	1
2	DISPLAY -									2
3										3 4
4	57	1464	A4	A9				LDY VGY	;NO. SINCE FAR PT. NEED NOT BE	5
5	58	1466	81	AA				LDA NY, OLDLLO	RECALCULATED, COPY IT TO NEW BUFFER.	6 7
6	59	1468	91	74				STA NY, VGLIST	•	8
7		146A	85	6C				STA CURNTY	; Z VECTOR LSB	9
8		146C	C8					INY		10
9		146D	81	AA				LDA NY, OLDLLO		12
10		146F	91	74				STA NY, VGLIST		13
1		1471	C9	10				CMP I,10		15
12		1473	90	00				IFCS		15 16
13		1475	09	ΕO				ORA I, OEO	;SIGN EXTEND	17
) 14		1474	02					ENDIF		19
15		1477	85	6D				STA CURNTY+1	; Z VECTOR MSB	20
16		1479	C8					INY		21 22 23 24
¹⁷ ا		147A	B1	AA				LDA NY, OLDLLO	• V WECTOR I CR	23
18		147C	91 85	74 6A				STA NY, VGLIST STA CURNTX	;X VECTOR LSB	24
19		147E		OA				INY		25 26
) 20 2°		1480 1481	C8 B1	AA				LDA NY, OLDLLO		27 28
22		1483	91	74				STA NY, VGLIST	•	28
23		1485	C9	10				CMP I,10	;	29 30
24		1487	90	00				IFCS		31 32
25		1489	09	E0				ORA I,OEO	;SIGN EXTEND	32
26		1488	02	£ U				ENDIF	\$ STOM EVIEWS	33 34
27		148B	85	6 B				STA CURNTX+1	;X VECTOR MSB	35
28		148D	C8	- 00				INY	The state of the s	37
29		148E	84	A9				STY VGY		38
30		1490		1511				JSR TIPACT	:YES. GENERATE TIP STUFF	39
3		1463	2F					ENDIF	The Charles III Cro.	41
32		1493	88	50	00			ELSE		42
33		144B	4A							43
34	86								;YES REDO WELL	
35		1496	20	1487				JSR FIXSTU	GENERATE FIXED STUFF	45 46 47
36	88	1499	20	1511				JSR TIPACT	GENERATE TIP STUFF	48
37	89	1495	06					ENDIF		49
38	90	149C	A6	38				LDX INDEX2		50
39		149E	16	039A				ASL X, LINSTA	CLEAR LINE STATUS	52
40		1441	E6	38				INC INDEX2		53
4		14A3	C6	37				DEC INDEX1		54 55
42		14A5	10	91				MIEND		53 54 55 56 57 58
43		14A7	68					PLA	;SAVE LOC OF NEW BUFFER	57
) 44		1448	85	AB				STA OLDLHI		59
45		1444	68	4 4				PLA CIPILO		60
46		14AB	85	AA				STA OLDLLO		61 62
) 47		14AD	A4	A9				LDY VGY		62 63 64
48		14AF	88	00000				DEY	AUDDATE MOLICE	64
49		1480	4C	0000G				JMP VGADD	;UPDATE VGLIST	65 66
50								. SOLIL DISPLAT - ENEM	LINES INITIAL FIXED VG CODES	67
5	103								PLACES COLOR STAT	68
52									: CNTR	69 70
00	106								VCTR TO FAR PT.	71
51	107								INTO VGLIST VGY	72
56		1483	80	40	68	05	ENLFIX	.BYTE 80,40,68,05	12:110 10E101 101	74
57		1487	30	40	33		FIXSTU	10116 00140100100		75
58	110	* 1 W T					, 17310		CALCULATE SCREEN LOCATION OF	76
59	111								FAR POINT	78
60		1487	A5	38				LDA INDEX2	grown romant	79
		and 1 No. 7		₹ ₩						100

DICD - ALTEN	מזומ כ	I AV EUNCTT	O ATARI MAC65 VM03.09 00 00 02	DACE SOL	
DISP - ALIEN SPLAY - ENEM			FIXED VG CODES	PAGE 30+	
112 1400	* *		TAV		
113 14B9 114 14BA	AA 18		TAX CLC	; AVERAGING SCREEN COORDNATE	
115 1488	69	01	ADC I,1	OF ADJACENT LINES	
116 14BD	29	0F	AND I, OF	you abonouss Exists	
117 14BF	A8	<u>.</u>	TAY		
118 14C0	BD	036A	LDA X, LIFSXL		
119 14C3	38		SEC	;ROUND	
120 14C4	79	036A	ADC Y, LIFSXL		
121 14C7	85	61	STA SXL		
122 1409	BD	035A	LDA X, LIFSXH		
123 14CC	79	0354	ADC Y, LIFSXH		
124 14CF	85	62	STA SXH ASL		
125 14D1 126 14D2	0 A 66	62	ROR SXH		
126 14D2 127 14D4	66	61	ROR SXL		
128 14D6	BD	0384	LDA X, LIFSZL		
129 14D9	38		SEC	; ROUND	
130 14DA	79	038A	ADC Y, LIFSZL		
131 14DD	85	63	STA SZL		
132 14DF	BD	037A	LDA X, LIFSZH		
133 14E2	79	037A	ADC Y, LIFSZH		
134 14E5	85	64	STA SZH		
135 14E7	0 A	£ 1.	ASL BOD 57H		
136 14E8 137 14EA	66 66	64	ROR SZH ROR SZL		
137 145A 138	90	03	NUN SZL	;FALL INTO YVGVCT	
139			-SBITE UTILITY - 0	UICK BLANK VECTOR FROM SX,SZ	
140				TY 2 WITH SXL 2 AND SZL 2 .	
141			;UPDATES VGY		
142 14EC	Δ4	Α9	YVGVCT LDY VGY		
143 14EE	A5	63	LDA SZL		
144 14F0	91	74	STA NY, VGLIST		
145 14F2	C8	4.0	INY STA CHRAITY		
146 14F3	85 A5	6C	STA CURNTY LDA SZH		
147 14F5 148 14F7	д э 8 5	64 6D	STA CURNTY+1		
149 14F9	29	1F	AND I,1F		
150 14FB	91	74	STA NY, VGLIST		
151 14FD	C8		INY		
152 14FE	A5	61	LDA SXL		
153 1500	91	74	STA NY, VGLIST		
154 1502	C8		INY		
155 1503	85	6A	STA CURNTX		
156 1505	A5	62	LDA SXH		
157 1507	85	6B	STA CURNTX+1		
158 1509	29	1F	AND I, IF		
159 150B 160 150D	91 C8	74	STA NY, VGLIST INY		
160 1500 161 150E	84	A9	STY VGY		
162 1510	60	~ 7	RTS		
163				NEMY LINES TIP STUFF	
164			THE PROPERTY AND ADDRESS OF THE PROPERTY A	;	
165				PLACES VECTOR TO NEAR PT AND	
166				; DOT STAT COLOR, JSRL DOT OR	
167				; SHATTER SCAL, SHATTER JSRL PIC	
168				; INTO VGLIST VGY	
169 1511			TIPACT	;OR IF INACTIVE, 4 SCAL 1,05	

Ψ-											
1	ALDISP -	ALIENS	DISP	LAY FUN	CTIO	ATARI MAC	65 VM	03.09 00 00	02 PAGE	58+	1
2	DISPLAY -	- ENEMY	LINE	S TIP	STUFF						2 3
3											4
4	170	1511	A6	38				INDEX2			5
5	171	1513	BD	03AC				X, LINEY		~ 4 T \ 1 P P T \ 1 P P	7
6		1516	DO	00			IFEQ			LINE ACTIVE	8
7	173	1518	A4	A9			LDY			NO. FILL WITH SCAL 1,0	10
8	174	151A	A2	03			LDX BEGI			HOOD TO EILL A BATEC	11
9		151C	Α9	00			LDA			COOP TO FILL 8 BYTES SCAL 1.0 LSB NOOP	12
11		151E	91	74				NY, VGLIST		SCAL IN LSB HOUP	14
12		1520	C8	17			INY	WI F VOLISI			15
13		1521	A9	71			LDA	1.71		SCAL 1,0 MSB NOOP	17
14		1523	91	74				NY, VGLIST		10012 210 1100 11001	18
15		1525	C8	* *			INY	,			19
16		1526	CA				DEX				21
17		1527	10	F3			MIEN	D			22
18		1529	84	A9			STY	VGY			24
19	185	152B	88	50	00		ELSE				9 10 11 11 12 13 14 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
20		1517	16								26 27
2	186	152E	85	57			STA	PYL		LINE IS ACTIVE	28
22	187									CALCULATE NEAR PT.	29
23	188	1530	20	129D				CHKDEP		YES, CHECK EYE	31
24		1533	BD	0435				X,LINEXM		X COORD OF MIDWAY PT.	32
25	190	1536	85	56			STA			T COODS OF MISSIAN ST	33
26	191	1538	BD	0445				X,LINEZM		Z COORD OF MIDWAY PT.	35
27		153B 153D	85 20	58 0EE2			STA	WORSCR		PROJECT ENEMY LIVE NEAR PT.	36
28	193	1930	20	VEEZ			334	WUNSCK		SAVE NEW COORDINATES	38
30		1540	20	1586			158	FCONNEC		DRAW VECTOR TO NEAR PT.	39
3		1543	A6	38				INDEX2		DAM FECION TO MEAN 1 14	41
32		1545	BD	039A				X, LINSTA			42
33		1548	29	40			AND				43
34	199	154A	FO	00			IFNE			WHAT S HAPPENING AT TIP	45
35	200	154C	20	0888			JSR	CASCAL		SHATTERED	46
36	201									SET PROJECTION SCALE	48
37		154F	AD	60CA				RANDOM			49
38	203	1552	29	02			AND	I,2			51
39		1554	18				CLC				52
40	205	1555	69	00G				I,PTSPAR		ANTTENNIANT CHATTER NIC	53
4	206	1557	AA	20000			TAX	V DICUI		DETERMINE SHATTER PIC	55
43	207	1558 1558	BD C8	0000G			INY	X,PICHI		INSERT JSRL TO SHATTER PIC	56
44	209	155C	91	74				NY, VGLIST		PINDER! USIL TO SHATTER FILE	58
4	210	155E	88	# - T			DEY	, +			59
46	211	155F	BD	0000G				X,PICLO			61
47	212	1562	91	74				NY, VGLIST			62
48	213	1564	C8				INY				63
49	214	1565	C8				INY				65
50	215	1566	84	A9			STY				66
5		1568	88	50	00		ELSE				68
52		1548	1F								49 50 51 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76
53	217	156B	A4	A9		WHITIP	LDY			JUST A DOT AT TIP	70
54	218	156D	A9	00				I, WHITE		COLOR SET STAT WHITE	72
55		156F	91	74				NY, VGLIST			73 74
56	220	1571	C8	40			INY	T 40			75
57	221	1572 1574	A9 91	68 74			LDA	NY, VGLIST			76
) S	223	1576	C8	1 T			INY	11 9 VULLO 1			78
5	224	1577	AD	0000G				JSRDOT		INSERT JSRL TO DOT	79
00	5m 5m "3	*** * * *	7732	55555						A A A A A A A A A A A A A A A A A A A	

)—						
1	ALDISP .	- ALIENS	DISPL	AY FUNCTIO	ATARI MAC65 VM	VM03.09 00 00 02 PAGE 58+
2	DISPLAY	- ENEMY	LINES	TIP STUFF		
3	225	1574	0.3	77.	CTA	A NY VGLIST
5		157A 157C	91 C8	74	INY	6
6		157D		0000G		A JSRDT1
7	228	1580	91	74		A NY, VGLIST
8		1582	C8	• •	INY	
9		1583	84	A9		Y VGY
10		156A	14		END I	DIF 13
11		152D	57		ENDI	DIF $_{1\epsilon}$
12		1585	60		RTS	<u>S</u>
13	1				•SB1	BTTL DISPLAY UTILITY - FAST CONNECT
14						DRAW VECTOR OF INTENSITY 0A0
15 16		1586	A4	Α9	FCONNEC	FROM CURNTX, Y, TO SX, SZ LDY VGY
17		1588	A5	63		A SZL
18		158A	38	03	SEC	23 C 24
19		158B	E5	6C		C CURNTY 25
20		158D	91	74		A NY, VGLIST
21		158F	C8		INY	Υ
22		1590	A5	64		A SZH
23		1592	E5	6D		C CURNTY+1
24		1594	29	1F		D I, IF
25 26		1596 1598	91 C8	74	INY	A NY, VGLIST
27		1599	A5	61		35 A SXL
28		159B	38		SEC	C 30
29		159C	E5	6A		C CURNTX
30	251	159E	91	74	STA	A NY, VGLIST
31		15A0	C8		INY	40
32		15A1	A5	62		A SXH
33		15A3	E5	6B		C CURNTX+1 44
34 35		15A5 15A7	29 09	1F A0		D I,1F
35		15A9	91	74		A I,0A0 A NY,VGLIST
37		15AB	C8	# " T	INY	48 Y
38		15AC	84	A9		Y VGY
39	260	15AE	60		RTS	S 51
40						49
40 41 42 43						54 55
42						56
43						57

)-								14121
1 2 2	ALDISP -			LAY FUNCTI	O ATARI MAC	65 VM03.09 00 00	0 02 PAGE 59	1 2 3
5	1 2	15AF	40	00	VGYAB1	.SBTTL UTILITY	- VG ABS POS	5 6 7
6 7 8	3 4 5	15AF 15B1 15B2	98 91	74		TYA STA NY, VGLIST		8 9 10 11
9 10 11	6 7 8	1584 1586 1587	A9 C8 91	71 74		INY STA NY, VGLIST	;SCALE BINARY 1, LINEAR O	12 13 14
12 13	10	1589 158A 158C	C8 D0 A0	02 00	VGYABS	INY BNE NOLABS LDY I,0		16 17 18
15 16	12	15BE 15C0 15C2	A9 91 A9	40 74 80	NOLABS		; INPUT X BASE PAGE LOC OF SCREEN COORDINATE PAIR ; VG CENTER	20 21 22
18 19 20	15 16	15C4 15C5 15C7	C8 91 C8	74		INY STA NY, VGLIST INY		23 24 25 26
21 22 23 24	18	15C8 15CA 15CC	85 85 91	02 6C 74		LDA ZX,2 STA CURNTY STA NY, VGLIST	;VCTR DELTA Z	27 28 29 30
24 25 26	21	15CE 15CF	C8 B5	03		INY LDA ZX,3	, VOIN DELIA L	31 32 33 34
27	24	15D1 15D3 15D5	85 29 91	6D 1F 74		STA CURNTY+1 AND I,1F STA NY, VGLIST		12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
28 29 30 31	28	15D7 15D9 15DB	85 85 C8	00 6A		LDA ZX,0 STA CURNTX INY		39 40 41
32 33 34	30 31	15DC 15DE 15E0	91 85 85	74 01 68		STA NY, VGLIST LDA ZX, 1 STA CURNTX+1	;DELTA X	43 44 45
35 36 37	33 34	15E2 15E4 15E5	29 C8 91			AND I,1F INY STA NY, VGLIST		48
38 39 40	I 7.	15E7	40	0000G		JMP VGADD	;OUTPUT BEAM AT ABS. POS. ;CURNTX,Y BEAM COORDS. ;VGLIST UPDATED	50 51 52 53
) 41 42 43								54 55 56 57
44 45 46								58 59 60 61
47 48 49								62 63 64 65
50 51 52								66 67 68 69
53 54 55								49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74
56 57 58								74 75 76 77 78 79
59								78 79 80

JOB TEMPEST PAGE 0080 DATE 17-04-1981 18 51 05 USER THEURER ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 60 2 UTILITY - VG ABS POS HLL65 2 3 5 12 13 14 15 0001 .END 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79

_													412
_ [·			DISPLAY FUNCTIO	ATARI MAC65 VM03.09	00	00 (02 PAGE 60+					1	
	SYMBOL 1	TABLE										2	3 0 "
1	3									2		4	1
_ 4	4 ACT IP	0344	ALLPOT 60C8		0D8		ALTCOL	06A9	R	AUDCTL	60C8	5	5
	5 AUDC1	60Cl	AUDC2 60D1		0C0		AUDF2	60D0	_	AUD2CT	60D8	7	
6	BCCURS	**** G	BCENEL ****		***		BCINFO	****		BCINVA	****	8	3
7	7 BCNYMP	**** G	BCSHOT ****			G	BCWELL	****		BFACTR	0078	9	0
) 8	BFASTA	**** G	BFAST1 ****			G	BFBST1	****	G	BIGTEX	017C		1
9	BINSCA	005A	BLDWEL 1157		156		BLUE	0006		BLULET	0007	12	2
1	OBOFLAS	0124	BONUS 0102		412		BOOKKS	0406	•	BOOMFL	010D		3 4
) 1	1 BOOMTI	010E	BOXPRO ****		415		BUFASH	****		BUFASL	****	11	5
1	BUFBSH	**** G	BUFBSL ****		054		BUFSWH	****	G	BUFSWL	****	10	6
1	3 CALMAG	079F R	CALOUT 12BD		108		CAMSTA	0100		CASCAL	0888		7 8
) 1	4 CBOOM	0024	CBUF1 0078		004		CDBOXP	0012		CDGETI	0006	19	9
1	5 CDGOVR	000C	CDHITB 000A		014		CDLOGP	0014		CDPLAY	0000	20	0
1	6 CDPLPL	000E	CDPRST 0010		8000		CDROP	0020		CDSYST	0002	2.	1 2
) 1	7 CD2GAM	0016	CENDGA 0008		0006		CENDWA	000E		CGETIN	0012	23	3
1	8 CHACHA	00A7	CHACOU 0135		8 A O		CHARCO	02F2		CHARL1	02AD	24	4
1	9 CHARL2	02C0	CHARY 02D3		2E6	0.0	CHISCH	0010	0	CHKDEP	129D	25	1 2 3 4 5 6 6 7 8
) 2	CHKSM6	02E1 RG	CHKSM7 0B46		2BC	KG	CHPLKI	0635	K	CINIRA	0010	2	7
2	CINVAL	0000	CLOGO 001A		001		CNEWAV	0000		CNEWGA	0000		
2	2 CNEWLI	0002	CNEWV2 0018		014		CNWLF2	001E		COCKTA	0010	29	0 0
) 2	COCTAL	0117	COLOR 009E		008		COLRAM	0019	C	COLTAB	1047	3:	9 0 1 2 3 3 4 4 5 5 6
2	4 CONNEC	1204 R	CPAUSE 000A		004		CPSPXI	FFFF	U	CPULSO	000D	32	2
2	CPULS1	000C	CPULS2 000B		OOA		CPULS4	0009		CREQRA CR4	0016	34	4
$ z _{\alpha}^{2}$	CRO	00F0	CRI 00F0 CSUSTA 0003		0B8		CR3	0088		CURMOD	0080	38	5
2	CSUINT CURNTX	0001			022		CURCOL	0001			0106	33	
2	9 CURSVH	006A 0105			200		CURSL2	0201 0107		CURSPO CURS4E	0051 0E1C	38	8
7 2	CURWAV	0105 009F	CURSVL 0104 C8 ODFF		202 04C		CURSYL Delta8	0544	۵	DENORM	007A	35	8 9
3	DEPCOL	0006	DGOVER ****		04C		DG000	002C	N	DG225	007A	40	0
3	DG450	0006 00CF	DGOVER **** DG675 OOAA		080		DISPLA	0000	P.C.	DIO	00F0	42	2 3
7 3	2 D6450 3 DII	00B8	DI2 0080		048		DISPLA DI4	0010	NO	DPLPLA	****	43	3
2	DPRSTA	**** G	DROUTA 0062		07A	R	DSBOOM	0704	R	DSPCHG	05A5	4-	4 5
3	5 DSPCUR	03D0 R	DSPENL 140C)5E4		DSPHOL	132B		DSPINV	03F7	44	6
7 3	6 DSPNYM	02E2 R	DSPSYS ****		181		DSTARF	1397		DSTATE	0057	47	7
3		**** G	D2GAME ****				EACTL				6000	4	9
3	8 EAIN	6050	ELICNT 0123		0003	3	ENLFIX	14B3		ENSIZE	0151	50	0
3	ESHCOU	0046	EXCESS 039A		10A		EXL	005E		EXPCOL	0000	5	0 1 2 3 4 4 5 6 6 7 7 8 8 9 9 0 0 1 1 2 2 3 3 4 4 5 6 6 6 6 7
4	EXPCOU	0116	EXPLOL 02FA		312		EXPLOT	0302		EXPLOY	030A	5.5	3
	1 EYEFAC	0065	E Y H 005B		05F		EYLDES	005D		EYLL	005C	54	4
4	2 EZL	0060	FARY 014E		00B		FCONNE	1586	R	FGREEN	0007	55	5
4	FIXSTU	1487 R	FLASH 000F		603		FLICOL	0003	.,	FLIPCO	0142	5.	7
4	4 FLIPIC	0435 R	FLITAB 0455		009	G	FPSTAR	067E	R	FRED	000C	58	8
4	5 FRTIMR	0053	FUSECO 0146		4E5		GAMOP1	071E		GAMOP3	071F	59	9
4	6 GETDSP	**** G	GREEN 0005		000	•	HIRATE	0127		HIWAVE	0126	6	1
4	HOLEYL	OAD6 R	HOLEZL DAE6		B16	R	HOLZAD	OAF6		HOLZDH	0806	62	2
4	8 HRANKH	0620	HRANKL 061E		61F		HRED	000D	•	HSCORH	0708	63 63	4
4	9 HSCORL	0706	HSCORM 0707		0000		IEYL	0004		IJMPDS	047E	65	5
5	ILINAN	09C6 R	ILINDD 00F0		010		INCCOU	0109		INDEX1	0037	60	6
5	INDEX2	0038	INDEX3 0039		03A		INDYHI	003C		INDYLO	003B	0.0	
5	2 INFO	**** G	INICOL OFEO		FB8	RG	INIMAT	100D		ININDX	0604	69	8 9 0 1 2 3 4 4 5 6
5	3 INITAL	0606	INITEM ****		.07F		INMCOU	0108		INOPO	0D00	70	0
5	4 INOP1	0E00	INPUT 004A		000		INTENS	0098		INTIME	0128	7:	2
5	5 INVABI	0007	INVACT 02A6		283		INVAC2	028A		INVAL1	0289	7:	3
5	6 INVAL2	02CC	INVAY 02DF		29F		INVALE	0E2C	R	INVALS	OEIC	7.	4
5	7 INVCAM	0291	INVCAR 0003		0003		INVDIR	0080		INVERS	****	73	6 4
5	8 INVEXP	**** G	INVFIR 0040		298		INVMOT	0080		INVPIC	0421	[7]	7 25
5	INVPIE	0435 R	INVPIT 042B		040		INVSEQ	0018		INI	0000	78	8
6		**** G	JMPALO ****			G	JMPBLO		G	JMPMAH			9

) -												
Г	1 ALDISP	- ALIENS DISPLA	Y FUNCTIO	ΔΤΔΒ	I MAC65 VM03.0	9 00 00	02 PAGE 60+					127
	2 SYMBOL		. , 0,10,120	******		, 00 00						2
	3											4
	4 JMPMAL	**** G	JMPMA2	**** G		**** G	JMPMH2	**** G	JMPMH4	**** G		5
	5 JSRDOT	**** G	JSRDT1	**** G	JUMPX	04D5 R	JUMPZ	04D1 R	KILLER	**** G		6 7
	6 LCIRCL	07D5 R	LCROSS	07F5 R		07E5 R	LDRDSP	**** G	LEDOFF	0003	{	8
	7 LEFSID	00 7 B	LETCOL	0005		010F	LIFSXH	035A	LIFSXL	036A		9
	8 LIFSZH	037A	LIFSZL	038A		1286 R	LINANG	03EE	LINEX	03CE	1	10
	9 LINEXM	0435	LINEY	03AC	LINEZ	03DE	LINEZM	0445	LINSCA	0059	1	12
	LINSTA	039A	LINSXH	031A		032A	LINSZH	033A	LINSZL	034A	1	13
	LINTOS	126D R	LITRAL	OOAC		0048	LIVES2	0049	LOGPRO	**** G	1	14 15
ľ	LPEANU	0805 R	LSCORH	0042		0040	LSCORM	0041	LVLWEL	1132 R		16 17
	LVSGAM	0158	MAH	6081	MAL	6080	MATRAC	0080	MBH	6083	1	18
	MBL MDITES	6082 0020	MBSTAR MDYPL	6080	MCOINC MECHS	0002	MCOINL	0004	MCOINR	0001		18
	16 MFAKE	0080	MFH	6098 6087	MFIRE	0003	MEH MFL	6085 6086	MEL MFLIP	6084 0004		20
	7 MGTMOD	0040	MHALT	0040		0004	MLED1	0002	MLED2	0001	2	22
\cup	18 MMCCNT	0002	MNL	608C		0020	MOPT13	0007	MRCCNT	0001	2	23
	MSTAT	6040	MSTRT1	0020		0040	MSUZA	0008	MSZXD	6094	2	21 22 23 24 25 26 27 28
	MTEMP	0031	MTEST	0010		0008	MVINVY	0010	MXH	6089	2	26
	MXL	6088	MXPH	6096	MXPL	6095	MYHIGH	6070	MYLOW	6060		27
:	22 MZBRIT	0000	MZCOLO	0008	MZHH	6090	MZHL	608F	MZLH	608E		
	23 MZLL	608D	M10	04FA R		0080	NCHARG	000C	NCRS1E	OE3C R	3	30
	24 NCRSIS	OE2C R	NCRS2E	OE4C R		OE3C R	NCRS3E	OE5C R	NCRS3S	OE4C R	3	29 30 31 32 33 34 35 36
:	NCRS4E	OE6C R	NCRS4S	OE5C R	NCRS5E	DE7C R	NCRS5S	DE6C R	NCRS6E	OE8C R	3	33
	NCRS6S	OE7C R	NCRS7E	OE9C R	NCRS7S	OE8C R	NCRS8E	OEAE R	NCRS8S	OE9C R	3	34
	NEARY	014D	NEOFLI	014F	NEWAIT	00A3	NEWLIX	07C6 R	NEWLIZ	08C6 R	3	36
	NEWPLA	003F	NEXPLO	8000		0100	NGAMEO	040E	NGAMIH	040D	3	37 38 39 40
	19 NGAMIL	040C	NGAM2H	0410		040F	NGAM20	0411	NGAVGH	0413	3	38 39
;	NGAVGL	0412	NGAVGZ	0414		8000	NICHAR	0004	NINVAD	0007	4	40
	NLINES	0010	NNYMPH	0040		15BE R	MYMON	0393 R	NOOPR	0061 R	4	41
	NPARTI	0010	NPCHAR	0008		0008	NPLAYR	0101	NRANKS	0063	4	42 43
;	NROMS	000C	NUM	0002		003E	NWNYMC	015B	NWTELI	015A	4	44
	NYMCOL	000C	NYMCOU	03AB	NYMPL	0203	NYMPY	0243	OBJIND	0055	4	45 46
	OCURSL	00A5	OFRTIM	0044		OOAB	OLDLLO	OOAA	OLOFLI	0150	4	46 47
;	OM2GAM	0001	ONELIN	OBEA R		0C15 R	OPFLIP	013D	OPFUSE		4	48 49
	OPPULS	013E	OPSPIN		OPTANK		OPTIN1	0009	OPTIN2			
	OPTIN3 PARLIX	0164	OTB Parliy	0052	OUTANK PARLIZ		PARLXA	1188 R	OTU	4000	5	51
ľ	PARLYA	0203 0020	PARLYV	0223 02E3		0020	PARLZY	0020	PARLXV PARTIX	0263	5	52 53
	PARTIY	0283	PARTIZ	0243		0000	PARTXV	0323	PARTYA	0000	5	54
	12 PARTYV	0343	PARTZA	0000		0363	PCHCOL	0001	PCOUNT	0600 R	5	55
	PCVELO	0009	PDIRED	000B		0009	PDIYEL	000A	PICHI	**** G		50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
	PICLO	**** G	PINDEX	0505 0505 R	PLAGRO		PLANEY	03FE	PLAYUP	003D	5	58
	POKEY	6000	POKEY2	60D0		60CB	POTGO2	60DB	PPSPXI	0007 G	5	60
	PPSTAR	067C R	PROG	9000	PSCALE		PSHCTR	0008	PTCURS	**** G	6	81
	7 PTESHO	**** G	PTEXP1	**** G	PTFUSE		PTFUSX	**** G	PTSPAR		6	32
<u> </u>	18 PTSPII	**** G	PTSPLA	**** G		**** G	PTSTR1	**** G	PTTANE	**** G	6	64
4	19 PTTANK	**** G	PTTANP	**** G		00B2	PULPIC	0565 R	PULPOT	0157	6	35
	PULSCO	0143	PULSON	0148	PULSOE		PULSOS	OEDE R	PULS1E	OEDE R	6	36
	PULSIS	OED6 R	PULS2E	OED6 R	PULS2S	OEC8 R	PULS3E	OEC8 R	PULS3S	OEBA R	6	68
	PULS4E	OEBA R	PULS4S	OEAE R	PULTAB	059F R	PULTIM	0147	PULVEL	FEAO	6	65 666 67 68 69 70 71 72 73
	PURPLE	0002	PXL	0056		OOEC	PXI	00D5	PX2	0081	7 ₇	70 71
	PX3	0090	PYL	0057		0058	PZO	0094	PZ1	0080		72
	PZ2	00B8	PZ3	00A7	QCHKS6		QCHKS7	**** G	QCHKS8		7	73
	QDSTAT	0001	QFRAME	0003		0002	QSTATE	0000	QSTATU	0005	7	74 75
:	OTMPAU	0004	QT1	0085		016C	QT3	0455	QT4	0720	7	76 4
	58 QT5	011F	QT6	011B	QUASEC		RANDOM	60CA	RANDO2			77 丛
	89 RANKS	0600	RATS	0000		0003	RITSID	007C	ROMSTA	3000	/7	78 79
(ROTCOL	06BF R	ROTDIS	U114	ROTFLG	U113	RQRDSP	**** G	RSCORH	0045	8	30

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ALDISP SYMBOL	- ALIENS DISPLAY	' FUNCTIO	ATARI	MAC65 VM03.	09 00 00 02	PAGE 60+				
		0.000011	0044	21110110	0000	011211 00	0.201 0	~ 4 * * * * * * * * * * * * * * * * * *	000***	
RSCORL	0043	RSCORM	0044	RUNGVG	0080	RUNLOC	02D1 R	SAVEND	03CE	
SAVEP	03BC	SAVEX	0035	SAVEY	0036	SBCACT	0128 R	SBCLOG	0108 R	
SBCSWI	0148 R	SCALE	**** G	SCALI	**** G	SCAL3	**** G	SCAPIC	0847 R	
SCAPI2	0B53 R	SCFL	0079	SECOND	0014	SECOPH	0408	SECOPL	0409	
SECOPM	040A	SECOUH	0408	SECOUL	0406	SECOUM	0407	SECUVG	0086	
SECUVY	016E	SETSHR	06D2 R	SHRSCA	06E0 R	SKCTL	60CF	SKCTL2	60DF	
SPACG	0000	SPARE3	0133	SPBINA	013A	SPECIA	0698 R	SPFTIM	013C	
SPINCO	0145	SPLINE	0139	SPOKE	1238 R	SPOKST	0425	SPWECO	1077 R	
SPXIND	013B	STALOC	02C0 R	SUBCOU	0099	SUZCNT	03AA	SUZTIM	0125	
SVGLIS	0076	SWAPVG	078E RG	SWFINA	004E	SWRELE	004F	SWSTAT	004D	
SWSTRT	004D	SXH	0062	SXL	0061	SYM	6092	SZH	0064	
SZL	0063	Sl	152C R	\$2	1569 R	S3	154A R	S4	1487 R	
S5	13D6 R	S6	01F7 R	S7	OIFF R	TANCOL	0002	TANKCO	0144	
TANPIC	0459 R	TANTAB	0468 R	TBHD	0050	TBLIND	0602	TCMFLG	00A2	
TEMPL	002A	TEMPX	002E	TEMPY	002F	TEMPZ	0030	TEMPO	0029	
TEMP1	002A	TEMP2	002B	TEMP3	002C	TEMP4	002D	TEXTYP	062F R	
TIMHIS	0605	TIPACT	1511 R	TNKOUT	00A1	TOUTO	0084	TRACOL	0005	
TRAPIC	046C R	TRATAB	047A R	TSLAMR	000B	TSPCOD	0687 R	TSPTIM	0674 R	
TURQOI	0004	TYPCOD	015E	UNITXH	009B	UNITXL	009A	UNITZH	009D	
JNITZL	009C	UPCURN	1220 R	VBASE	OEIC R	VECRAM	2000	VGADD	**** G	
VGADD2	**** G	VGADD3	**** G	VGBRIT	0073 G	VGCNTR	**** G	VGDOT	0384 RG	
VGHALT	**** G	VGHEXZ	**** G	VGJSRL	**** G	VGLIST	0074 G	VGRTSL	**** G	
VGSCAL	**** G	VGSCAL	**** G	VGSIZE	0072 G	VGSTAR	4800	VGSTAT	**** G	
VGSTA1	**** G	VGSTOP	5800	VGVCTR	**** G	VGVTR1	**** G	VGVTR2	**** G	
VGSTAL	0049	VGYABS	15BC RG	VGYAB1	15AF RG	WAVENI	0046	WAVEN2	0047	
NCHAMX		WCHARF		WCHARI		WCHARL		WELBIN	0B36 R	
	011A		0119		0118		0120			
MELCOL	0006	WELLID	0112	WELLIS	0B26 R	WELPIC	1183 R	WELSEN	OAD6 R	
WELSEQ	OAC6 R	WELTYP	0111	WFLICA	015D	WFLMAX	012E	WFLMIN	0129	
WEUFRQ	015F	WFUMAX	0132	WFUMIN	012D	WFUSCH	0159	WFUSIH	0169	
WFUSIL	0164	WHICHB	0781 R	WHITE	0000	WHITIP	156B R	WINVIL	0160	
NINVIN	0165	MLNNIM	011D	WINVMX	011C	XMMYNW	OllE	WORSCR	OEE2 R	
MPULCA	015C	WPULFI	016D	WPUMAX	012F	WPUMIN	012A	WSPMAX	0131	
WSPMIN	012C	WTACAR	0149	WTAMAX	0130	WTAMIN	0128	WTCHDG	5000	
WTFMAX	0136	WTTFRA	00B3	XADJL	0066	XCOMP	006E G	XSUBR	06A1 R	
KOH	0080	XOL	0078	X1H	0081	X1L	0079	X2H	0082	
(2L	007A	X3H	0083	X3L	00 7 B	X4H	0084	X4L	007C	
(5H	0085	X5L	007D	X6H	0086	X6L	007E	X7H	0087	
(7L	007F	YCOMP	0070	YDEUNI	00A0	YELLOW	0001	YVGVCT	14EC R	
ZABFLI	0000	ZABFUS	0004	ZABPUL	0001	ZABTAN	0002	ZABTRA	0003	
ZADEST	0121	ZADJL	0068	ZAPCOL	0000	ZATVG1	00C3 RG	ZATVG2	0024 RG	
ZBLACK	000F	ZBLUE	000B	ZCARFL	0001	ZCARFU	0003	ZCARNO	0000	
CARPU	0002	ZDIRDO	0080	ZDIRUP	0000	ZFIRNO	0000	ZFIRYE	0040	
ZGREEN	0007	ZMOTJM	0080	ZMOTMO	0000	ZPNLOC	OOAE	ZPOFFS	OOAF	
ZPURPL	0008	ZQATLI	03A1 RG	ZQPOKS	0620 RG	ZQPONS	13FB RG	ZRED	000C	
ZROCCW	0040	ZROTCW	0000	ZTURQO	0003	ZWHITE	0000	ZYELLO	0004	
ZOH	0090	ZOL	0088	Z1H	0091	Z1L	0089	Z2H	0092	
Z2L	008A	Z3H	0093	Z3L	008B	Z4H	0094	Z4L	008C	
Z5H	0095	Z5L	008D	Z6H	0096	Z6L	008E	Z7H	0097	
27L	008F	\$BC	0018	\$BCCNT	0016	\$CCTIM	0013	\$CMODE	0009	
CNCT	0017	\$CNSTT	000D	\$COINA	0008	\$ INTCT	0007	\$LAM	0008	
SLMBIT	0008	\$LMTIM	000C	\$PSTSL	0010	\$TEST	0008	\$\$CRDT	0006	
·Z·	0002		0001	***PUV	0000		0010		0000	
		•••ONF				•••RD		•••SPU	0000	
· · · SUV	0000	• • • T	1585 R	UV	0006	•••X	0000			
. ABS.	0721 00									

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DATE 17-04-1981 18 51 05 USER THEURER JOB TEMPEST PAGE 0084 RK1 ALDIS2, ALDIS2.LST ALDIS2 6 7 DATE 17-04-1981 18 51 05 USER THEURER JOB TEMPEST PAGE 0085

ALDISP - ALIENS DISPLAY FUNCTIO ATARI MAC65 VM03.09 00 00 02 PAGE 60+ 2 SYMBOL TABLE RK1 ALDIS2.OBJ.RK1 ALDIS2.LST DK1 ALDIS2 A TOTAL OF 11,177 STATEMENTS WERE PROCESSED. 8 CPU TIME - 00 00 00.4 I/O TIME - 00 00 00.0 14 15 18 19 20 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 45 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 71 72 73 74 75 76 77 78 79